TEST REPORT

Applicant:	Zhejiang Lierda Internet of Things Technology Co., Ltd.
Address:	Room 1402, Building 1, No. 1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang Prov.
Equipment Type:	UB37 Series Wi-Fi6 Modules
Model Name:	L-NLEUB37-G5NN4 (refer to section 2.3)
Brand Name:	Lierda
FCC ID:	2AOFDL-NLEUB37
Test Standard:	47 CFR Part 15 Subpart C (refer to section 3.1)
Sample Arrival Date:	Sep. 18, 2024
Test Date:	Sep. 19, 2024 - Oct. 12, 2024
Date of Issue:	Nov. 08, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Li Ganming **Checked by:** Ye Hongji **Approved by:** Sunny Zou (Technical Director)

Revision History

Version	Issue Date	Revisions
Rev. 01	Nov. 04, 2024	Initial Issue
Rev. 02	Nov. 08, 2024	Updated table format in section A.6.

TABLE OF CONTENTS

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.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Zhejiang Lierda Internet of Things Technology Co., Ltd.
Address	Room 1402, Building 1, No. 1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang Prov.

2.2 Manufacturer Information

Manufacturer	Zhejiang Lierda Internet of Things Technology Co., Ltd.
Address	Room 1402, Building 1, No. 1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang Prov.

2.3 General Description for Equipment under Test (EUT)

EUT Name	UB37 Series Wi-Fi6 Modules
Model Name Under Test	L-NLEUB37-G5NN4
Series Model Name	L-NLEUB37-G5NN4-U, L-NLEUB37-G5NN4-P, L-NLEUB37-G5NN4-L, L-NLEUB37-G5NN4-E
Description of Model name differentiation	All models have the same hardware and software, only differ in the following content: L-NLEUB37-G5NN4 without IPEX terminal, no TVS electrostatic protection; L-NLEUB37-G5NN4-P with IPEX terminal, no TVS electrostatic protection; L-NLEUB37-G5NN4-U with IPEX terminal, no TVS electrostatic protection; L-NLEUB37-G5NN4-L with IPEX terminal, no TVS electrostatic protection, LDO power supply; L-NLEUB37-G5NN 4-E without IPEX terminal, no TVS electrostatic protection. (this information provided by the applicant)
Hardware Version	01
Software Version	01
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	Bluetooth BLE WIFI 802.11b, 802.11g, 802.11n and 802.11ax

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 MHz + (N-1)*5 MHz, where - f_c = “Operating Frequency” in MHz, - N = “Channel Number” with the range from 1 to 11. 802.11n(40 MHz): 2.422 GHz - 2.452 GHz f_c = 2412 MHz + (N-1)*5 MHz, where - f_c = “Operating Frequency” in MHz, - N = “Channel Number” with the range from 3 to 9.
Modulation Type	DSSS, OFDM, OFDMA
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Antenna System (eg., MIMO, Smart Antenna)	N/A
Categorization as Correlated or Completely Uncorrelated	N/A
Antenna Type	Dipole Antenna
Antenna Gain	2.46 dBi
About the Product	Only the WIFI 802.11b, 802.11g, 802.11n (HT20/40), 802.11ax (HE20) was tested in this report.

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	BPSK	4

(802.11ax-20 MHz)	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

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	1/6/6.5/13.5/ 4 Mbps	1/6/11	3/6/9
Occupied Bandwidth	11b/11g/11n20/11n40/ 11ax20	1/6/6.5/13.5/ 4 Mbps	1/6/11	3/6/9
Conducted Spurious Emission	11b/11g/11n20/11n40/ 11ax20	1/6/6.5/13.5/ 4 Mbps	1/6/11	3/6/9
Conducted Emission	11b/11g/11n20/11n40/ 11ax20	1/6/6.5/13.5/ 4 Mbps	1/6/11	3/6/9
Radiated Spurious Emission	11b/11g/11n20/11n40/ 11ax20	1/6/6.5/13.5/ 4 Mbps	1/6/11	3/6/9
Band Edge	11b/11g/11n20/11n40/ 11ax20	1/6/6.5/13.5/ 4 Mbps	1/6/11	3/6/9
Power spectral density (PSD)	11b/11g/11n20/11n40/ 11ax20	1/6/6.5/13.5/ 4 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	ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
3	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.	Test Result	Verdict
1	Antenna Requirement	15.203	N/A	Pass[Note 1]
2	Output Power	15.247 (b)	ANNEX A.1	Pass
3	Occupied Bandwidth	15.247 (a)	ANNEX A.2	Pass
4	Conducted Spurious Emission	15.247 (d)	ANNEX A.3	Pass
5	Band Edge(Authorized-band band-edge)	15.247 (d)	ANNEX A.4	Pass
6	Conducted Emission	15.207	ANNEX A.5	Pass
7	Radiated Spurious Emission	15.209; 15.247 (d)	ANNEX A.6	Pass
8	Band Edge(Restricted-band band-edge)	15.209; 15.247 (d)	ANNEX A.7	Pass
9	Power spectral density (PSD)	15.247 (e)	ANNEX A.8	Pass
Note [1]: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.				

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

Relative Humidity	39% to 66%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+20.0℃ to +26.6℃
Working Voltage of the EUT	NV (Normal Voltage)	3.3 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	KEYSIGHT	N9020A	MY50330200	2024.05.08	2025.05.07
Power Sensor	KEYSIGHT	U2063XA	MY58000251	2024.07.04	2025.07.03
Spectrum Analyzer	KEYSIGHT	N9020A	MY52510065	2024.08.01	2025.07.31
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	01631	2022.02.23	2025.02.22
Test Antenna-Horn	A-INFO	LB-180400KF	J211060273	2024.06.15	2027.06.14
Anechoic Chamber	RAINFORD	9m*6m*6m	144	2022.02.19	2025.09.03
Amplifier	COM-MV	LSCX_LNA1-12G-01	180602	2024.08.01	2025.07.31
Amplifier	COM-MV	XKu_LNA7-18G-01	180601	2024.08.01	2025.07.31
Amplifier	COM-MV	KA LNA18 40G-01	18050001	2023.12.06	2024.12.05
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2024.08.01	2025.07.31
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2024.01.23	2025.01.22
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	130	2024.07.13	2027.07.12
EMI Receiver	Agilent	N9038A	MY55330120	2024.08.01	2025.07.31
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-00867	2022.04.12	2025.04.11
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2024.01.23	2025.01.22
Amplifier	COM-MV	ZT30-1000M	B2017119081	2023.12.05	2024.12.04
Anechoic Chamber	YiHeng	9m*6m*6m	142	2024.07.21	2027.07.20
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2024.08.01	2025.07.31
LISN	SCHWARZBECK	NSLK 8127	8127-687	2024.05.09	2025.05.08
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	112	2022.02.19	2025.02.18

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.

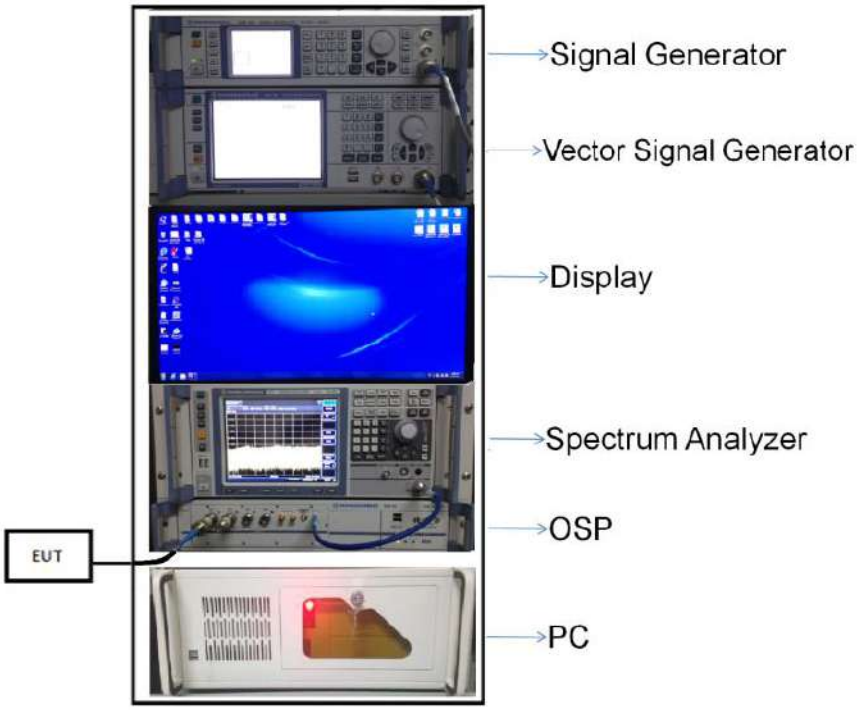
Parameters	Uncertainty
Occupied Channel Bandwidth	2.8%
RF output power, conducted	1.28 dB
Power Spectral Density, conducted	1.30 dB
Unwanted Emissions, conducted	1.84 dB
All emissions, radiated	5.36 dB
Temperature	0.8°C
Humidity	4%

4.5 Description of Test Setup

4.5.1 For Antenna Port Test

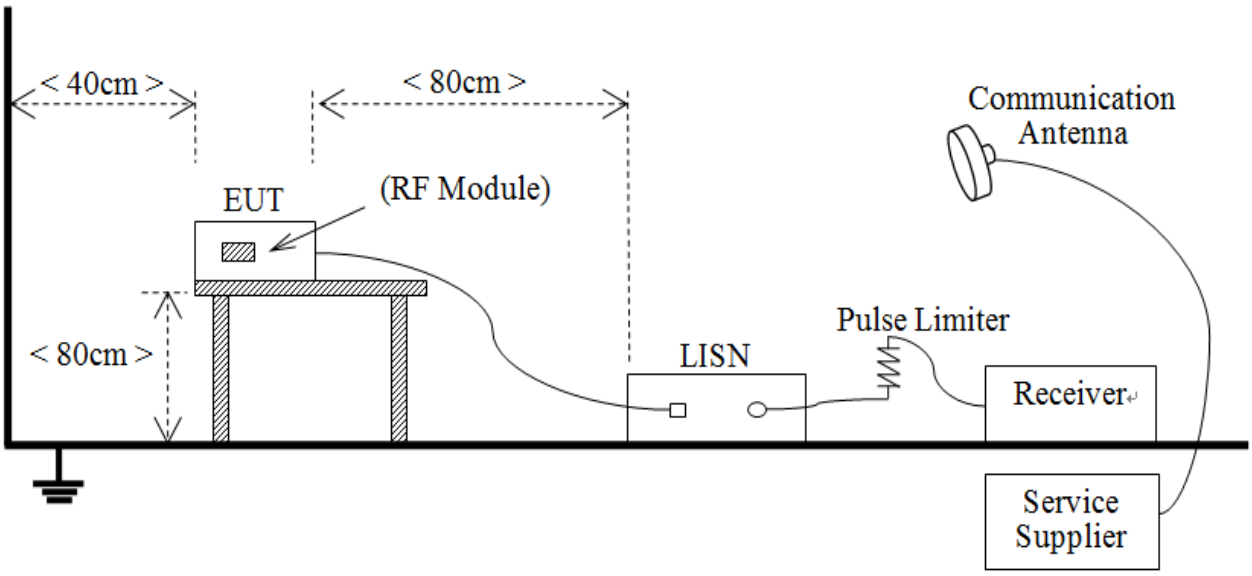
Conducted value (dBm) = Measurement value (dBm) + cable loss (dB)

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



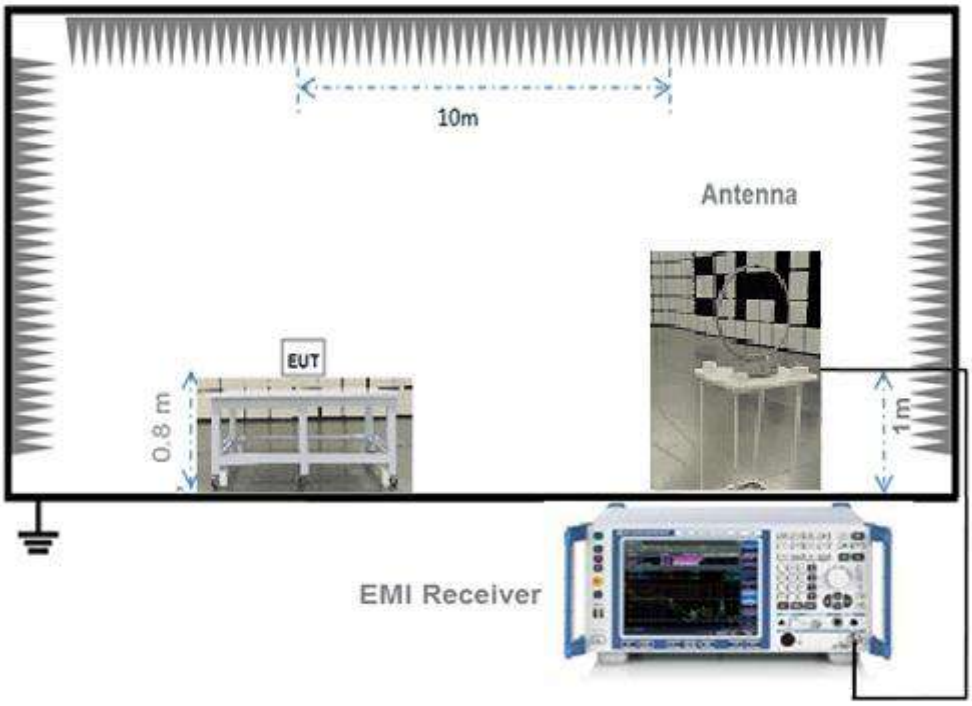
(Diagram 1)

4.5.2 For AC Power Supply Port Test



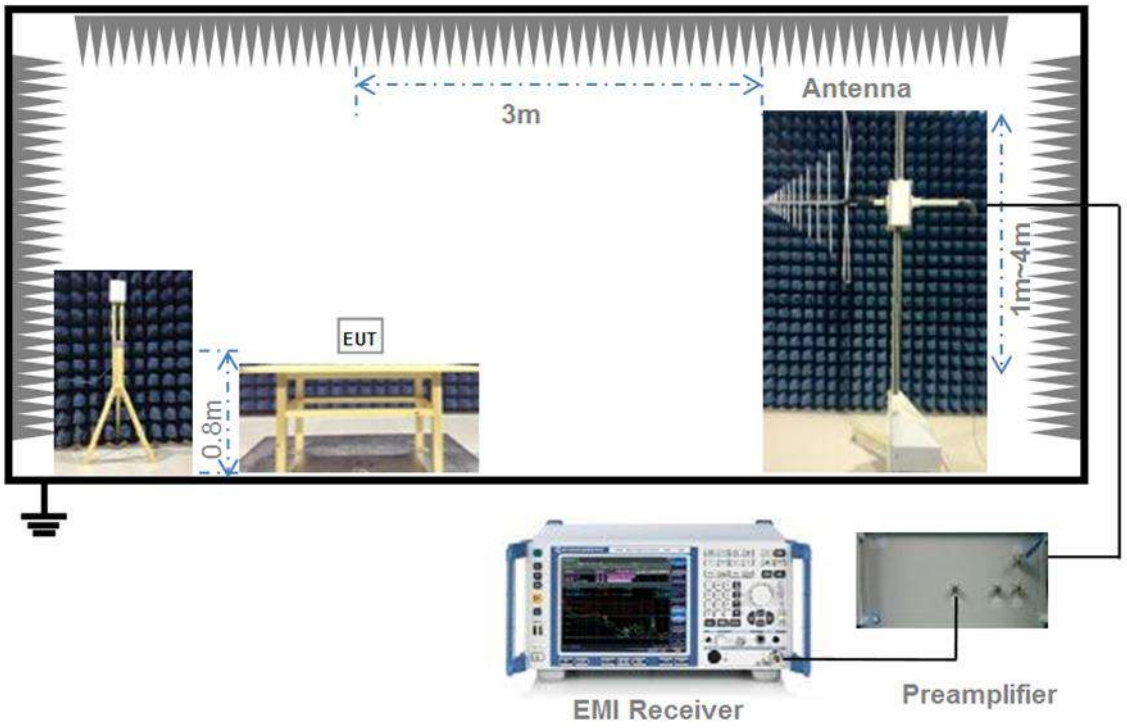
(Diagram 2)

4.5.3 For Radiated Test (Below 30 MHz)



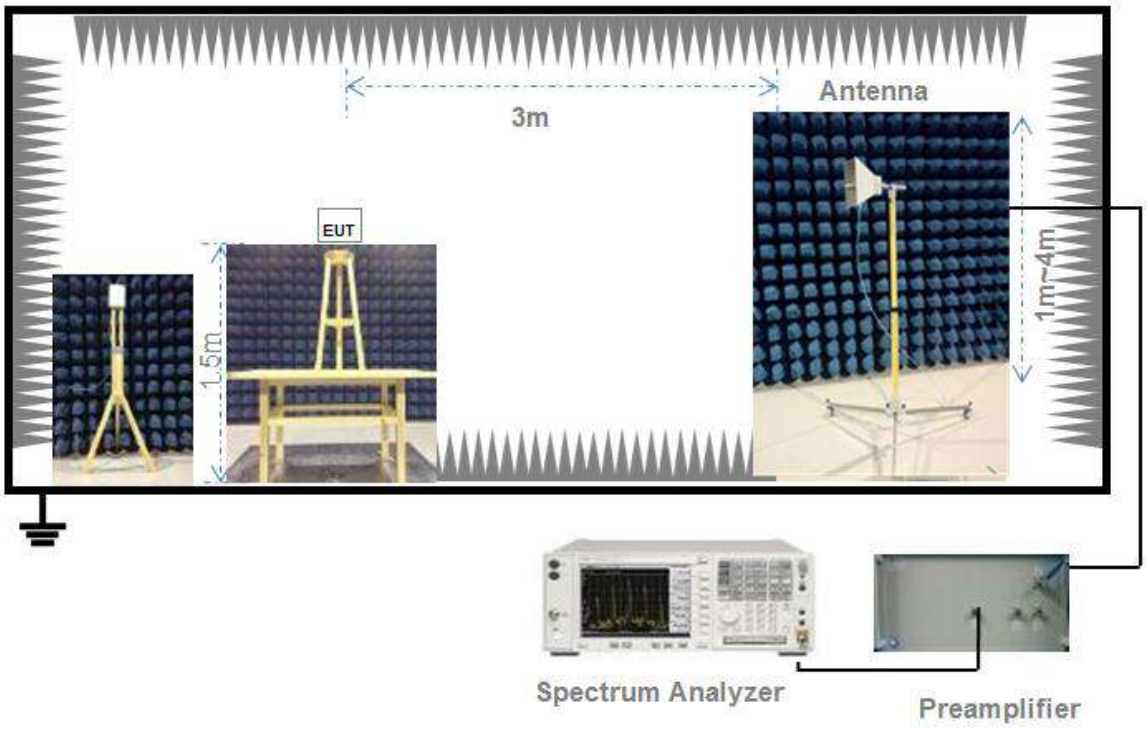
(Diagram 3)

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 = EIRP – 20log D + 104.8

where:

E = electric field strength in dBμV/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

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)

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.

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 10log (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 ≥ OBW if possible; otherwise, set RBW to the largest available value.

Set VBW ≥ 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 ≤ 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)

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)

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 ≥ 3 x 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 ⩾ 3 x 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)

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 $\geqslant$ 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 $\geqslant$ 3 x 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 (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

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 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	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)

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 (μV/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:

$E = EIRP – 20\log D + 104.8$

where:

E = electric field strength in dBμV/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 ≥ 3 x 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 ≥ 3 x RBW.

e) Detector = RMS, if span/(# of points in sweep) ≤ (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 ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ 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)

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 ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ 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)

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 kHz $\leqslant$ RBW $\leqslant$ 100 kHz.

Set the VBW $\geqslant$ 3 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	100	100	100.00%	0.00
802.11g	4.045	4.1	98.66%	0.06
802.11n-20 MHz	3.76	3.83	98.17%	0.08
802.11n-40 MHz	1.827	1.898	96.26%	0.17
802.11ax-20 MHz	3.373	3.419	98.65%	0.06

Peak Power Test Data

802.11b Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	21.98	157.76	30	1000	Pass
Middle	21.76	149.97			Pass
High	21.73	148.94			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	24.83	304.09	30	1000	Pass
Middle	25.34	341.98			Pass
High	25.12	325.09			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	24.75	298.54	30	1000	Pass
Middle	25.09	322.85			Pass
High	24.97	314.05			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	23.37	217.27	30	1000	Pass
Middle	23.87	243.78			Pass
High	23.66	232.27			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	24.52	283.14	30	1000	Pass
Middle	24.68	293.76			Pass
High	24.60	288.40			Pass

Average Power Test Data

802.11b Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.85	76.74	30	1000	Pass
Middle	18.64	73.11			Pass
High	18.61	72.61			Pass

802.11g Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.30	67.61	30	1000	Pass
Middle	18.32	67.92			Pass
High	18.29	67.45			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.54	71.45	30	1000	Pass
Middle	18.40	69.18			Pass
High	18.28	67.30			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.83	76.38	30	1000	Pass
Middle	18.77	75.34			Pass
High	19.02	79.80			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.76	75.16	30	1000	Pass
Middle	18.60	72.44			Pass
High	18.43	69.66			Pass

A.2 Occupied Bandwidth

Test Data

802.11b Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	10.200000	12.070000	⩾500
Middle	10.000000	12.069000	⩾500
High	10.100000	12.069000	⩾500

802.11g Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	16.600000	17.811000	⩾500
Middle	16.600000	17.822000	⩾500
High	16.600000	17.807000	⩾500

802.11n-20MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	17.800000	18.575000	⩾500
Middle	17.800000	18.664000	⩾500
High	17.800000	18.594000	⩾500

802.11n-40MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	35.300000	36.463000	⩾500
Middle	35.500000	36.454000	⩾500
High	35.200000	36.471000	⩾500

802.11ax-20 MHz(SU) Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	18.900000	19.122000	⩾500
Middle	19.000000	19.126000	⩾500
High	18.900000	19.137000	⩾500

Test Plots

6 dB Bandwidth

802.11b LOW CHANNEL

802.11b MIDDLE CHANNEL

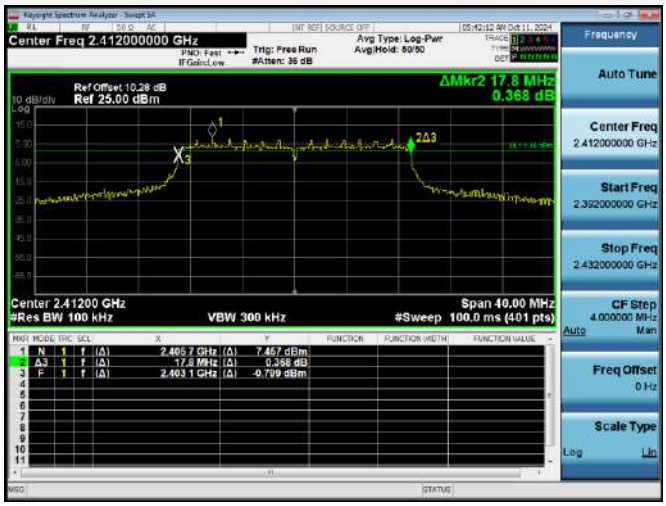
802.11b HIGH CHANNEL

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

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

A.3 Conducted Spurious Emissions

Test Data

802.11b Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-41.54	9.45	-10.55	Pass
Middle	-41.93	9.94	-10.06	Pass
High	-40.47	9.52	-10.48	Pass

802.11g Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-41.56	8.46	-11.54	Pass
Middle	-43.29	7.89	-12.12	Pass
High	-43.28	7.77	-12.23	Pass

802.11n-20MHz Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-40.74	7.66	-12.34	Pass
Middle	-40.15	8.68	-11.32	Pass
High	-41.69	7.74	-12.26	Pass

802.11n-40MHz Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-44.70	5.74	-14.26	Pass
Middle	-41.25	5.68	-14.32	Pass
High	-40.61	5.55	-14.45	Pass

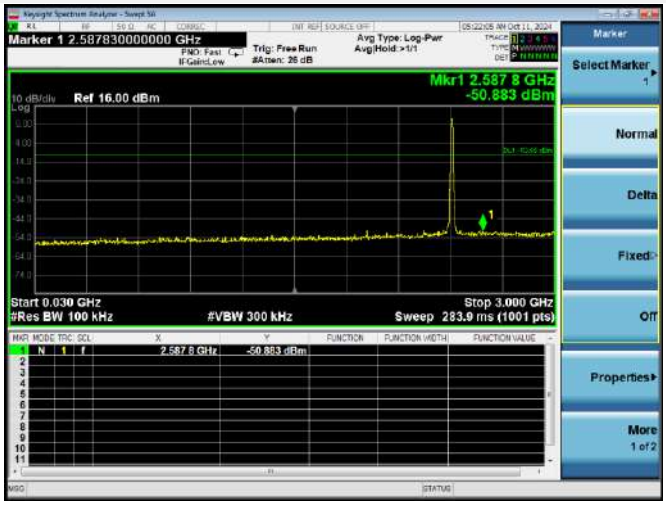
802.11ax-20 MHz(SU) Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-41.06	8.08	-11.92	Pass
Middle	-42.27	7.96	-12.04	Pass
High	-41.90	7.77	-12.23	Pass

Test Plots

802.11b LOW CHANNEL CARRIER LEVEL

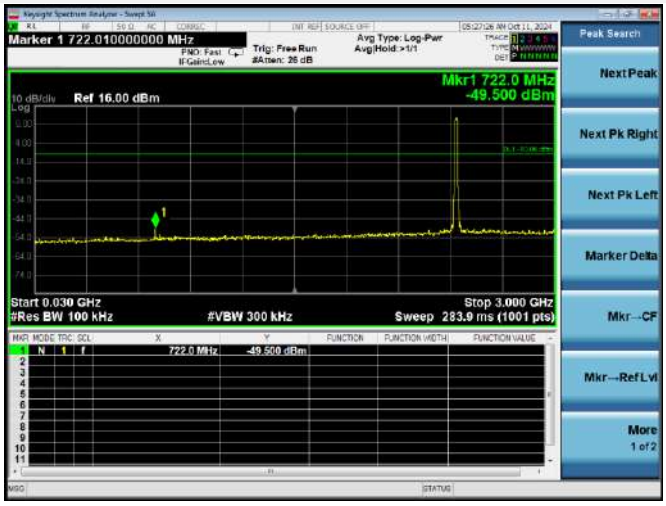
802.11b LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



802.11b LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

802.11b MIDDLE CHANNEL CARRIER LEVEL

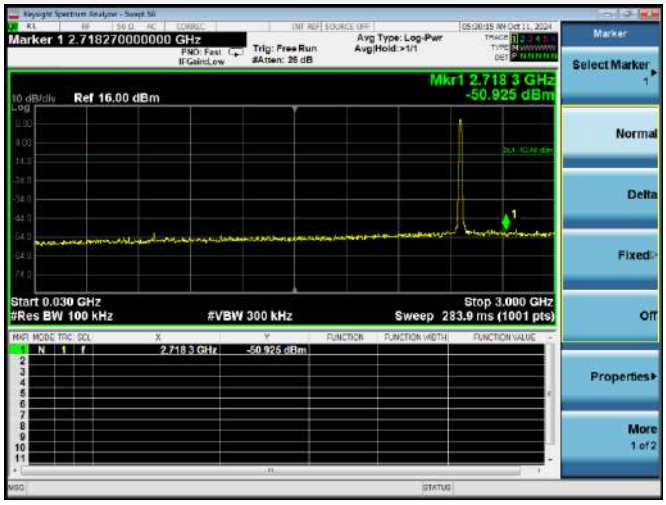
802.11b MIDDLE CHANNEL, SPURIOUS
30 MHz ~ 3 GHz



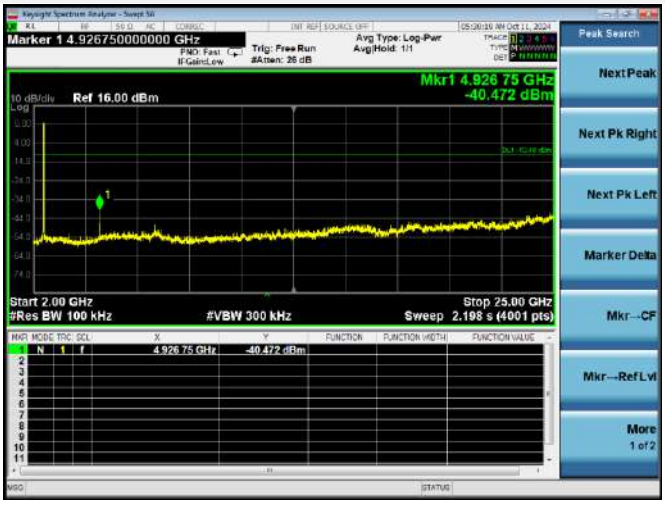
802.11b MIDDLE CHANNEL, SPURIOUS
2 GHz ~ 25 GHz

802.11b HIGH CHANNEL CARRIER LEVEL

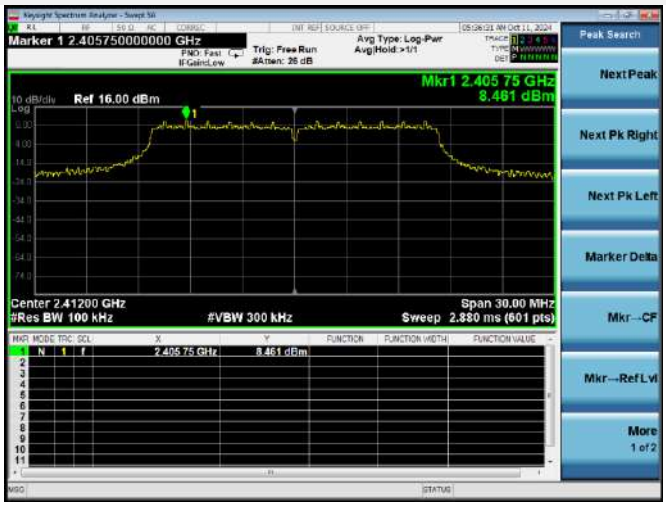
802.11b HIGH CHANNEL, SPURIOUS
30 MHz ~ 3 GHz



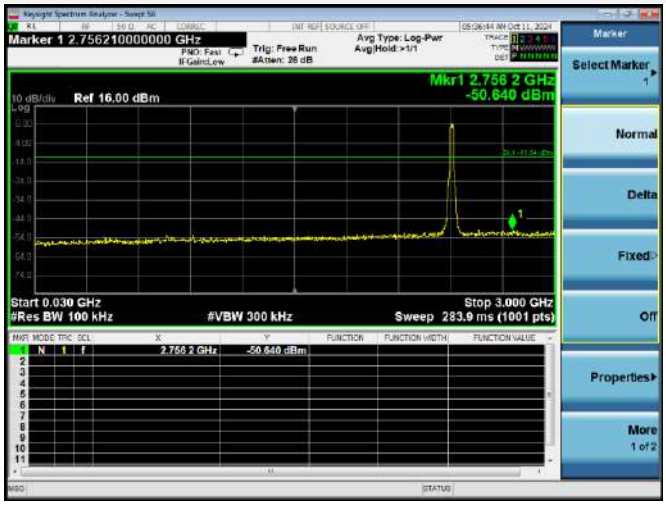
802.11b HIGH CHANNEL, SPURIOUS
2 GHz ~ 25 GHz



802.11g LOW CHANNEL CARRIER LEVEL

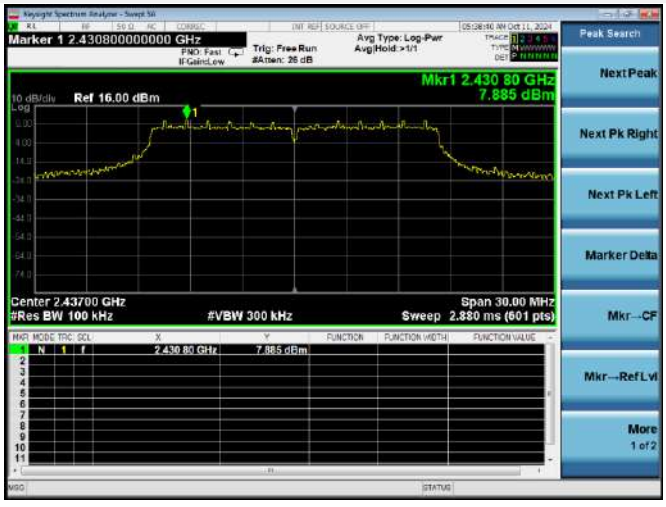


802.11g LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

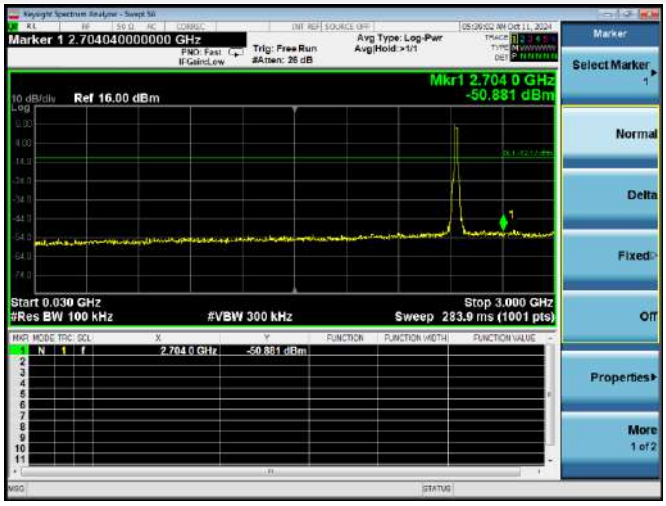


802.11g LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

802.11g MIDDLE CHANNEL CARRIER LEVEL



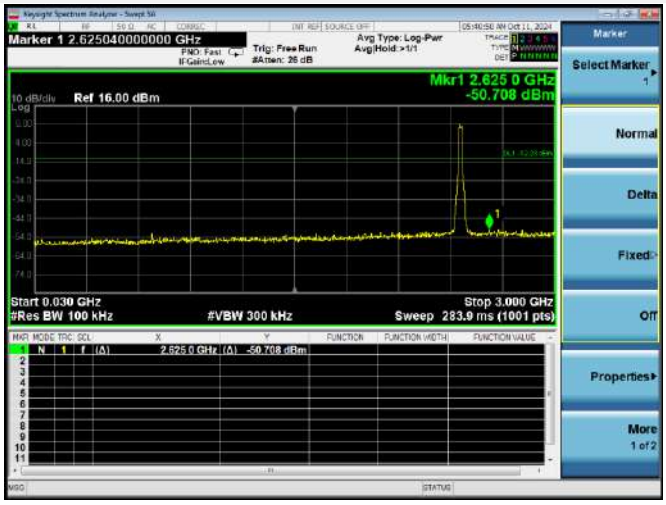
802.11g MIDDLE CHANNEL, SPURIOUS
30 MHz ~ 3 GHz



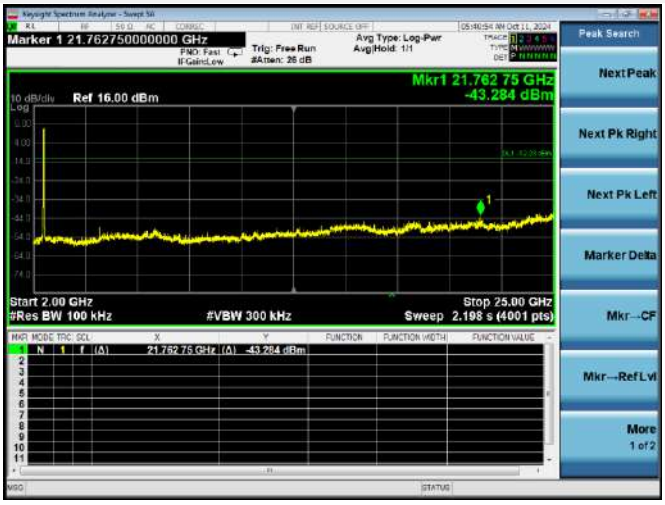
802.11g MIDDLE CHANNEL, SPURIOUS
2 GHz ~ 25 GHz

802.11g HIGH CHANNEL CARRIER LEVEL

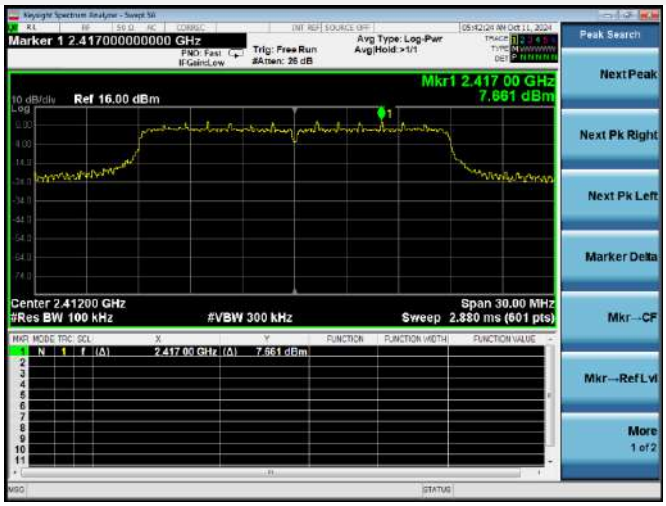
802.11g HIGH CHANNEL, SPURIOUS
30 MHz ~ 3 GHz



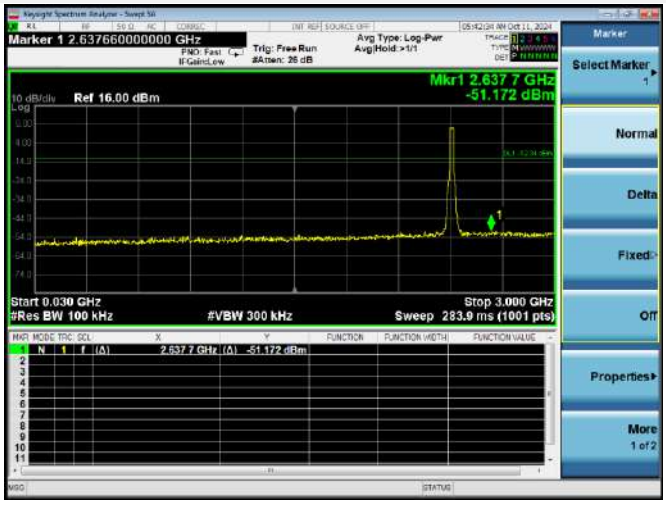
802.11g HIGH CHANNEL, SPURIOUS
2 GHz ~ 25 GHz



802.11n-20 MHz LOW CHANNEL CARRIER LEVEL

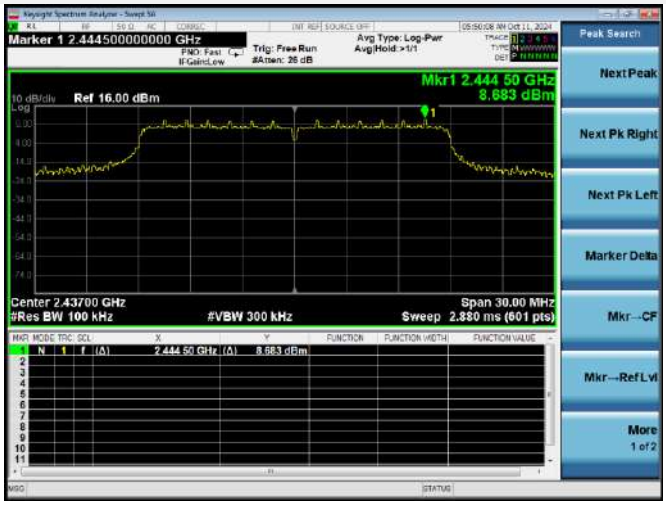


802.11n-20 MHz LOW CHANNEL, SPURIOUS
30 MHz ~ 3 GHz

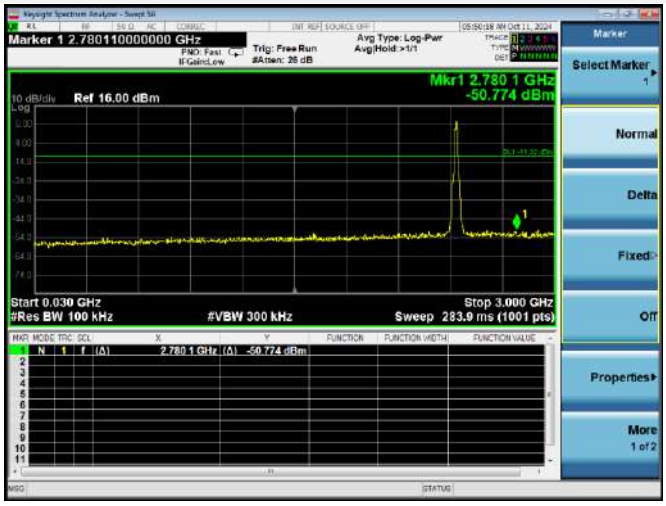


802.11n-20 MHz LOW CHANNEL, SPURIOUS
2 GHz ~ 25 GHz

802.11n-20 MHz MIDDLE CHANNEL CARRIER LEVEL



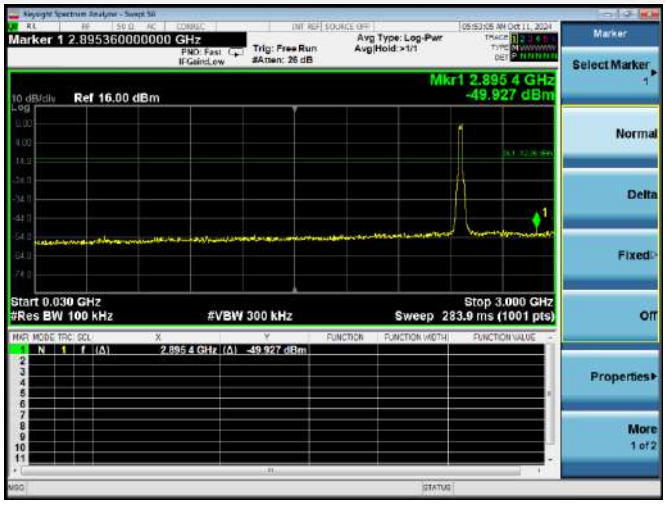
802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



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

802.11n-20 MHz HIGH CHANNEL CARRIER LEVEL

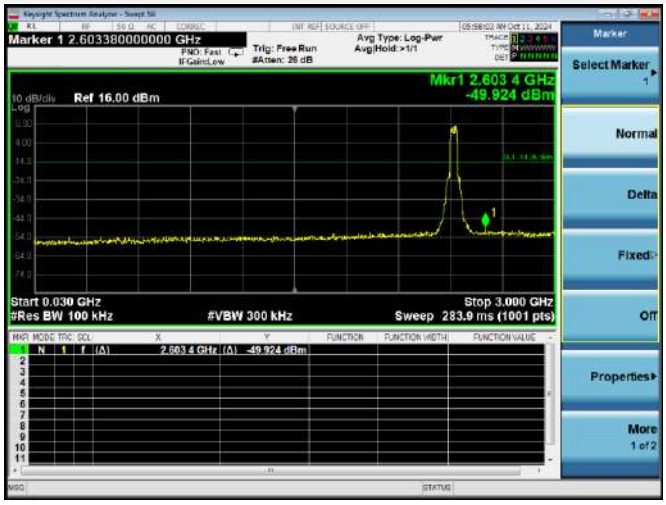
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



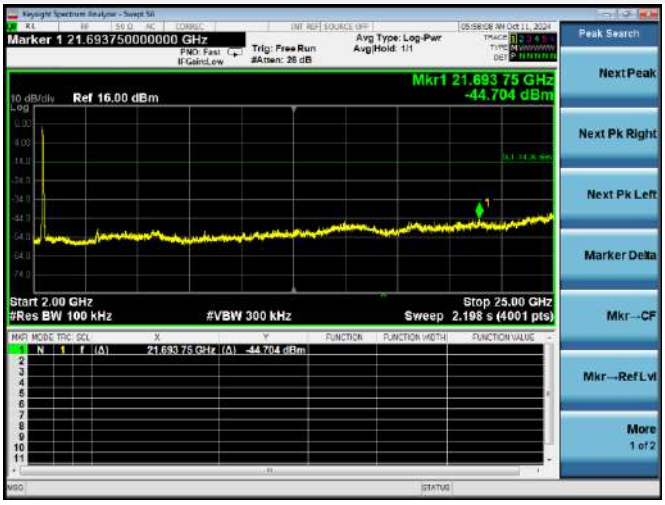
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

802.11n-40 MHz LOW CHANNEL CARRIER LEVEL

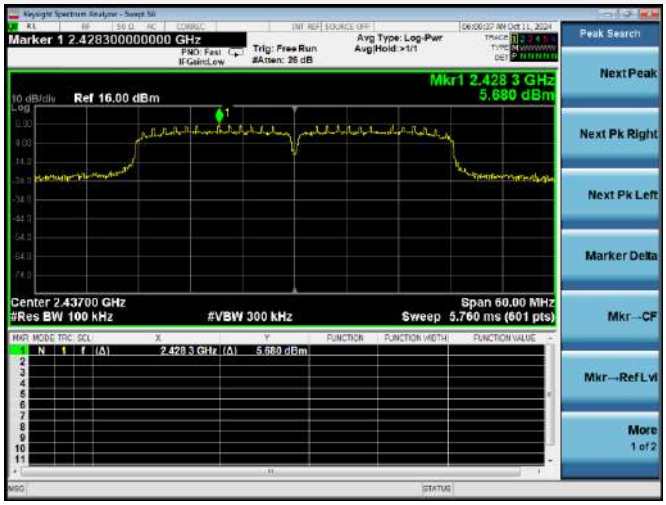
802.11n-40 MHz LOW CHANNEL, SPURIOUS
30 MHz ~ 3 GHz



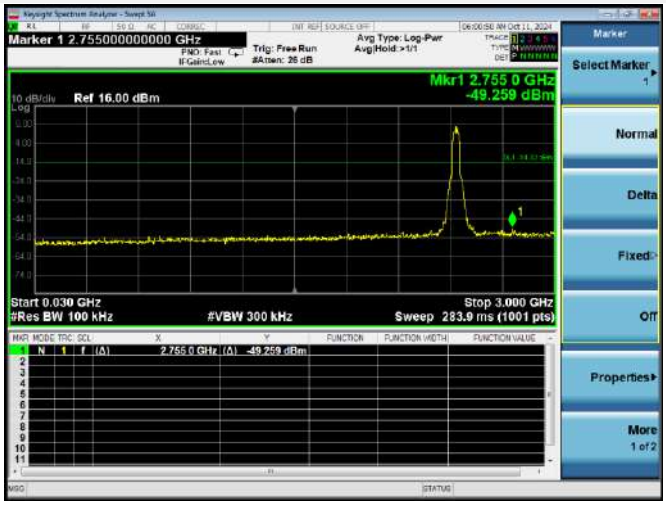
802.11n-40 MHz LOW CHANNEL, SPURIOUS
2 GHz ~ 25 GHz



802.11n-40 MHz MIDDLE CHANNEL CARRIER LEVEL



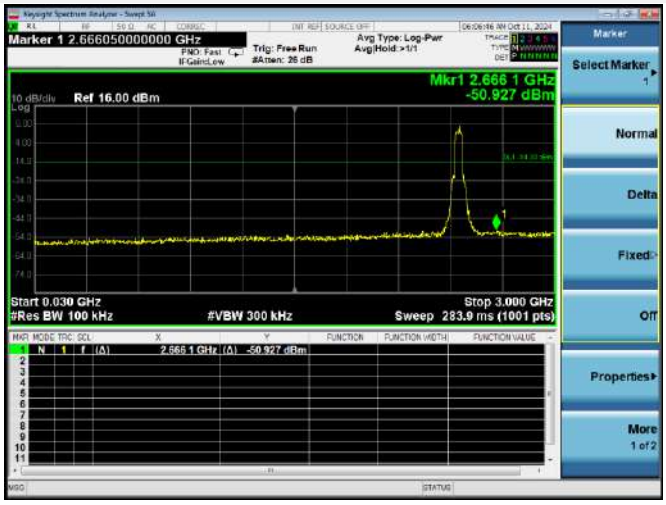
802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



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

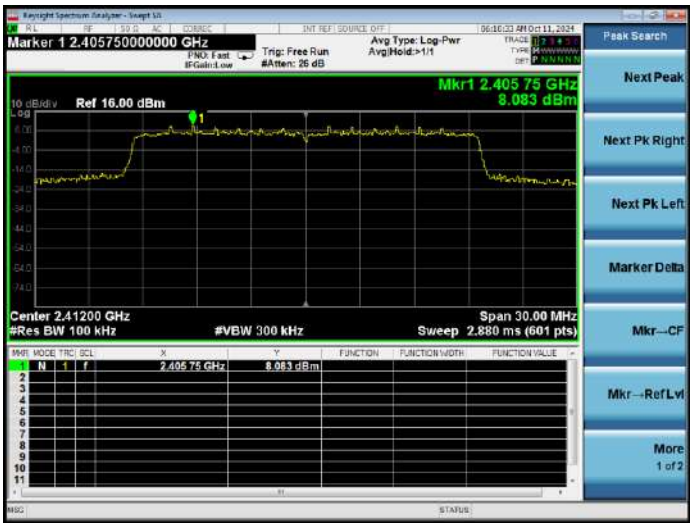
802.11n-40 MHz HIGH CHANNEL CARRIER LEVEL

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

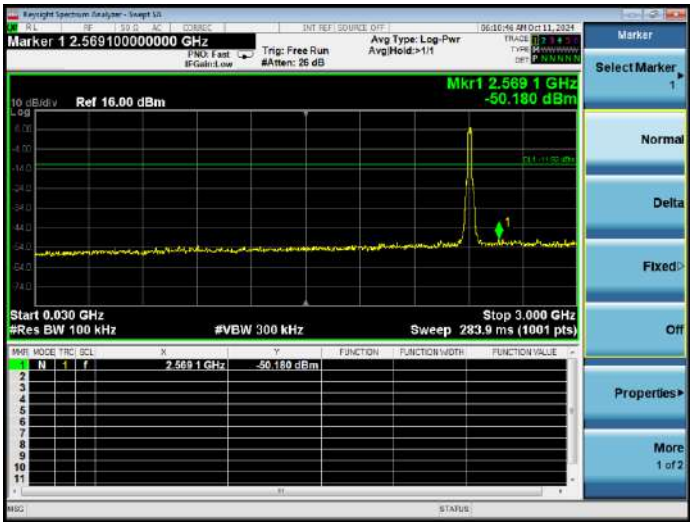


802.11n-40 MHz HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

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

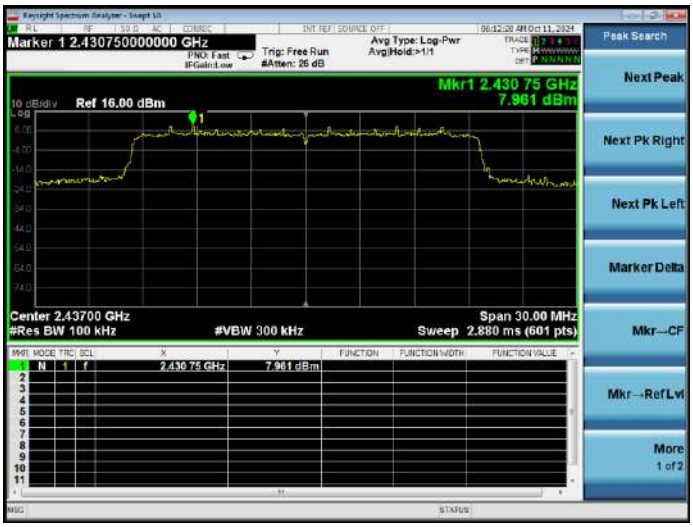


802.11ax-20 MHz(SU) LOW CHANNEL, SPURIOUS
30 MHz ~ 3 GHz

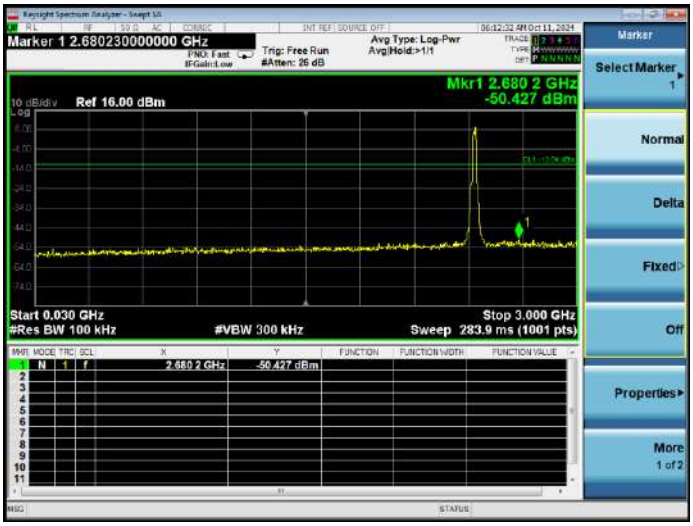


802.11ax-20 MHz(SU) LOW CHANNEL, SPURIOUS
2 GHz ~ 25 GHz

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

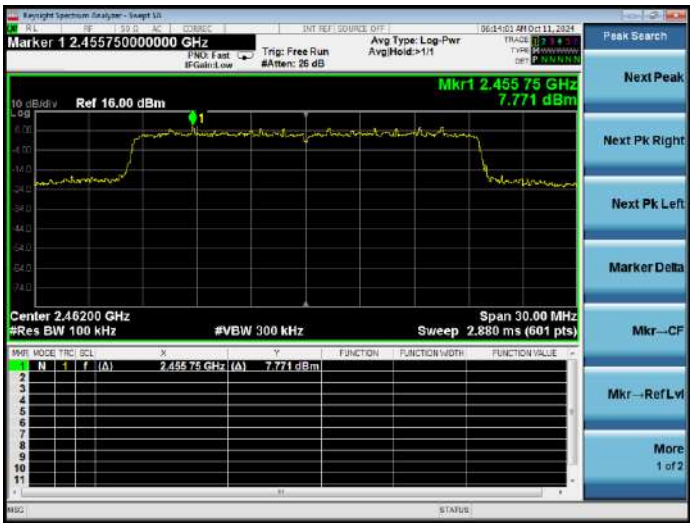


802.11ax-20 MHz(SU) MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

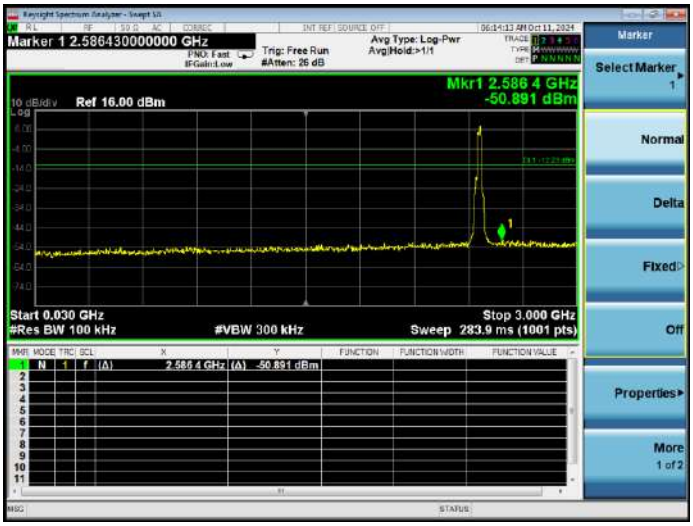


802.11ax-20 MHz(SU) MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

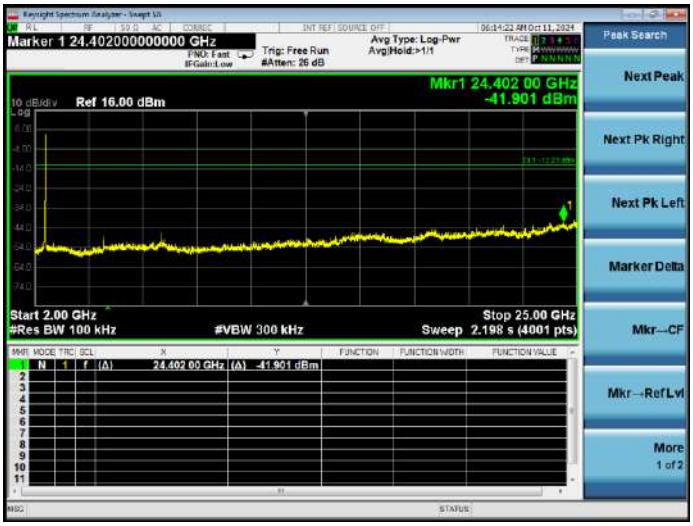
802.11ax-20 MHz(SU) HIGH CHANNEL CARRIER LEVEL



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



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



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.

Test Data

802.11b Mode：

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-35.67	9.45	-10.55	Pass
High Channel	-44.35	9.52	-10.48	Pass

802.11g Mode：

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-17.72	8.46	-11.54	Pass
High Channel	-30.17	7.77	-12.23	Pass

802.11n-20 MHz Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-17.49	7.66	-12.34	Pass
High Channel	-27.76	7.74	-12.26	Pass

802.11n-40 MHz Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-18.42	5.74	-14.26	Pass
High Channel	-20.39	5.55	-14.45	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	-17.58	8.08	-11.92	Pass
High Channel	-24.23	7.77	-12.23	Pass

Test Plots

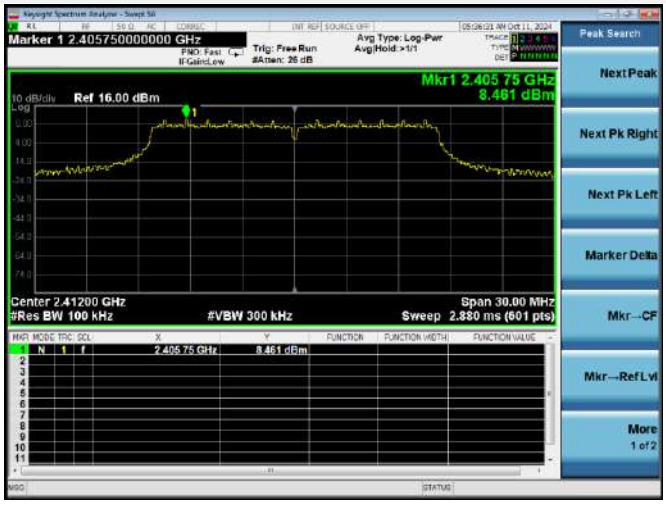
802.11b LOW CHANNEL, CARRIER LEVEL

802.11b LOW CHANNEL, BAND EDGE

802.11b HIGH CHANNEL, CARRIER LEVEL

802.11b HIGH CHANNEL, BAND EDGE

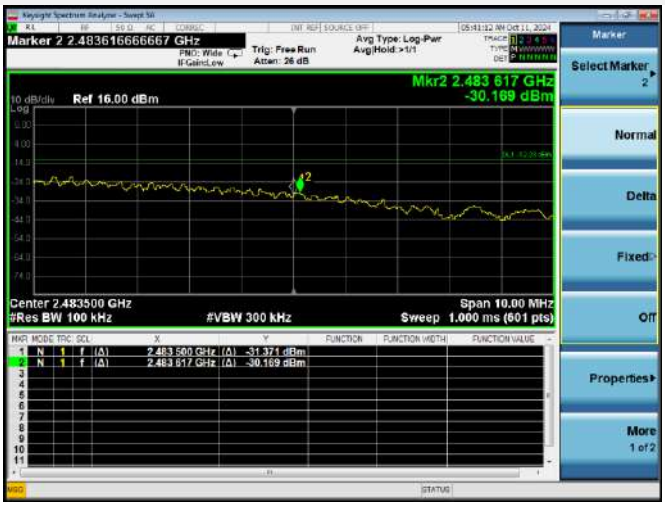
802.11g LOW CHANNEL, CARRIER LEVEL



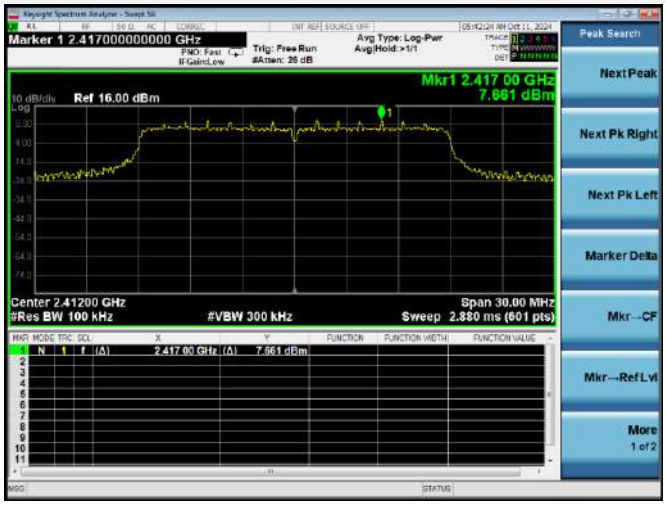
802.11g LOW CHANNEL, BAND EDGE

802.11g HIGH CHANNEL, CARRIER LEVEL

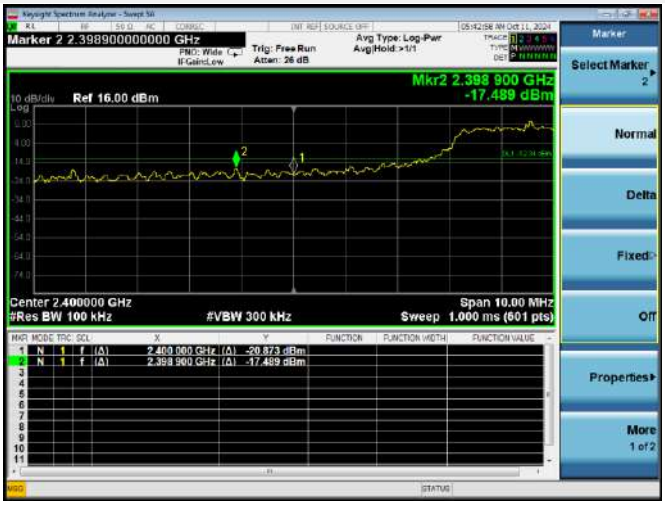
802.11g HIGH CHANNEL, BAND EDGE



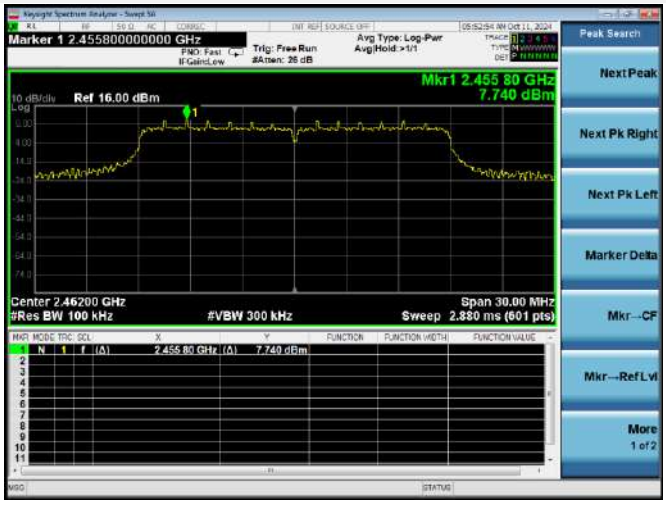
802.11n-20 MHz LOW CHANNEL, CARRIER LEVEL



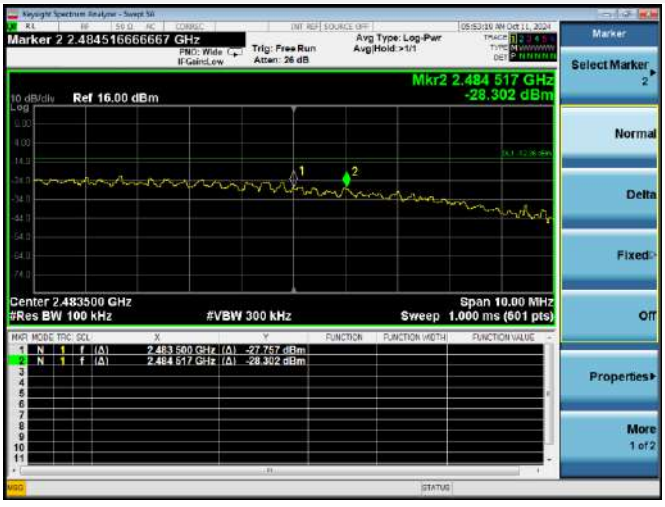
802.11n-20 MHz LOW CHANNEL, BAND EDGE



802.11n-20 MHz HIGH CHANNEL, CARRIER LEVEL



802.11n-20 MHz HIGH CHANNEL, BAND EDGE

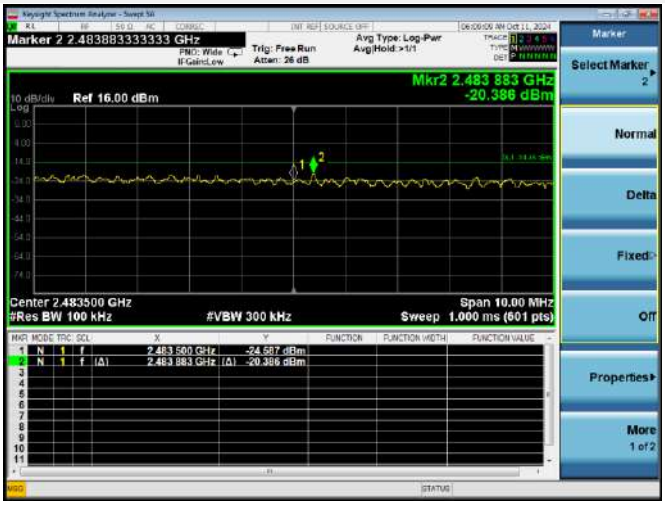


802.11n-40 MHz LOW CHANNEL, CARRIER LEVEL

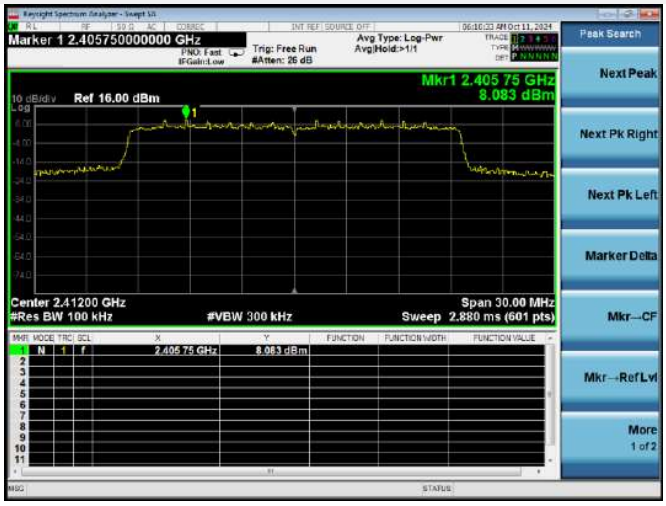
802.11n-40 MHz LOW CHANNEL, BAND EDGE

802.11n-40 MHz HIGH CHANNEL, CARRIER LEVEL

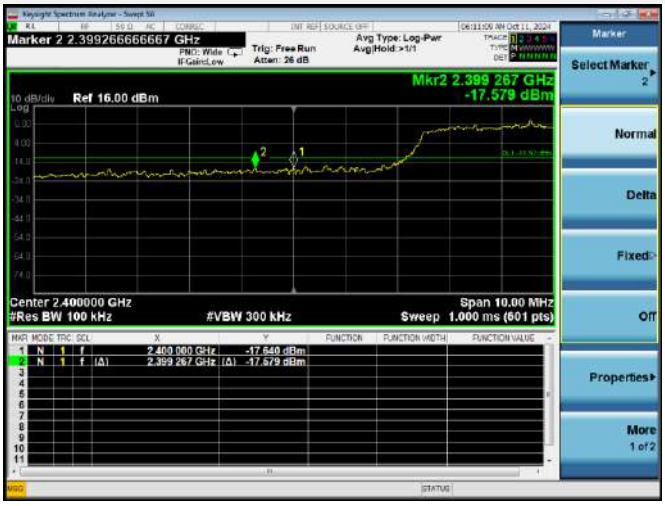
802.11n-40 MHz HIGH CHANNEL, BAND EDGE



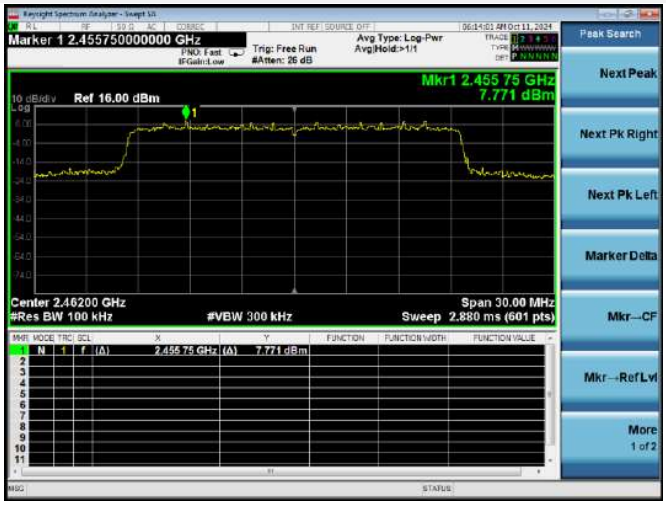
802.11ax-20 MHz(SU) LOW CHANNEL, CARRIER LEVEL



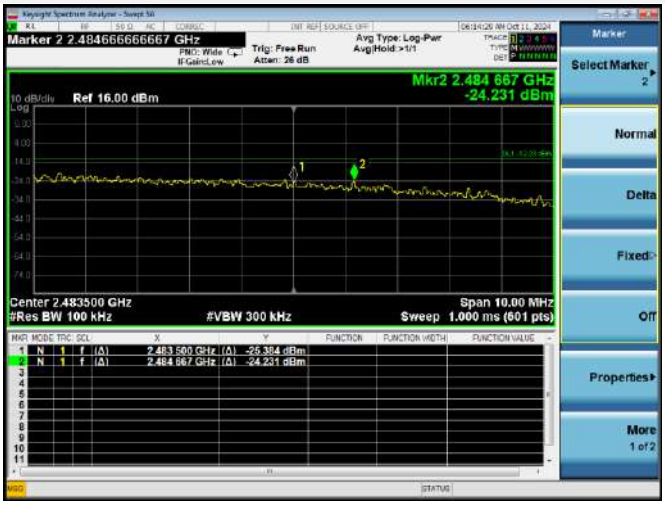
802.11ax-20 MHz(SU) LOW CHANNEL, BAND EDGE



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



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



A.5 Conducted Emissions

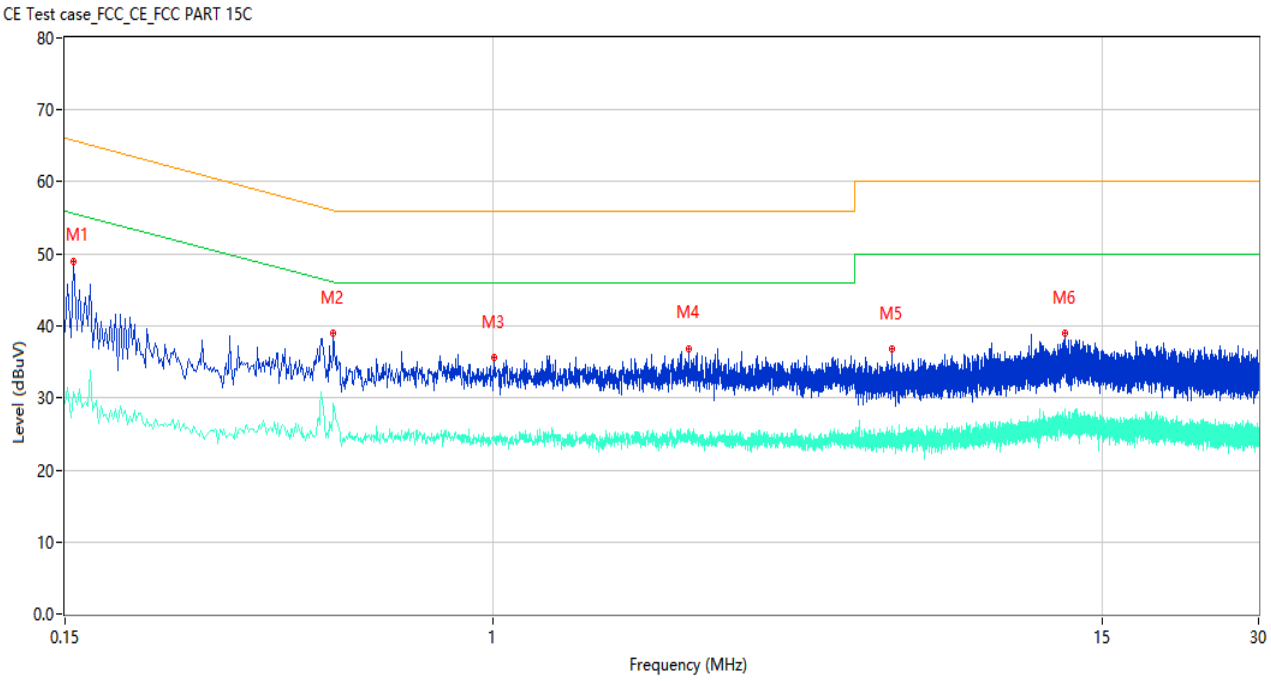
Note [1]: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.

Note [2]: 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.

Note [3]: Results (dBuV) = Original reading level of Spectrum Analyzer (dBuV) + Factor (dB)

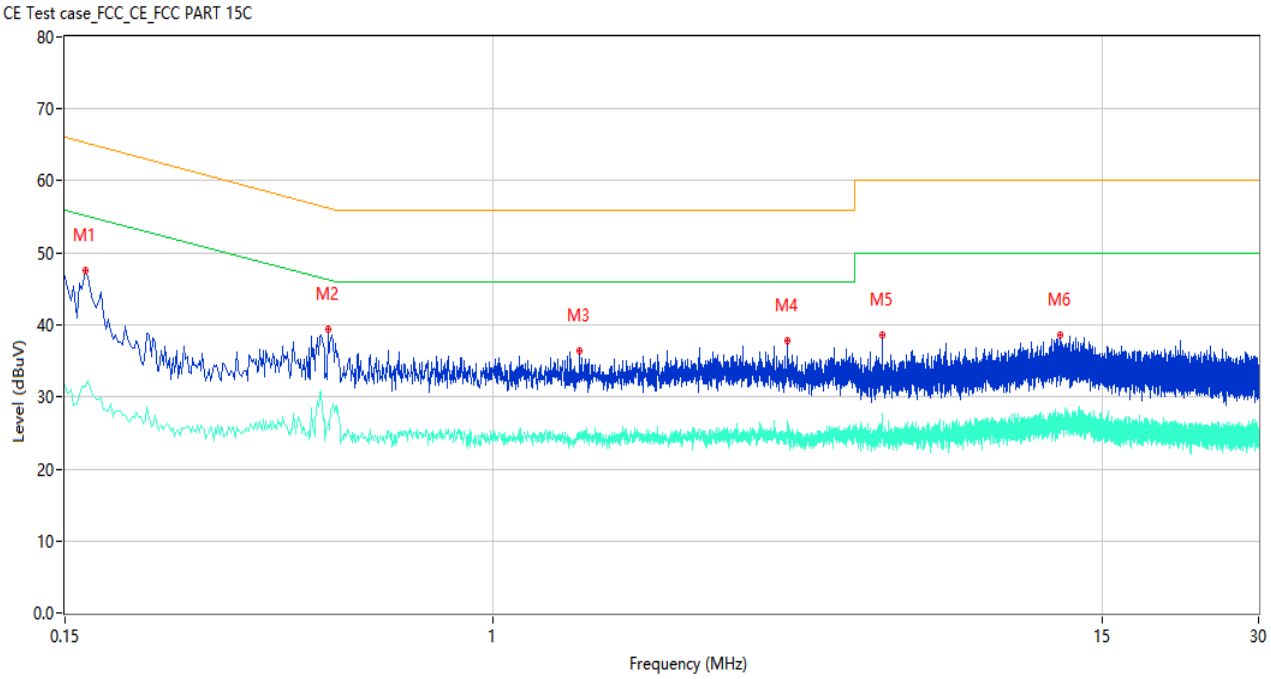
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.156	49.05	9.78	65.67	16.62	Peak	L	Pass
1**	0.156	30.88	9.78	55.67	24.79	AV	L	Pass
2	0.494	38.93	9.99	56.10	17.17	Peak	L	Pass
2**	0.494	29.26	9.99	46.10	16.84	AV	L	Pass
3	1.006	35.66	10.00	56.00	20.34	Peak	L	Pass
3**	1.006	24.64	10.00	46.00	21.36	AV	L	Pass
4	2.394	36.91	10.28	56.00	19.09	Peak	L	Pass
4**	2.394	25.00	10.28	46.00	21.00	AV	L	Pass
5	5.896	36.80	10.45	60.00	23.20	Peak	L	Pass
5**	5.896	25.69	10.45	50.00	24.31	AV	L	Pass
6	12.692	39.00	10.44	60.00	21.00	Peak	L	Pass
6**	12.692	26.18	10.44	50.00	23.82	AV	L	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.164	47.56	9.78	65.26	17.70	Peak	N	Pass
1**	0.164	31.44	9.78	55.26	23.82	AV	N	Pass
2	0.482	39.45	10.00	56.30	16.85	Peak	N	Pass
2**	0.482	26.33	10.00	46.30	19.97	AV	N	Pass
3	1.472	36.48	10.16	56.00	19.52	Peak	N	Pass
3**	1.472	25.03	10.16	46.00	20.97	AV	N	Pass
4	3.706	37.73	10.29	56.00	18.27	Peak	N	Pass
4**	3.706	26.62	10.29	46.00	19.38	AV	N	Pass
5	5.648	38.66	10.39	60.00	21.34	Peak	N	Pass
5**	5.648	27.46	10.39	50.00	22.54	AV	N	Pass
6	12.414	38.59	10.65	60.00	21.41	Peak	N	Pass
6**	12.414	27.52	10.65	50.00	22.48	AV	N	Pass

A.6 Radiated Emission

Note [1]: The symbol of "--" in the table which means not application.

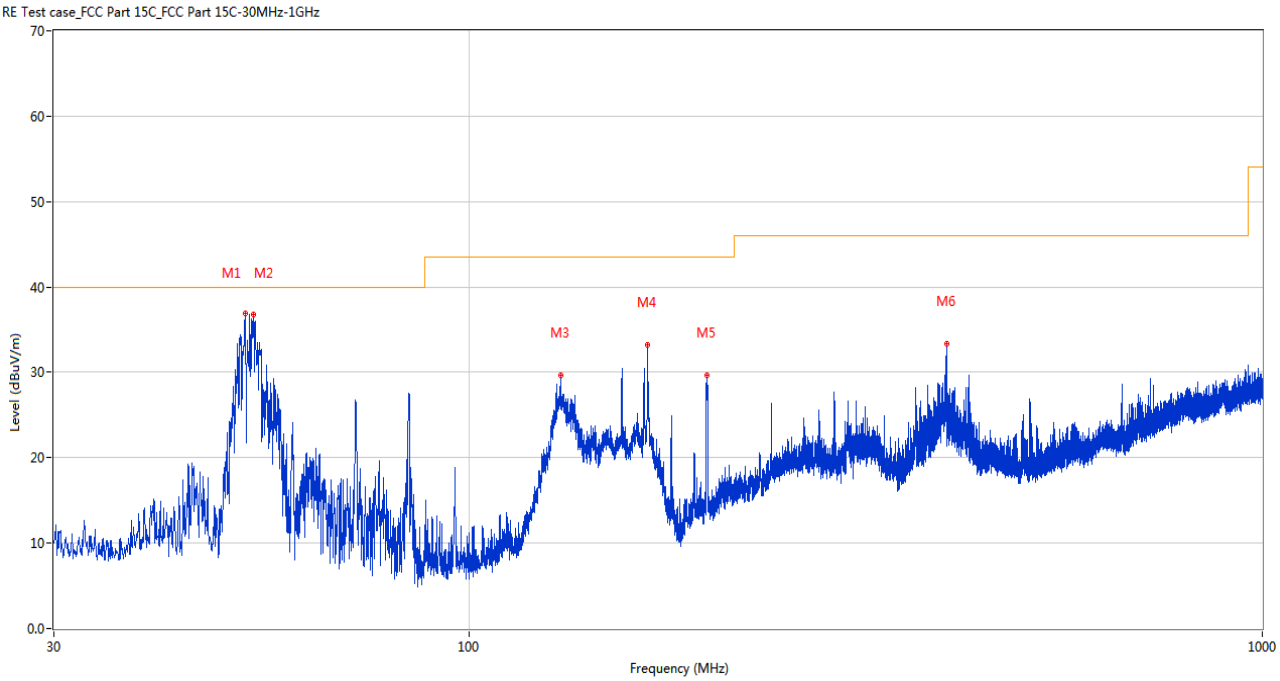
Note [2]: For the test data above 1 GHz，According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note [3]: 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.

Note [4]: The EUT is working in the Normal link mode below 1 GHz. All modes have been tested and normal link mode is worst.

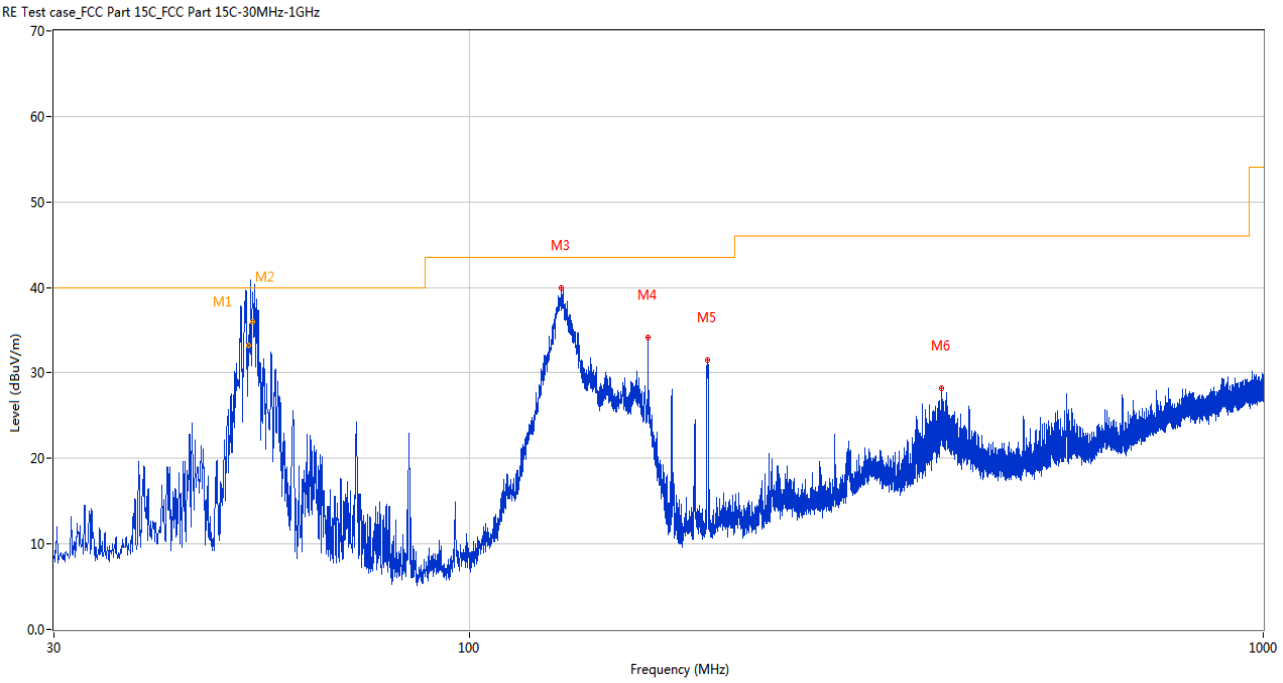
Test Data and Plots

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	52.261	36.93	-26.77	40.0	3.07	Peak	28.00	200	Horizontal	Pass
2	53.523	36.80	-26.88	40.0	3.20	Peak	178.00	200	Horizontal	Pass
3	130.492	29.69	-27.37	43.5	13.81	Peak	315.00	200	Horizontal	Pass
4	167.837	33.28	-25.48	43.5	10.22	Peak	35.00	200	Horizontal	Pass
5	199.314	29.68	-28.70	43.5	13.82	Peak	258.00	200	Horizontal	Pass
6	399.813	33.40	-21.26	46.0	12.60	Peak	209.00	100	Horizontal	Pass

30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	52.828	41.24	-26.75	40.0	-1.24	Peak	86.00	101	Vertical	N/A
1*	52.828	33.27	-26.75	40.0	6.73	QP	86.00	101	Vertical	Pass
2	53.334	41.65	-26.68	40.0	-1.65	Peak	98.00	112	Vertical	N/A
2*	53.334	35.95	-26.68	40.0	4.05	QP	98.00	112	Vertical	Pass
3	130.540	39.97	-27.36	43.5	3.53	Peak	76.00	100	Vertical	Pass
4	167.934	34.16	-25.50	43.5	9.34	Peak	166.00	100	Vertical	Pass
5	199.362	31.57	-28.70	43.5	11.93	Peak	360.00	100	Vertical	Pass
6	393.265	28.16	-21.65	46.0	17.84	Peak	38.00	100	Vertical	Pass

Note [1]: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Note [2]: The spurious above 18G is noise only, do not show on the report.

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	1443.548	45.49	74.0	28.51	Peak	91.00	400	Horizontal	Pass
1**	1443.548	40.43	54.0	13.57	AV	91.00	400	Horizontal	Pass
2	2672.675	49.82	74.0	24.18	Peak	148.00	400	Horizontal	Pass
2**	2672.675	44.85	54.0	9.15	AV	148.00	400	Horizontal	Pass
3	4948.982	48.78	74.0	25.22	Peak	178.00	200	Horizontal	Pass
3**	4948.982	39.32	54.0	14.68	AV	178.00	200	Horizontal	Pass
4	7687.905	53.28	74.0	20.72	Peak	22.00	400	Horizontal	Pass
4**	7687.905	43.37	54.0	10.63	AV	22.00	400	Horizontal	Pass
5	12463.766	56.20	74.0	17.80	Peak	173.00	300	Horizontal	Pass
5**	12463.766	41.57	54.0	12.43	AV	173.00	300	Horizontal	Pass
6	14458.895	54.39	74.0	19.61	Peak	300.00	100	Horizontal	Pass
6**	14458.895	47.14	54.0	6.86	AV	300.00	100	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	1330.153	45.35	74.0	28.65	Peak	44.00	300	Vertical	Pass
1**	1330.153	33.76	54.0	20.24	AV	44.00	300	Vertical	Pass
2	2949.125	48.40	74.0	25.60	Peak	329.00	300	Vertical	Pass
2**	2949.125	43.64	54.0	10.36	AV	329.00	300	Vertical	Pass
3	4744.961	48.41	74.0	25.59	Peak	210.00	200	Vertical	Pass
3**	4744.961	38.37	54.0	15.63	AV	210.00	200	Vertical	Pass
4	7169.002	52.94	74.0	21.06	Peak	70.00	400	Vertical	Pass
4**	7169.002	44.06	54.0	9.94	AV	70.00	400	Vertical	Pass
5	12518.447	52.01	74.0	21.99	Peak	191.00	100	Vertical	Pass
5**	12518.447	45.23	54.0	8.77	AV	191.00	100	Vertical	Pass
6	17117.468	54.54	74.0	19.46	Peak	16.00	400	Vertical	Pass
6**	17117.468	48.11	54.0	5.89	AV	16.00	400	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	1441.254	47.04	74.0	26.96	Peak	208.00	400	Horizontal	Pass
1**	1441.254	44.10	54.0	9.90	AV	208.00	400	Horizontal	Pass
2	2670.646	52.78	74.0	21.22	Peak	4.00	400	Horizontal	Pass
2**	2670.646	43.50	54.0	10.50	AV	4.00	400	Horizontal	Pass
3	4952.047	48.94	74.0	25.06	Peak	272.00	200	Horizontal	Pass
3**	4952.047	41.44	54.0	12.56	AV	272.00	200	Horizontal	Pass
4	7687.688	53.25	74.0	20.75	Peak	175.00	300	Horizontal	Pass
4**	7687.688	41.81	54.0	12.19	AV	175.00	300	Horizontal	Pass
5	12464.434	53.54	74.0	20.46	Peak	27.00	100	Horizontal	Pass
5**	12464.434	41.90	54.0	12.10	AV	27.00	100	Horizontal	Pass
6	14454.463	55.64	74.0	18.36	Peak	310.00	300	Horizontal	Pass
6**	14454.463	45.19	54.0	8.81	AV	310.00	300	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	1336.343	44.62	74.0	29.38	Peak	311.00	200	Vertical	Pass
1**	1336.343	36.53	54.0	17.47	AV	311.00	200	Vertical	Pass
2	2946.077	52.02	74.0	21.98	Peak	81.00	100	Vertical	Pass
2**	2946.077	38.06	54.0	15.94	AV	81.00	100	Vertical	Pass
3	4746.711	48.53	74.0	25.47	Peak	131.00	200	Vertical	Pass
3**	4746.711	41.38	54.0	12.62	AV	131.00	200	Vertical	Pass
4	7165.676	54.08	74.0	19.92	Peak	281.00	300	Vertical	Pass
4**	7165.676	43.24	54.0	10.76	AV	281.00	300	Vertical	Pass
5	12516.838	54.70	74.0	19.30	Peak	310.00	100	Vertical	Pass
5**	12516.838	43.26	54.0	10.74	AV	310.00	100	Vertical	Pass
6	17118.055	52.79	74.0	21.21	Peak	275.00	300	Vertical	Pass
6**	17118.055	45.42	54.0	8.58	AV	275.00	300	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	1442.062	44.40	74.0	29.60	Peak	134.00	300	Horizontal	Pass
1**	1442.062	43.94	54.0	10.06	AV	134.00	300	Horizontal	Pass
2	2670.158	51.11	74.0	22.89	Peak	154.00	400	Horizontal	Pass
2**	2670.158	39.69	54.0	14.31	AV	154.00	400	Horizontal	Pass
3	4948.165	50.59	74.0	23.41	Peak	125.00	200	Horizontal	Pass
3**	4948.165	38.38	54.0	15.62	AV	125.00	200	Horizontal	Pass
4	7688.081	55.47	74.0	18.53	Peak	140.00	200	Horizontal	Pass
4**	7688.081	41.21	54.0	12.79	AV	140.00	200	Horizontal	Pass
5	12466.043	55.88	74.0	18.12	Peak	59.00	200	Horizontal	Pass
5**	12466.043	43.55	54.0	10.45	AV	59.00	200	Horizontal	Pass
6	14459.181	53.92	74.0	20.08	Peak	45.00	200	Horizontal	Pass
6**	14459.181	43.35	54.0	10.65	AV	45.00	200	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	1334.158	43.58	74.0	30.42	Peak	197.00	300	Vertical	Pass
1**	1334.158	32.61	54.0	21.39	AV	197.00	300	Vertical	Pass
2	2948.006	49.00	74.0	25.00	Peak	30.00	200	Vertical	Pass
2**	2948.006	39.84	54.0	14.16	AV	30.00	200	Vertical	Pass
3	4747.665	48.18	74.0	25.82	Peak	316.00	200	Vertical	Pass
3**	4747.665	39.76	54.0	14.24	AV	316.00	200	Vertical	Pass
4	7166.369	55.05	74.0	18.95	Peak	231.00	400	Vertical	Pass
4**	7166.369	42.78	54.0	11.22	AV	231.00	400	Vertical	Pass
5	12519.671	53.27	74.0	20.73	Peak	212.00	200	Vertical	Pass
5**	12519.671	43.87	54.0	10.13	AV	212.00	200	Vertical	Pass
6	17115.369	53.67	74.0	20.33	Peak	248.00	100	Vertical	Pass
6**	17115.369	43.68	54.0	10.32	AV	248.00	100	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	1439.915	45.46	74.0	28.54	Peak	41.00	100	Horizontal	Pass
1**	1439.915	41.66	54.0	12.34	AV	41.00	100	Horizontal	Pass
2	2672.214	50.82	74.0	23.18	Peak	62.00	400	Horizontal	Pass
2**	2672.214	39.61	54.0	14.39	AV	62.00	400	Horizontal	Pass
3	4953.640	51.14	74.0	22.86	Peak	26.00	200	Horizontal	Pass
3**	4953.640	40.41	54.0	13.59	AV	26.00	200	Horizontal	Pass
4	7687.658	55.94	74.0	18.06	Peak	238.00	100	Horizontal	Pass
4**	7687.658	40.62	54.0	13.38	AV	238.00	100	Horizontal	Pass
5	12464.414	51.80	74.0	22.20	Peak	26.00	100	Horizontal	Pass
5**	12464.414	43.84	54.0	10.16	AV	26.00	100	Horizontal	Pass
6	14458.158	56.61	74.0	17.39	Peak	181.00	400	Horizontal	Pass
6**	14458.158	44.59	54.0	9.41	AV	181.00	400	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	1334.052	41.05	74.0	32.95	Peak	6.00	300	Vertical	Pass
1**	1334.052	35.12	54.0	18.88	AV	6.00	300	Vertical	Pass
2	2946.809	48.76	74.0	25.24	Peak	295.00	400	Vertical	Pass
2**	2946.809	39.07	54.0	14.93	AV	295.00	400	Vertical	Pass
3	4750.455	47.73	74.0	26.27	Peak	182.00	200	Vertical	Pass
3**	4750.455	42.29	54.0	11.71	AV	182.00	200	Vertical	Pass
4	7166.728	56.30	74.0	17.70	Peak	105.00	100	Vertical	Pass
4**	7166.728	42.45	54.0	11.55	AV	105.00	100	Vertical	Pass
5	12518.349	51.68	74.0	22.32	Peak	343.00	400	Vertical	Pass
5**	12518.349	43.88	54.0	10.12	AV	343.00	400	Vertical	Pass
6	17115.720	57.95	74.0	16.05	Peak	89.00	100	Vertical	Pass
6**	17115.720	44.84	54.0	9.16	AV	89.00	100	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	1439.696	44.76	74.0	29.24	Peak	128.00	100	Horizontal	Pass
1**	1439.696	43.14	54.0	10.86	AV	128.00	100	Horizontal	Pass
2	2674.477	53.76	74.0	20.24	Peak	268.00	300	Horizontal	Pass
2**	2674.477	41.43	54.0	12.57	AV	268.00	300	Horizontal	Pass
3	4952.579	50.58	74.0	23.42	Peak	312.00	200	Horizontal	Pass
3**	4952.579	38.97	54.0	15.03	AV	312.00	200	Horizontal	Pass
4	7688.225	51.60	74.0	22.40	Peak	151.00	400	Horizontal	Pass
4**	7688.225	45.11	54.0	8.89	AV	151.00	400	Horizontal	Pass
5	12465.416	55.28	74.0	18.72	Peak	288.00	200	Horizontal	Pass
5**	12465.416	42.80	54.0	11.20	AV	288.00	200	Horizontal	Pass
6	14459.889	53.96	74.0	20.04	Peak	249.00	200	Horizontal	Pass
6**	14459.889	47.49	54.0	6.51	AV	249.00	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	1331.390	43.29	74.0	30.71	Peak	202.00	100	Vertical	Pass
1**	1331.390	36.56	54.0	17.44	AV	202.00	100	Vertical	Pass
2	2951.494	51.20	74.0	22.80	Peak	248.00	200	Vertical	Pass
2**	2951.494	39.52	54.0	14.48	AV	248.00	200	Vertical	Pass
3	4749.793	49.47	74.0	24.53	Peak	146.00	200	Vertical	Pass
3**	4749.793	36.61	54.0	17.39	AV	146.00	200	Vertical	Pass
4	7168.173	55.89	74.0	18.11	Peak	267.00	400	Vertical	Pass
4**	7168.173	45.16	54.0	8.84	AV	267.00	400	Vertical	Pass
5	12521.630	51.36	74.0	22.64	Peak	66.00	200	Vertical	Pass
5**	12521.630	45.31	54.0	8.69	AV	66.00	200	Vertical	Pass
6	17116.590	52.88	74.0	21.12	Peak	68.00	200	Vertical	Pass
6**	17116.590	48.87	54.0	5.13	AV	68.00	200	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	1441.102	47.73	74.0	26.27	Peak	56.00	200	Horizontal	Pass
1**	1441.102	39.70	54.0	14.30	AV	56.00	200	Horizontal	Pass
2	2668.853	51.16	74.0	22.84	Peak	206.00	400	Horizontal	Pass
2**	2668.853	44.96	54.0	9.04	AV	206.00	400	Horizontal	Pass
3	4952.217	47.44	74.0	26.56	Peak	42.00	200	Horizontal	Pass
3**	4952.217	38.45	54.0	15.55	AV	42.00	200	Horizontal	Pass
4	7687.706	54.25	74.0	19.75	Peak	277.00	300	Horizontal	Pass
4**	7687.706	44.61	54.0	9.39	AV	277.00	300	Horizontal	Pass
5	12466.733	52.04	74.0	21.96	Peak	45.00	400	Horizontal	Pass
5**	12466.733	41.15	54.0	12.85	AV	45.00	400	Horizontal	Pass
6	14456.440	57.10	74.0	16.90	Peak	24.00	200	Horizontal	Pass
6**	14456.440	48.64	54.0	5.36	AV	24.00	200	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	1330.116	42.94	74.0	31.06	Peak	46.00	300	Vertical	Pass
1**	1330.116	34.60	54.0	19.40	AV	46.00	300	Vertical	Pass
2	2950.733	53.00	74.0	21.00	Peak	15.00	100	Vertical	Pass
2**	2950.733	39.49	54.0	14.51	AV	15.00	100	Vertical	Pass
3	4748.482	49.18	74.0	24.82	Peak	31.00	200	Vertical	Pass
3**	4748.482	40.05	54.0	13.95	AV	31.00	200	Vertical	Pass
4	7166.349	56.26	74.0	17.74	Peak	196.00	100	Vertical	Pass
4**	7166.349	45.19	54.0	8.81	AV	196.00	100	Vertical	Pass
5	12515.179	54.07	74.0	19.93	Peak	3.00	400	Vertical	Pass
5**	12515.179	45.45	54.0	8.55	AV	3.00	400	Vertical	Pass
6	17114.558	53.50	74.0	20.50	Peak	44.00	400	Vertical	Pass
6**	17114.558	46.02	54.0	7.98	AV	44.00	400	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	1443.337	45.91	74.0	28.09	Peak	285.00	300	Horizontal	Pass
1**	1443.337	42.83	54.0	11.17	AV	285.00	300	Horizontal	Pass
2	2669.512	50.69	74.0	23.31	Peak	29.00	100	Horizontal	Pass
2**	2669.512	43.43	54.0	10.57	AV	29.00	100	Horizontal	Pass
3	4946.618	50.61	74.0	23.39	Peak	189.00	200	Horizontal	Pass
3**	4946.618	38.20	54.0	15.80	AV	189.00	200	Horizontal	Pass
4	7687.827	55.69	74.0	18.31	Peak	304.00	300	Horizontal	Pass
4**	7687.827	40.70	54.0	13.30	AV	304.00	300	Horizontal	Pass
5	12461.769	52.28	74.0	21.72	Peak	176.00	300	Horizontal	Pass
5**	12461.769	44.35	54.0	9.65	AV	176.00	300	Horizontal	Pass
6	14458.232	53.40	74.0	20.60	Peak	83.00	400	Horizontal	Pass
6**	14458.232	45.13	54.0	8.87	AV	83.00	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	1335.932	42.40	74.0	31.60	Peak	184.00	100	Vertical	Pass
1**	1335.932	35.15	54.0	18.85	AV	184.00	100	Vertical	Pass
2	2949.441	53.03	74.0	20.97	Peak	313.00	200	Vertical	Pass
2**	2949.441	38.12	54.0	15.88	AV	313.00	200	Vertical	Pass
3	4746.267	49.97	74.0	24.03	Peak	195.00	200	Vertical	Pass
3**	4746.267	37.10	54.0	16.90	AV	195.00	200	Vertical	Pass
4	7166.567	52.68	74.0	21.32	Peak	293.00	300	Vertical	Pass
4**	7166.567	44.50	54.0	9.50	AV	293.00	300	Vertical	Pass
5	12518.094	54.22	74.0	19.78	Peak	88.00	400	Vertical	Pass
5**	12518.094	42.73	54.0	11.27	AV	88.00	400	Vertical	Pass
6	17118.740	53.48	74.0	20.52	Peak	4.00	300	Vertical	Pass
6**	17118.740	44.54	54.0	9.46	AV	4.00	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	1439.354	45.67	74.0	28.33	Peak	258.00	300	Horizontal	Pass
1**	1439.354	44.83	54.0	9.17	AV	258.00	300	Horizontal	Pass
2	2674.219	48.88	74.0	25.12	Peak	32.00	400	Horizontal	Pass
2**	2674.219	40.38	54.0	13.62	AV	32.00	400	Horizontal	Pass
3	4952.978	47.79	74.0	26.21	Peak	241.00	200	Horizontal	Pass
3**	4952.978	41.12	54.0	12.88	AV	241.00	200	Horizontal	Pass
4	7687.632	51.96	74.0	22.04	Peak	264.00	100	Horizontal	Pass
4**	7687.632	45.67	54.0	8.33	AV	264.00	100	Horizontal	Pass
5	12468.453	54.98	74.0	19.02	Peak	113.00	400	Horizontal	Pass
5**	12468.453	41.30	54.0	12.70	AV	113.00	400	Horizontal	Pass
6	14454.426	56.33	74.0	17.67	Peak	249.00	100	Horizontal	Pass
6**	14454.426	45.15	54.0	8.85	AV	249.00	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	1335.331	42.51	74.0	31.49	Peak	30.00	300	Vertical	Pass
1**	1335.331	35.38	54.0	18.62	AV	30.00	300	Vertical	Pass
2	2946.549	48.30	74.0	25.70	Peak	335.00	300	Vertical	Pass
2**	2946.549	42.58	54.0	11.42	AV	335.00	300	Vertical	Pass
3	4749.126	51.00	74.0	23.00	Peak	168.00	200	Vertical	Pass
3**	4749.126	40.23	54.0	13.77	AV	168.00	200	Vertical	Pass
4	7172.297	50.95	74.0	23.05	Peak	191.00	200	Vertical	Pass
4**	7172.297	44.67	54.0	9.33	AV	191.00	200	Vertical	Pass
5	12519.388	55.28	74.0	18.72	Peak	146.00	200	Vertical	Pass
5**	12519.388	43.87	54.0	10.13	AV	146.00	200	Vertical	Pass
6	17114.322	53.12	74.0	20.88	Peak	74.00	400	Vertical	Pass
6**	17114.322	45.67	54.0	8.33	AV	74.00	400	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	1441.344	45.08	74.0	28.92	Peak	54.00	400	Horizontal	Pass
1**	1441.344	42.46	54.0	11.54	AV	54.00	400	Horizontal	Pass
2	2670.478	51.72	74.0	22.28	Peak	49.00	300	Horizontal	Pass
2**	2670.478	41.32	54.0	12.68	AV	49.00	300	Horizontal	Pass
3	4950.724	47.35	74.0	26.65	Peak	17.00	200	Horizontal	Pass
3**	4950.724	36.98	54.0	17.02	AV	17.00	200	Horizontal	Pass
4	7686.720	53.21	74.0	20.79	Peak	50.00	400	Horizontal	Pass
4**	7686.720	40.89	54.0	13.11	AV	50.00	400	Horizontal	Pass
5	12460.954	50.93	74.0	23.07	Peak	359.00	300	Horizontal	Pass
5**	12460.954	46.20	54.0	7.80	AV	359.00	300	Horizontal	Pass
6	14453.998	54.03	74.0	19.97	Peak	56.00	300	Horizontal	Pass
6**	14453.998	45.57	54.0	8.43	AV	56.00	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	1329.557	43.06	74.0	30.94	Peak	213.00	100	Vertical	Pass
1**	1329.557	33.20	54.0	20.80	AV	213.00	100	Vertical	Pass
2	2949.439	50.25	74.0	23.75	Peak	121.00	100	Vertical	Pass
2**	2949.439	41.71	54.0	12.29	AV	121.00	100	Vertical	Pass
3	4745.470	52.67	74.0	21.33	Peak	268.00	200	Vertical	Pass
3**	4745.470	38.80	54.0	15.20	AV	268.00	200	Vertical	Pass
4	7172.144	53.54	74.0	20.46	Peak	186.00	100	Vertical	Pass
4**	7172.144	46.67	54.0	7.33	AV	186.00	100	Vertical	Pass
5	12521.041	52.93	74.0	21.07	Peak	204.00	400	Vertical	Pass
5**	12521.041	41.96	54.0	12.04	AV	204.00	400	Vertical	Pass
6	17114.815	53.05	74.0	20.95	Peak	261.00	200	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	1438.168	46.62	74.0	27.38	Peak	94.00	300	Horizontal	Pass
1**	1438.168	43.10	54.0	10.90	AV	94.00	300	Horizontal	Pass
2	2674.244	48.73	74.0	25.27	Peak	31.00	300	Horizontal	Pass
2**	2674.244	42.60	54.0	11.40	AV	31.00	300	Horizontal	Pass
3	4951.252	47.35	74.0	26.65	Peak	187.00	200	Horizontal	Pass
3**	4951.252	38.41	54.0	15.59	AV	187.00	200	Horizontal	Pass
4	7685.043	55.93	74.0	18.07	Peak	356.00	300	Horizontal	Pass
4**	7685.043	41.25	54.0	12.75	AV	356.00	300	Horizontal	Pass
5	12463.603	51.93	74.0	22.07	Peak	0.00	400	Horizontal	Pass
5**	12463.603	44.04	54.0	9.96	AV	0.00	400	Horizontal	Pass
6	14453.934	56.90	74.0	17.10	Peak	10.00	200	Horizontal	Pass
6**	14453.934	48.20	54.0	5.80	AV	10.00	200	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	1333.544	44.77	74.0	29.23	Peak	132.00	300	Vertical	Pass
1**	1333.544	32.62	54.0	21.38	AV	132.00	300	Vertical	Pass
2	2944.819	49.39	74.0	24.61	Peak	182.00	300	Vertical	Pass
2**	2944.819	40.64	54.0	13.36	AV	182.00	300	Vertical	Pass
3	4746.101	52.16	74.0	21.84	Peak	233.00	200	Vertical	Pass
3**	4746.101	41.83	54.0	12.17	AV	233.00	200	Vertical	Pass
4	7170.323	53.83	74.0	20.17	Peak	30.00	100	Vertical	Pass
4**	7170.323	44.90	54.0	9.10	AV	30.00	100	Vertical	Pass
5	12518.483	55.38	74.0	18.62	Peak	303.00	300	Vertical	Pass
5**	12518.483	46.21	54.0	7.79	AV	303.00	300	Vertical	Pass
6	17119.519	56.75	74.0	17.25	Peak	24.00	100	Vertical	Pass
6**	17119.519	49.06	54.0	4.94	AV	24.00	100	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	1443.077	48.59	74.0	25.41	Peak	188.00	100	Horizontal	Pass
1**	1443.077	43.84	54.0	10.16	AV	188.00	100	Horizontal	Pass
2	2669.179	51.41	74.0	22.59	Peak	347.00	100	Horizontal	Pass
2**	2669.179	44.60	54.0	9.40	AV	347.00	100	Horizontal	Pass
3	4946.809	51.21	74.0	22.79	Peak	159.00	200	Horizontal	Pass
3**	4946.809	41.63	54.0	12.37	AV	159.00	200	Horizontal	Pass
4	7683.129	56.61	74.0	17.39	Peak	324.00	400	Horizontal	Pass
4**	7683.129	40.76	54.0	13.24	AV	324.00	400	Horizontal	Pass
5	12466.763	54.59	74.0	19.41	Peak	358.00	400	Horizontal	Pass
5**	12466.763	42.93	54.0	11.07	AV	358.00	400	Horizontal	Pass
6	14460.516	56.42	74.0	17.58	Peak	275.00	400	Horizontal	Pass
6**	14460.516	43.78	54.0	10.22	AV	275.00	400	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	1336.360	44.76	74.0	29.24	Peak	116.00	400	Vertical	Pass
1**	1336.360	34.06	54.0	19.94	AV	116.00	400	Vertical	Pass
2	2946.037	53.10	74.0	20.90	Peak	220.00	300	Vertical	Pass
2**	2946.037	42.26	54.0	11.74	AV	220.00	300	Vertical	Pass
3	4747.533	52.01	74.0	21.99	Peak	131.00	200	Vertical	Pass
3**	4747.533	42.07	54.0	11.93	AV	131.00	200	Vertical	Pass
4	7167.675	55.19	74.0	18.81	Peak	222.00	100	Vertical	Pass
4**	7167.675	43.87	54.0	10.13	AV	222.00	100	Vertical	Pass
5	12516.219	53.88	74.0	20.12	Peak	46.00	200	Vertical	Pass
5**	12516.219	46.71	54.0	7.29	AV	46.00	200	Vertical	Pass
6	17112.214	53.74	74.0	20.26	Peak	2.00	100	Vertical	Pass
6**	17112.214	46.84	54.0	7.16	AV	2.00	100	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	1441.686	48.59	74.0	25.41	Peak	251.00	100	Horizontal	Pass
1**	1441.686	44.81	54.0	9.19	AV	251.00	100	Horizontal	Pass
2	2674.604	50.53	74.0	23.47	Peak	27.00	200	Horizontal	Pass
2**	2674.604	43.68	54.0	10.32	AV	27.00	200	Horizontal	Pass
3	4949.432	47.00	74.0	27.00	Peak	76.00	200	Horizontal	Pass
3**	4949.432	38.20	54.0	15.80	AV	76.00	200	Horizontal	Pass
4	7684.488	55.23	74.0	18.77	Peak	161.00	200	Horizontal	Pass
4**	7684.488	41.47	54.0	12.53	AV	161.00	200	Horizontal	Pass
5	12464.660	52.60	74.0	21.40	Peak	80.00	200	Horizontal	Pass
5**	12464.660	43.58	54.0	10.42	AV	80.00	200	Horizontal	Pass
6	14457.746	56.79	74.0	17.21	Peak	47.00	400	Horizontal	Pass
6**	14457.746	46.01	54.0	7.99	AV	47.00	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	1334.127	42.69	74.0	31.31	Peak	214.00	100	Vertical	Pass
1**	1334.127	31.15	54.0	22.85	AV	214.00	100	Vertical	Pass
2	2947.600	51.11	74.0	22.89	Peak	249.00	200	Vertical	Pass
2**	2947.600	43.08	54.0	10.92	AV	249.00	200	Vertical	Pass
3	4749.382	46.97	74.0	27.03	Peak	145.00	200	Vertical	Pass
3**	4749.382	40.43	54.0	13.57	AV	145.00	200	Vertical	Pass
4	7167.737	56.31	74.0	17.69	Peak	359.00	100	Vertical	Pass
4**	7167.737	45.91	54.0	8.09	AV	359.00	100	Vertical	Pass
5	12518.592	52.79	74.0	21.21	Peak	161.00	300	Vertical	Pass
5**	12518.592	45.12	54.0	8.88	AV	161.00	300	Vertical	Pass
6	17115.376	57.67	74.0	16.33	Peak	110.00	100	Vertical	Pass
6**	17115.376	48.66	54.0	5.34	AV	110.00	100	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	1439.984	46.27	74.0	27.73	Peak	155.00	200	Horizontal	Pass
1**	1439.984	41.36	54.0	12.64	AV	155.00	200	Horizontal	Pass
2	2670.759	51.81	74.0	22.19	Peak	170.00	300	Horizontal	Pass
2**	2670.759	41.96	54.0	12.04	AV	170.00	300	Horizontal	Pass
3	4946.599	48.43	74.0	25.57	Peak	347.00	200	Horizontal	Pass
3**	4946.599	39.25	54.0	14.75	AV	347.00	200	Horizontal	Pass
4	7689.624	53.66	74.0	20.34	Peak	118.00	200	Horizontal	Pass
4**	7689.624	41.25	54.0	12.75	AV	118.00	200	Horizontal	Pass
5	12467.076	54.47	74.0	19.53	Peak	261.00	200	Horizontal	Pass
5**	12467.076	46.56	54.0	7.44	AV	261.00	200	Horizontal	Pass
6	14457.673	53.25	74.0	20.75	Peak	81.00	300	Horizontal	Pass
6**	14457.673	46.11	54.0	7.89	AV	81.00	300	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	1336.218	41.08	74.0	32.92	Peak	284.00	300	Vertical	Pass
1**	1336.218	34.91	54.0	19.09	AV	284.00	300	Vertical	Pass
2	2948.384	52.53	74.0	21.47	Peak	359.00	300	Vertical	Pass
2**	2948.384	41.55	54.0	12.45	AV	359.00	300	Vertical	Pass
3	4746.428	51.23	74.0	22.77	Peak	48.00	200	Vertical	Pass
3**	4746.428	38.37	54.0	15.63	AV	48.00	200	Vertical	Pass
4	7169.084	52.68	74.0	21.32	Peak	274.00	200	Vertical	Pass
4**	7169.084	42.73	54.0	11.27	AV	274.00	200	Vertical	Pass
5	12522.600	53.90	74.0	20.10	Peak	315.00	300	Vertical	Pass
5**	12522.600	46.08	54.0	7.92	AV	315.00	300	Vertical	Pass
6	17116.368	52.36	74.0	21.64	Peak	162.00	100	Vertical	Pass
6**	17116.368	46.46	54.0	7.54	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	1441.810	42.66	74.0	31.34	Peak	254.00	400	Horizontal	Pass
1**	1441.810	43.47	54.0	10.53	AV	254.00	400	Horizontal	Pass
2	2669.161	50.43	74.0	23.57	Peak	308.00	100	Horizontal	Pass
2**	2669.161	44.85	54.0	9.15	AV	308.00	100	Horizontal	Pass
3	4954.051	49.15	74.0	24.85	Peak	116.00	200	Horizontal	Pass
3**	4954.051	37.68	54.0	16.32	AV	116.00	200	Horizontal	Pass
4	7686.329	54.55	74.0	19.45	Peak	87.00	100	Horizontal	Pass
4**	7686.329	43.79	54.0	10.21	AV	87.00	100	Horizontal	Pass
5	12467.813	51.62	74.0	22.38	Peak	282.00	400	Horizontal	Pass
5**	12467.813	44.01	54.0	9.99	AV	282.00	400	Horizontal	Pass
6	14456.041	56.03	74.0	17.97	Peak	164.00	300	Horizontal	Pass
6**	14456.041	48.41	54.0	5.59	AV	164.00	300	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	1328.967	43.97	74.0	30.03	Peak	140.00	100	Vertical	Pass
1**	1328.967	33.01	54.0	20.99	AV	140.00	100	Vertical	Pass
2	2947.580	49.82	74.0	24.18	Peak	349.00	200	Vertical	Pass
2**	2947.580	43.40	54.0	10.60	AV	349.00	200	Vertical	Pass
3	4752.097	49.10	74.0	24.90	Peak	247.00	200	Vertical	Pass
3**	4752.097	38.65	54.0	15.35	AV	247.00	200	Vertical	Pass
4	7172.014	56.20	74.0	17.80	Peak	158.00	400	Vertical	Pass
4**	7172.014	43.76	54.0	10.24	AV	158.00	400	Vertical	Pass
5	12519.197	52.16	74.0	21.84	Peak	338.00	100	Vertical	Pass
5**	12519.197	45.84	54.0	8.16	AV	338.00	100	Vertical	Pass
6	17112.721	56.11	74.0	17.89	Peak	122.00	300	Vertical	Pass
6**	17112.721	48.86	54.0	5.14	AV	122.00	300	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	1440.823	44.90	74.0	29.10	Peak	359.00	300	Horizontal	Pass
1**	1440.823	44.39	54.0	9.61	AV	359.00	300	Horizontal	Pass
2	2669.094	50.15	74.0	23.85	Peak	257.00	100	Horizontal	Pass
2**	2669.094	44.25	54.0	9.75	AV	257.00	100	Horizontal	Pass
3	4947.642	50.03	74.0	23.97	Peak	85.00	200	Horizontal	Pass
3**	4947.642	41.23	54.0	12.77	AV	85.00	200	Horizontal	Pass
4	7683.736	51.56	74.0	22.44	Peak	11.00	100	Horizontal	Pass
4**	7683.736	42.87	54.0	11.13	AV	11.00	100	Horizontal	Pass
5	12461.854	53.36	74.0	20.64	Peak	51.00	200	Horizontal	Pass
5**	12461.854	45.22	54.0	8.78	AV	51.00	200	Horizontal	Pass
6	14458.088	54.23	74.0	19.77	Peak	27.00	400	Horizontal	Pass
6**	14458.088	48.50	54.0	5.50	AV	27.00	400	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	1332.010	40.92	74.0	33.08	Peak	167.00	400	Vertical	Pass
1**	1332.010	32.73	54.0	21.27	AV	167.00	400	Vertical	Pass
2	2950.305	48.81	74.0	25.19	Peak	31.00	200	Vertical	Pass
2**	2950.305	41.83	54.0	12.17	AV	31.00	200	Vertical	Pass
3	4752.521	51.67	74.0	22.33	Peak	222.00	200	Vertical	Pass
3**	4752.521	38.54	54.0	15.46	AV	222.00	200	Vertical	Pass
4	7170.953	51.61	74.0	22.39	Peak	270.00	200	Vertical	Pass
4**	7170.953	42.45	54.0	11.55	AV	270.00	200	Vertical	Pass
5	12515.713	52.41	74.0	21.59	Peak	244.00	400	Vertical	Pass
5**	12515.713	45.53	54.0	8.47	AV	244.00	400	Vertical	Pass
6	17112.467	54.36	74.0	19.64	Peak	161.00	400	Vertical	Pass
6**	17112.467	46.58	54.0	7.42	AV	161.00	400	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.

Test Data and Plots

802.11b LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2363.041	56.63	74.0	17.37	Peak	321.00	300	Horizontal	Pass
1**	2363.041	46.3	54.0	7.70	AV	321.00	300	Horizontal	Pass
2	2390.000	54.54	74.0	19.46	Peak	56.00	200	Horizontal	Pass
2**	2390.000	46.33	54.0	7.67	AV	56.00	200	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	56.85	74.0	17.15	Peak	60.00	100	Horizontal	Pass
1**	2483.500	46.96	54.0	7.04	AV	60.00	100	Horizontal	Pass
2	2485.304	59.1	74.0	14.90	Peak	331.00	200	Horizontal	Pass
2**	2485.304	46.46	54.0	7.54	AV	331.00	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	2362.336	56.5	74.0	17.50	Peak	14.00	100	Horizontal	Pass
1**	2362.336	46.05	54.0	7.95	AV	14.00	100	Horizontal	Pass
2	2390.000	57.69	74.0	16.31	Peak	287.00	200	Horizontal	Pass
2**	2390.000	47.64	54.0	6.36	AV	287.00	200	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	55.62	74.0	18.38	Peak	277.00	300	Horizontal	Pass
1**	2483.500	45.56	54.0	8.44	AV	277.00	300	Horizontal	Pass
2	2484.632	60.01	74.0	13.99	Peak	330.00	100	Horizontal	Pass
2**	2484.632	47.51	54.0	6.49	AV	330.00	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	2363.561	56.69	74.0	17.31	Peak	257.00	300	Horizontal	Pass
1**	2363.561	45.7	54.0	8.30	AV	257.00	300	Horizontal	Pass
2	2390.000	57.37	74.0	16.63	Peak	211.00	300	Horizontal	Pass
2**	2390.000	46.32	54.0	7.68	AV	211.00	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	55.21	74.0	18.79	Peak	160.00	200	Horizontal	Pass
1**	2483.500	48.7	54.0	5.30	AV	160.00	200	Horizontal	Pass
2	2486.771	59.71	74.0	14.29	Peak	1.00	100	Horizontal	Pass
2**	2486.771	46.45	54.0	7.55	AV	1.00	100	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	2362.003	56.46	74.0	17.54	Peak	176.00	300	Horizontal	Pass
1**	2362.003	45.09	54.0	8.91	AV	176.00	300	Horizontal	Pass
2	2390.000	57.98	74.0	16.02	Peak	320.00	200	Horizontal	Pass
2**	2390.000	46.11	54.0	7.89	AV	320.00	200	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	55.04	74.0	18.96	Peak	133.00	200	Horizontal	Pass
1**	2483.500	48.4	54.0	5.60	AV	133.00	200	Horizontal	Pass
2	2486.418	57.67	74.0	16.33	Peak	121.00	200	Horizontal	Pass
2**	2486.418	45.34	54.0	8.66	AV	121.00	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	2363.160	56.84	74.0	17.16	Peak	325.00	200	Horizontal	Pass
1**	2363.160	43.6	54.0	10.40	AV	325.00	200	Horizontal	Pass
2	2390.000	57.37	74.0	16.63	Peak	235.00	200	Horizontal	Pass
2**	2390.000	46.13	54.0	7.87	AV	235.00	200	Horizontal	Pass

802.11 ax20(SU) HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	55.37	74.0	18.63	Peak	342.00	100	Horizontal	Pass
1**	2483.500	47.01	54.0	6.99	AV	342.00	100	Horizontal	Pass
2	2486.471	57.03	74.0	16.97	Peak	358.00	200	Horizontal	Pass
2**	2486.471	48.24	54.0	5.76	AV	358.00	200	Horizontal	Pass

A.8 Power Spectral Density (PSD)

Test Data

802.11b Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-4.69	8
Middle	-3.45	8
High	-4.01	8

802.11g Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-6.97	8
Middle	-6.43	8
High	-7.33	8

802.11n-20 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-7.65	8
Middle	-7.38	8
High	-6.89	8

802.11n-40 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-10.06	8
Middle	-9.27	8
High	-9.94	8

802.11ax-20 MHz(SU) Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-8.80	8
Middle	-7.90	8
High	-7.95	8

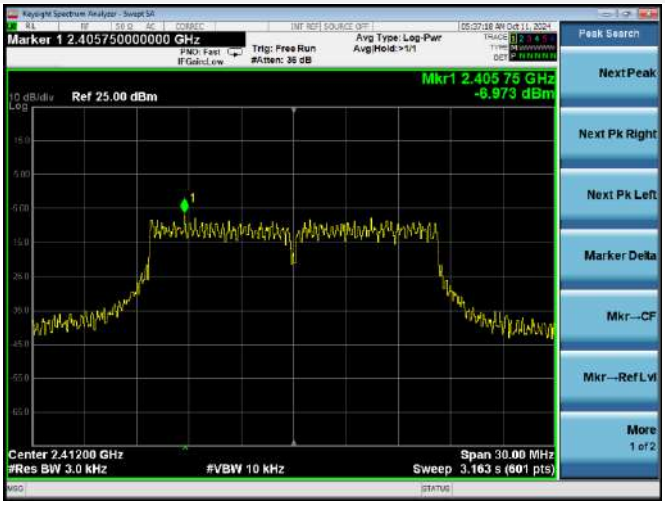
Test Plots

802.11b LOW CHANNEL

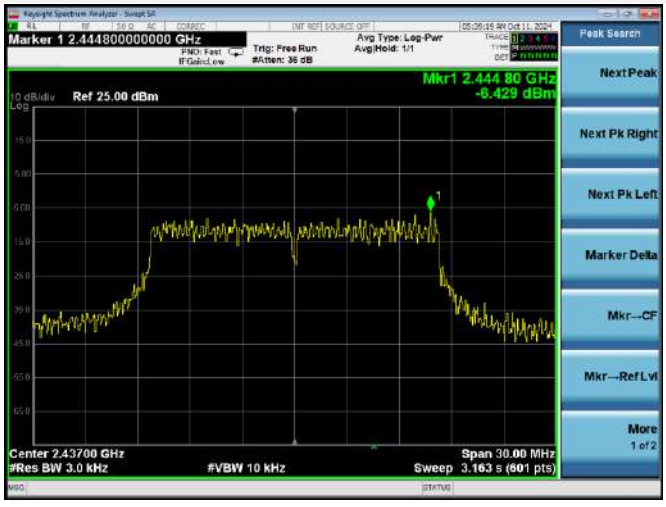
802.11b MIDDLE CHANNEL

802.11b HIGH CHANNEL

802.11g LOW CHANNEL

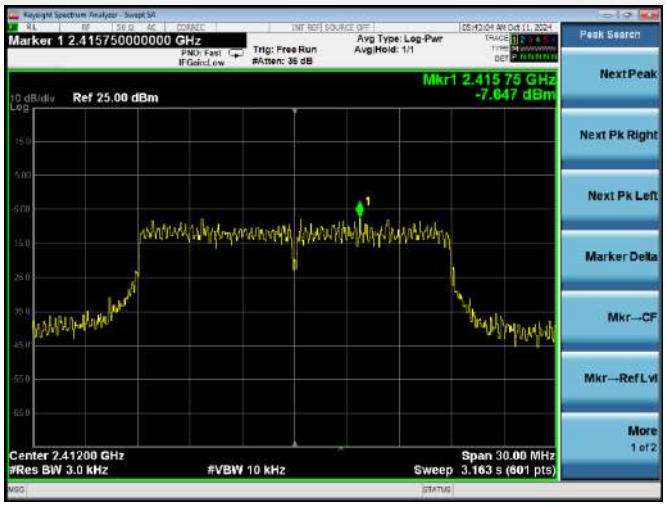


802.11g MIDDLE CHANNEL

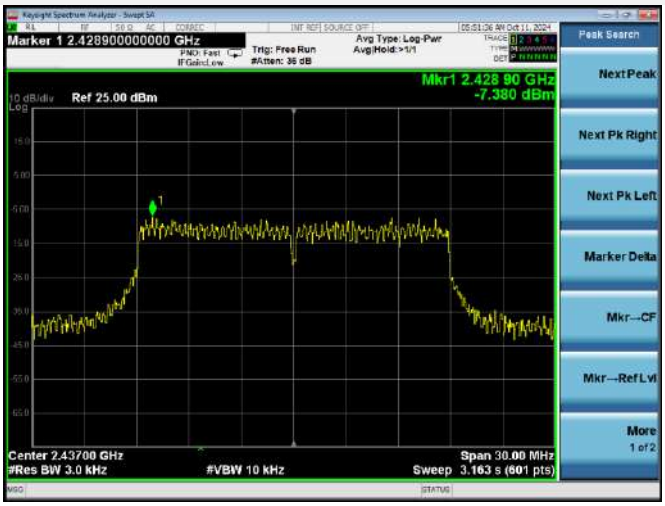


802.11g HIGH CHANNEL

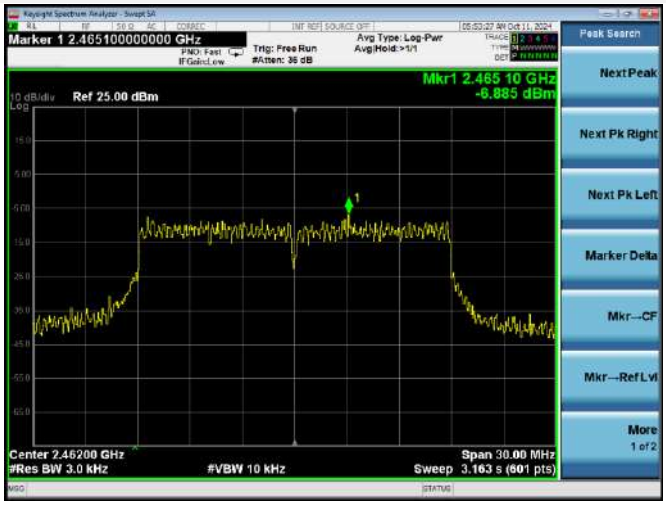
802.11n-20 MHz LOW CHANNEL



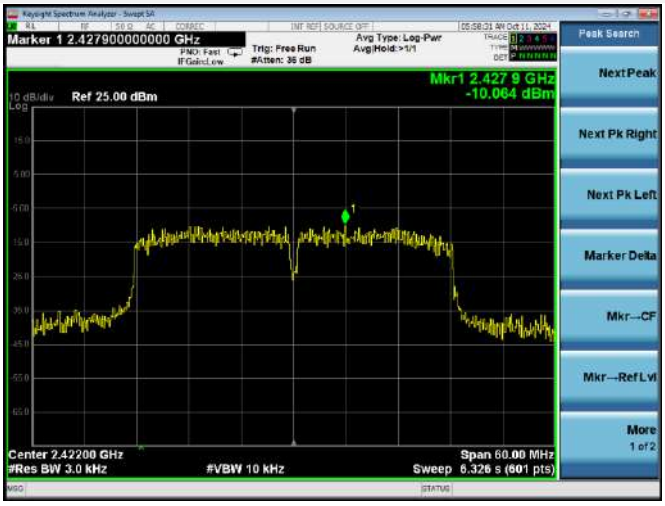
802.11n-20 MHz MIDDLE CHANNEL



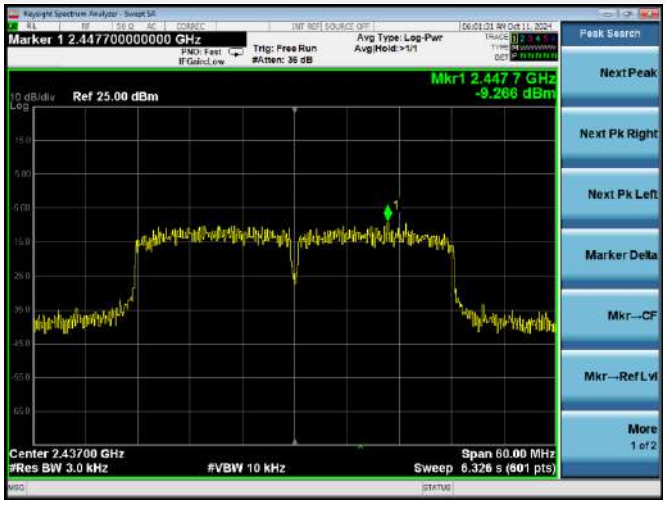
802.11n-20 MHz HIGH CHANNEL



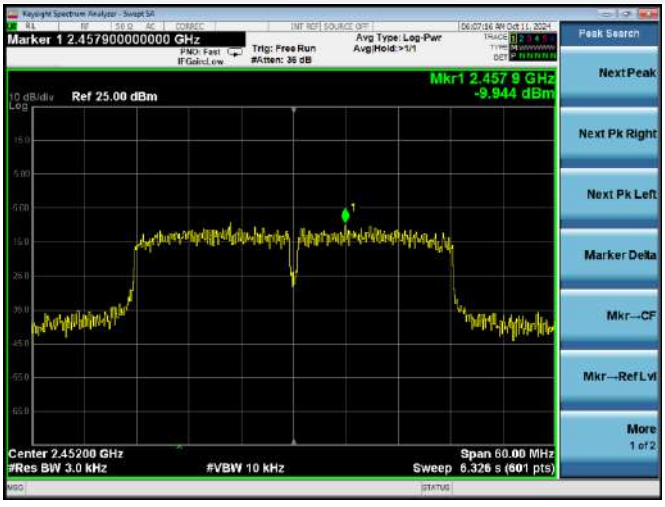
802.11n-40 MHz LOW CHANNEL



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

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2490729-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2490729-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2490729-AI.PDF”.

Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
3. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the “inspection and testing dedicated stamp” or test report stamp.
5. The test data and results are only valid for the tested samples provided by the customer.
6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--