

TEST REPORT

Applicant: Wuxi iData Technology Co., Ltd.
Address: Floor 11, Building B1, No.999 Gaolang East Road,
Wuxi City, P.R.C.
Equipment Type: New Mobile Computer
Model Name: iData K3 Pro (refer to section 2.3)
Brand Name: iData
FCC ID: 2ADE3IDATAK3PRO
Test Standard: 47 CFR Part 15 Subpart C
(refer to section 3.1)
Sample Arrival Date: Feb. 17, 2025
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ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Julie Zhu

Checked by: Ye Hongji

Approved by: Sunny Zou
(Technical Director)

Julie Zhu

Ye Hongji

Sunny Zou

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Mar. 11, 2025</u>	<u>Initial Issue</u>

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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	Wuxi iData Technology Co., Ltd.
Address	Floor 11, Building B1, No.999 Gaolang East Road, Wuxi City, P.R.C.

2.2 Manufacturer Information

Manufacturer	Wuxi iData Technology Co., Ltd.
Address	Floor 11, Building B1, No.999 Gaolang East Road, Wuxi City, P.R.C.

2.3 General Description for Equipment under Test (EUT)

EUT Name	New Mobile Computer
Model Name Under Test	iData K3 Pro
Series Model Name	iData K3, iData K3W, iData K3S, iData K3V, iData K31, iData K32, iData K3X, iData K3 Strong, iData K3 Cold, iData K3 Grip, iData K3 UHF, iData K3 Wireless, iData K3 Plus, iData k3 Lite, iData K3 Max, iData K3 Ultra, iData K3 Premium, iData K3 Pro Edition, iData K3 Plus Edition, iData K3HC, K3, K3W, K3S, K3V, K31, K32, K3X, K3 5G, K3 Strong, K3 Cold, K3 Grip, K3 UHF, K3 Wireless, K3 Pro, K3 Plus, K3 Lite, K3 Max, K3 Ultra, K3 Premium, K3 Pro Edition, K3 Plus Edition, K3HC, K51, K52, F53, F55, C56, C57, M58, M59, MC005
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only differ in model name. (this information provided by the applicant)
Hardware Version	Z231RQ_V25
Software Version	14.00.044
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	2G Network GSM/GPRS/EDGE 850/1900 3G Network WCDMAHSDPA/HSUPA Band 2/4/5 4G Network FDD LTE Band 2/4/5/7/12/17/66/71 TDD LTE Band 41 Bluetooth (BR+EDR+BLE) WIFI 802.11a, 802.11b, 802.11g, 802.11n(HT20/40) and 802.11ac(VHT20/40/80), GNSS, NFC
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The requirement for the following technical information of the EUT was tested in this report:

Frequency Range	802.11b/g/n(20 MHz): 2.412 GHz - 2.462 GHz $f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$, where - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 1 to 11. 802.11n(40 MHz): 2.422 GHz - 2.452 GHz $f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$, where - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 3 to 9.
Modulation Type	DSSS, OFDM
Product Type	☐ Mobile ☒ Portable ☐ Fix Location
Antenna System (eg., MIMO, Smart Antenna)	N/A
Categorization as Correlated or Completely Uncorrelated	N/A
Antenna Type	PIFA Antenna
Antenna Gain	4.07 dBi
About the Product	Only the WIFI 802.11b, 802.11g, 802.11n (HT20/40) 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

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	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Occupied Bandwidth	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Conducted Spurious Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Conducted Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Radiated Spurious Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Band Edge	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Power spectral density (PSD)	11b/11g/11n20/11n40	1/6/6.5/13.5 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	47% to 58%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+21.3℃ to +23.8℃
Working Voltage of the EUT	NV (Normal Voltage)	3.85 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	KEYSIGHT	N9020A	MY46471071	2024.07.04	2025.07.03
Power Sensor	KEYSIGHT	U2063XA	MY58000247	2024.07.04	2025.07.03
Spectrum Analyzer	KEYSIGHT	N9020A	MY52510065	2024.08.01	2025.07.31
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	02460	2024.05.16	2027.05.15
Test Antenna-Horn	A-INFO	LB-180400KF	J211060273	2024.06.15	2027.06.14
Anechoic Chamber	RAINFORD	9m*6m*6m	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
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2024.08.01	2025.07.31
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-01162	2023.08.04	2026.08.03
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2024.01.23	2027.01.22
Amplifier	COM-MV	ZT30-1000M	B2018054558	2024.11.28	2025.11.27
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	130	2024.07.13	2027.07.12
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2024.08.01	2025.07.31
LISN	SCHWARZBECK	NSLK 8127	8127-687	2024.05.09	2025.05.08
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	112	2025.02.14	2028.02.13

4.3 Test Software List

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

4.4 Measurement Uncertainty

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

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

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

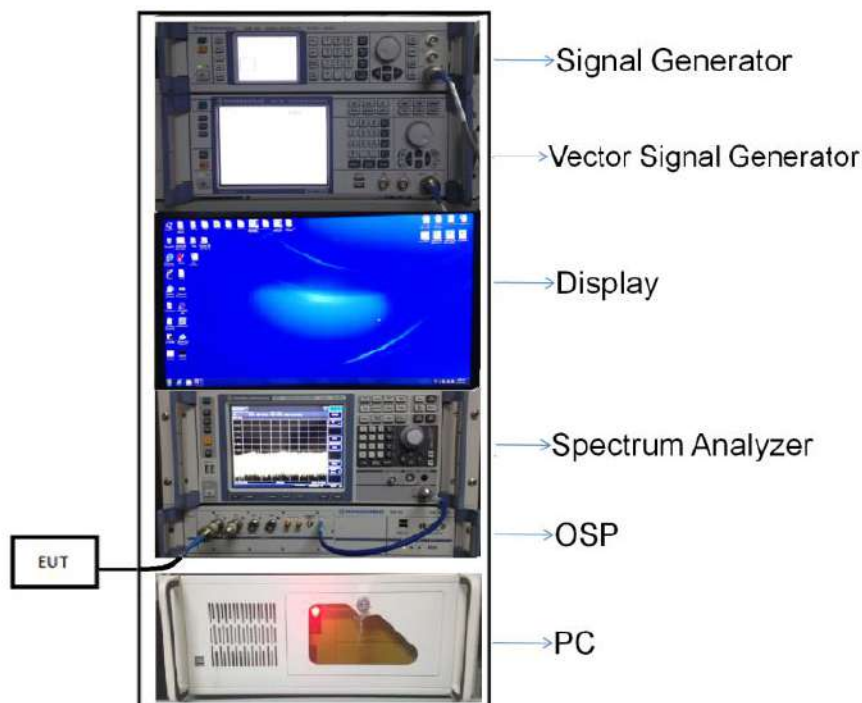
4.5 Description of Test Setup

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



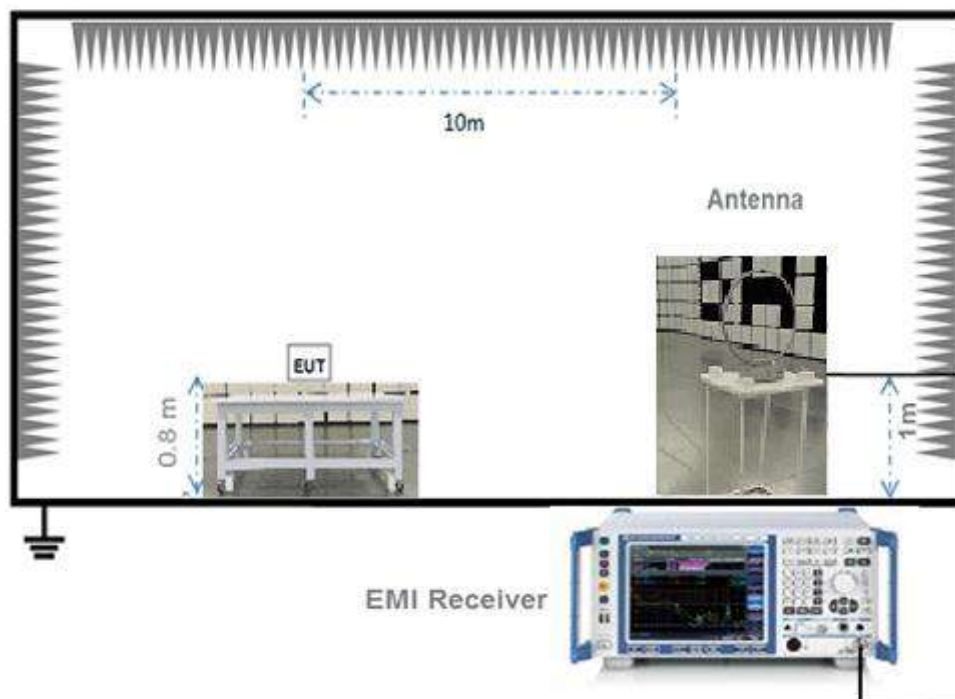
(Diagram 1)

4.5.2 For AC Power Supply Port Test



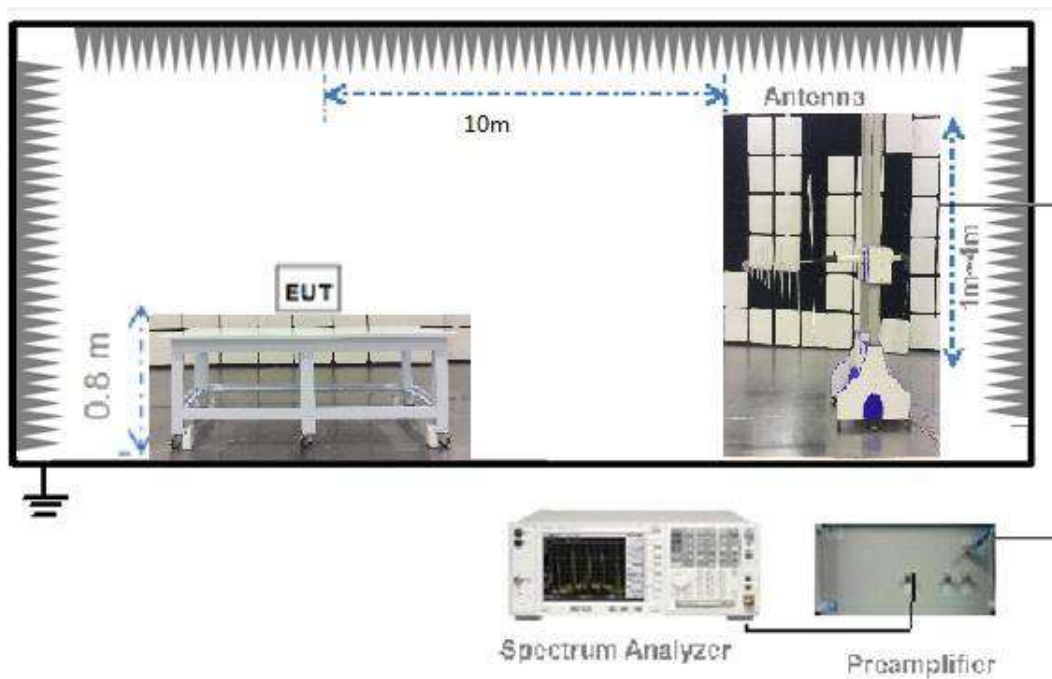
(Diagram 2)

4.5.3 For Radiated Test (Below 30 MHz)



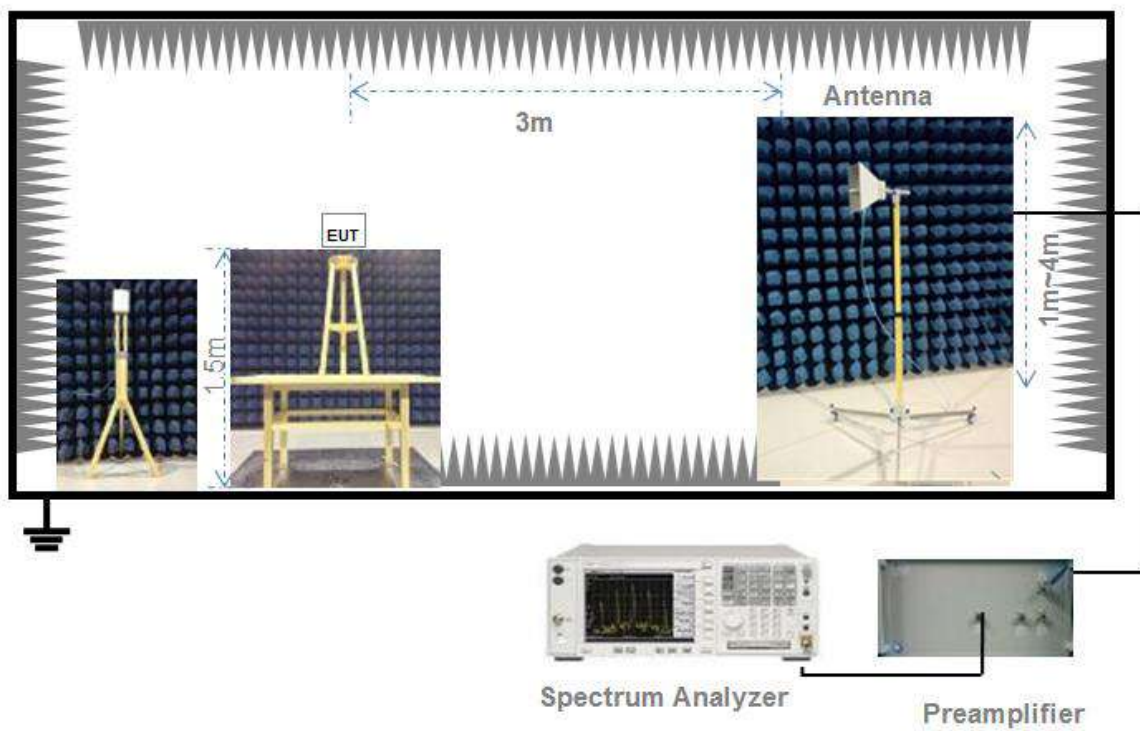
(Diagram 3)

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:

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

where:

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

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

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

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203

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 $10\log(1/x)$, where x is the duty cycle.

Measurements of duty cycle

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between

bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

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

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

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

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

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 Occupied Bandwidth

5.3.1 Limit

FCC §15.247(a)

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 $\geq 3 \times$ RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

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

Emission level measurement

Use the following spectrum analyzer settings:

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

Set the RBW = 100 kHz.

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

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

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

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

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Band Edge (Authorized-band band-edge)

5.5.1 Limit

FCC §15.247(d)

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

5.5.2 Test Setup

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

5.5.3 Test Procedure

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

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

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

Set span to 2 MHz

RBW = 100 kHz.

VBW $\geq 3 \times$ RBW.

Detector = peak.

Sweep time = auto.

Trace mode = max hold.

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

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

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

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

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

Attenuation: Auto (at least 10 dB preferred).

Sweep time: Coupled.

Resolution bandwidth: 100 kHz.

Video bandwidth: 300 kHz.

Detector: Peak.

Trace: Max hold.

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Conducted Emission

5.6.1 Limit

FCC §15.207

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

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

5.6.2 Test Setup

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

5.6.3 Test Procedure

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

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

5.6.4 Test Result

Please refer to ANNEX A.5.

5.7 Radiated Spurious Emission

5.7.1 Limit

FCC §15.209&15.247(d)

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:

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

where:

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

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

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

Quasi-Peak measurement procedure

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

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

Peak power measurement procedure

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

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

longer for low duty cycle applications).

Table 1—RBW as a function of frequency

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

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

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

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

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

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

Determining the applicable transmit antenna gain

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

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

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

Radiated spurious emission test

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

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

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

The power of the EUT transmitting frequency should be ignored.

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

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

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

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.7.4 Test Result

Please refer to ANNEX A.6.

5.8 Band Edge (Restricted-band band-edge)

5.8.1 Limit

FCC §15.209&15.247(d)

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

5.8.2 Test Setup

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

5.8.3 Test Procedure

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

The power of the EUT transmitting frequency should be ignored.

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

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

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

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

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

5.8.4 Test Result

Please refer to ANNEX A.7.

5.9 Power Spectral density (PSD)

5.9.1 Limit

FCC §15.247(e)

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

5.9.2 Test Setup

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

5.9.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

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

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

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

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

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.9.4 Test Result

Please refer to ANNEX A.8.

ANNEX A TEST RESULT

A.1 Output Power

Duty Cycle

Test Mode	On Time (ms)	On+Off time (ms)	Duty Cycle	Duty Factor
802.11b	8.368	8.425	99.32%	0.03
802.11g	1.39	1.436	96.80%	0.14
802.11n-20 MHz	1.297	1.345	96.43%	0.16
802.11n-40 MHz	0.647	0.692	93.50%	0.29

Peak Power Test Data

802.11b Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	20.45	110.92	30	1000	Pass
Middle	20.59	114.55			Pass
High	20.81	120.50			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	21.61	144.88	30	1000	Pass
Middle	21.72	148.59			Pass
High	21.70	147.91			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	20.57	114.02	30	1000	Pass
Middle	20.35	108.39			Pass
High	20.71	117.76			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	21.51	141.58	30	1000	Pass
Middle	21.51	141.58			Pass
High	21.46	139.96			Pass

Average Power Test Data

802.11b Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	17.93	62.09	30	1000	Pass
Middle	18.08	64.27			Pass
High	18.09	64.42			Pass

802.11g Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	15.57	36.06	30	1000	Pass
Middle	15.57	36.06			Pass
High	15.61	36.39			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.47	27.99	30	1000	Pass
Middle	14.54	28.44			Pass
High	14.57	28.64			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	15.61	36.39	30	1000	Pass
Middle	15.74	37.50			Pass
High	15.72	37.33			Pass

A.2 Occupied Bandwidth

Test Data

802.11b Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	8.200000	13.108000	≥ 500
Middle	8.700000	13.077000	≥ 500
High	8.700000	13.037000	≥ 500

802.11g Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	15.400000	17.140000	≥ 500
Middle	15.600000	17.197000	≥ 500
High	15.300000	17.173000	≥ 500

802.11n-20MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	15.400000	18.098000	≥ 500
Middle	15.400000	18.057000	≥ 500
High	15.400000	18.146000	≥ 500

802.11n-40MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	35.200000	36.298000	≥ 500
Middle	35.200000	36.260000	≥ 500
High	35.200000	36.238000	≥ 500

Test Plots

6 dB Bandwidth

802.11b LOW CHANNEL



802.11b MIDDLE CHANNEL



802.11b HIGH CHANNEL



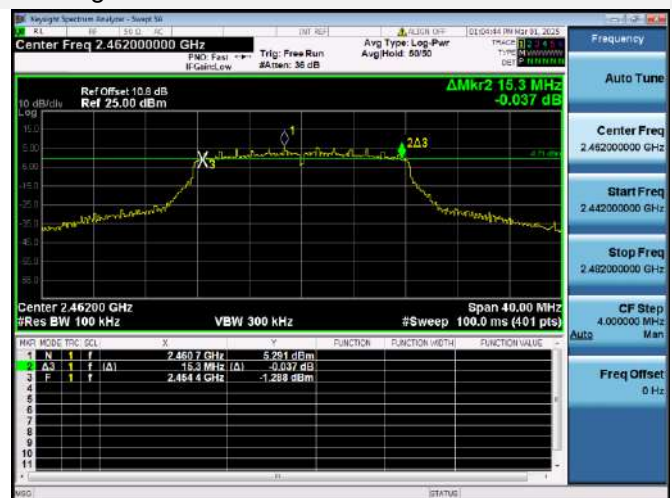
802.11g LOW CHANNEL



802.11g MIDDLE CHANNEL



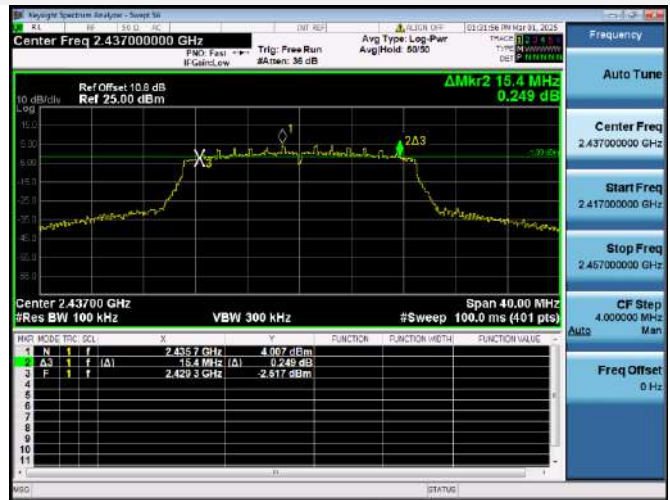
802.11g HIGH CHANNEL



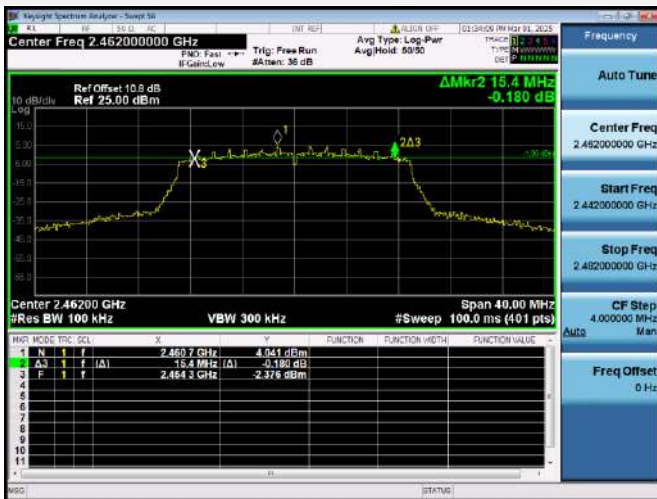
802.11n-20 MHz LOW CHANNEL



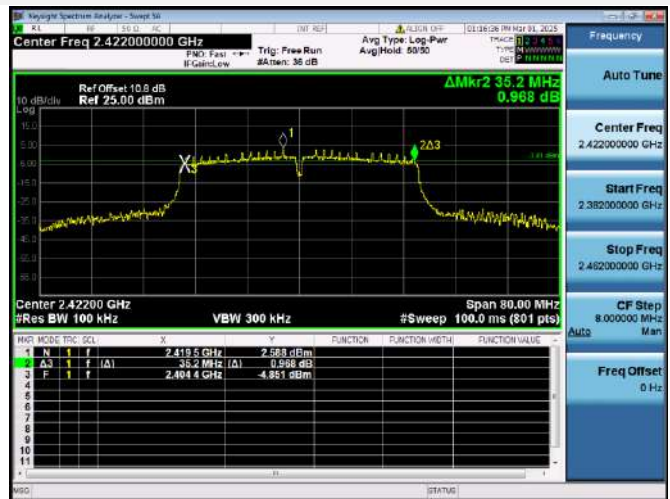
802.11n-20 MHz MIDDLE CHANNEL



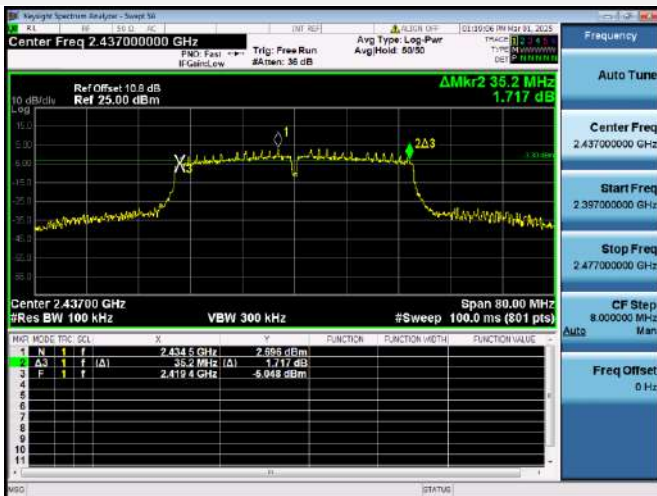
802.11n-20 MHz HIGH CHANNEL



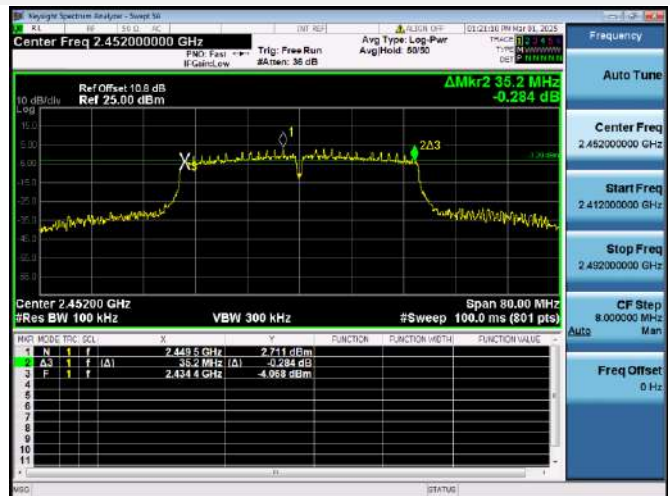
802.11n-40 MHz LOW CHANNEL



802.11n-40 MHz MIDDLE CHANNEL



802.11n-40 MHz HIGH CHANNEL



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



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	-28.96	10.21	-9.80	Pass
Middle	-29.34	10.14	-9.86	Pass
High	-28.15	10.41	-9.59	Pass

802.11g Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-35.00	5.81	-14.19	Pass
Middle	-34.28	5.92	-14.08	Pass
High	-34.94	5.80	-14.20	Pass

802.11n-20MHz Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-38.30	4.58	-15.42	Pass
Middle	-39.46	4.72	-15.28	Pass
High	-38.59	4.68	-15.32	Pass

802.11n-40MHz Mode:

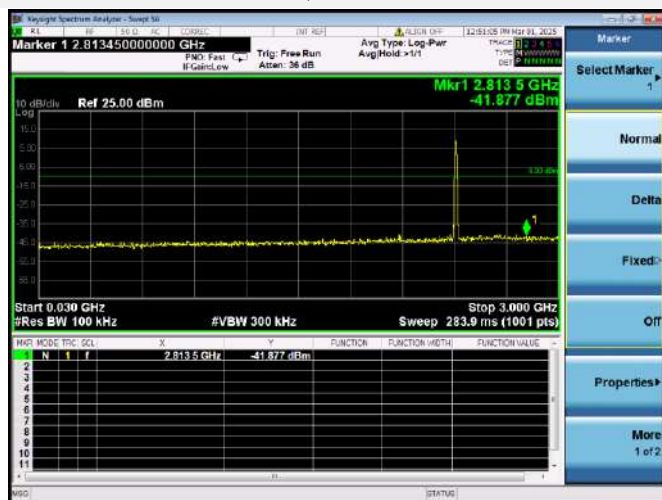
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-39.17	2.78	-17.22	Pass
Middle	-38.27	2.84	-17.16	Pass
High	-38.73	2.98	-17.02	Pass

Test Plots

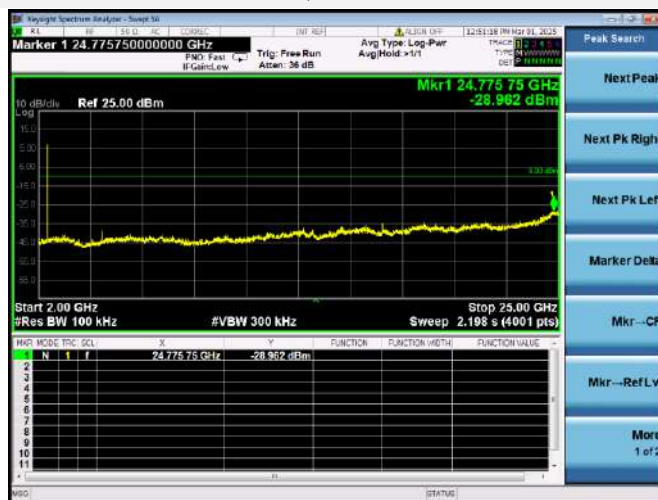
802.11b LOW CHANNEL CARRIER LEVEL



802.11b LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



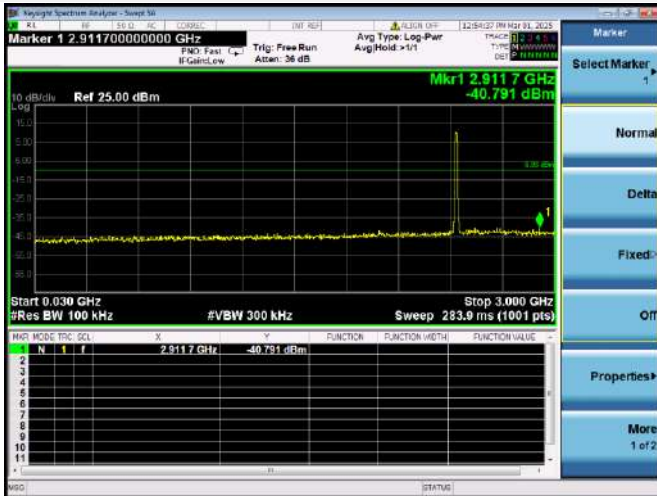
802.11b LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



802.11b MIDDLE CHANNEL CARRIER LEVEL



802.11b MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



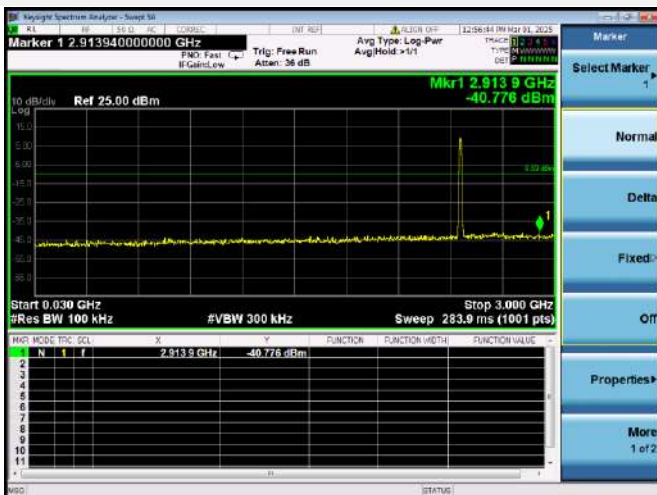
802.11b MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



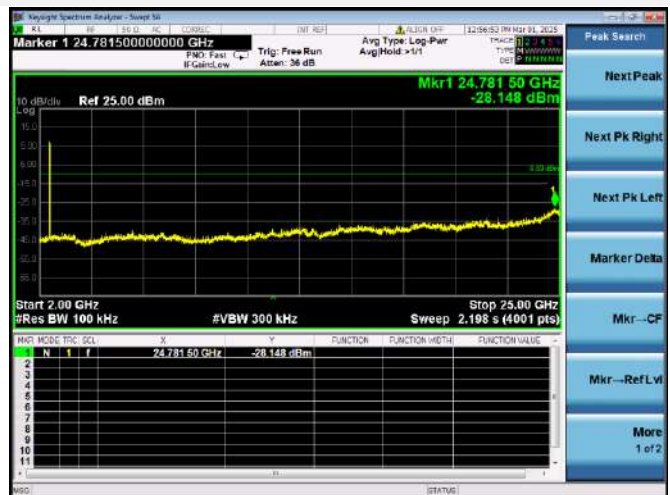
802.11b HIGH CHANNEL CARRIER LEVEL



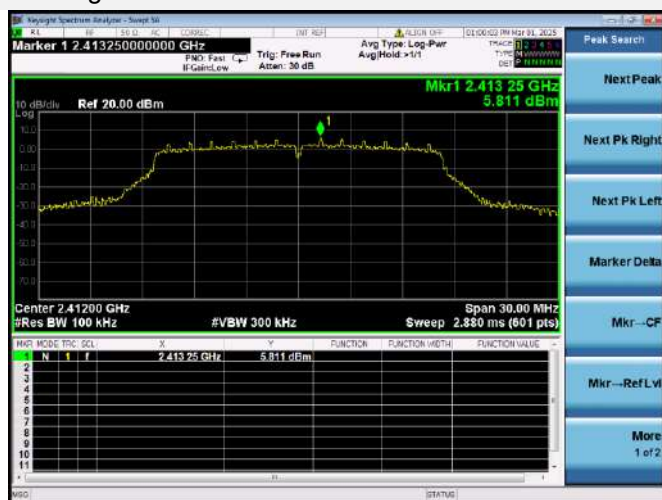
802.11b HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



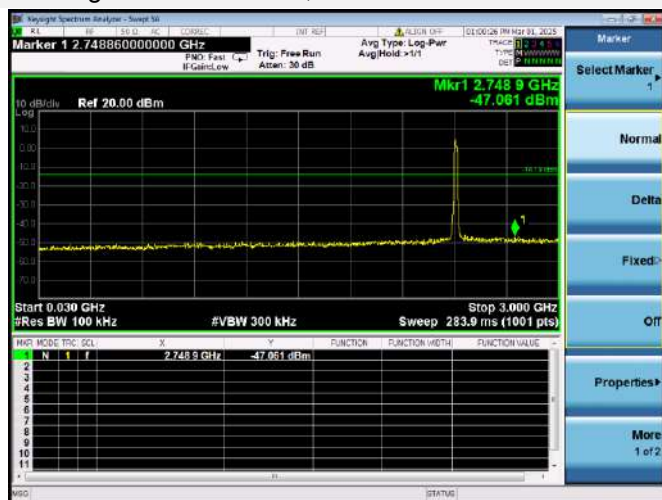
802.11b HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



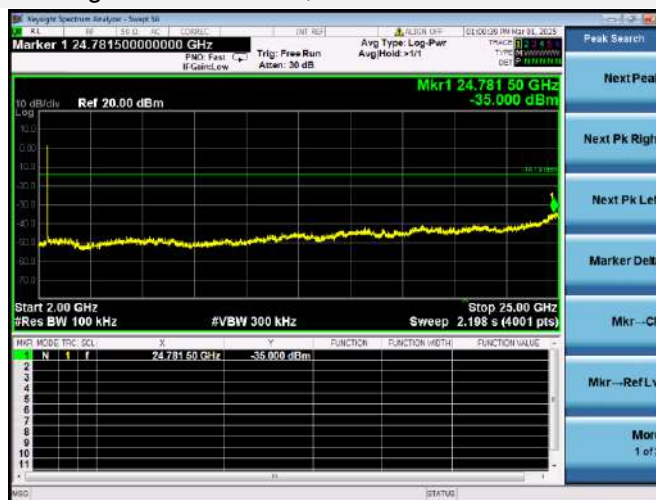
802.11g LOW CHANNEL CARRIER LEVEL



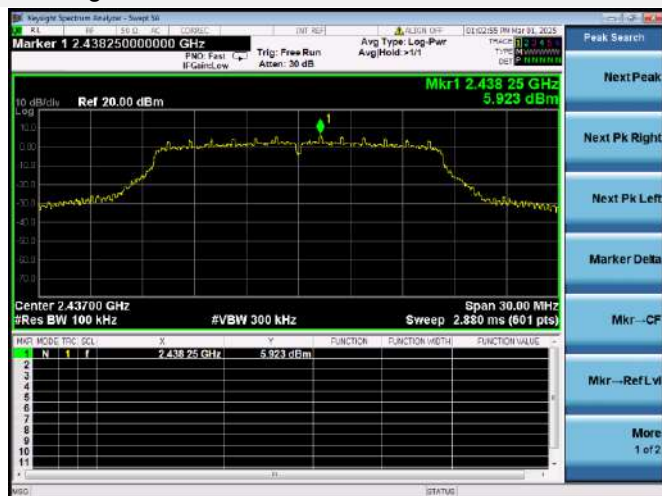
802.11g LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



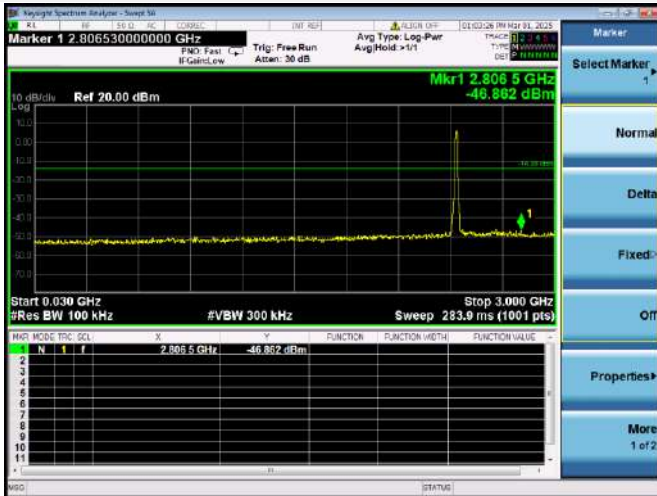
802.11g LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



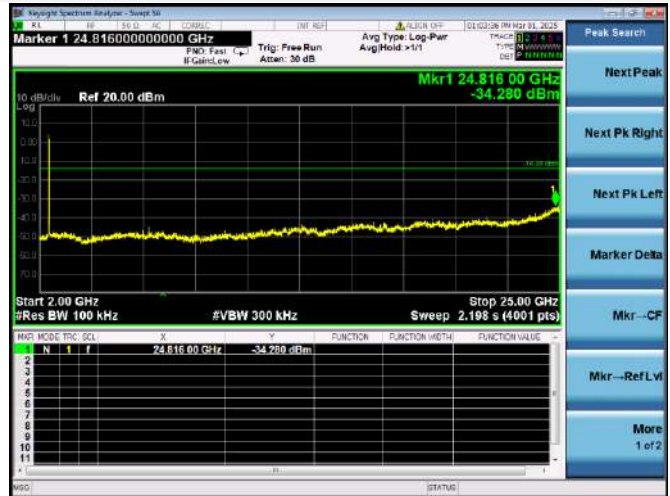
802.11g MIDDLE CHANNEL CARRIER LEVEL



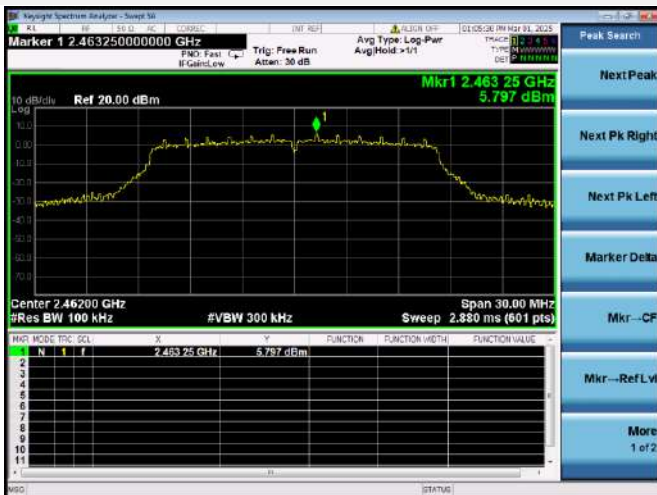
802.11g MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



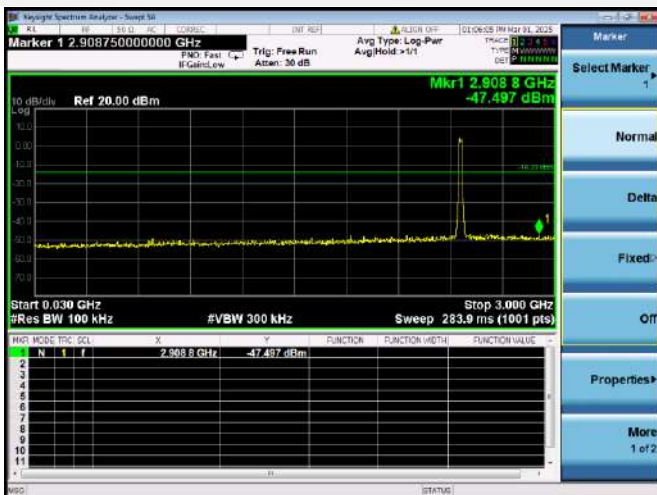
802.11g MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



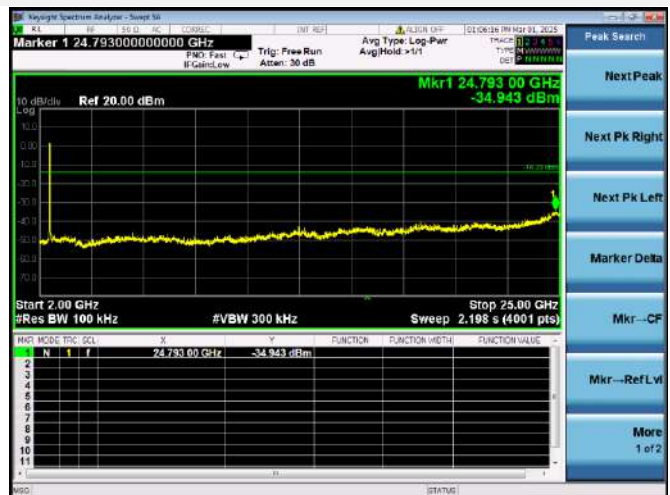
802.11g HIGH CHANNEL CARRIER LEVEL



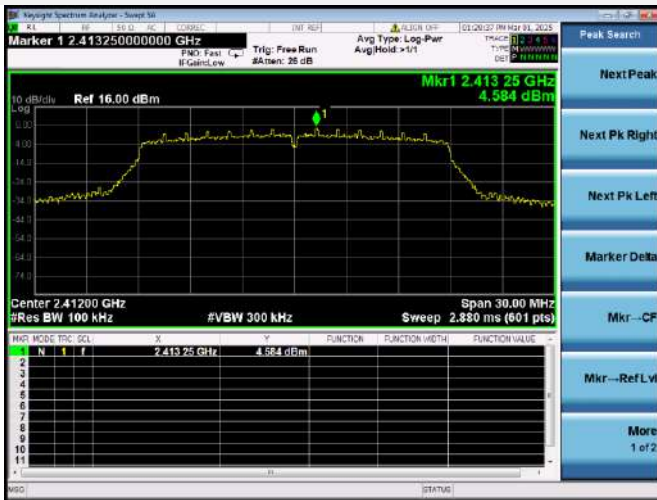
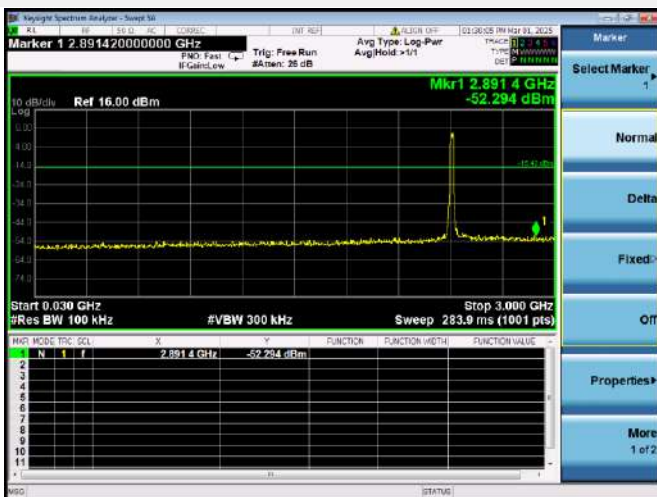
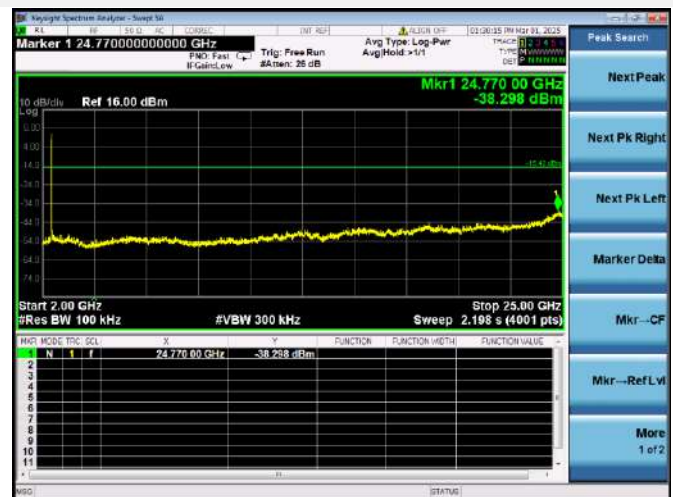
802.11g HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



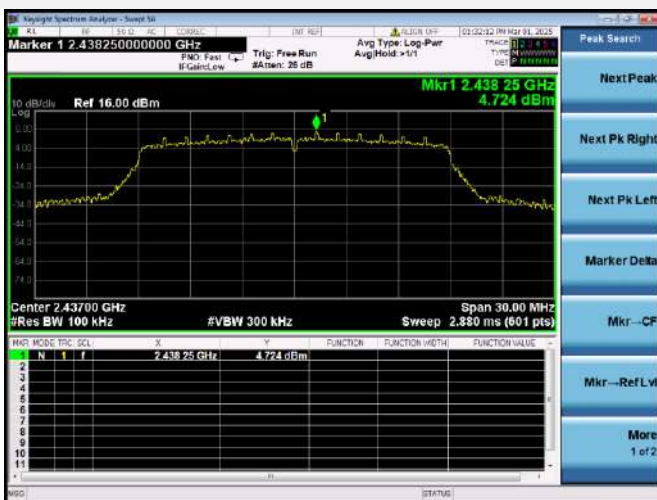
802.11g HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



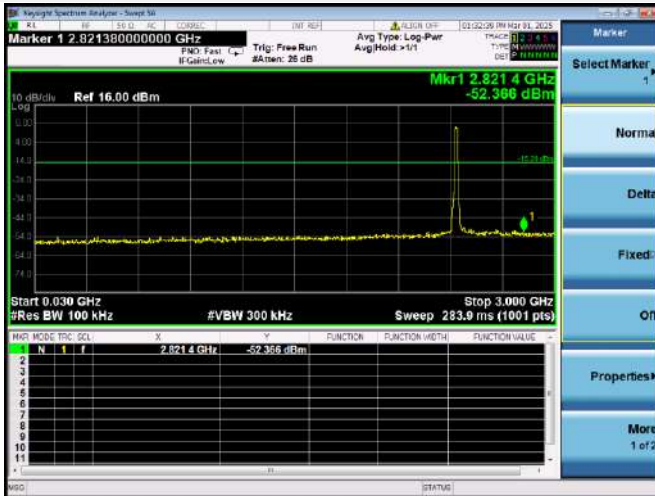
802.11n-20 MHz LOW CHANNEL CARRIER LEVEL

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

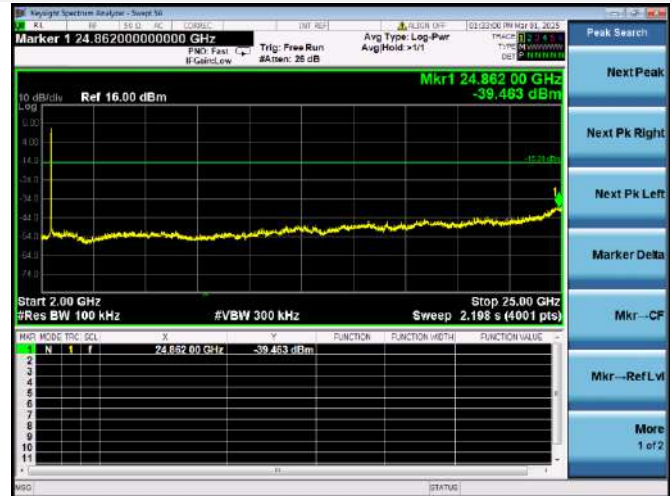
802.11n-20 MHz MIDDLE CHANNEL CARRIER LEVEL



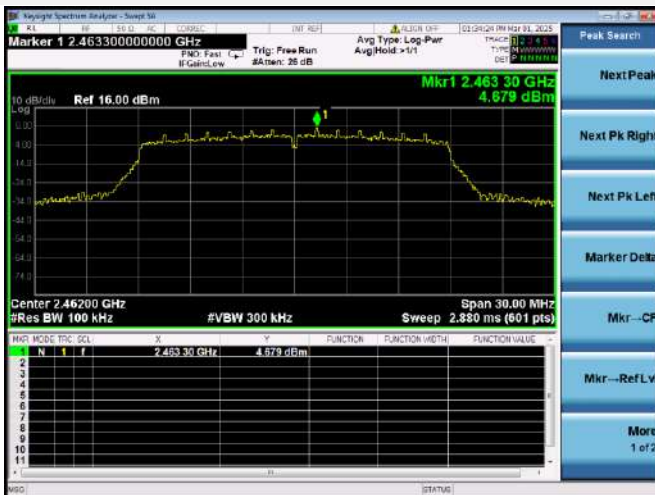
802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



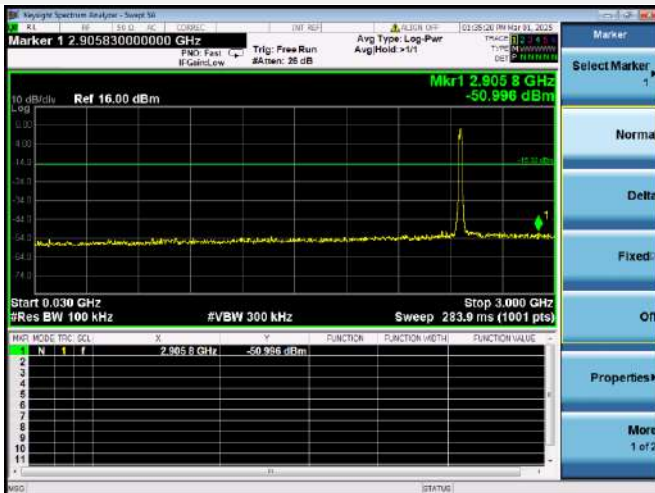
802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



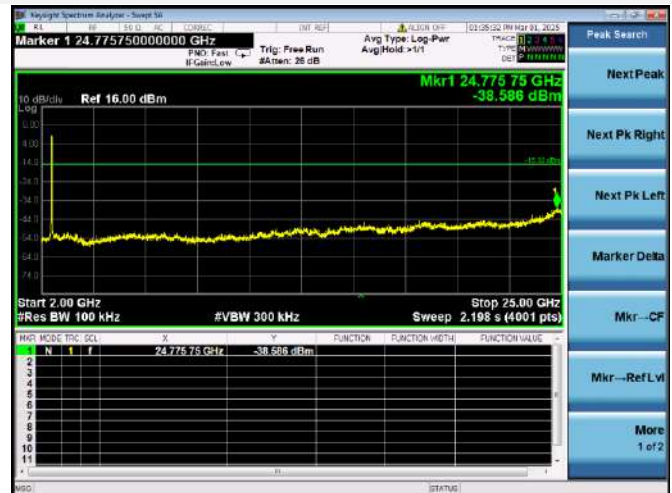
802.11n-20 MHz HIGH CHANNEL CARRIER LEVEL



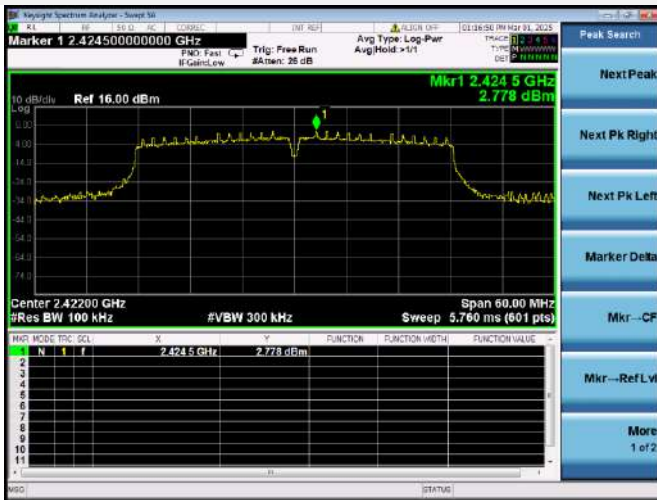
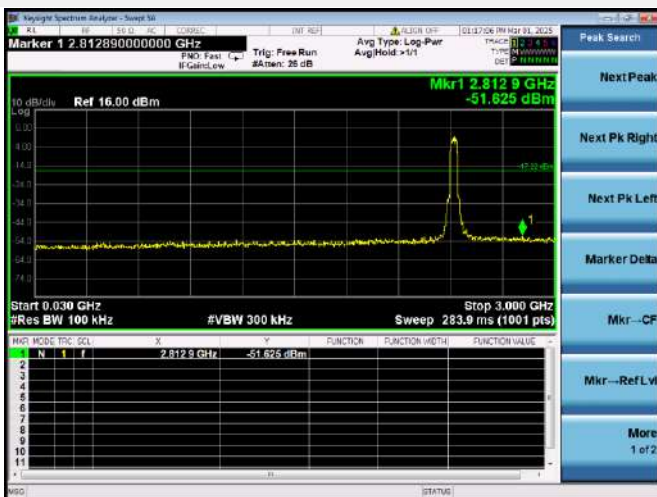
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



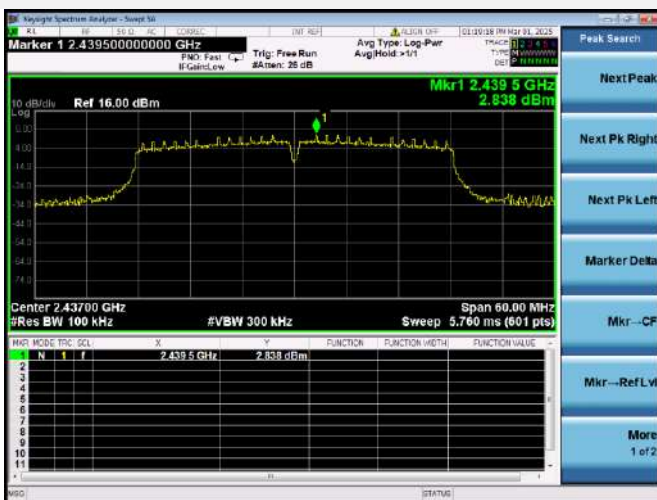
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



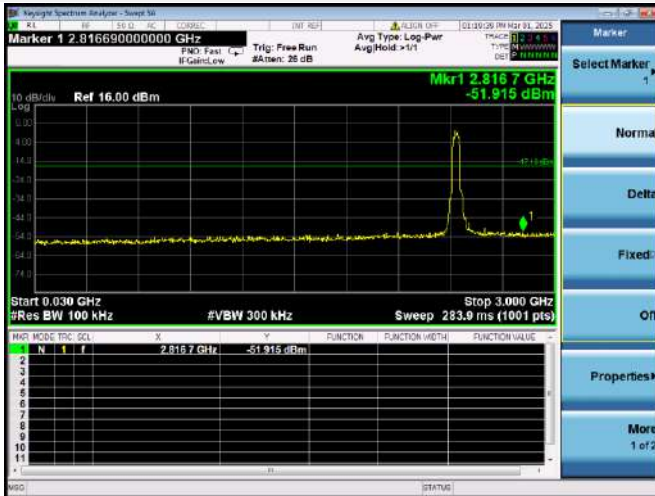
802.11n-40 MHz LOW CHANNEL CARRIER LEVEL

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

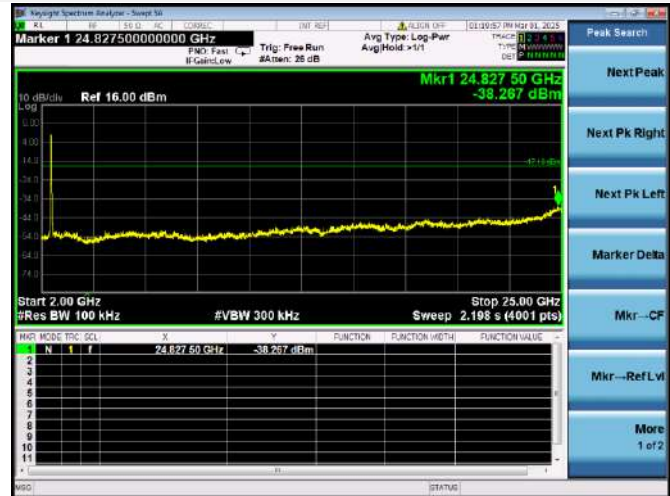
802.11n-40 MHz MIDDLE CHANNEL CARRIER LEVEL



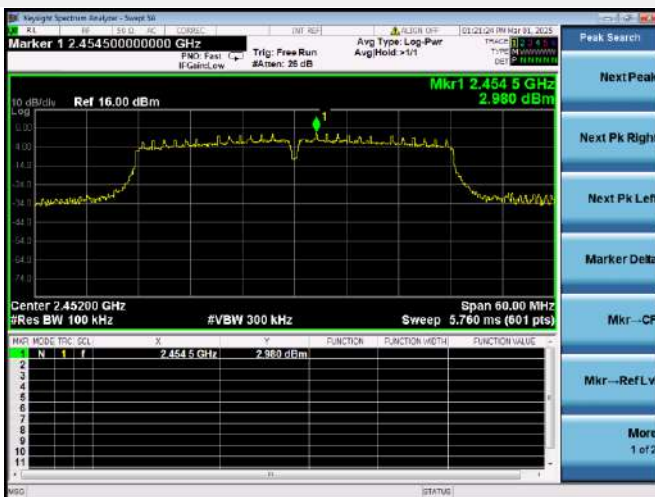
802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



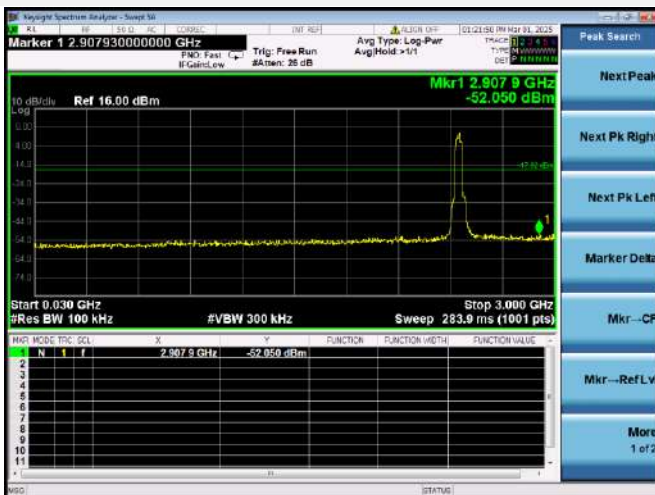
802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



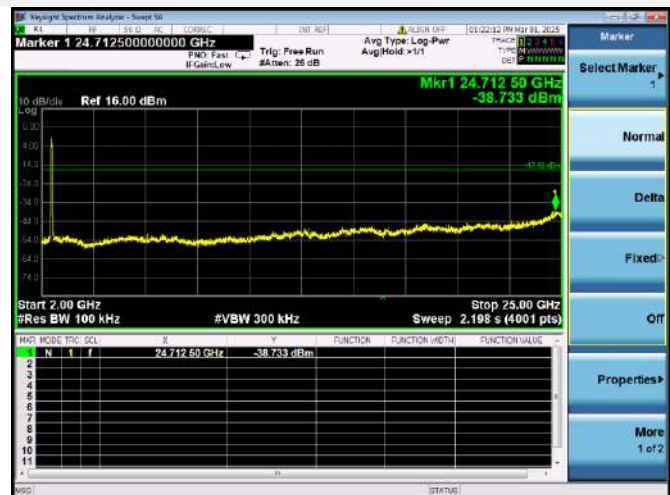
802.11n-40 MHz HIGH CHANNEL CARRIER LEVEL



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



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



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	-34.78	10.21	-9.80	Pass
High Channel	-46.13	10.41	-9.59	Pass

802.11g Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-26.31	5.81	-14.19	Pass
High Channel	-40.14	5.80	-14.20	Pass

802.11n-20 MHz Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-27.64	4.58	-15.42	Pass
High Channel	-43.12	4.68	-15.32	Pass

802.11n-40 MHz Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-29.00	2.78	-17.22	Pass
High Channel	-30.04	2.98	-17.02	Pass

Test Plots

802.11b LOW CHANNEL, CARRIER LEVEL



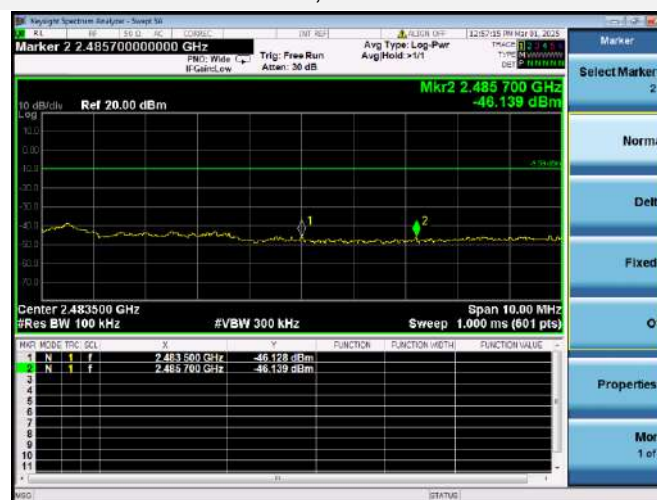
802.11b LOW CHANNEL, BAND EDGE



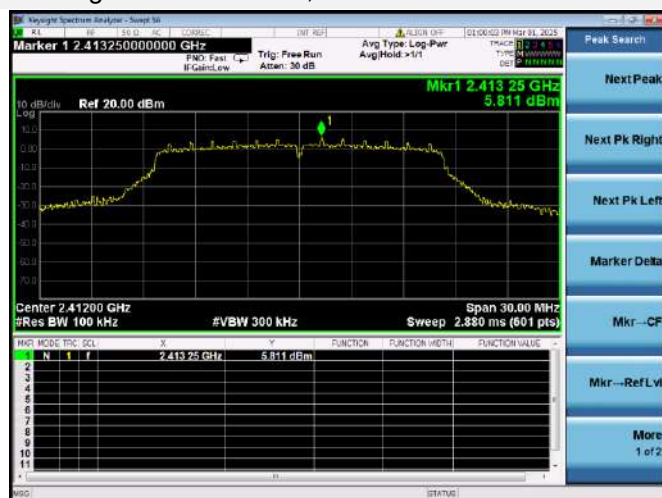
802.11b HIGH CHANNEL, CARRIER LEVEL



802.11b HIGH CHANNEL, BAND EDGE



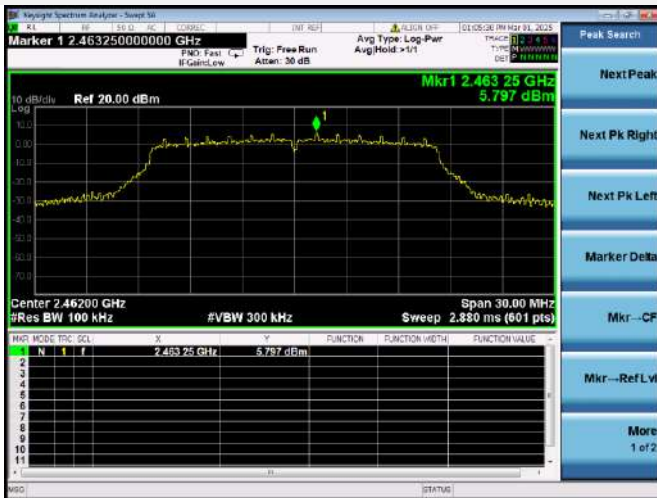
802.11g LOW CHANNEL, CARRIER LEVEL



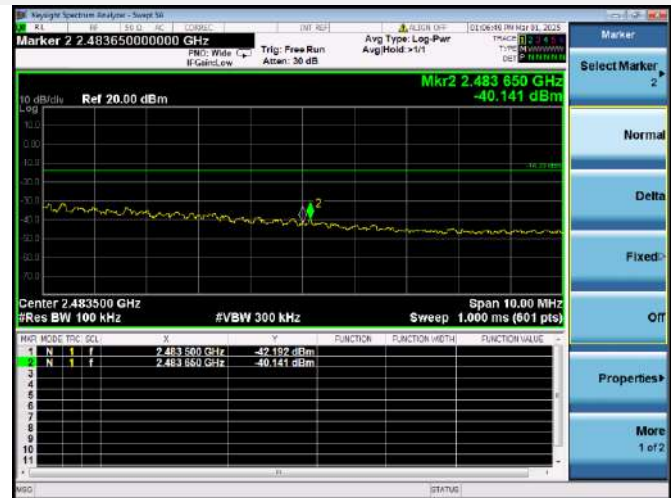
802.11g LOW CHANNEL, BAND EDGE



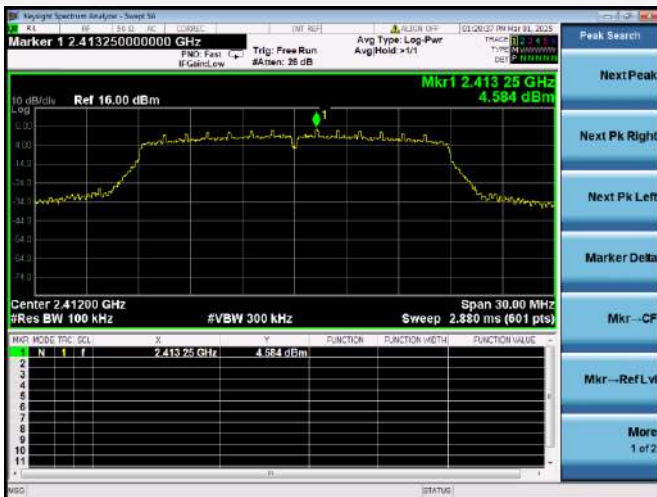
802.11g HIGH CHANNEL, CARRIER LEVEL



802.11g HIGH CHANNEL, BAND EDGE



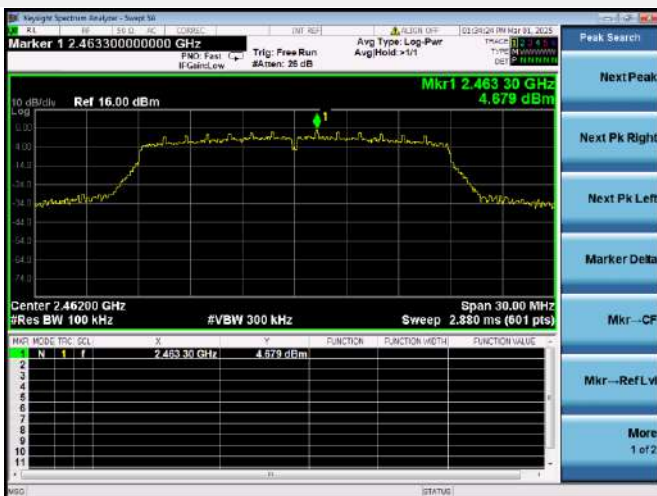
802.11n-20 MHz LOW CHANNEL, CARRIER LEVEL



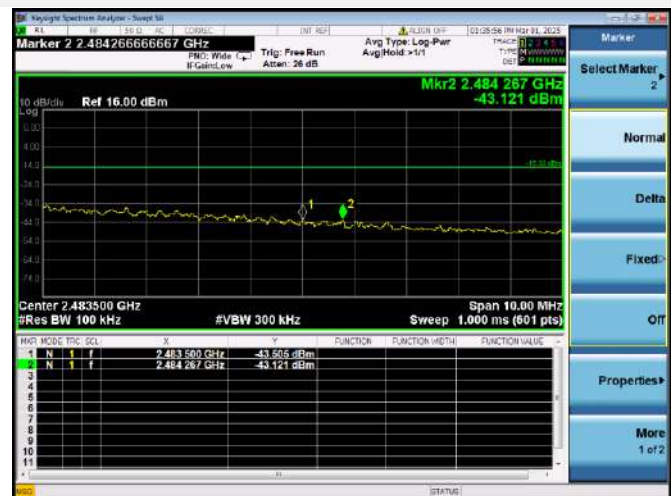
802.11n-20 MHz LOW CHANNEL, BAND EDGE



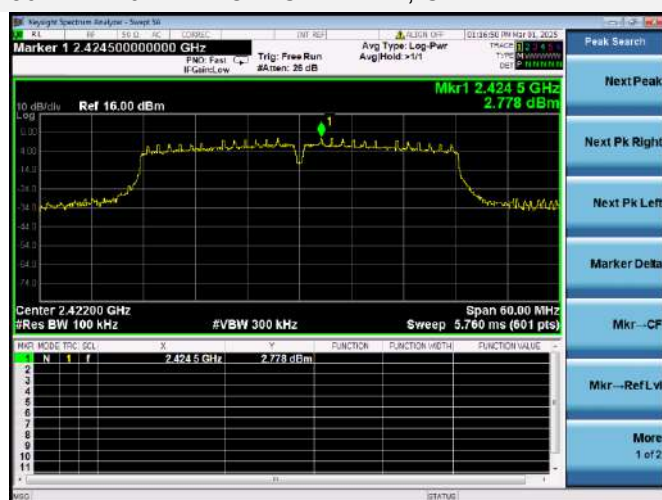
802.11n-20 MHz HIGH CHANNEL, CARRIER LEVEL



802.11n-20 MHz HIGH CHANNEL, BAND EDGE



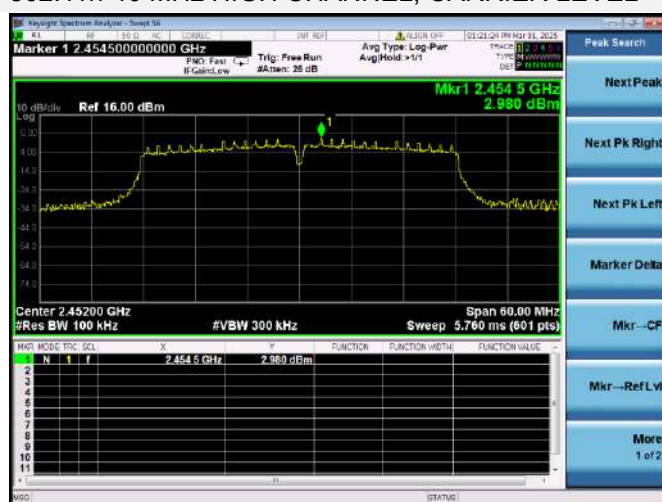
802.11n-40 MHz LOW CHANNEL, CARRIER LEVEL



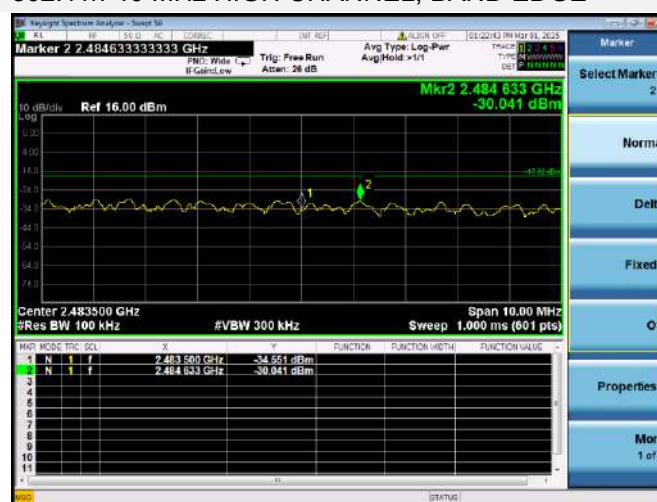
802.11n-40 MHz LOW CHANNEL, BAND EDGE



802.11n-40 MHz HIGH CHANNEL, CARRIER LEVEL



802.11n-40 MHz HIGH CHANNEL, BAND EDGE



A.5 Conducted Emissions

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

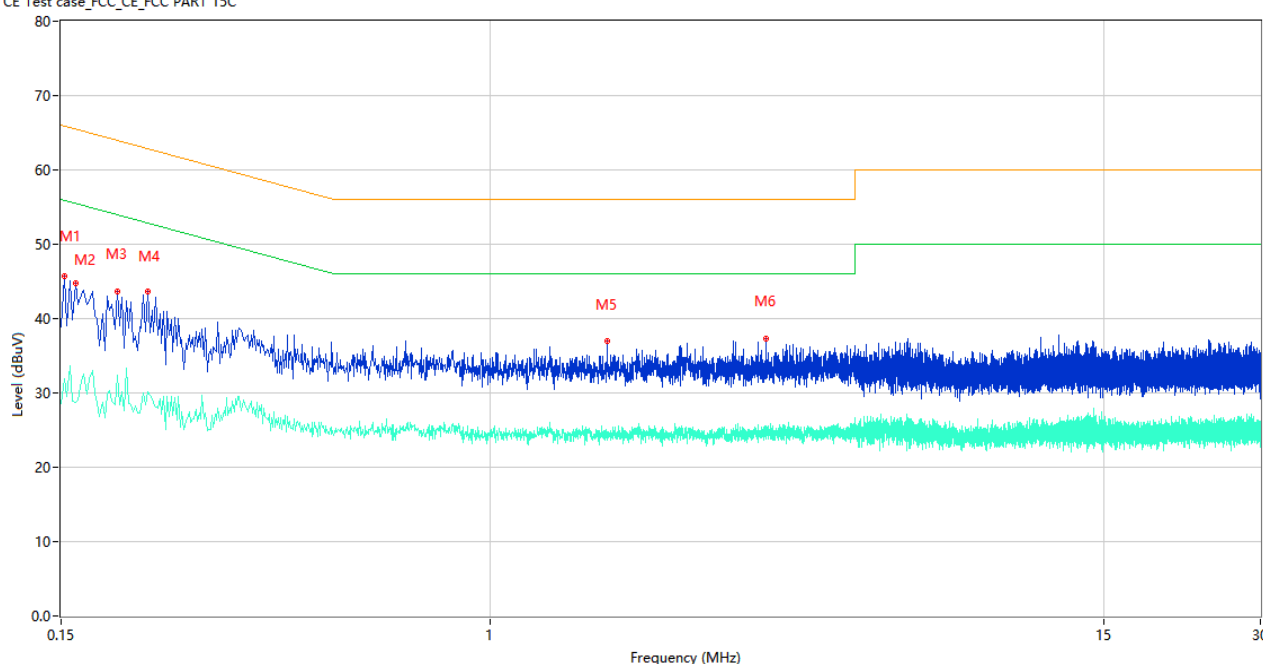
Note²: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration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

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

Test Data and Plots

PHASE L

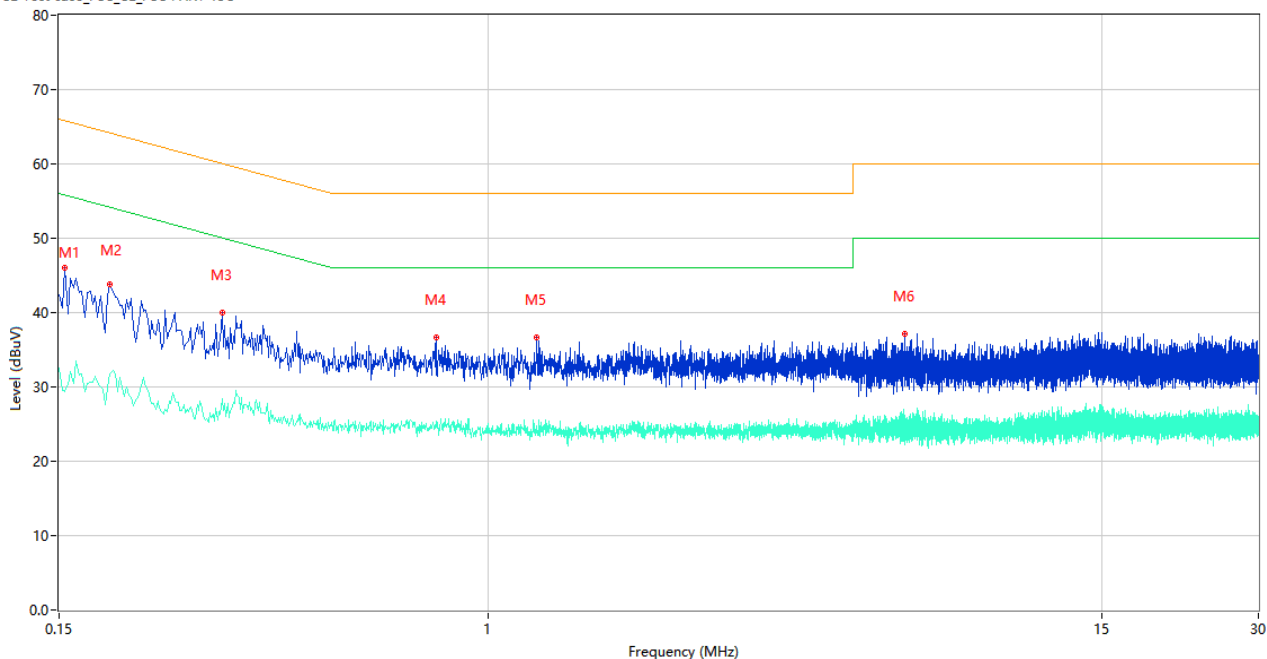
CE Test case_FCC_CE_FCC PART 15C



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.152	45.75	9.78	65.89	20.14	Peak	L	Pass
1**	0.152	31.98	9.78	55.89	23.91	AV	L	Pass
2	0.160	44.69	9.78	65.46	20.77	Peak	L	Pass
2**	0.160	28.74	9.78	55.46	26.72	AV	L	Pass
3	0.192	43.69	9.77	63.95	20.26	Peak	L	Pass
3**	0.192	32.45	9.77	53.95	21.50	AV	L	Pass
4	0.220	43.67	9.77	62.82	19.15	Peak	L	Pass
4**	0.220	30.15	9.77	52.82	22.67	AV	L	Pass
5	1.672	36.96	10.05	56.00	19.04	Peak	L	Pass
5**	1.672	23.71	10.05	46.00	22.29	AV	L	Pass
6	3.376	37.33	10.30	56.00	18.67	Peak	L	Pass
6**	3.376	24.79	10.30	46.00	21.21	AV	L	Pass

PHASE N

CE Test case_FCC_CE_FCC PART 15C



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.154	46.05	9.78	65.78	19.73	Peak	N	Pass
1**	0.154	29.36	9.78	55.78	26.42	AV	N	Pass
2	0.188	43.86	9.78	64.12	20.26	Peak	N	Pass
2**	0.188	31.71	9.78	54.12	22.41	AV	N	Pass
3	0.308	40.00	9.92	60.02	20.02	Peak	N	Pass
3**	0.308	28.43	9.92	50.02	21.59	AV	N	Pass
4	0.794	36.67	10.49	56.00	19.33	Peak	N	Pass
4**	0.794	25.35	10.49	46.00	20.65	AV	N	Pass
5	1.238	36.69	10.33	56.00	19.31	Peak	N	Pass
5**	1.238	24.34	10.33	46.00	21.66	AV	N	Pass
6	6.288	37.20	10.28	60.00	22.80	Peak	N	Pass
6**	6.288	25.01	10.28	50.00	24.99	AV	N	Pass

A.6 Radiated Emission

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

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

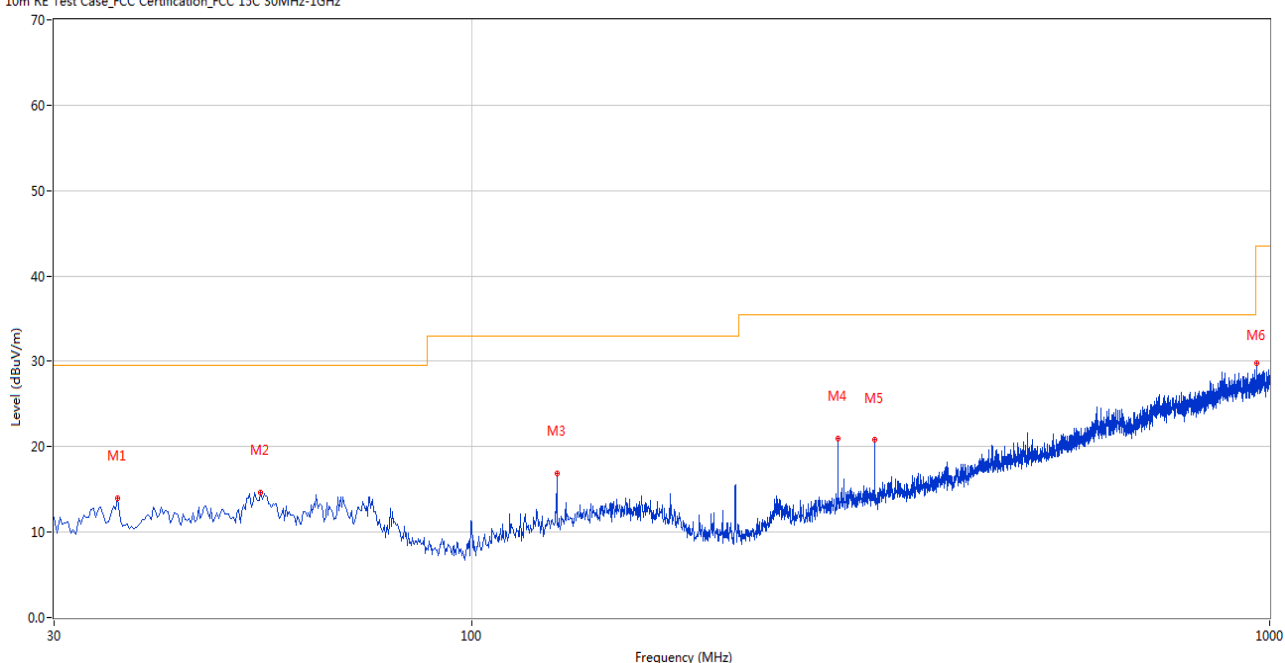
Note³: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

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

Test Data and Plots

30 MHz to 1 GHz, ANT H

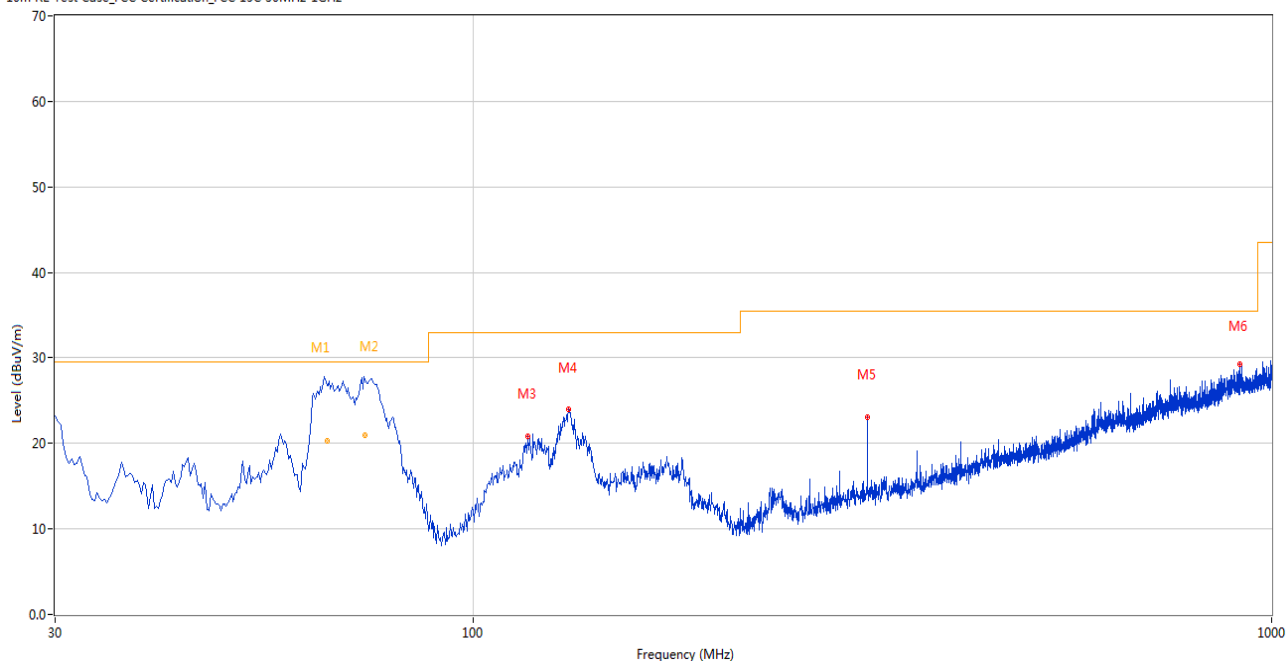
10m RE Test Case_FCC Certification_FCC 15C 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	36.061	13.96	-27.09	29.5	15.54	Peak	0.00	200	Horizontal	Pass
2	54.486	14.65	-26.11	29.5	14.85	Peak	1.00	100	Horizontal	Pass
3	127.946	16.92	-27.27	33.0	16.08	Peak	132.00	100	Horizontal	Pass
4	287.956	20.94	-25.18	35.5	14.56	Peak	192.00	200	Horizontal	Pass
5	319.958	20.76	-24.36	35.5	14.74	Peak	0.00	200	Horizontal	Pass
6	964.846	29.77	-10.12	43.5	13.73	Peak	38.00	200	Horizontal	Pass

30 MHz to 1 GHz, ANT V

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



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	65.651	23.92	-27.47	29.5	5.58	Peak	0.00	138	Vertical	N/A
1*	65.651	20.33	-27.47	29.5	9.17	QP	0.00	138	Vertical	Pass
2	73.190	24.57	-28.86	29.5	4.93	Peak	182.00	199	Vertical	N/A
2*	73.190	20.97	-28.86	29.5	8.53	QP	182.00	199	Vertical	Pass
3	117.036	20.77	-28.37	33.0	12.23	Peak	0.00	100	Vertical	Pass
4	131.825	23.93	-26.97	33.0	9.07	Peak	308.00	200	Vertical	Pass
5	311.957	23.13	-24.38	35.5	12.37	Peak	117.00	100	Vertical	Pass
6	913.692	29.31	-10.44	35.5	6.19	Peak	159.00	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	1326.773	42.65	74.0	31.35	Peak	350.00	400	Horizontal	Pass
1**	1326.773	39.03	54.0	14.97	AV	350.00	400	Horizontal	Pass
2	2997.844	50.97	74.0	23.03	Peak	62.00	100	Horizontal	Pass
2**	2997.844	43.40	54.0	10.60	AV	62.00	100	Horizontal	Pass
3	4813.920	47.60	74.0	26.40	Peak	314.00	200	Horizontal	Pass
3**	4813.920	41.53	54.0	12.47	AV	314.00	200	Horizontal	Pass
4	6884.527	54.61	74.0	19.39	Peak	87.00	200	Horizontal	Pass
4**	6884.527	42.17	54.0	11.83	AV	87.00	200	Horizontal	Pass
5	12489.944	54.66	74.0	19.34	Peak	174.00	300	Horizontal	Pass
5**	12489.944	46.29	54.0	7.71	AV	174.00	300	Horizontal	Pass
6	17092.140	55.22	74.0	18.78	Peak	173.00	400	Horizontal	Pass
6**	17092.140	48.25	54.0	5.75	AV	173.00	400	Horizontal	Pass

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

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1336.870	43.61	74.0	30.39	Peak	204.00	100	Vertical	Pass
1**	1336.870	38.96	54.0	15.04	AV	204.00	100	Vertical	Pass
2	2984.986	53.12	74.0	20.88	Peak	33.00	100	Vertical	Pass
2**	2984.986	43.92	54.0	10.08	AV	33.00	100	Vertical	Pass
3	4850.681	48.19	74.0	25.81	Peak	53.00	200	Vertical	Pass
3**	4850.681	42.77	54.0	11.23	AV	53.00	200	Vertical	Pass
4	7929.991	55.64	74.0	18.36	Peak	65.00	300	Vertical	Pass
4**	7929.991	43.43	54.0	10.57	AV	65.00	300	Vertical	Pass
5	12991.218	53.49	74.0	20.51	Peak	71.00	300	Vertical	Pass
5**	12991.218	43.85	54.0	10.15	AV	71.00	300	Vertical	Pass
6	17011.381	56.29	74.0	17.71	Peak	160.00	200	Vertical	Pass
6**	17011.381	45.46	54.0	8.54	AV	160.00	200	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	1326.029	46.83	74.0	27.17	Peak	56.00	300	Horizontal	Pass
1**	1326.029	38.25	54.0	15.75	AV	56.00	300	Horizontal	Pass
2	3000.321	52.05	74.0	21.95	Peak	23.00	300	Horizontal	Pass
2**	3000.321	39.76	54.0	14.24	AV	23.00	300	Horizontal	Pass
3	4811.578	51.48	74.0	22.52	Peak	212.00	200	Horizontal	Pass
3**	4811.578	42.85	54.0	11.15	AV	212.00	200	Horizontal	Pass
4	6884.898	51.30	74.0	22.70	Peak	32.00	400	Horizontal	Pass
4**	6884.898	46.97	54.0	7.03	AV	32.00	400	Horizontal	Pass
5	12489.543	50.90	74.0	23.10	Peak	50.00	100	Horizontal	Pass
5**	12489.543	46.40	54.0	7.60	AV	50.00	100	Horizontal	Pass
6	17094.176	54.15	74.0	19.85	Peak	351.00	400	Horizontal	Pass
6**	17094.176	47.07	54.0	6.93	AV	351.00	400	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	1331.248	42.33	74.0	31.67	Peak	3.00	300	Vertical	Pass
1**	1331.248	37.61	54.0	16.39	AV	3.00	300	Vertical	Pass
2	2980.222	53.42	74.0	20.58	Peak	59.00	100	Vertical	Pass
2**	2980.222	39.85	54.0	14.15	AV	59.00	100	Vertical	Pass
3	4851.525	49.32	74.0	24.68	Peak	197.00	200	Vertical	Pass
3**	4851.525	38.01	54.0	15.99	AV	197.00	200	Vertical	Pass
4	7932.657	53.34	74.0	20.66	Peak	360.00	200	Vertical	Pass
4**	7932.657	46.32	54.0	7.68	AV	360.00	200	Vertical	Pass
5	12992.933	55.87	74.0	18.13	Peak	130.00	100	Vertical	Pass
5**	12992.933	43.91	54.0	10.09	AV	130.00	100	Vertical	Pass
6	17012.569	57.79	74.0	16.21	Peak	291.00	200	Vertical	Pass
6**	17012.569	47.75	54.0	6.25	AV	291.00	200	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	1332.694	47.22	74.0	26.78	Peak	43.00	300	Horizontal	Pass
1**	1332.694	34.40	54.0	19.60	AV	43.00	300	Horizontal	Pass
2	3000.349	51.69	74.0	22.31	Peak	173.00	300	Horizontal	Pass
2**	3000.349	44.07	54.0	9.93	AV	173.00	300	Horizontal	Pass
3	4812.598	48.72	74.0	25.28	Peak	146.00	200	Horizontal	Pass
3**	4812.598	42.82	54.0	11.18	AV	146.00	200	Horizontal	Pass
4	6890.004	50.21	74.0	23.79	Peak	290.00	300	Horizontal	Pass
4**	6890.004	45.94	54.0	8.06	AV	290.00	300	Horizontal	Pass
5	12491.874	54.08	74.0	19.92	Peak	153.00	100	Horizontal	Pass
5**	12491.874	44.57	54.0	9.43	AV	153.00	100	Horizontal	Pass
6	17091.131	56.57	74.0	17.43	Peak	48.00	200	Horizontal	Pass
6**	17091.131	44.83	54.0	9.17	AV	48.00	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	1333.965	43.43	74.0	30.57	Peak	92.00	300	Vertical	Pass
1**	1333.965	38.42	54.0	15.58	AV	92.00	300	Vertical	Pass
2	2980.393	51.44	74.0	22.56	Peak	56.00	400	Vertical	Pass
2**	2980.393	44.20	54.0	9.80	AV	56.00	400	Vertical	Pass
3	4854.536	49.33	74.0	24.67	Peak	175.00	200	Vertical	Pass
3**	4854.536	38.01	54.0	15.99	AV	175.00	200	Vertical	Pass
4	7931.860	55.44	74.0	18.56	Peak	235.00	100	Vertical	Pass
4**	7931.860	42.18	54.0	11.82	AV	235.00	100	Vertical	Pass
5	12995.433	52.93	74.0	21.07	Peak	190.00	200	Vertical	Pass
5**	12995.433	42.48	54.0	11.52	AV	190.00	200	Vertical	Pass
6	17017.457	53.61	74.0	20.39	Peak	148.00	300	Vertical	Pass
6**	17017.457	45.42	54.0	8.58	AV	148.00	300	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	1328.618	43.76	74.0	30.24	Peak	297.00	200	Horizontal	Pass
1**	1328.618	35.07	54.0	18.93	AV	297.00	200	Horizontal	Pass
2	2999.055	52.18	74.0	21.82	Peak	108.00	200	Horizontal	Pass
2**	2999.055	40.95	54.0	13.05	AV	108.00	200	Horizontal	Pass
3	4810.776	49.00	74.0	25.00	Peak	6.00	200	Horizontal	Pass
3**	4810.776	38.92	54.0	15.08	AV	6.00	200	Horizontal	Pass
4	6886.987	52.15	74.0	21.85	Peak	40.00	400	Horizontal	Pass
4**	6886.987	42.01	54.0	11.99	AV	40.00	400	Horizontal	Pass
5	12486.874	51.52	74.0	22.48	Peak	136.00	300	Horizontal	Pass
5**	12486.874	47.05	54.0	6.95	AV	136.00	300	Horizontal	Pass
6	17091.815	55.38	74.0	18.62	Peak	324.00	300	Horizontal	Pass
6**	17091.815	43.65	54.0	10.35	AV	324.00	300	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	1333.330	45.17	74.0	28.83	Peak	92.00	300	Vertical	Pass
1**	1333.330	35.25	54.0	18.75	AV	92.00	300	Vertical	Pass
2	2978.839	47.53	74.0	26.47	Peak	93.00	200	Vertical	Pass
2**	2978.839	42.48	54.0	11.52	AV	93.00	200	Vertical	Pass
3	4852.974	51.73	74.0	22.27	Peak	176.00	200	Vertical	Pass
3**	4852.974	37.91	54.0	16.09	AV	176.00	200	Vertical	Pass
4	7926.771	54.80	74.0	19.20	Peak	304.00	200	Vertical	Pass
4**	7926.771	42.21	54.0	11.79	AV	304.00	200	Vertical	Pass
5	12997.280	54.83	74.0	19.17	Peak	215.00	300	Vertical	Pass
5**	12997.280	44.10	54.0	9.90	AV	215.00	300	Vertical	Pass
6	17014.402	55.65	74.0	18.35	Peak	267.00	100	Vertical	Pass
6**	17014.402	45.33	54.0	8.67	AV	267.00	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	1329.199	47.40	74.0	26.60	Peak	56.00	300	Horizontal	Pass
1**	1329.199	36.07	54.0	17.93	AV	56.00	300	Horizontal	Pass
2	2995.221	49.39	74.0	24.61	Peak	51.00	100	Horizontal	Pass
2**	2995.221	42.95	54.0	11.05	AV	51.00	100	Horizontal	Pass
3	4806.579	48.25	74.0	25.75	Peak	97.00	200	Horizontal	Pass
3**	4806.579	40.85	54.0	13.15	AV	97.00	200	Horizontal	Pass
4	6883.197	55.13	74.0	18.87	Peak	182.00	400	Horizontal	Pass
4**	6883.197	44.97	54.0	9.03	AV	182.00	400	Horizontal	Pass
5	12489.222	55.46	74.0	18.54	Peak	312.00	200	Horizontal	Pass
5**	12489.222	45.06	54.0	8.94	AV	312.00	200	Horizontal	Pass
6	17087.191	52.13	74.0	21.87	Peak	20.00	200	Horizontal	Pass
6**	17087.191	43.08	54.0	10.92	AV	20.00	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	1332.217	43.39	74.0	30.61	Peak	0.00	200	Vertical	Pass
1**	1332.217	39.61	54.0	14.39	AV	0.00	200	Vertical	Pass
2	2982.994	48.97	74.0	25.03	Peak	226.00	300	Vertical	Pass
2**	2982.994	40.17	54.0	13.83	AV	226.00	300	Vertical	Pass
3	4850.540	48.24	74.0	25.76	Peak	130.00	200	Vertical	Pass
3**	4850.540	37.85	54.0	16.15	AV	130.00	200	Vertical	Pass
4	7931.570	52.65	74.0	21.35	Peak	96.00	400	Vertical	Pass
4**	7931.570	47.28	54.0	6.72	AV	96.00	400	Vertical	Pass
5	12991.812	52.75	74.0	21.25	Peak	325.00	300	Vertical	Pass
5**	12991.812	46.75	54.0	7.25	AV	325.00	300	Vertical	Pass
6	17015.143	55.92	74.0	18.08	Peak	123.00	100	Vertical	Pass
6**	17015.143	46.97	54.0	7.03	AV	123.00	100	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	1328.352	45.50	74.0	28.50	Peak	259.00	100	Horizontal	Pass
1**	1328.352	35.06	54.0	18.94	AV	259.00	100	Horizontal	Pass
2	2997.573	47.91	74.0	26.09	Peak	28.00	300	Horizontal	Pass
2**	2997.573	40.04	54.0	13.96	AV	28.00	300	Horizontal	Pass
3	4813.899	49.05	74.0	24.95	Peak	262.00	200	Horizontal	Pass
3**	4813.899	42.09	54.0	11.91	AV	262.00	200	Horizontal	Pass
4	6890.339	55.54	74.0	18.46	Peak	231.00	400	Horizontal	Pass
4**	6890.339	45.06	54.0	8.94	AV	231.00	400	Horizontal	Pass
5	12487.504	55.56	74.0	18.44	Peak	256.00	200	Horizontal	Pass
5**	12487.504	42.87	54.0	11.13	AV	256.00	200	Horizontal	Pass
6	17090.731	54.47	74.0	19.53	Peak	75.00	300	Horizontal	Pass
6**	17090.731	46.01	54.0	7.99	AV	75.00	300	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	1333.745	45.27	74.0	28.73	Peak	126.00	400	Vertical	Pass
1**	1333.745	34.95	54.0	19.05	AV	126.00	400	Vertical	Pass
2	2978.061	52.78	74.0	21.22	Peak	57.00	200	Vertical	Pass
2**	2978.061	42.54	54.0	11.46	AV	57.00	200	Vertical	Pass
3	4853.947	50.25	74.0	23.75	Peak	168.00	200	Vertical	Pass
3**	4853.947	43.36	54.0	10.64	AV	168.00	200	Vertical	Pass
4	7930.095	53.82	74.0	20.18	Peak	227.00	400	Vertical	Pass
4**	7930.095	43.68	54.0	10.32	AV	227.00	400	Vertical	Pass
5	12997.762	55.73	74.0	18.27	Peak	155.00	100	Vertical	Pass
5**	12997.762	47.28	54.0	6.72	AV	155.00	100	Vertical	Pass
6	17010.960	52.79	74.0	21.21	Peak	208.00	100	Vertical	Pass
6**	17010.960	45.20	54.0	8.80	AV	208.00	100	Vertical	Pass

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

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1332.704	42.47	74.0	31.53	Peak	320.00	200	Horizontal	Pass
1**	1332.704	33.99	54.0	20.01	AV	320.00	200	Horizontal	Pass
2	2996.813	49.21	74.0	24.79	Peak	269.00	100	Horizontal	Pass
2**	2996.813	43.74	54.0	10.26	AV	269.00	100	Horizontal	Pass
3	4807.605	50.68	74.0	23.32	Peak	162.00	200	Horizontal	Pass
3**	4807.605	42.48	54.0	11.52	AV	162.00	200	Horizontal	Pass
4	6889.639	51.71	74.0	22.29	Peak	55.00	100	Horizontal	Pass
4**	6889.639	46.92	54.0	7.08	AV	55.00	100	Horizontal	Pass
5	12485.309	52.26	74.0	21.74	Peak	101.00	200	Horizontal	Pass
5**	12485.309	46.50	54.0	7.50	AV	101.00	200	Horizontal	Pass
6	17090.669	55.90	74.0	18.10	Peak	93.00	300	Horizontal	Pass
6**	17090.669	48.56	54.0	5.44	AV	93.00	300	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	1334.083	42.81	74.0	31.19	Peak	113.00	200	Vertical	Pass
1**	1334.083	39.46	54.0	14.54	AV	113.00	200	Vertical	Pass
2	2984.441	51.84	74.0	22.16	Peak	307.00	100	Vertical	Pass
2**	2984.441	39.86	54.0	14.14	AV	307.00	100	Vertical	Pass
3	4857.321	48.70	74.0	25.30	Peak	194.00	200	Vertical	Pass
3**	4857.321	43.26	54.0	10.74	AV	194.00	200	Vertical	Pass
4	7930.674	50.96	74.0	23.04	Peak	278.00	400	Vertical	Pass
4**	7930.674	43.41	54.0	10.59	AV	278.00	400	Vertical	Pass
5	12996.367	51.59	74.0	22.41	Peak	238.00	400	Vertical	Pass
5**	12996.367	42.62	54.0	11.38	AV	238.00	400	Vertical	Pass
6	17015.876	54.02	74.0	19.98	Peak	45.00	400	Vertical	Pass
6**	17015.876	47.77	54.0	6.23	AV	45.00	400	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	1329.587	47.01	74.0	26.99	Peak	53.00	300	Horizontal	Pass
1**	1329.587	36.34	54.0	17.66	AV	53.00	300	Horizontal	Pass
2	2998.971	53.15	74.0	20.85	Peak	319.00	300	Horizontal	Pass
2**	2998.971	42.04	54.0	11.96	AV	319.00	300	Horizontal	Pass
3	4808.570	51.30	74.0	22.70	Peak	190.00	200	Horizontal	Pass
3**	4808.570	41.49	54.0	12.51	AV	190.00	200	Horizontal	Pass
4	6884.988	53.01	74.0	20.99	Peak	202.00	200	Horizontal	Pass
4**	6884.988	45.55	54.0	8.45	AV	202.00	200	Horizontal	Pass
5	12489.954	51.72	74.0	22.28	Peak	331.00	300	Horizontal	Pass
5**	12489.954	45.79	54.0	8.21	AV	331.00	300	Horizontal	Pass
6	17092.161	56.79	74.0	17.21	Peak	139.00	200	Horizontal	Pass
6**	17092.161	43.39	54.0	10.61	AV	139.00	200	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	1332.841	46.40	74.0	27.60	Peak	175.00	400	Vertical	Pass
1**	1332.841	37.61	54.0	16.39	AV	175.00	400	Vertical	Pass
2	2980.642	49.56	74.0	24.44	Peak	44.00	100	Vertical	Pass
2**	2980.642	43.87	54.0	10.13	AV	44.00	100	Vertical	Pass
3	4854.194	52.30	74.0	21.70	Peak	213.00	200	Vertical	Pass
3**	4854.194	38.60	54.0	15.40	AV	213.00	200	Vertical	Pass
4	7932.518	55.53	74.0	18.47	Peak	7.00	400	Vertical	Pass
4**	7932.518	43.14	54.0	10.86	AV	7.00	400	Vertical	Pass
5	12992.246	50.92	74.0	23.08	Peak	80.00	400	Vertical	Pass
5**	12992.246	47.33	54.0	6.67	AV	80.00	400	Vertical	Pass
6	17015.923	55.65	74.0	18.35	Peak	256.00	400	Vertical	Pass
6**	17015.923	48.53	54.0	5.47	AV	256.00	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	1326.994	44.41	74.0	29.59	Peak	205.00	100	Horizontal	Pass
1**	1326.994	39.77	54.0	14.23	AV	205.00	100	Horizontal	Pass
2	2996.307	50.90	74.0	23.10	Peak	137.00	200	Horizontal	Pass
2**	2996.307	41.00	54.0	13.00	AV	137.00	200	Horizontal	Pass
3	4808.065	48.31	74.0	25.69	Peak	58.00	200	Horizontal	Pass
3**	4808.065	41.96	54.0	12.04	AV	58.00	200	Horizontal	Pass
4	6884.568	53.43	74.0	20.57	Peak	96.00	400	Horizontal	Pass
4**	6884.568	42.87	54.0	11.13	AV	96.00	400	Horizontal	Pass
5	12489.810	51.98	74.0	22.02	Peak	27.00	400	Horizontal	Pass
5**	12489.810	45.20	54.0	8.80	AV	27.00	400	Horizontal	Pass
6	17092.586	57.64	74.0	16.36	Peak	258.00	100	Horizontal	Pass
6**	17092.586	48.91	54.0	5.09	AV	258.00	100	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	1328.965	44.94	74.0	29.06	Peak	24.00	200	Vertical	Pass
1**	1328.965	36.84	54.0	17.16	AV	24.00	200	Vertical	Pass
2	2985.293	52.87	74.0	21.13	Peak	56.00	200	Vertical	Pass
2**	2985.293	43.67	54.0	10.33	AV	56.00	200	Vertical	Pass
3	4853.198	49.41	74.0	24.59	Peak	296.00	200	Vertical	Pass
3**	4853.198	38.65	54.0	15.35	AV	296.00	200	Vertical	Pass
4	7927.081	51.41	74.0	22.59	Peak	328.00	300	Vertical	Pass
4**	7927.081	46.74	54.0	7.26	AV	328.00	300	Vertical	Pass
5	12993.102	53.89	74.0	20.11	Peak	304.00	100	Vertical	Pass
5**	12993.102	45.00	54.0	9.00	AV	304.00	100	Vertical	Pass
6	17018.712	54.66	74.0	19.34	Peak	69.00	300	Vertical	Pass
6**	17018.712	47.43	54.0	6.57	AV	69.00	300	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	1330.273	43.98	74.0	30.02	Peak	61.00	100	Horizontal	Pass
1**	1330.273	37.33	54.0	16.67	AV	61.00	100	Horizontal	Pass
2	2999.224	48.24	74.0	25.76	Peak	8.00	400	Horizontal	Pass
2**	2999.224	41.53	54.0	12.47	AV	8.00	400	Horizontal	Pass
3	4810.045	49.27	74.0	24.73	Peak	144.00	200	Horizontal	Pass
3**	4810.045	41.59	54.0	12.41	AV	144.00	200	Horizontal	Pass
4	6882.881	50.57	74.0	23.43	Peak	316.00	200	Horizontal	Pass
4**	6882.881	42.64	54.0	11.36	AV	316.00	200	Horizontal	Pass
5	12489.603	52.09	74.0	21.91	Peak	242.00	200	Horizontal	Pass
5**	12489.603	45.69	54.0	8.31	AV	242.00	200	Horizontal	Pass
6	17092.589	56.40	74.0	17.60	Peak	329.00	100	Horizontal	Pass
6**	17092.589	44.65	54.0	9.35	AV	329.00	100	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	1336.345	43.64	74.0	30.36	Peak	243.00	300	Vertical	Pass
1**	1336.345	39.26	54.0	14.74	AV	243.00	300	Vertical	Pass
2	2981.955	48.00	74.0	26.00	Peak	356.00	200	Vertical	Pass
2**	2981.955	41.30	54.0	12.70	AV	356.00	200	Vertical	Pass
3	4854.304	52.43	74.0	21.57	Peak	168.00	200	Vertical	Pass
3**	4854.304	40.38	54.0	13.62	AV	168.00	200	Vertical	Pass
4	7928.092	54.06	74.0	19.94	Peak	134.00	300	Vertical	Pass
4**	7928.092	47.03	54.0	6.97	AV	134.00	300	Vertical	Pass
5	12993.967	51.72	74.0	22.28	Peak	111.00	100	Vertical	Pass
5**	12993.967	47.31	54.0	6.69	AV	111.00	100	Vertical	Pass
6	17011.627	54.15	74.0	19.85	Peak	349.00	200	Vertical	Pass
6**	17011.627	44.53	54.0	9.47	AV	349.00	200	Vertical	Pass

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

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1326.847	44.16	74.0	29.84	Peak	142.00	400	Horizontal	Pass
1**	1326.847	36.60	54.0	17.40	AV	142.00	400	Horizontal	Pass
2	2995.565	48.30	74.0	25.70	Peak	197.00	400	Horizontal	Pass
2**	2995.565	39.81	54.0	14.19	AV	197.00	400	Horizontal	Pass
3	4813.432	52.55	74.0	21.45	Peak	135.00	200	Horizontal	Pass
3**	4813.432	39.33	54.0	14.67	AV	135.00	200	Horizontal	Pass
4	6890.331	55.76	74.0	18.24	Peak	84.00	400	Horizontal	Pass
4**	6890.331	46.13	54.0	7.87	AV	84.00	400	Horizontal	Pass
5	12491.546	53.62	74.0	20.38	Peak	76.00	100	Horizontal	Pass
5**	12491.546	46.80	54.0	7.20	AV	76.00	100	Horizontal	Pass
6	17087.675	57.34	74.0	16.66	Peak	266.00	400	Horizontal	Pass
6**	17087.675	43.72	54.0	10.28	AV	266.00	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	1333.148	47.26	74.0	26.74	Peak	344.00	100	Vertical	Pass
1**	1333.148	40.23	54.0	13.77	AV	344.00	100	Vertical	Pass
2	2983.650	52.23	74.0	21.77	Peak	95.00	100	Vertical	Pass
2**	2983.650	42.19	54.0	11.81	AV	95.00	100	Vertical	Pass
3	4853.014	50.58	74.0	23.42	Peak	252.00	200	Vertical	Pass
3**	4853.014	39.44	54.0	14.56	AV	252.00	200	Vertical	Pass
4	7930.856	56.53	74.0	17.47	Peak	103.00	400	Vertical	Pass
4**	7930.856	42.48	54.0	11.52	AV	103.00	400	Vertical	Pass
5	12991.609	50.87	74.0	23.13	Peak	82.00	100	Vertical	Pass
5**	12991.609	47.46	54.0	6.54	AV	82.00	100	Vertical	Pass
6	17014.949	58.25	74.0	15.75	Peak	77.00	300	Vertical	Pass
6**	17014.949	46.67	54.0	7.33	AV	77.00	300	Vertical	Pass

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

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1328.658	41.83	74.0	32.17	Peak	128.00	100	Horizontal	Pass
1**	1328.658	36.78	54.0	17.22	AV	128.00	100	Horizontal	Pass
2	2993.134	48.20	74.0	25.80	Peak	229.00	300	Horizontal	Pass
2**	2993.134	43.01	54.0	10.99	AV	229.00	300	Horizontal	Pass
3	4809.098	48.51	74.0	25.49	Peak	87.00	200	Horizontal	Pass
3**	4809.098	38.06	54.0	15.94	AV	87.00	200	Horizontal	Pass
4	6887.232	51.24	74.0	22.76	Peak	100.00	400	Horizontal	Pass
4**	6887.232	43.64	54.0	10.36	AV	100.00	400	Horizontal	Pass
5	12491.291	56.63	74.0	17.37	Peak	196.00	200	Horizontal	Pass
5**	12491.291	41.80	54.0	12.20	AV	196.00	200	Horizontal	Pass
6	17086.748	55.91	74.0	18.09	Peak	232.00	100	Horizontal	Pass
6**	17086.748	45.31	54.0	8.69	AV	232.00	100	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	1334.138	46.57	74.0	27.43	Peak	138.00	200	Vertical	Pass
1**	1334.138	37.11	54.0	16.89	AV	138.00	200	Vertical	Pass
2	2978.151	49.65	74.0	24.35	Peak	12.00	100	Vertical	Pass
2**	2978.151	40.37	54.0	13.63	AV	12.00	100	Vertical	Pass
3	4850.305	48.32	74.0	25.68	Peak	285.00	200	Vertical	Pass
3**	4850.305	40.20	54.0	13.80	AV	285.00	200	Vertical	Pass
4	7927.253	53.64	74.0	20.36	Peak	103.00	400	Vertical	Pass
4**	7927.253	42.88	54.0	11.12	AV	103.00	400	Vertical	Pass
5	12991.236	55.29	74.0	18.71	Peak	261.00	100	Vertical	Pass
5**	12991.236	44.74	54.0	9.26	AV	261.00	100	Vertical	Pass
6	17018.217	52.81	74.0	21.19	Peak	262.00	200	Vertical	Pass
6**	17018.217	49.02	54.0	4.98	AV	262.00	200	Vertical	Pass

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

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

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

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

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	2385.356	60.06	74.0	13.94	Peak	137.00	300	Horizontal	Pass
1**	2385.356	49.38	54.0	4.62	AV	137.00	300	Horizontal	Pass
2	2390.000	57.17	74.0	16.83	Peak	59.00	100	Horizontal	Pass
2**	2390.000	46.76	54.0	7.24	AV	59.00	100	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	55.82	74.0	18.18	Peak	322.00	300	Horizontal	Pass
1**	2483.500	46.91	54.0	7.09	AV	322.00	300	Horizontal	Pass
2	2488.769	57.58	74.0	16.42	Peak	106.00	100	Horizontal	Pass
2**	2488.769	49.82	54.0	4.18	AV	106.00	100	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	2385.794	58.19	74.0	15.81	Peak	118.00	300	Horizontal	Pass
1**	2385.794	48.05	54.0	5.95	AV	118.00	300	Horizontal	Pass
2	2390.000	57.15	74.0	16.85	Peak	224.00	100	Horizontal	Pass
2**	2390.000	43.79	54.0	10.21	AV	224.00	100	Horizontal	Pass

802.11g HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	55.33	74.0	18.67	Peak	181.00	300	Horizontal	Pass
1**	2483.500	47.78	54.0	6.22	AV	181.00	300	Horizontal	Pass
2	2488.580	59.44	74.0	14.56	Peak	201.00	300	Horizontal	Pass
2**	2488.580	47.07	54.0	6.93	AV	201.00	300	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	2384.911	57.62	74.0	16.38	Peak	161.00	200	Horizontal	Pass
1**	2384.911	51.76	54.0	2.24	AV	161.00	200	Horizontal	Pass
2	2390.000	55.35	74.0	18.65	Peak	335.00	300	Horizontal	Pass
2**	2390.000	44.56	54.0	9.44	AV	335.00	300	Horizontal	Pass

802.11n20 HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	56.68	74.0	17.32	Peak	66.00	300	Horizontal	Pass
1**	2483.500	44.47	54.0	9.53	AV	66.00	300	Horizontal	Pass
2	2486.835	58.54	74.0	15.46	Peak	168.00	200	Horizontal	Pass
2**	2486.835	47.03	54.0	6.97	AV	168.00	200	Horizontal	Pass

802.11n40 LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2385.595	57.49	74.0	16.51	Peak	214.00	100	Horizontal	Pass
1**	2385.595	47.84	54.0	6.16	AV	214.00	100	Horizontal	Pass
2	2390.000	55.79	74.0	18.21	Peak	251.00	100	Horizontal	Pass
2**	2390.000	47.32	54.0	6.68	AV	251.00	100	Horizontal	Pass

802.11n40 HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	57.11	74.0	16.89	Peak	117.00	100	Horizontal	Pass
1**	2483.500	46.3	54.0	7.70	AV	117.00	100	Horizontal	Pass
2	2486.845	56.81	74.0	17.19	Peak	7.00	100	Horizontal	Pass
2**	2486.845	47.06	54.0	6.94	AV	7.00	100	Horizontal	Pass

A.8 Power Spectral Density (PSD)

Test Data

802.11b Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-3.52	8
Middle	-3.06	8
High	-4.72	8

802.11g Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-7.74	8
Middle	-8.39	8
High	-9.07	8

802.11n-20 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-9.32	8
Middle	-9.74	8
High	-10.42	8

802.11n-40 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-11.74	8
Middle	-12.10	8
High	-11.81	8

Test Plots

802.11b LOW CHANNEL



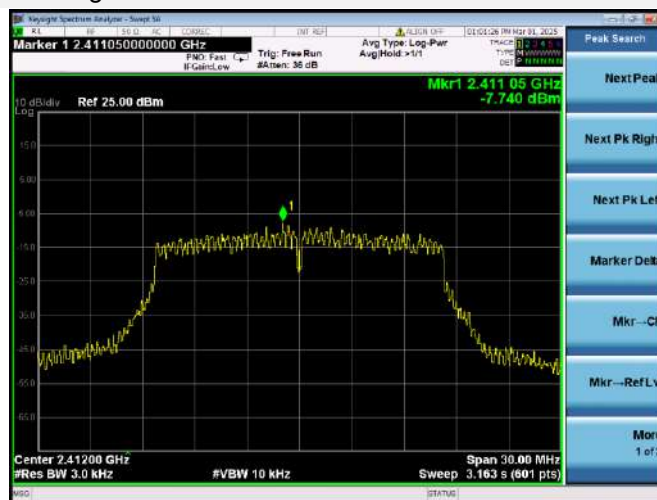
802.11b MIDDLE CHANNEL



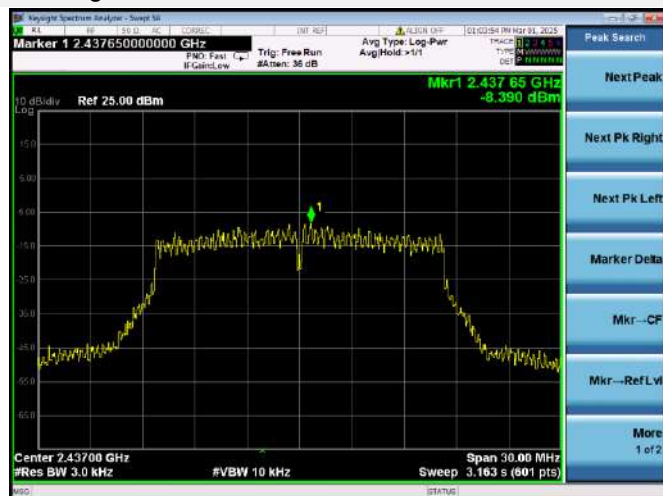
802.11b HIGH CHANNEL



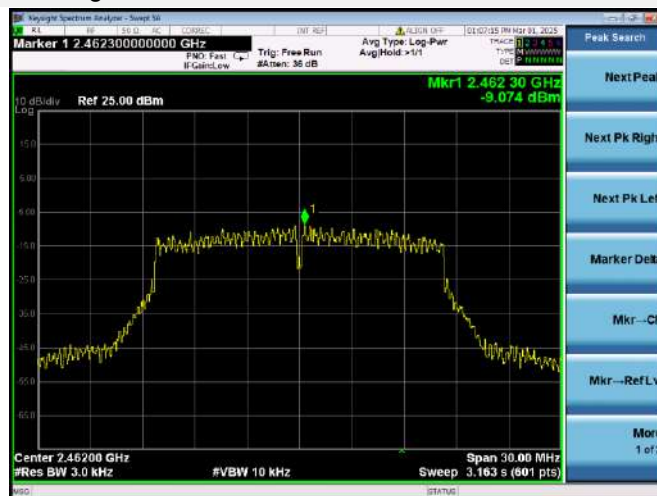
802.11g LOW CHANNEL



802.11g MIDDLE CHANNEL



802.11g HIGH CHANNEL



802.11n-20 MHz LOW CHANNEL



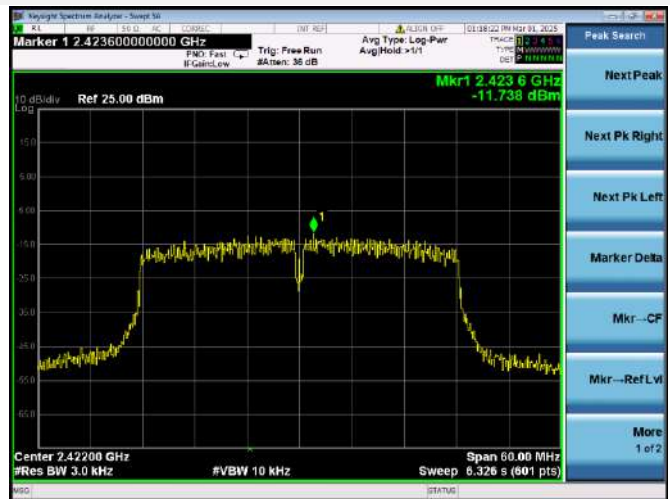
802.11n-20 MHz MIDDLE CHANNEL



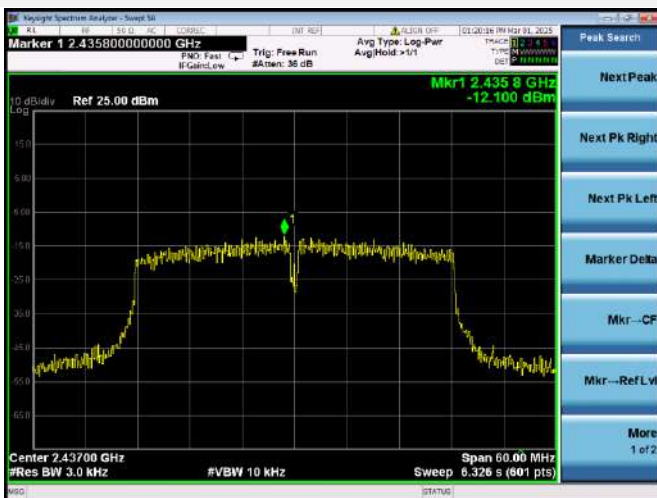
802.11n-20 MHz HIGH CHANNEL



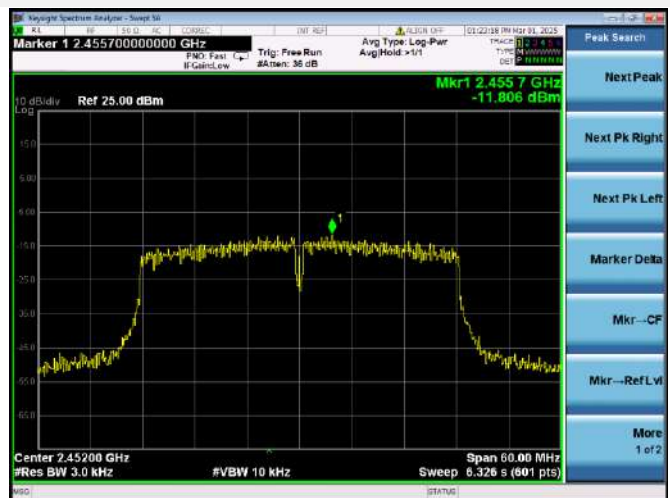
802.11n-40 MHz LOW CHANNEL



802.11n-40 MHz MIDDLE CHANNEL



802.11n-40 MHz HIGH CHANNEL



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2520364-AR-2.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2520364-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2520364-AI.PDF”.

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--END OF REPORT--