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TESTING
CNAS L6791

TEST REPORT

Applicant:	Seeed Technology Co., Ltd.
Address:	9F, Building G3, TCL International E city, Shuguang Community, Xili street, Nanshan, Shenzhen, Guangdong Province, P.R.C
Equipment Type:	Seeed Studio Wio-LR2021 Wireless module
Model Name:	Wio-LR2021
Brand Name:	N/A
FCC ID:	Z4T-WIO-LR2021
Test Standard:	47 CFR Part 15 Subpart C (refer to section 3.1)
Sample Arrival Date:	May 18, 2026
Test Date:	May 20, 2026 - Jul. 13, 2026
Date of Issue:	Sep. 08, 2026

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Yang Wenxuan **Checked by:** Li Ganming **Approved by:** Tolan Tu

(Testing Director)

Revision History

Version	Issue Date	Revisions
Rev. 01	Aug. 21, 2026	Initial Issue
Rev. 02	Sep. 08, 2026	Updated the model name. Updated the documents of ANNEX C and ANNEX D.

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	601, Building 2, Intelligent Connected Vehicle Industrial Park, No.55, Xiangshan Road, Luotian Community, Yanluo Sub-district, Bao'an District, Shenzhen
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☑ Building 2, Intelligent Connected Vehicle Industrial Park, No.55, Xiangshan Road, Luotian Community, Yanluo Sub-district, Bao'an District, Shenzhen, Guangdong
	☐ 1/F., Building B, Ganghongji High-Tech Intelligent Industrial Park, No.1008, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong
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	Seeed Technology Co., Ltd.
Address	9F, Building G3, TCL International E city, Shuguang Community, Xili street, Nanshan, Shenzhen, Guangdong Province, P.R.C

2.2 Manufacturer Information

Manufacturer	Seeed Technology Co., Ltd.
Address	9F, Building G3, TCL International E city, Shuguang Community, Xili street, Nanshan, Shenzhen, Guangdong Province, P.R.C

2.3 General Description for Equipment under Test (EUT)

EUT Name	Seeed Studio Wio-LR2021 Wireless module
Model Name Under Test	Wio-LR2021
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V1.0
Software Version	V1.0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	LoRa, 2.4G ISM Band

The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology	DTS
Modulation Type	FSK
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Frequency Range	The frequency range used is 2400 MHz to 2483.5 MHz.
Number of Channel	20 (at intervals of 4 MHz)
Tested Channel	0 (2403 MHz), 36 (2439 MHz), 76 (2479 MHz)
Adaptive or Non-Adaptive	Non-Adaptive
The Max RF Output power	11.75 dBm
Antenna System (MIMO Smart Antenna)	N/A

Type	MPN	Band	Antenna Gain	Antenna Type	Number of pages of test data
2.4G ISM Band	M04-0105060R0A	2400-2500MHz	2.55 dBi	Helical Antenna	pages 38 to 39, pages 47 to 48, pages 55 to 60, pages 80 to 81
	M01-0601930R0A	2400-2501MHz	2.53 dBi	FPC Antenna	pages 40 to 41, pages 49 to 50, pages 61 to 66, pages 82 to 83
	M02-0600110R0A	2400-2502MHz	5.03 dBi	Fiberglass Omni-directional Antenna	pages 42 to 43, pages 51 to 52, pages 67 to 72, pages 84 to 85
	M02-0200290R0A	2400-2502MHz	2.35 dBi	Dipole Antenna	pages 44 to 45, pages 53 to 54, pages 73 to 78, pages 86 to 87

All channel was listed on the following table:

812K

Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)
0	**2403**	20	2423	40	2443	60	2463
4	2407	24	2427	44	2447	64	2467
8	2411	28	2431	48	2451	68	2471
12	2415	32	2435	52	2455	72	2475
16	2419	**36**	**2439**	56	2459	**76**	**2479**

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	KDB 558074 D01 15.247 Meas Guidance v05r02☆	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	ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024☆	American National Standard for Procedures for Compliance Testing of Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	Channel	Test Result	Verdict
1	Antenna Requirement	15.203	N/A	--	Pass[Note]
2	Output Power	15.247(b)	Low/Middle/High	ANNEX A.1	Pass
3	Occupied Bandwidth	15.247(a)	Low/Middle/High	ANNEX A.2	Pass
4	Conducted Spurious Emission	15.247(d)	Low/Middle/High	ANNEX A.3	Pass
5	Band Edge(Authorized-band band-edge)	15.247(d)	Low/ High	ANNEX A.4	Pass
6	Conducted Emission	15.207	Low/Middle/High	ANNEX A.5	Pass
7	Radiated Spurious Emission	15.209 15.247(d)	Low/Middle/High	ANNEX A.6	Pass
8	Band Edge(Restricted-band band-edge)	15.209 15.247(d)	Low/Middle/High	ANNEX A.7	Pass
9	Power spectral density (PSD)	15.247(e)	Low/Middle/High	ANNEX A.8	Pass
Note: 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	46% to 69%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+20.2℃ to +25.8℃
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
Power Sensor	KEYSIGHT	U2063XA	MY58000247	2025.06.16	2026.06.15
				2026.06.01	2027.05.31
Spectrum Analyzer	KEYSIGHT	N9020A	MY52510065	2025.06.16	2026.06.15
				2026.06.01	2027.05.31
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2025.10.30	2026.10.29
Spectrum Analyzer	KEYSIGHT	N9020A	MY54432240	2026.03.24	2027.03.23
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	00884	2025.03.01	2028.02.29
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	01631	2025.02.22	2028.02.21
Test Antenna-Horn	A-INFO	LB-180400KF	J211060273	2024.06.15	2027.06.14
Anechoic Chamber	EMC Electronic Co, Ltd	9m*6m*6m	213	2026.03.03	2028.03.02
Amplifier	COM-MV	LSCX_LNA1-12G-01	180602	2026.05.20	2027.05.19
Amplifier	COM-MV	XKu_LNA7-18G-01	180601	2026.05.20	2027.05.19
Amplifier	COM-MV	KA LNA18 40G-01	10248150	2025.12.04	2026.12.03
EMI Receiver	ROHDE&SCHWARZ	ESR7	103027	2025.10.30	2026.10.29
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2024.01.23	2027.01.22
Amplifier (30MHz-1GHz)	COM-MV	ZT30-1000M	B2018054558	2025.11.26	2026.11.25
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	883	2025.03.23	2028.03.22
Anechoic Chamber (10m#2)	YiHeng	21m*11m*8m	101-1	2025.10.16	2028.10.15
EMI Receiver	Keysight	N9038A	MY55330120	2025.06.17	2026.06.16
				2026.06.02	2027.06.01
Amplifier (30MHz-1GHz)	COM-MV	ZT30-1000M	B2017119081	2025.11.26	2026.11.25
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-00867	2025.03.23	2028.03.22
Anechoic Chamber	YiHeng	9m*6m*6m	106-1	2026.01.20	2029.01.19

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2025.09.25	2026.09.24
LISN	SCHWARZBECK	NSLK 8127	8127-687	2026.03.25	2027.03.24
ISN	TESEQ	ISN T800	34449	2025.10.20	2026.10.19
ISN	TESEQ	ISN T8-Cat6	53561	2025.06.01	2026.05.31
				2026.05.29	2027.05.28
Shielded Room	Chang Chuang	4m*4m*3m	662	2025.10.12	2028.10.11

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	V19.8.28.435	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

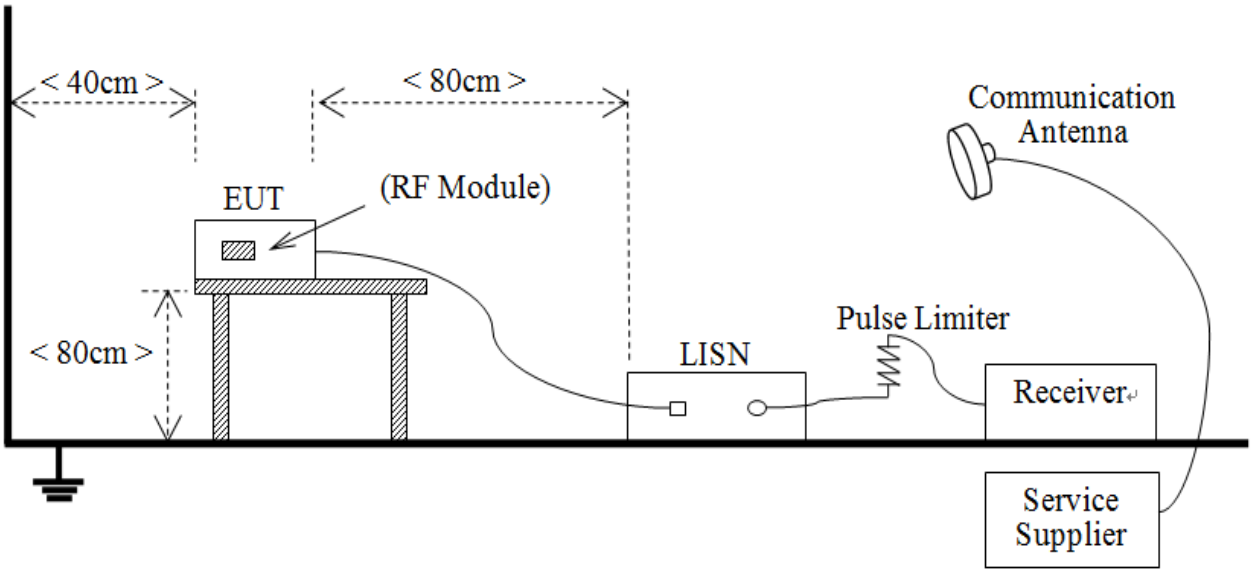
4.5.1. For Antenna Port Test

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

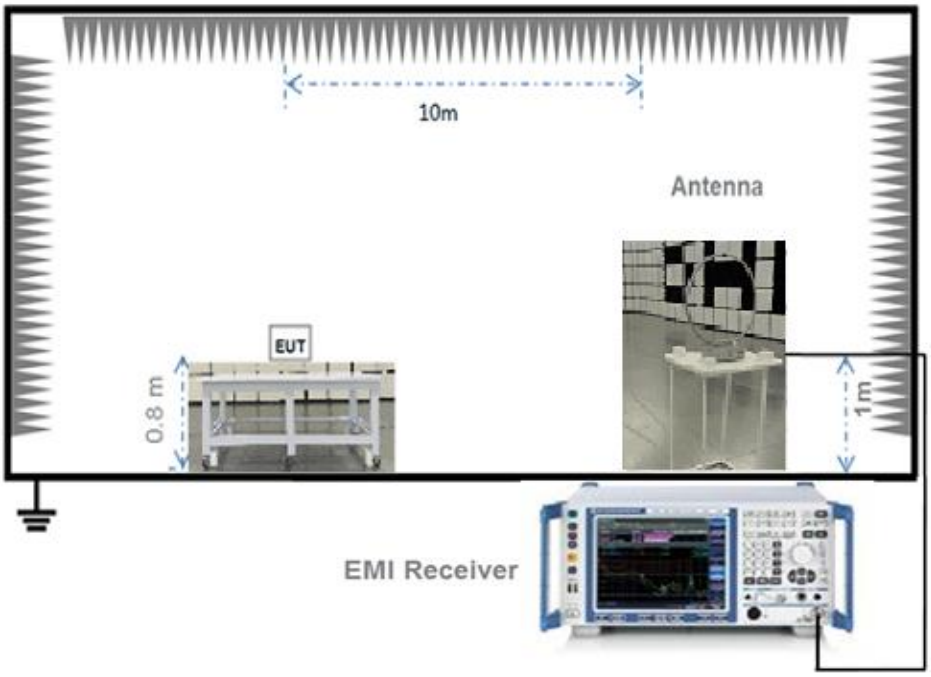
(Diagram 1)

4.5.2. For AC Power Supply Port Test



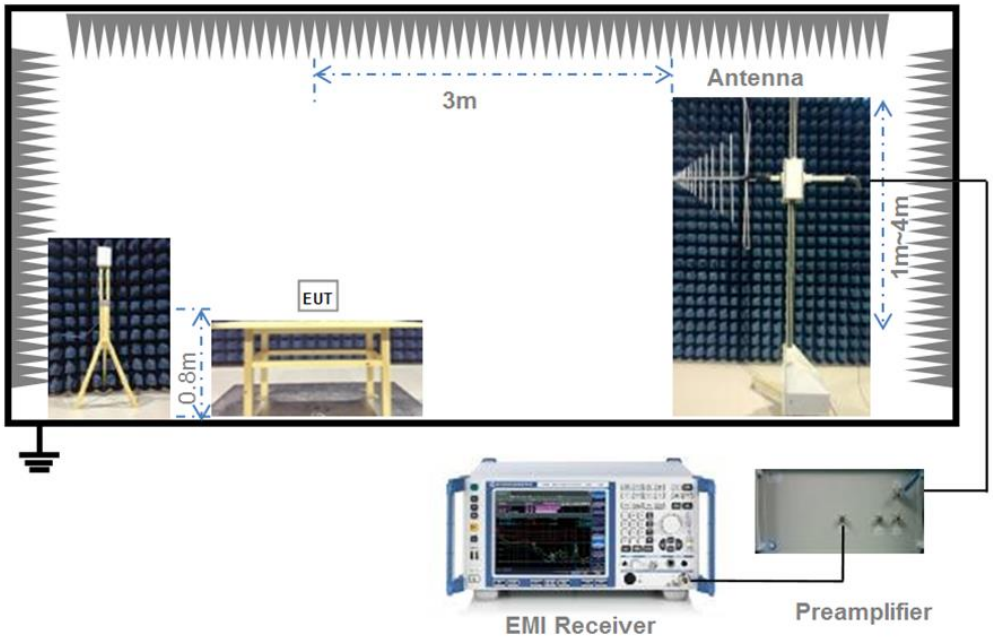
(Diagram 2)

4.5.3. For Radiated Test (Below 30 MHz)



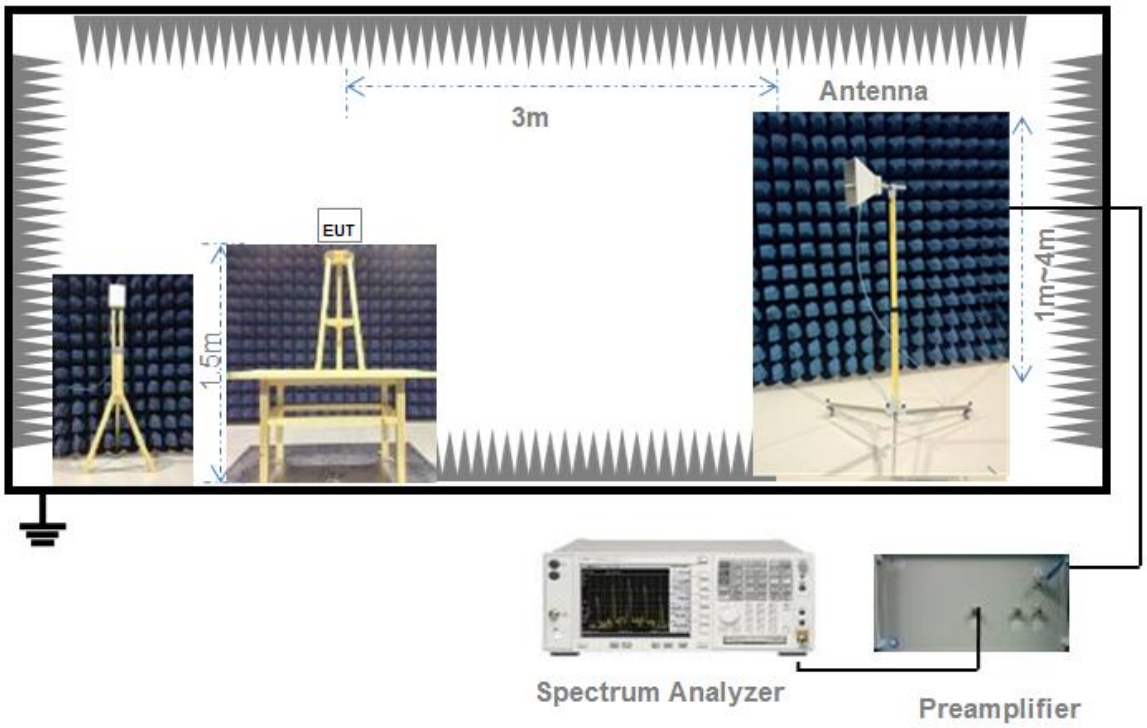
(Diagram 3)

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.

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1. Relevant Standards

FCC §15.203 & 15.247(b)

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

a) Maximum peak conducted output power

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

Set the RBW ≥ DTS bandwidth.

Set VBW ≥ 3 x RBW.

Set span ≥ 3 x RBW

Sweep time = auto couple.

Detector = peak.

Trace mode = max hold.

Allow trace to fully stabilize.

Use peak marker function to determine the peak amplitude level.

b) 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 =shall be in the range of 1% to 5% of the OBW but not less than 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 ≥ 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 ≥ 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.

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. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.
3. 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.
4. 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 C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024 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 Ta1.

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).

Ta1—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 C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024. All detected emissions shall comply with the applicable limits.

The measurement frequency range is from 30MHz 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 4.5.3 to 4.5.5 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.

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of Section 5.4(4), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

5.9.2. Test Setup

See section 4.5.1 (Diagram 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 ≤ RBW ≤ 100 kHz.

Set the VBW ≥ 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

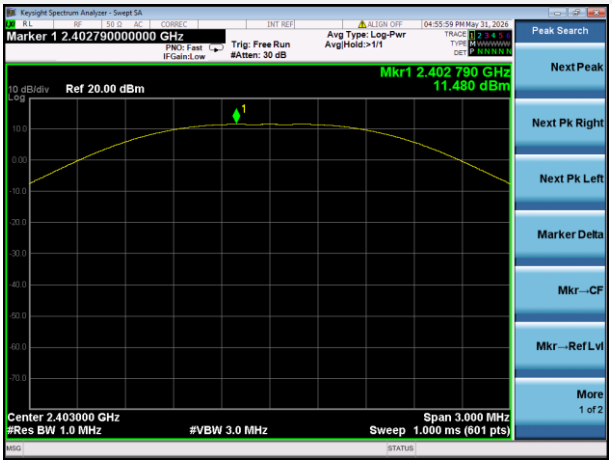
A.1 Output Power

Peak Power Test Data

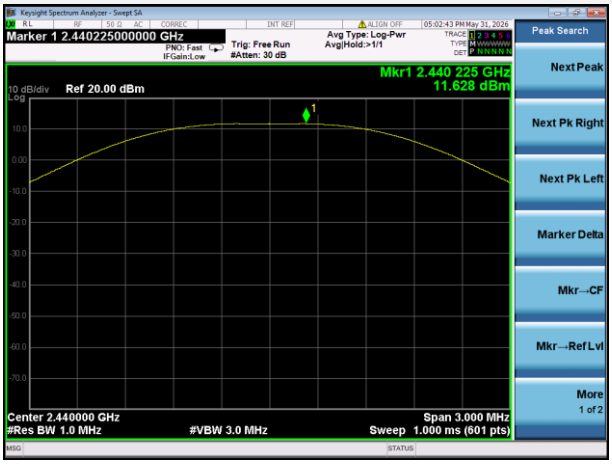
Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW			
Low Channel	11.48	14.06	30	1000	Pass
Middle Channel	11.63	14.55			Pass
High Channel	11.75	14.95			Pass

Test Plots

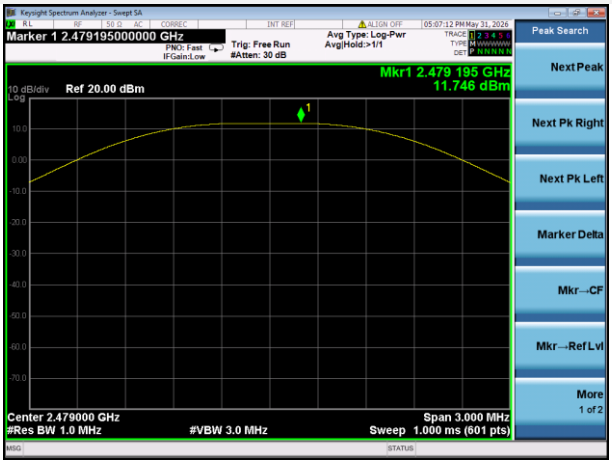
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



A.2 Occupied Bandwidth

Test Data

Channel	6 dB Bandwidth (kHz)	99% Bandwidth (kHz)	6 dB Bandwidth Limits (kHz)
Low Channel	554.200	892.430	≥500
Middle Channel	554.200	894.490	≥500
High Channel	554.200	894.560	≥500

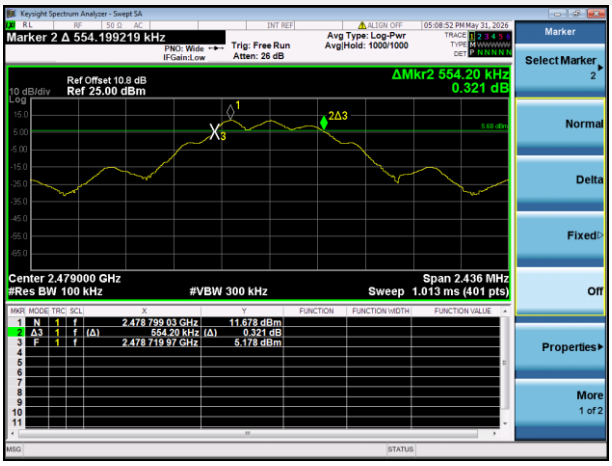
Test Plots

6 dB Bandwidth

LOW CHANNEL

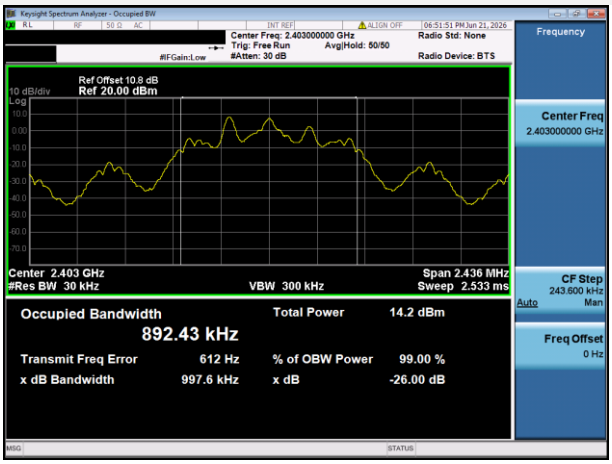
MIDDLE CHANNEL

HIGH CHANNEL

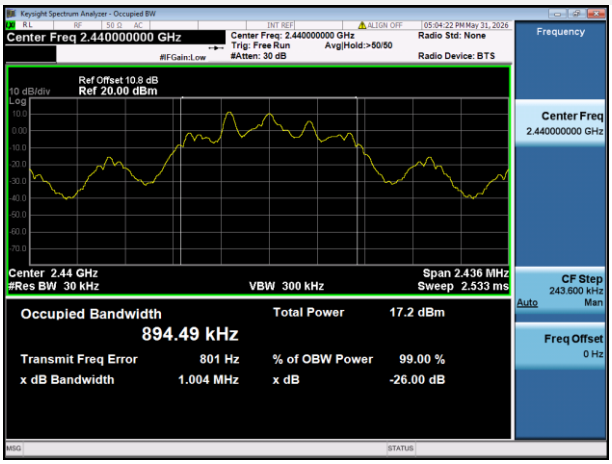


99% Bandwidth

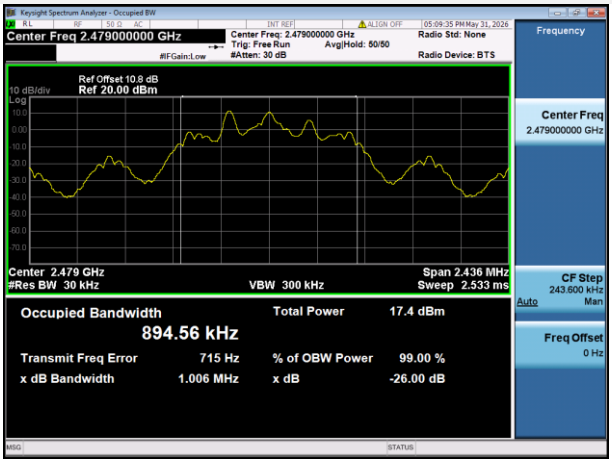
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



A.3 Conducted Spurious Emissions

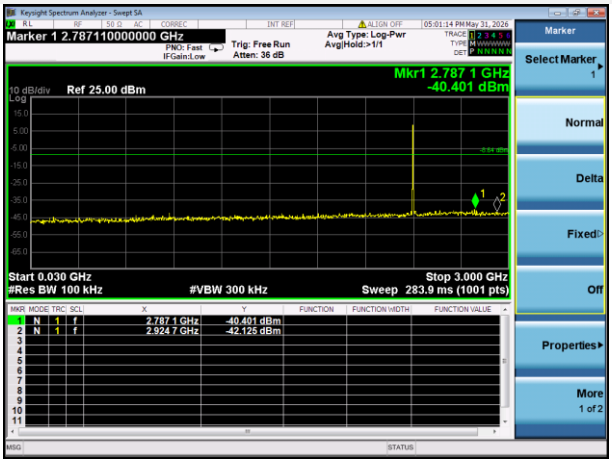
Test Data

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-29.29	11.36	-8.64	Pass
Middle Channel	-29.66	11.52	-8.48	Pass
High Channel	-29.25	11.66	-8.34	Pass

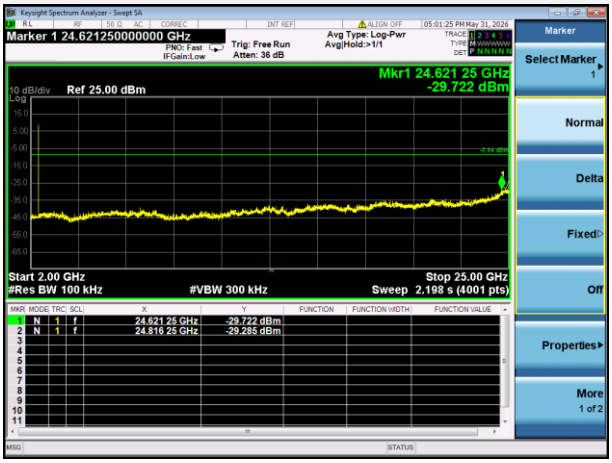
Test Plots

LOW CHANNEL, CARRIER LEVEL

LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

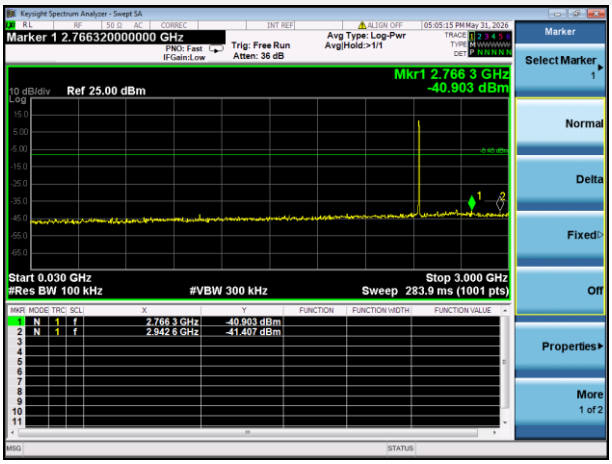


LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

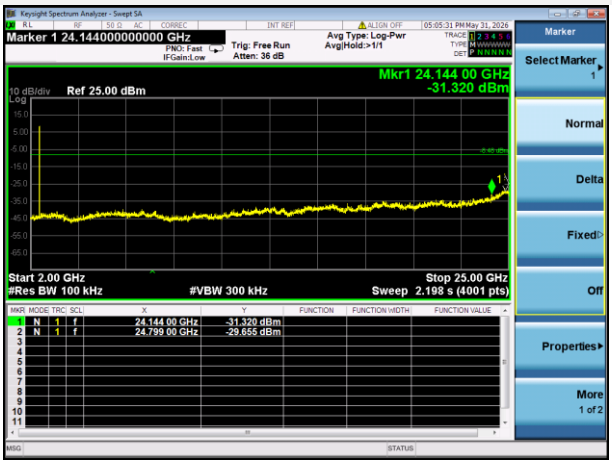


MIDDLE CHANNEL, CARRIER LEVEL

MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

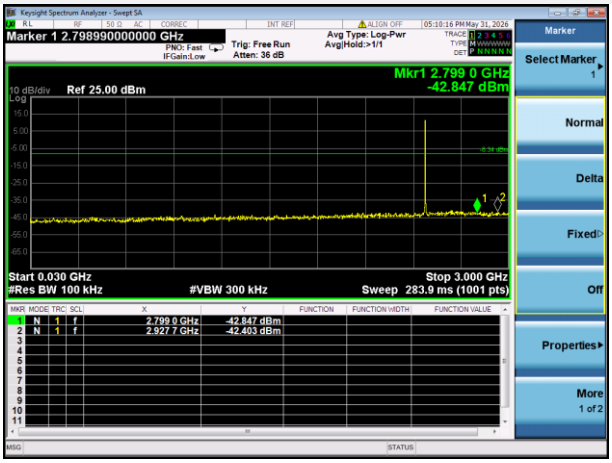


MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

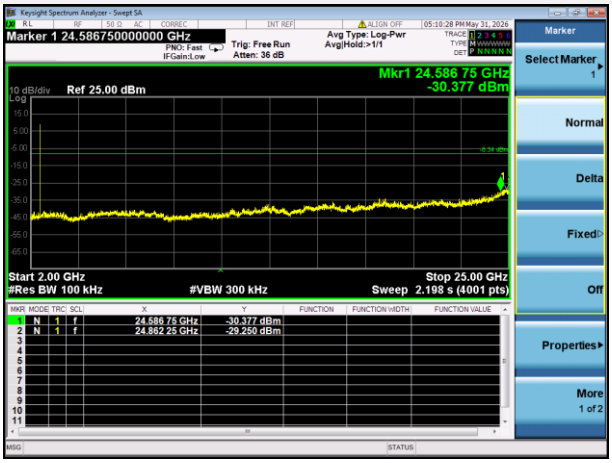


HIGH CHANNEL, CARRIER LEVEL

HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



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

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

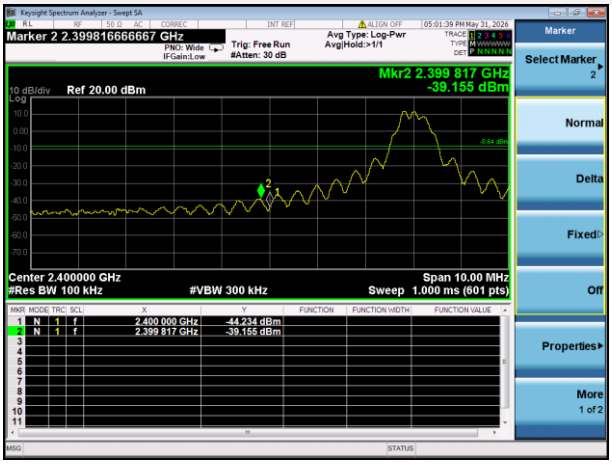
Test Data

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-39.16	11.36	-8.64	Pass
High Channel	-42.67	11.66	-8.34	Pass

Test Plots

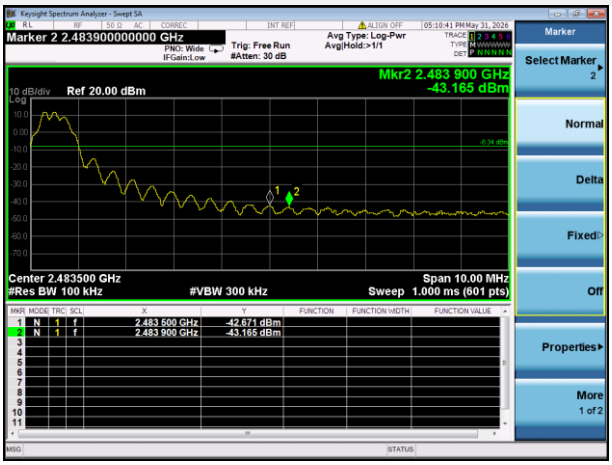
LOW CHANNEL, CARRIER LEVEL

LOW CHANNEL, BAND EDGE



HIGH CHANNEL, CARRIER LEVEL

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.

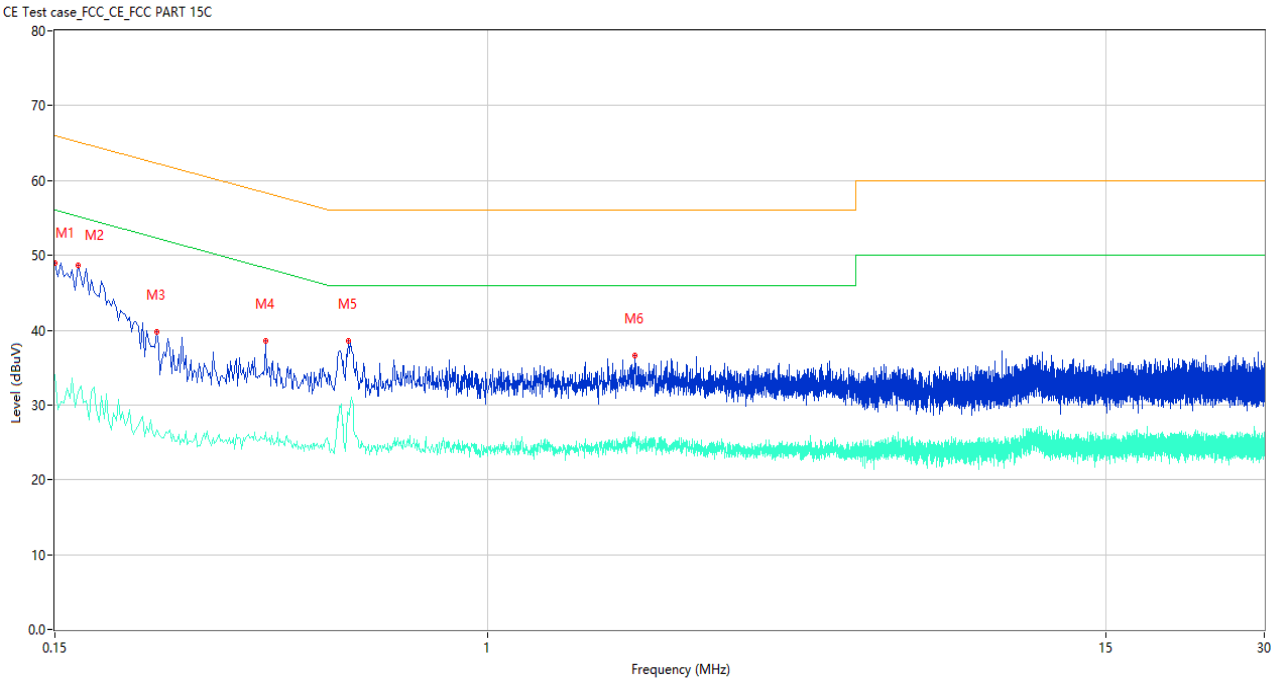
Note [2]: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

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

Test Data and Plots

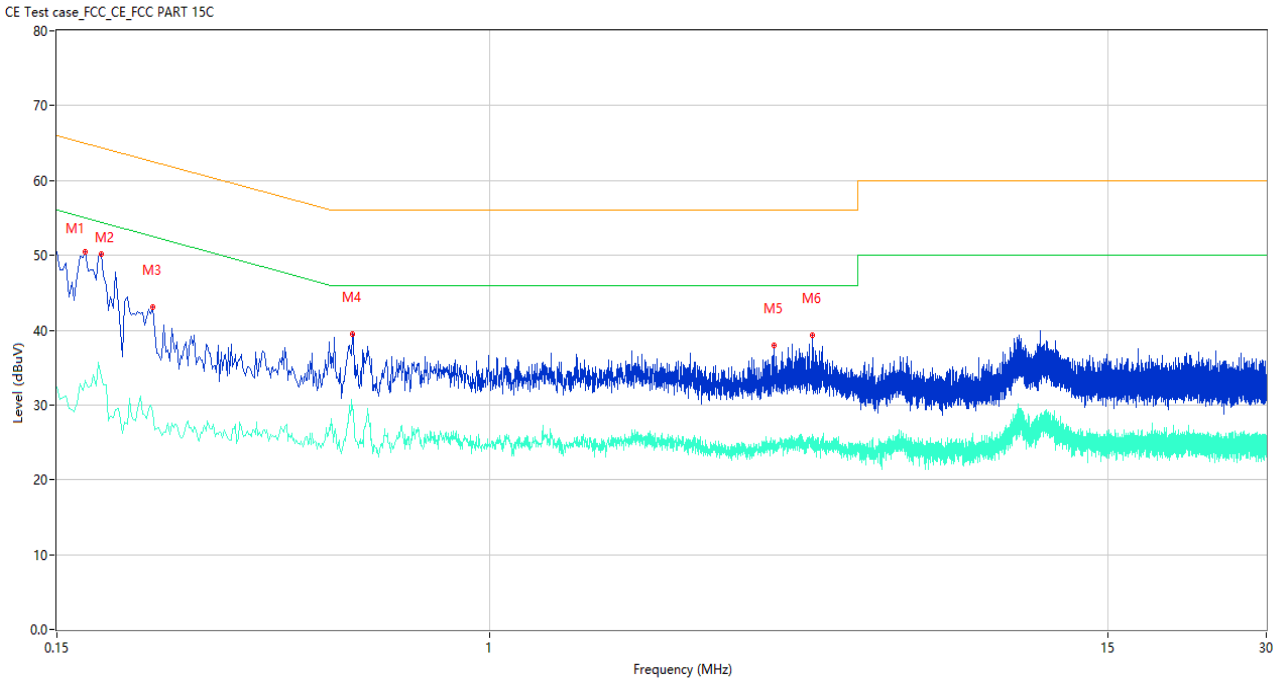
Helical Antenna

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.150	49.03	9.77	66.00	16.97	Peak	L	Pass
1**	0.150	34.07	9.77	56.00	21.93	AV	L	Pass
2	0.166	48.72	9.76	65.16	16.44	Peak	L	Pass
2**	0.166	31.80	9.76	55.16	23.36	AV	L	Pass
3	0.234	39.76	9.75	62.31	22.55	Peak	L	Pass
3**	0.234	26.73	9.75	52.31	25.58	AV	L	Pass
4	0.378	38.58	10.62	58.32	19.74	Peak	L	Pass
4**	0.378	26.44	10.62	48.32	21.88	AV	L	Pass
5	0.542	38.56	10.00	56.00	17.44	Peak	L	Pass
5**	0.542	28.96	10.00	46.00	17.04	AV	L	Pass
6	1.906	36.62	10.64	56.00	19.38	Peak	L	Pass
6**	1.906	26.43	10.64	46.00	19.57	AV	L	Pass

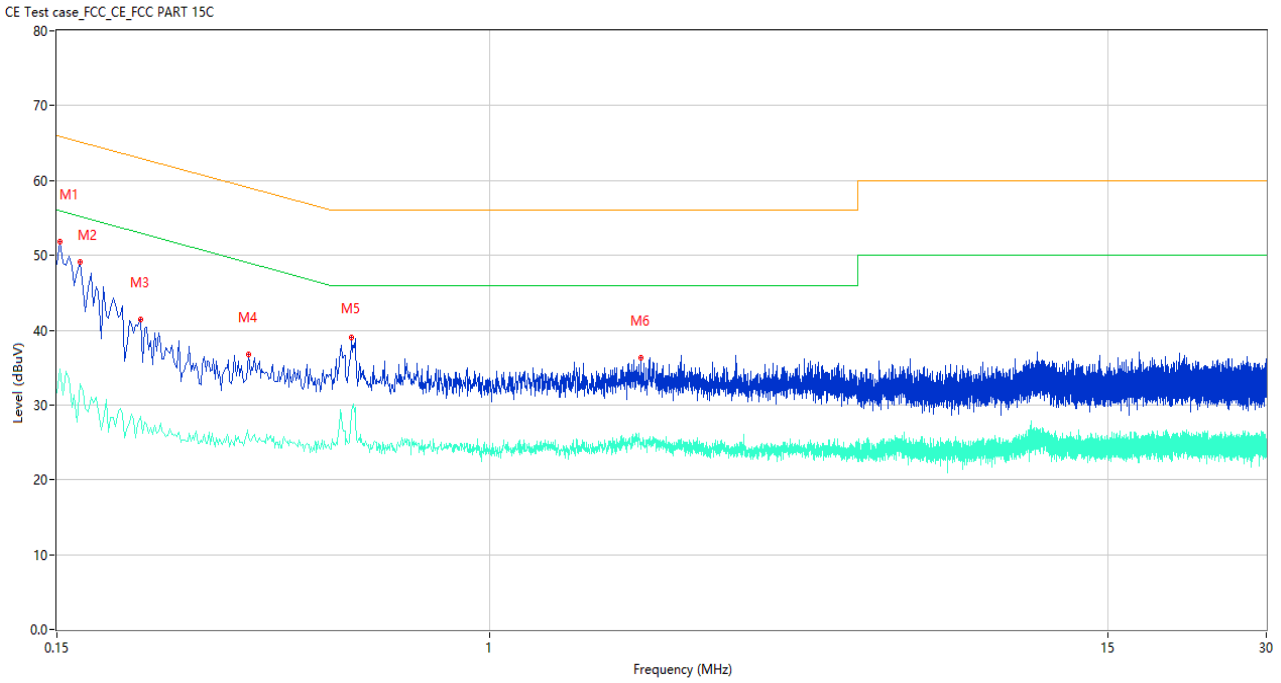
PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.170	50.47	9.76	64.96	14.49	Peak	N	Pass
1**	0.170	33.32	9.76	54.96	21.64	AV	N	Pass
2	0.182	50.18	9.76	64.39	14.21	Peak	N	Pass
2**	0.182	33.88	9.76	54.39	20.51	AV	N	Pass
3	0.228	43.11	9.75	62.52	19.41	Peak	N	Pass
3**	0.228	29.11	9.75	52.52	23.41	AV	N	Pass
4	0.548	39.50	10.01	56.00	16.50	Peak	N	Pass
4**	0.548	29.38	10.01	46.00	16.62	AV	N	Pass
5	3.476	38.01	10.13	56.00	17.99	Peak	N	Pass
5**	3.476	25.14	10.13	46.00	20.86	AV	N	Pass
6	4.114	39.29	10.18	56.00	16.71	Peak	N	Pass
6**	4.114	26.00	10.18	46.00	20.00	AV	N	Pass

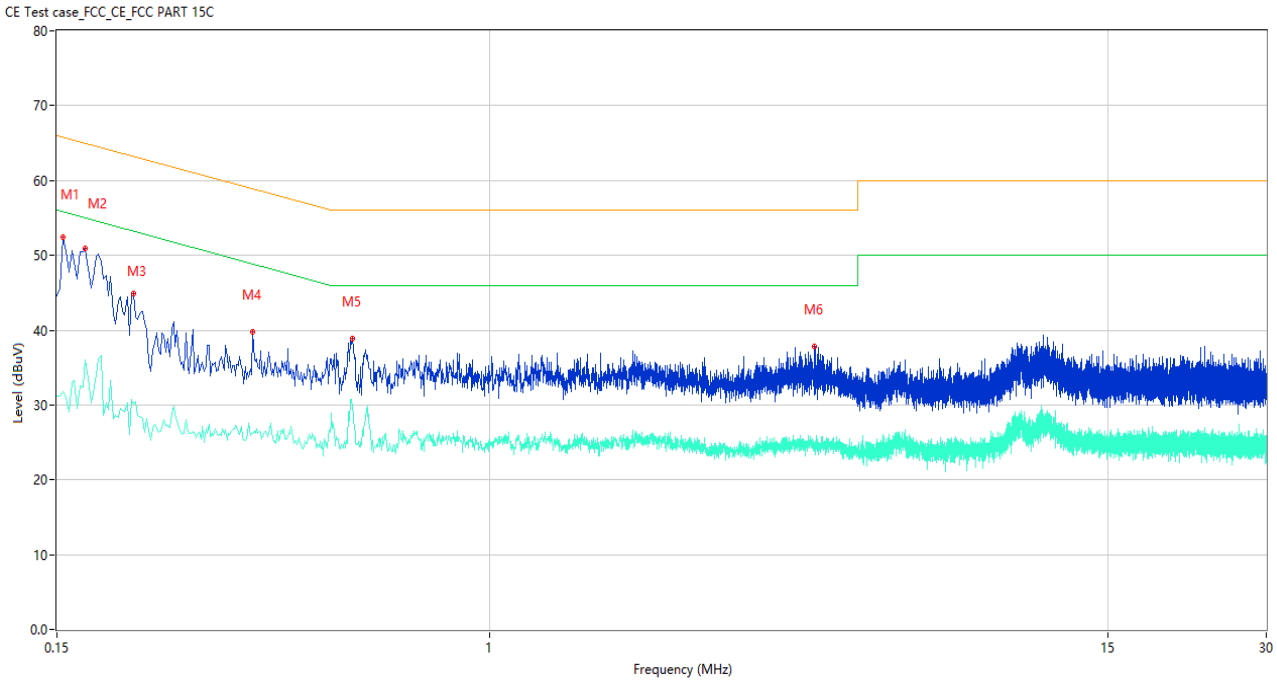
FPC Antenna

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.152	51.86	9.77	65.89	14.03	Peak	L	Pass
1**	0.152	34.85	9.77	55.89	21.04	AV	L	Pass
2	0.166	49.05	9.76	65.16	16.11	Peak	L	Pass
2**	0.166	32.84	9.76	55.16	22.32	AV	L	Pass
3	0.216	41.45	9.75	62.97	21.52	Peak	L	Pass
3**	0.216	28.50	9.75	52.97	24.47	AV	L	Pass
4	0.348	36.71	10.70	59.01	22.30	Peak	L	Pass
4**	0.348	25.76	10.70	49.01	23.25	AV	L	Pass
5	0.546	38.97	10.01	56.00	17.03	Peak	L	Pass
5**	0.546	29.23	10.01	46.00	16.77	AV	L	Pass
6	1.936	36.34	10.29	56.00	19.66	Peak	L	Pass
6**	1.936	24.06	10.29	46.00	21.94	AV	L	Pass

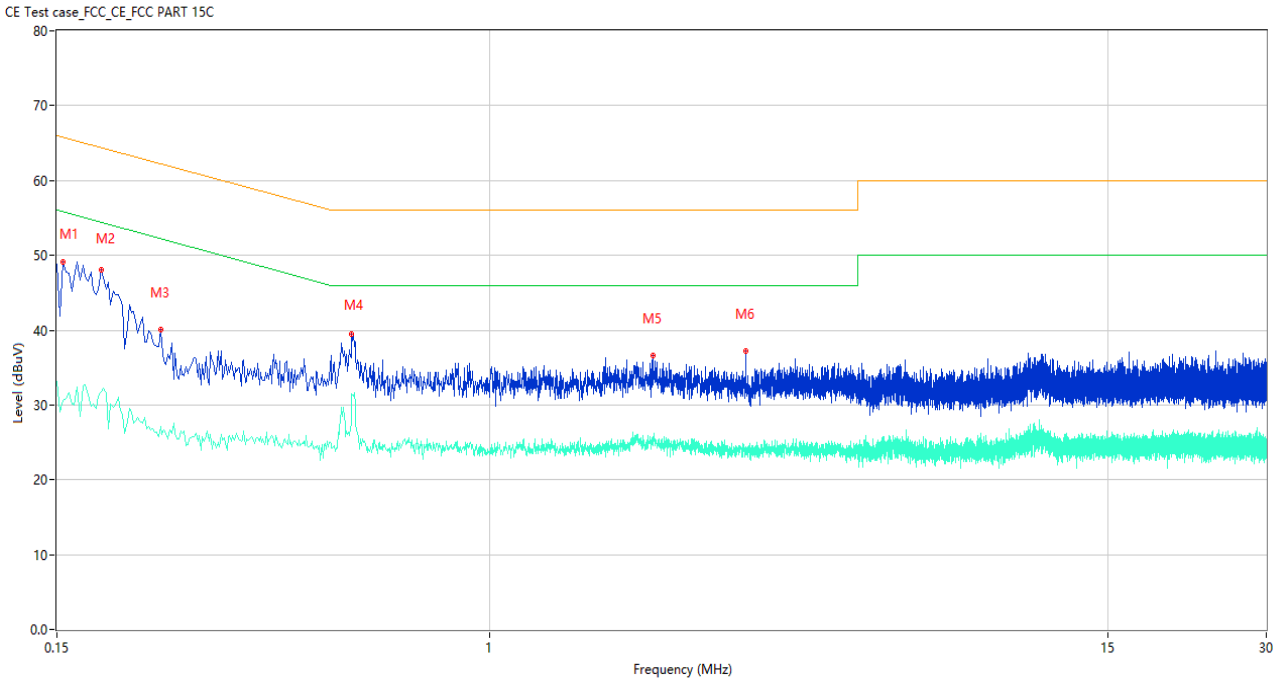
PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.154	52.36	9.77	65.78	13.42	Peak	N	Pass
1**	0.154	31.76	9.77	55.78	24.02	AV	N	Pass
2	0.170	50.85	9.76	64.96	14.11	Peak	N	Pass
2**	0.170	36.08	9.76	54.96	18.88	AV	N	Pass
3	0.210	44.94	9.75	63.21	18.27	Peak	N	Pass
3**	0.210	30.16	9.75	53.21	23.05	AV	N	Pass
4	0.354	39.81	10.72	58.87	19.06	Peak	N	Pass
4**	0.354	26.27	10.72	48.87	22.60	AV	N	Pass
5	0.548	38.91	10.01	56.00	17.09	Peak	N	Pass
5**	0.548	29.78	10.01	46.00	16.22	AV	N	Pass
6	4.152	37.77	9.87	56.00	18.23	Peak	N	Pass
6**	4.152	24.40	9.87	46.00	21.60	AV	N	Pass

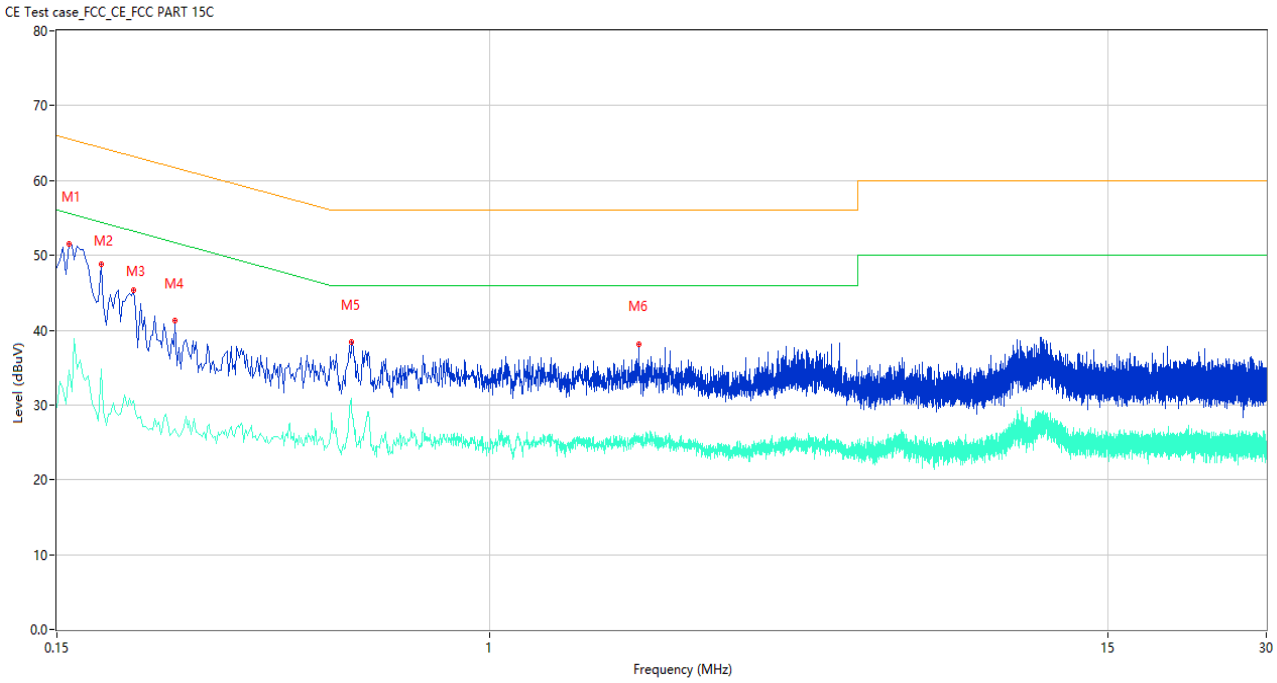
Fiberglass Omni-directional Antenna

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.154	49.15	9.77	65.78	16.63	Peak	L	Pass
1**	0.154	30.63	9.77	55.78	25.15	AV	L	Pass
2	0.182	48.11	9.76	64.39	16.28	Peak	L	Pass
2**	0.182	31.72	9.76	54.39	22.67	AV	L	Pass
3	0.236	40.15	9.75	62.24	22.09	Peak	L	Pass
3**	0.236	27.19	9.75	52.24	25.05	AV	L	Pass
4	0.546	39.53	10.01	56.00	16.47	Peak	L	Pass
4**	0.546	31.44	10.01	46.00	14.56	AV	L	Pass
5	2.040	36.62	10.43	56.00	19.38	Peak	L	Pass
5**	2.040	25.80	10.43	46.00	20.20	AV	L	Pass
6	3.070	37.23	9.95	56.00	18.77	Peak	L	Pass
6**	3.070	23.84	9.95	46.00	22.16	AV	L	Pass

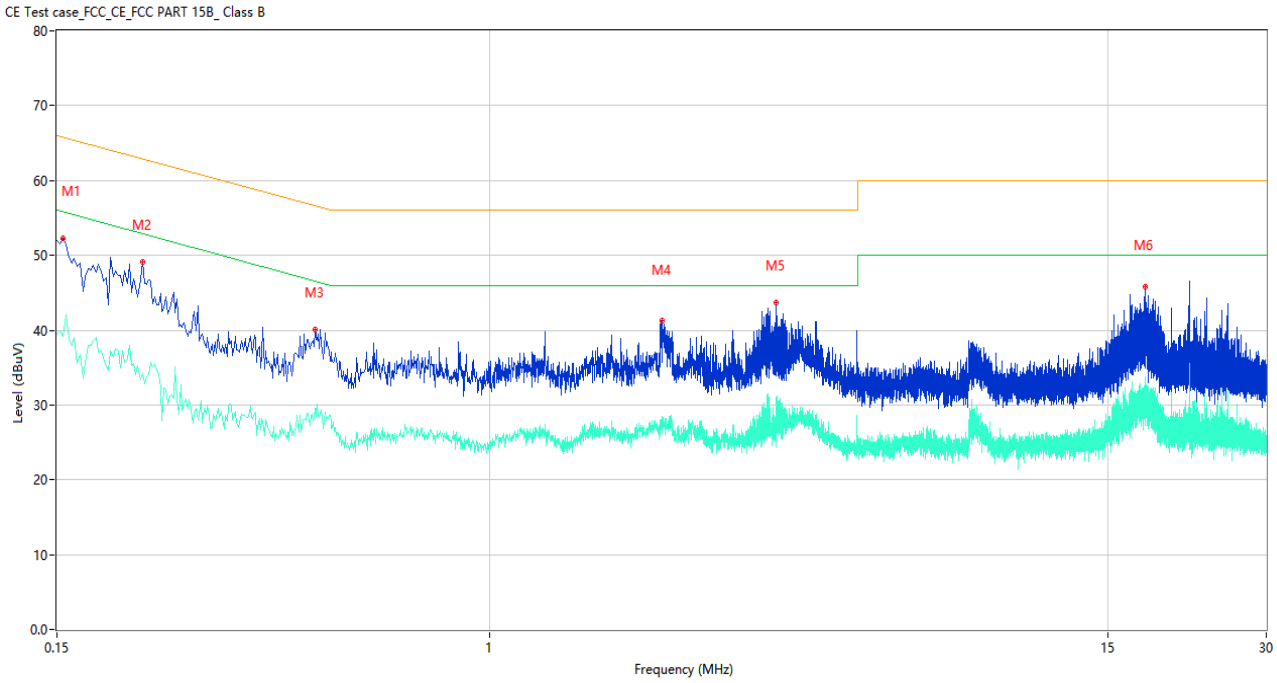
PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.158	51.51	9.77	65.57	14.06	Peak	N	Pass
1**	0.158	34.67	9.77	55.57	20.90	AV	N	Pass
2	0.182	48.88	9.76	64.39	15.51	Peak	N	Pass
2**	0.182	34.81	9.76	54.39	19.58	AV	N	Pass
3	0.210	45.36	9.75	63.21	17.85	Peak	N	Pass
3**	0.210	30.51	9.75	53.21	22.70	AV	N	Pass
4	0.252	41.29	9.74	61.69	20.40	Peak	N	Pass
4**	0.252	26.76	9.74	51.69	24.93	AV	N	Pass
5	0.546	38.45	10.01	56.00	17.55	Peak	N	Pass
5**	0.546	29.57	10.01	46.00	16.43	AV	N	Pass
6	1.920	38.06	10.48	56.00	17.94	Peak	N	Pass
6**	1.920	25.24	10.48	46.00	20.76	AV	N	Pass

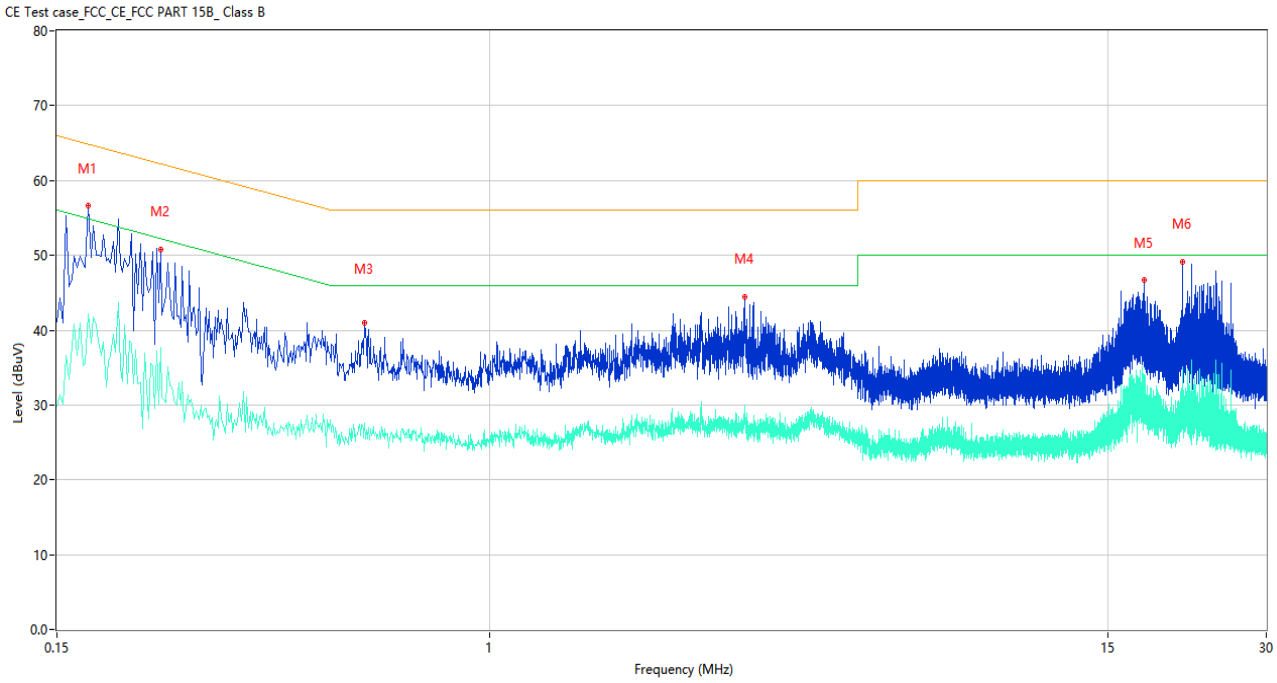
Dipole Antenna

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.154	52.21	9.77	65.78	13.57	Peak	L	Pass
1**	0.154	39.15	9.77	55.78	16.63	AV	L	Pass
2	0.218	49.10	9.75	62.89	13.79	Peak	L	Pass
2**	0.218	34.22	9.75	52.89	18.67	AV	L	Pass
3	0.464	40.07	10.00	56.62	16.55	Peak	L	Pass
3**	0.464	29.47	10.00	46.62	17.15	AV	L	Pass
4	2.130	41.34	10.07	56.00	14.66	Peak	L	Pass
4**	2.130	28.48	10.07	46.00	17.52	AV	L	Pass
5	3.502	43.63	10.06	56.00	12.37	Peak	L	Pass
5**	3.502	31.08	10.06	46.00	14.92	AV	L	Pass
6	17.640	45.81	10.93	60.00	14.19	Peak	L	Pass
6**	17.640	33.60	10.93	50.00	16.40	AV	L	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.172	56.66	9.76	64.86	8.20	Peak	N	Pass
1**	0.172	42.18	9.76	54.86	12.68	AV	N	Pass
2	0.236	50.85	9.75	62.24	11.39	Peak	N	Pass
2**	0.236	37.69	9.75	52.24	14.55	AV	N	Pass
3	0.578	41.04	10.08	56.00	14.96	Peak	N	Pass
3**	0.578	27.50	10.08	46.00	18.50	AV	N	Pass
4	3.052	44.52	10.04	56.00	11.48	Peak	N	Pass
4**	3.052	29.97	10.04	46.00	16.03	AV	N	Pass
5	17.542	46.69	10.86	60.00	13.31	Peak	N	Pass
5**	17.542	27.58	10.86	50.00	22.42	AV	N	Pass
6	20.798	49.19	11.04	60.00	10.81	Peak	N	Pass
6**	20.798	35.17	11.04	50.00	14.83	AV	N	Pass

A.6 Radiated Spurious 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 C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024, 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.

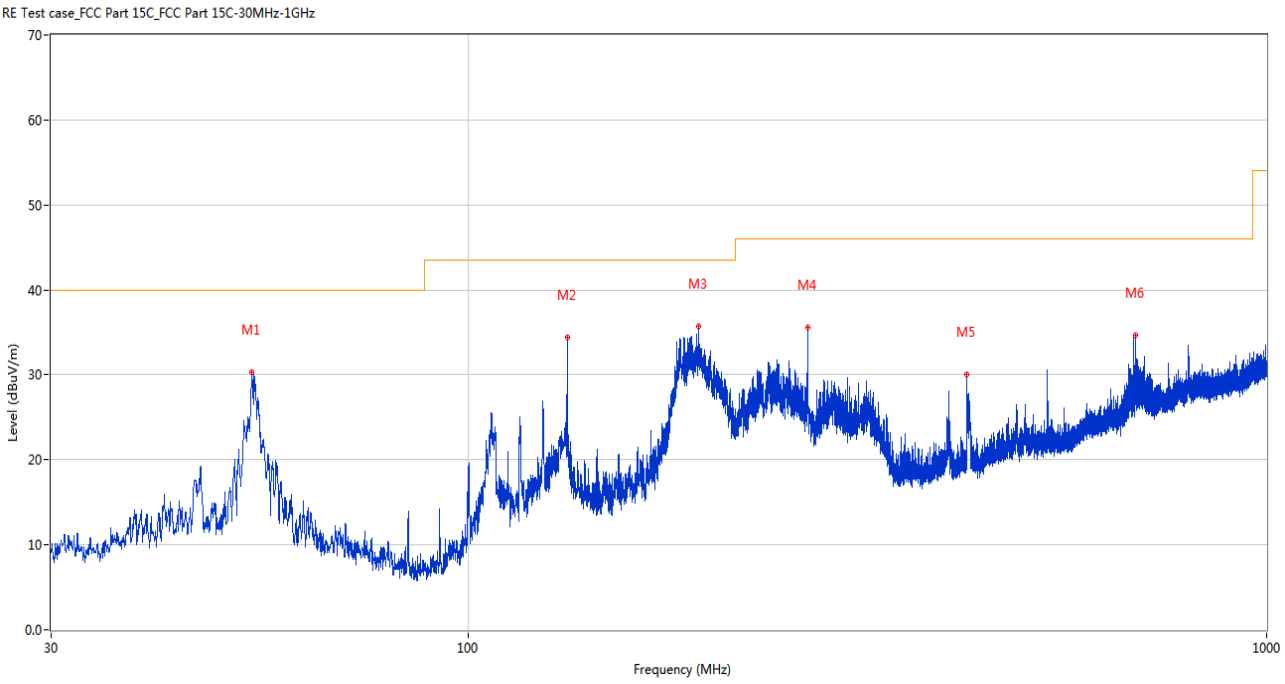
Note [3]: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note [4]: Results (dBuV/m) = Original reading level of Spectrum Analyzer (dBuV/m) + Factor (dB)

Test Data and Plots

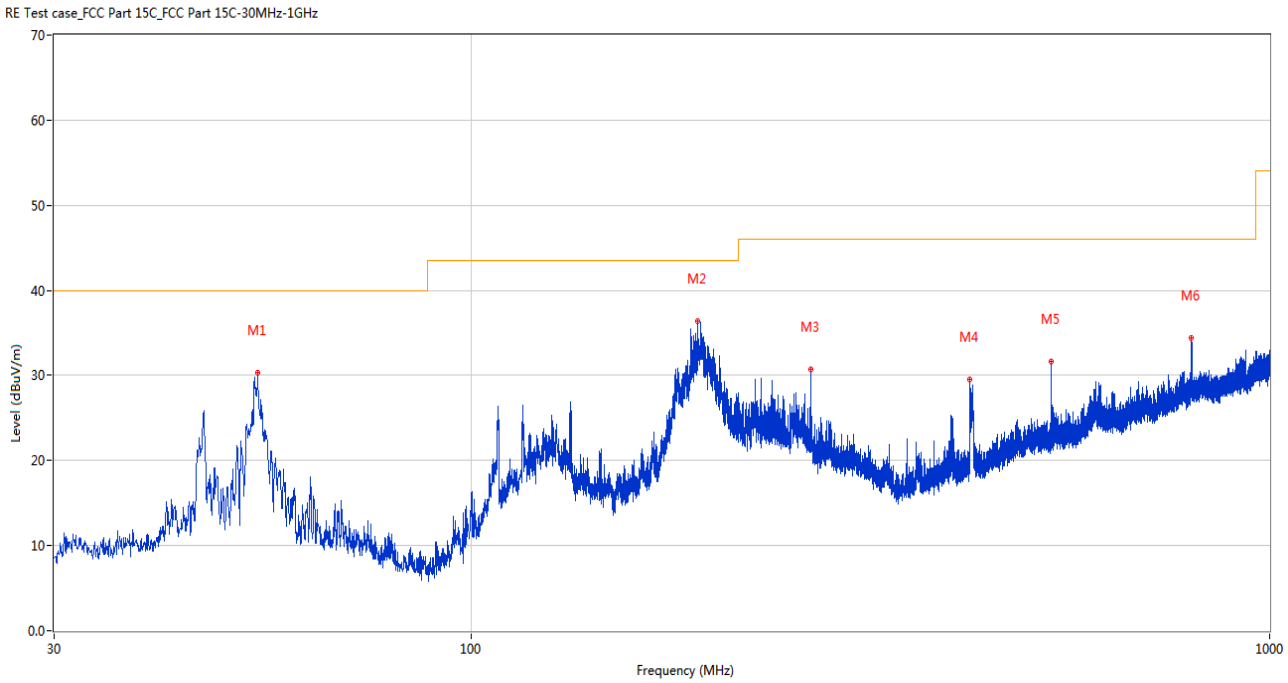
Helical Antenna

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	53.523	30.30	-24.93	40.0	9.70	Peak	196.00	200	Horizontal	Pass
2	133.160	34.46	-25.15	43.5	9.04	Peak	188.00	200	Horizontal	Pass
3	194.076	35.75	-26.60	43.5	7.75	Peak	273.00	200	Horizontal	Pass
4	266.438	35.59	-23.62	46.0	10.41	Peak	125.00	100	Horizontal	Pass
5	421.250	30.02	-18.33	46.0	15.98	Peak	265.00	200	Horizontal	Pass
6	685.235	34.73	-11.57	46.0	11.27	Peak	232.00	100	Horizontal	Pass

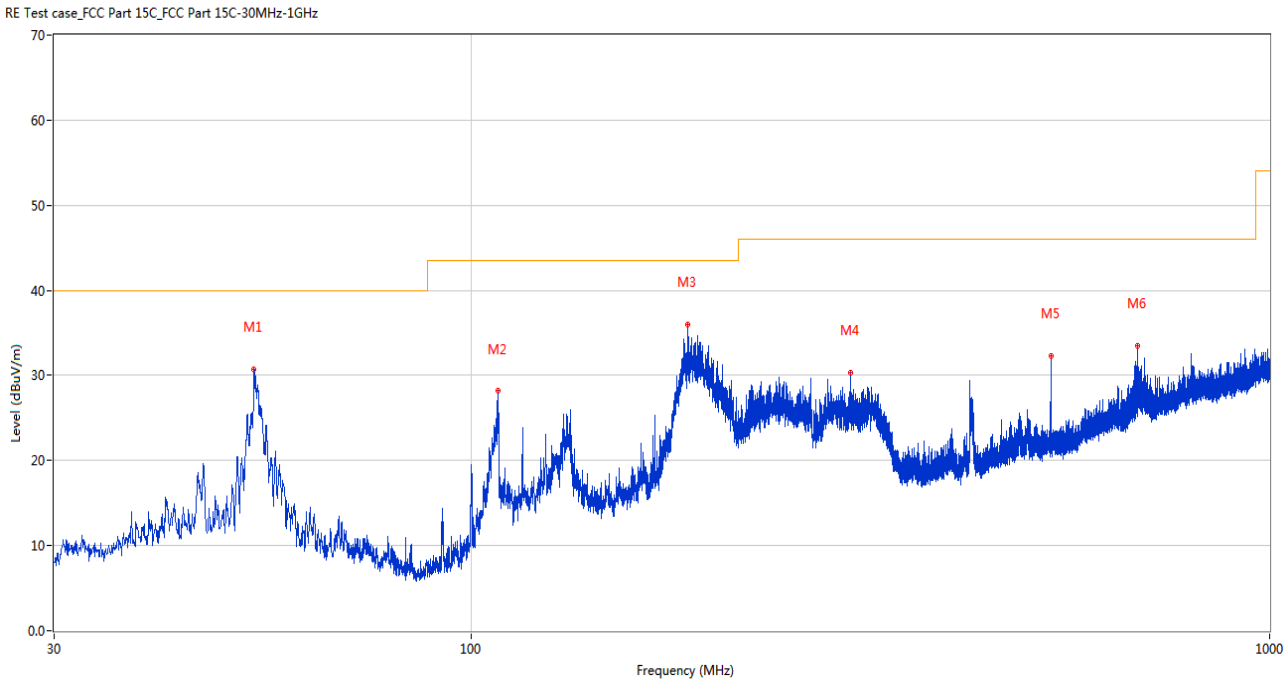
30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	53.959	30.28	-24.95	40.0	9.72	Peak	291.00	100	Vertical	Pass
2	191.796	36.40	-26.53	43.5	7.10	Peak	257.00	100	Vertical	Pass
3	266.389	30.76	-23.61	46.0	15.24	Peak	122.00	200	Vertical	Pass
4	421.250	29.58	-18.33	46.0	16.42	Peak	207.00	100	Vertical	Pass
5	532.994	31.62	-15.07	46.0	14.38	Peak	156.00	200	Vertical	Pass
6	796.446	34.36	-9.04	46.0	11.64	Peak	207.00	100	Vertical	Pass

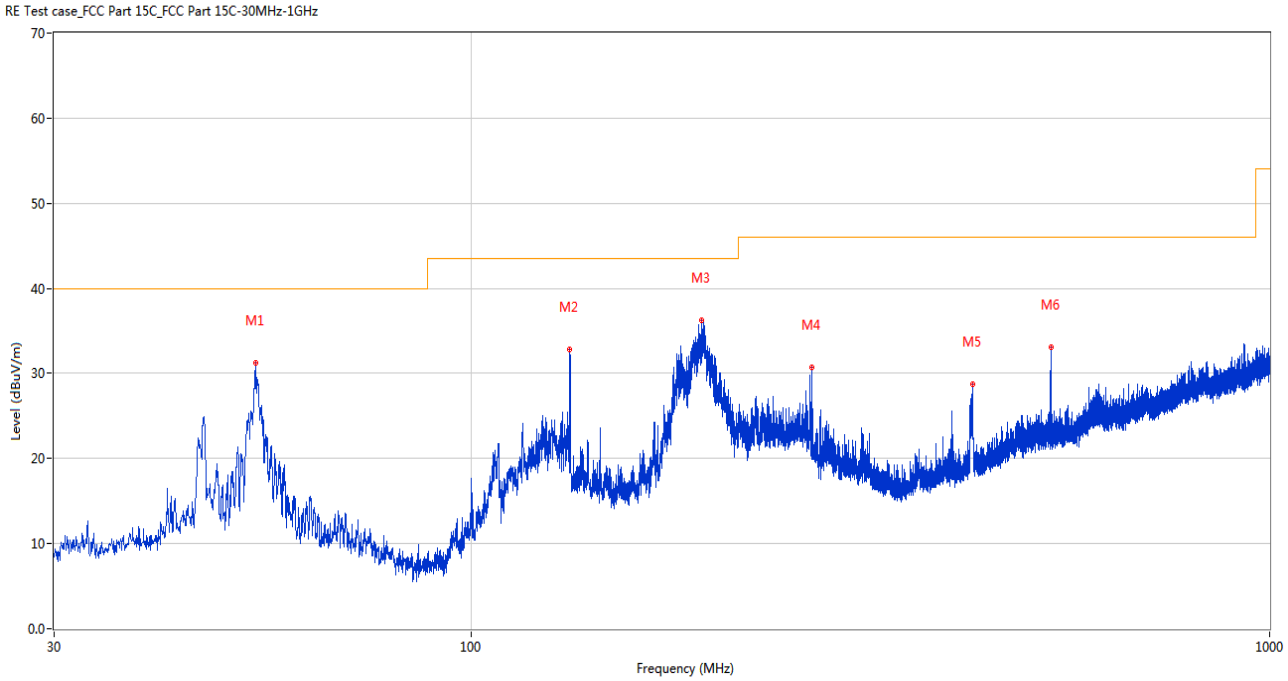
FPC Antenna

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	53.425	30.78	-24.93	40.0	9.22	Peak	360.00	200	Horizontal	Pass
2	107.842	28.15	-27.77	43.5	15.35	Peak	0.00	200	Horizontal	Pass
3	186.849	36.01	-26.04	43.5	7.49	Peak	271.00	200	Horizontal	Pass
4	298.738	30.31	-22.05	46.0	15.69	Peak	278.00	100	Horizontal	Pass
5	532.994	32.28	-15.07	46.0	13.72	Peak	233.00	100	Horizontal	Pass
6	683.634	33.49	-11.68	46.0	12.51	Peak	242.00	100	Horizontal	Pass

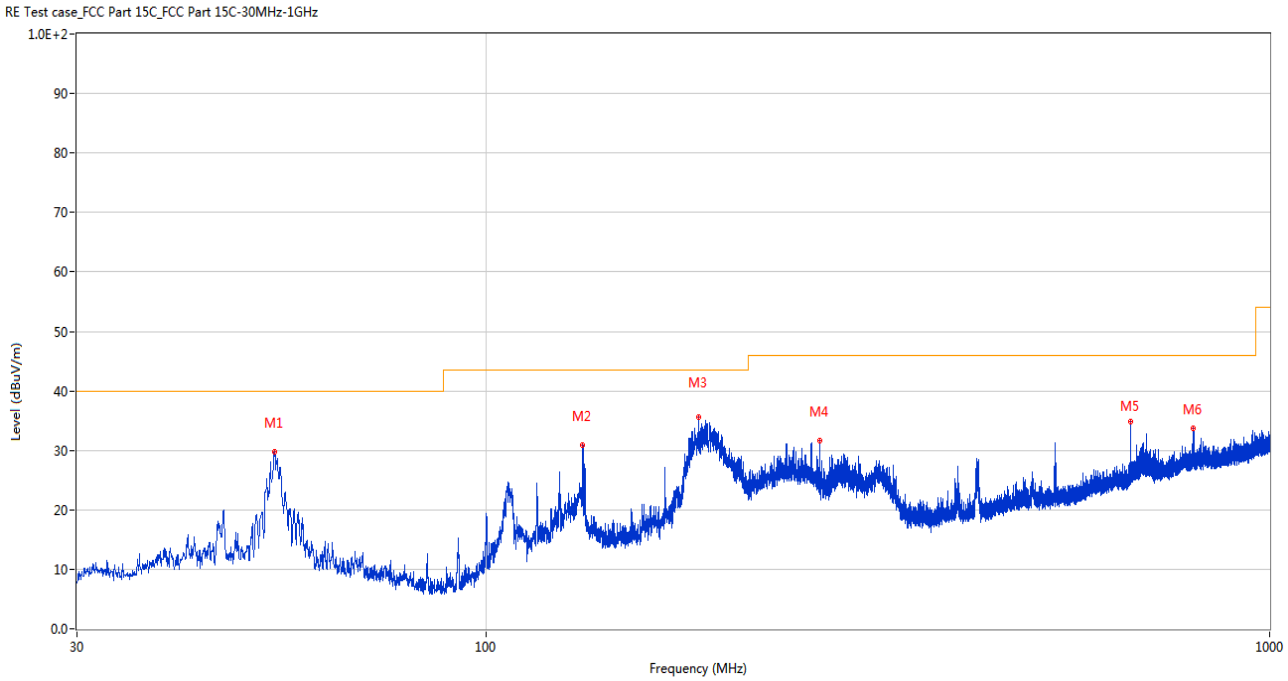
30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	53.620	31.30	-24.93	40.0	8.70	Peak	262.00	100	Vertical	Pass
2	132.820	32.77	-25.20	43.5	10.73	Peak	347.00	100	Vertical	Pass
3	194.512	36.31	-26.61	43.5	7.19	Peak	246.00	100	Vertical	Pass
4	266.680	30.74	-23.62	46.0	15.26	Peak	172.00	100	Vertical	Pass
5	424.693	28.77	-17.93	46.0	17.23	Peak	181.00	100	Vertical	Pass
6	531.927	33.09	-15.18	46.0	12.91	Peak	5.00	100	Vertical	Pass

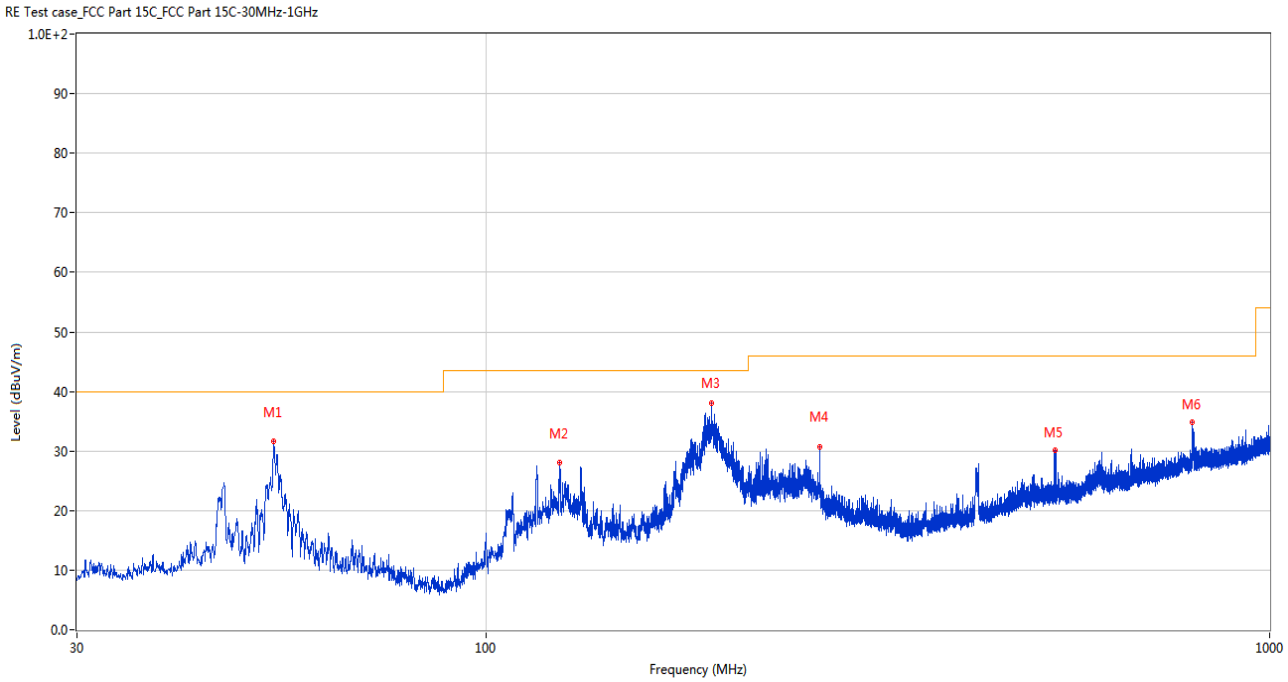
Fiberglass Omni-directional Antenna

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	53.571	29.70	-24.93	40.0	10.30	Peak	327.00	200	Horizontal	Pass
2	132.771	30.86	-25.20	43.5	12.64	Peak	174.00	200	Horizontal	Pass
3	186.752	35.53	-26.03	43.5	7.97	Peak	275.00	200	Horizontal	Pass
4	266.147	31.58	-23.61	46.0	14.42	Peak	57.00	100	Horizontal	Pass
5	664.234	34.80	-11.92	46.0	11.20	Peak	244.00	100	Horizontal	Pass
6	798.580	33.63	-9.07	46.0	12.37	Peak	223.00	100	Horizontal	Pass

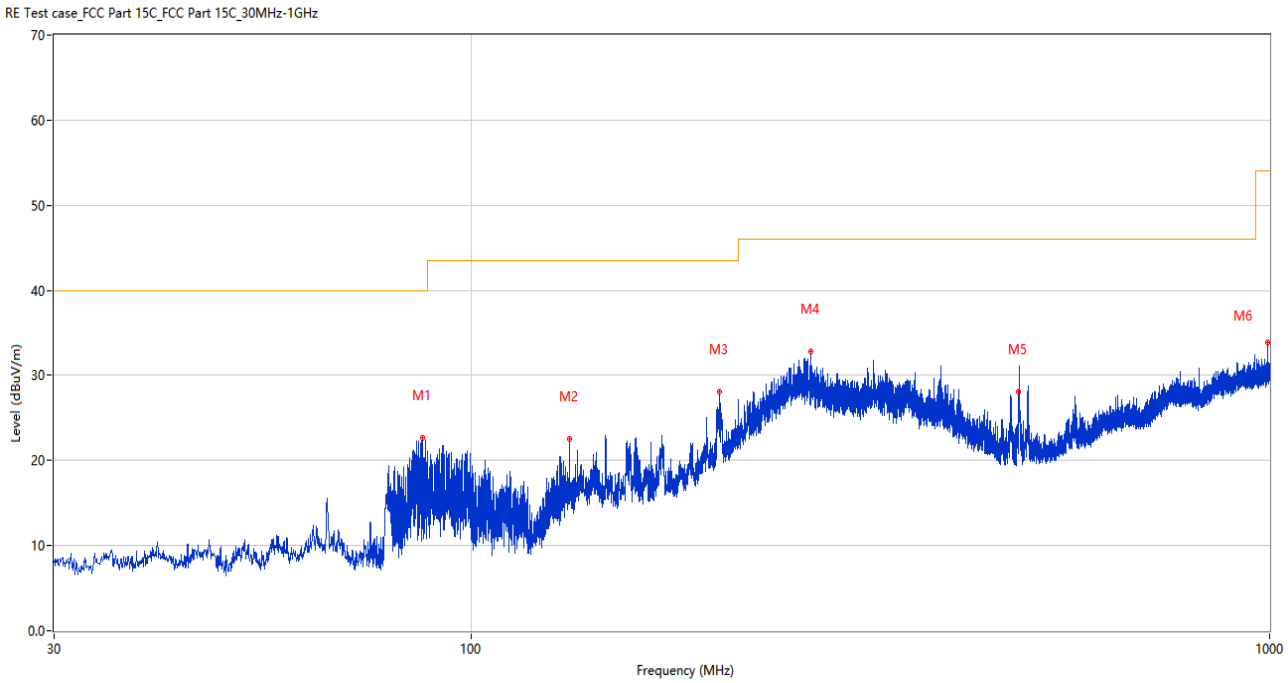
30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	53.474	31.55	-24.93	40.0	8.45	Peak	283.00	100	Vertical	Pass
2	124.090	28.04	-26.35	43.5	15.46	Peak	152.00	100	Vertical	Pass
3	193.639	38.08	-26.59	43.5	5.42	Peak	232.00	100	Vertical	Pass
4	266.680	30.74	-23.62	46.0	15.26	Peak	126.00	100	Vertical	Pass
5	532.994	30.10	-15.07	46.0	15.90	Peak	179.00	100	Vertical	Pass
6	797.028	34.87	-9.02	46.0	11.13	Peak	215.00	100	Vertical	Pass

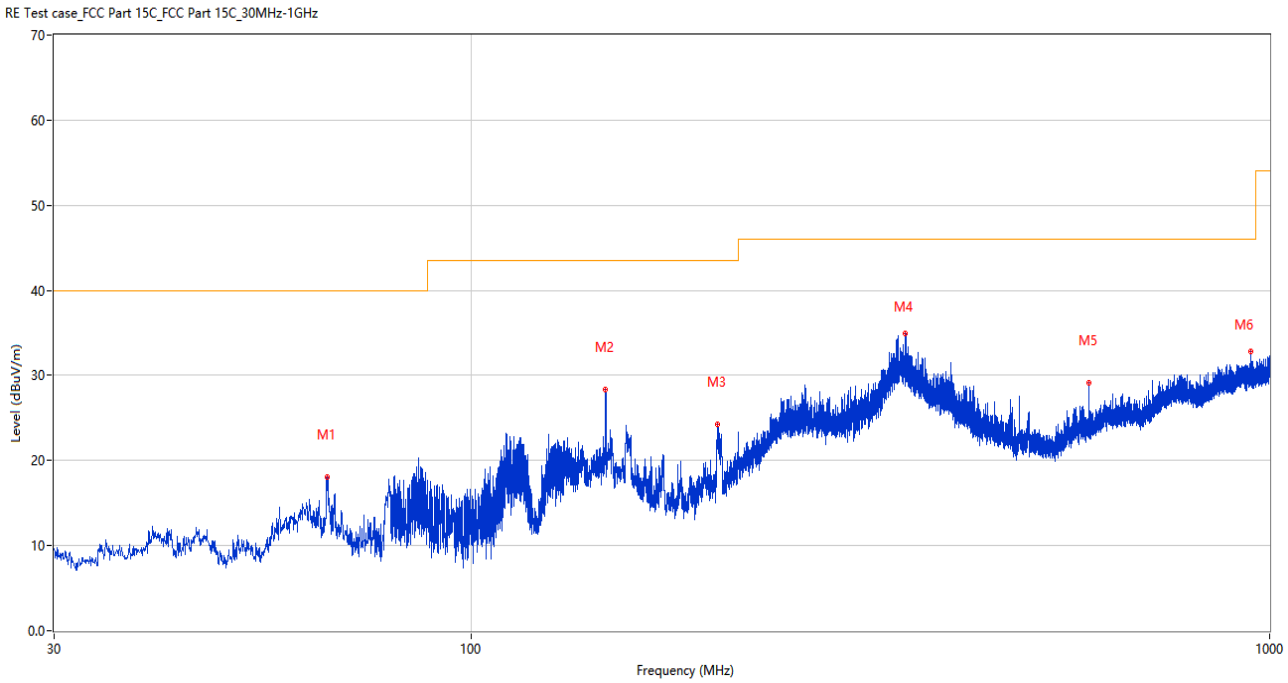
Dipole Antenna

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	86.745	22.68	-34.00	40.0	17.32	Peak	273.20	200	Horizontal	Pass
2	132.723	22.54	-28.84	43.5	20.96	Peak	319.10	200	Horizontal	Pass
3	204.746	28.05	-30.24	43.5	15.45	Peak	263.30	100	Horizontal	Pass
4	265.904	32.86	-27.15	46.0	13.14	Peak	54.60	100	Horizontal	Pass
5	484.784	28.06	-19.51	46.0	17.94	Peak	268.40	100	Horizontal	Pass
6	995.344	33.86	-8.82	54.0	20.14	Peak	296.60	100	Horizontal	Pass

30 MHz to 1 GHz, ANT V



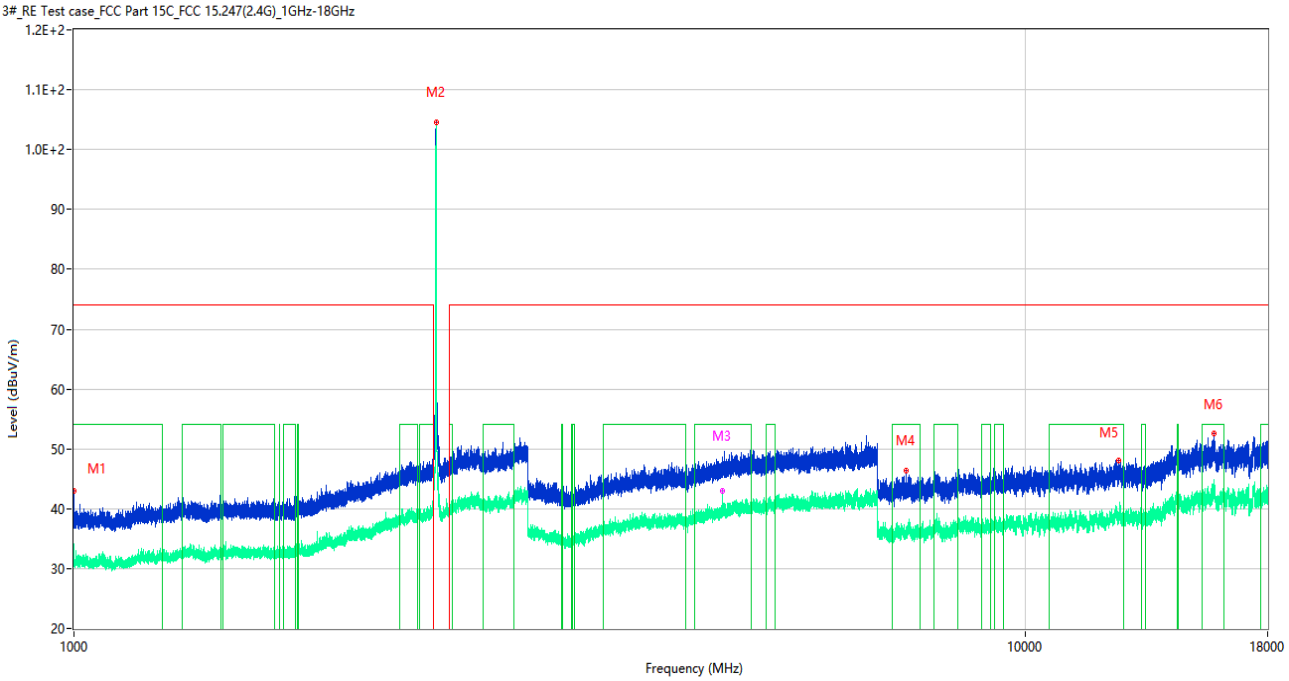
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	65.890	18.05	-29.82	40.0	21.95	Peak	252.60	100	Vertical	Pass
2	147.273	28.33	-27.48	43.5	15.17	Peak	3.00	100	Vertical	Pass
3	203.436	24.22	-30.25	43.5	19.28	Peak	227.20	100	Vertical	Pass
4	349.566	34.93	-23.97	46.0	11.07	Peak	192.20	100	Vertical	Pass
5	593.376	29.13	-16.18	46.0	16.87	Peak	72.20	100	Vertical	Pass
6	947.669	32.81	-9.24	46.0	13.19	Peak	296.00	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 from 18GHz-25GHz is noise only, do not show on the report.

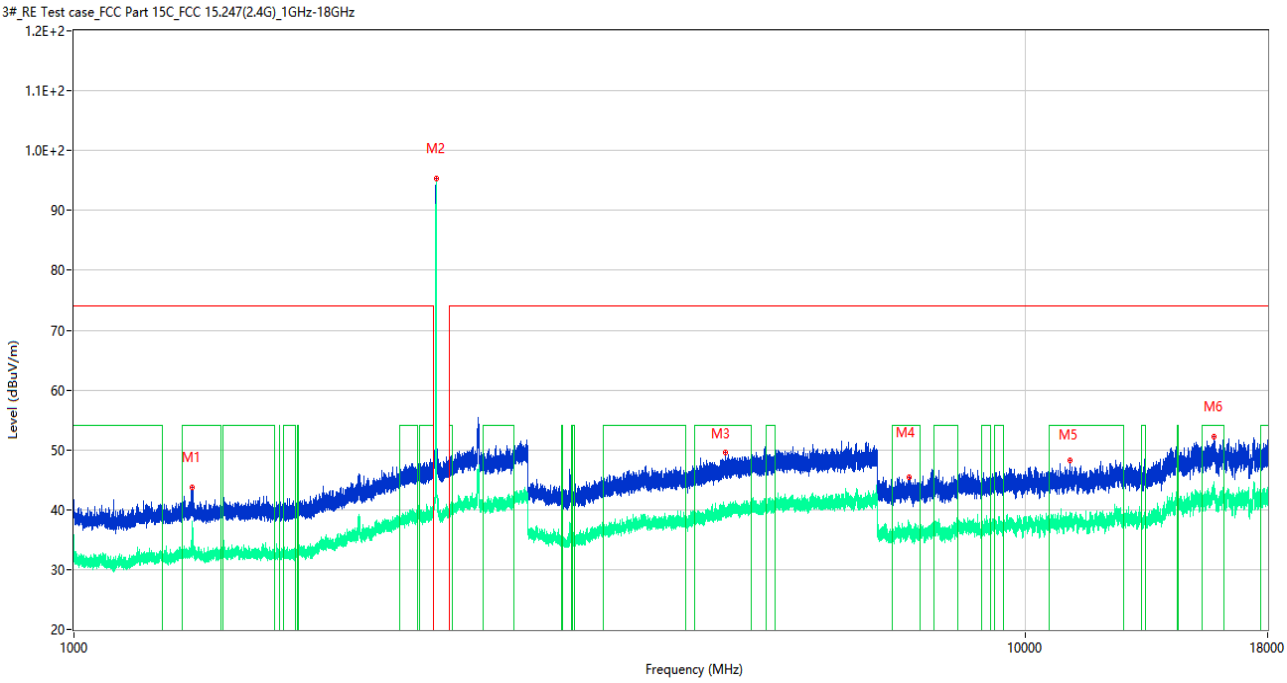
Helical Antenna

LOW CHANNEL 1 GHz to 18 GHz, ANT H



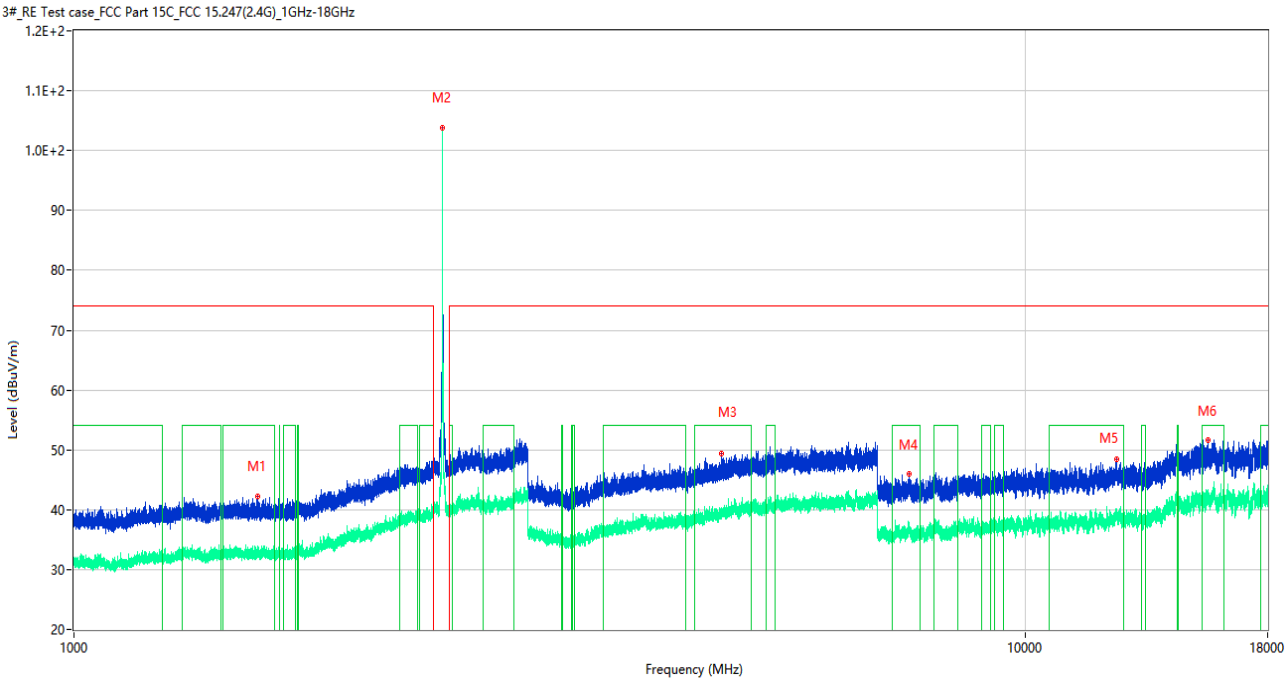
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1000.100	42.96	74.0	31.04	Peak	106.00	300	Horizontal	Pass
1**	1000.100	31.66	54.0	22.34	AV	106.00	300	Horizontal	Pass
2	2403.200	104.64	--	--	Peak	57.00	200	Horizontal	N/A
2**	2403.200	104.10	--	--	AV	57.00	200	Horizontal	N/A
3	4806.400	46.71	74.0	27.29	Peak	2.00	150	Horizontal	Pass
3**	4806.400	43.05	54.0	10.95	AV	2.00	150	Horizontal	Pass
4	7505.425	46.43	74.0	27.57	Peak	360.00	400	Horizontal	Pass
4**	7505.425	36.92	54.0	17.08	AV	360.00	400	Horizontal	Pass
5	12561.401	48.07	74.0	25.93	Peak	223.00	150	Horizontal	Pass
5**	12561.401	39.00	54.0	15.00	AV	223.00	150	Horizontal	Pass
6	15798.938	52.52	74.0	21.48	Peak	343.00	300	Horizontal	Pass
6**	15798.938	42.22	54.0	11.78	AV	343.00	300	Horizontal	Pass

LOW CHANNEL 1 GHz to 18 GHz, ANT V



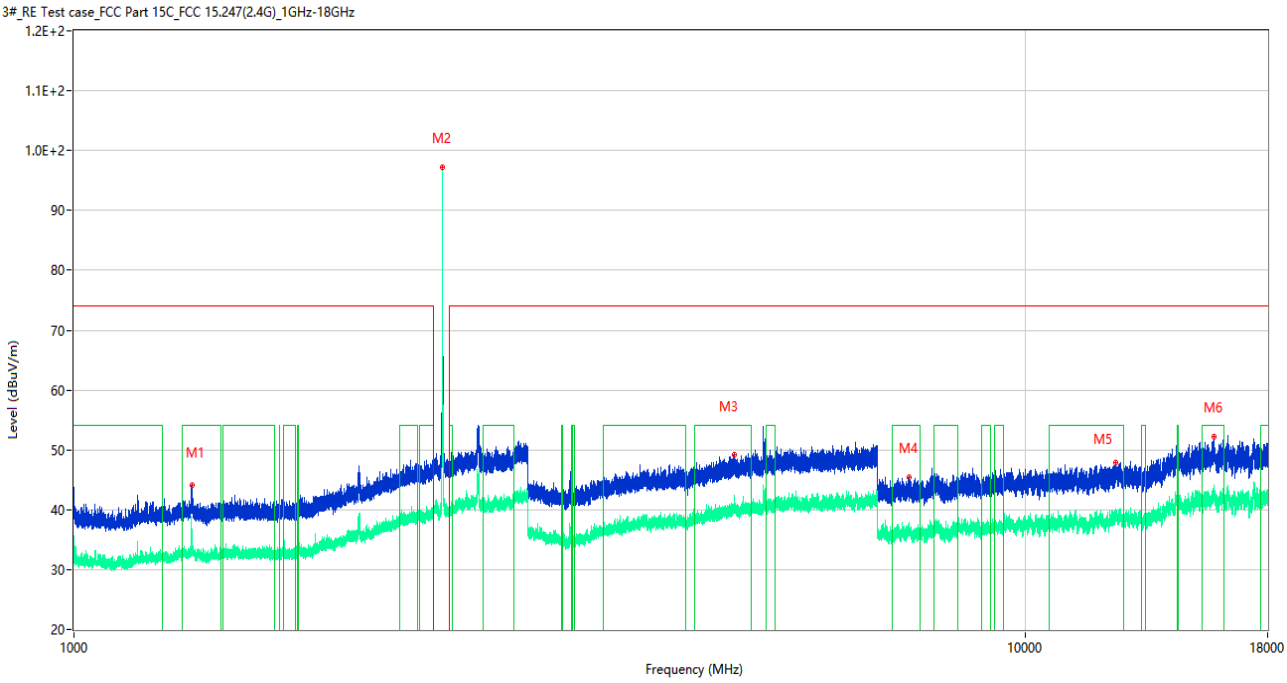
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.200	43.81	74.0	30.19	Peak	165.00	400	Vertical	Pass
1**	1331.200	34.66	54.0	19.34	AV	165.00	400	Vertical	Pass
2	2403.200	95.41	--	--	Peak	86.00	200	Vertical	N/A
2**	2403.200	94.88	--	--	AV	86.00	200	Vertical	N/A
3	4837.400	49.65	74.0	24.35	Peak	114.00	100	Vertical	Pass
3**	4837.400	40.19	54.0	13.81	AV	114.00	100	Vertical	Pass
4	7554.013	45.46	74.0	28.54	Peak	275.00	400	Vertical	Pass
4**	7554.013	37.51	54.0	16.49	AV	275.00	400	Vertical	Pass
5	11157.250	48.24	74.0	25.76	Peak	86.00	100	Vertical	Pass
5**	11157.250	38.92	54.0	15.08	AV	86.00	100	Vertical	Pass
6	15799.200	52.21	74.0	21.79	Peak	102.00	150	Vertical	Pass
6**	15799.200	43.08	54.0	10.92	AV	102.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H



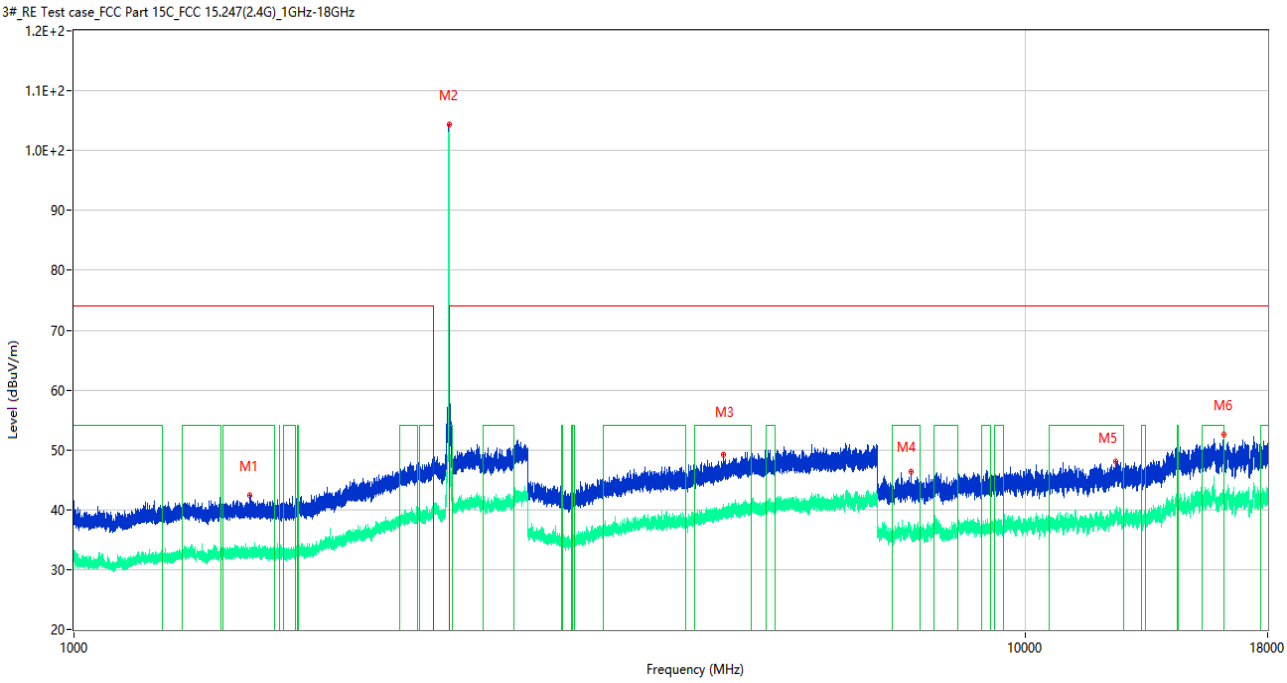
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1560.000	42.28	74.0	31.72	Peak	238.00	200	Horizontal	Pass
1**	1560.000	33.35	54.0	20.65	AV	238.00	200	Horizontal	Pass
2	2440.800	103.88	--	--	Peak	225.00	150	Horizontal	N/A
2**	2440.800	103.65	--	--	AV	225.00	150	Horizontal	N/A
3	4800.800	49.34	74.0	24.66	Peak	231.00	150	Horizontal	Pass
3**	4800.800	39.18	54.0	14.82	AV	231.00	150	Horizontal	Pass
4	7549.700	45.96	74.0	28.04	Peak	185.00	100	Horizontal	Pass
4**	7549.700	37.66	54.0	16.34	AV	185.00	100	Horizontal	Pass
5	12488.088	48.47	74.0	25.53	Peak	254.00	150	Horizontal	Pass
5**	12488.088	39.12	54.0	14.88	AV	254.00	150	Horizontal	Pass
6	15577.125	51.61	74.0	22.39	Peak	57.00	300	Horizontal	Pass
6**	15577.125	42.93	54.0	11.07	AV	57.00	300	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V



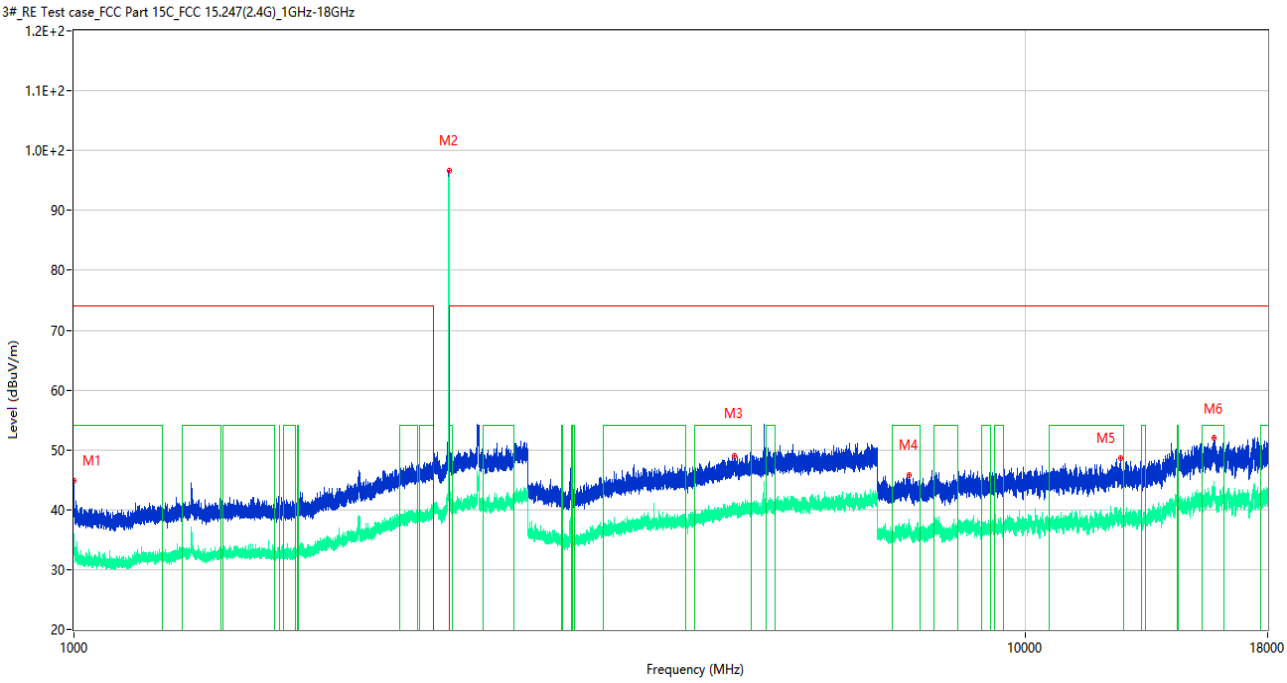
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.100	44.19	74.0	29.81	Peak	142.00	400	Vertical	Pass
1**	1331.100	32.66	54.0	21.34	AV	142.00	400	Vertical	Pass
2	2440.800	97.13	--	--	Peak	207.00	100	Vertical	N/A
2**	2440.800	96.86	--	--	AV	207.00	100	Vertical	N/A
3	4946.400	49.13	74.0	24.87	Peak	307.00	100	Vertical	Pass
3**	4946.400	40.84	54.0	13.16	AV	307.00	100	Vertical	Pass
4	7547.112	45.34	74.0	28.66	Peak	153.00	100	Vertical	Pass
4**	7547.112	36.69	54.0	17.31	AV	153.00	100	Vertical	Pass
5	12461.062	47.96	74.0	26.04	Peak	0.00	200	Vertical	Pass
5**	12461.062	39.11	54.0	14.89	AV	0.00	200	Vertical	Pass
6	15801.825	52.18	74.0	21.82	Peak	54.00	100	Vertical	Pass
6**	15801.825	43.09	54.0	10.91	AV	54.00	100	Vertical	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1531.600	42.32	74.0	31.68	Peak	256.00	100	Horizontal	Pass
1**	1531.600	32.48	54.0	21.52	AV	256.00	100	Horizontal	Pass
2	2479.200	104.34	--	--	Peak	256.00	150	Horizontal	N/A
2**	2479.200	103.69	--	--	AV	256.00	150	Horizontal	N/A
3	4818.000	49.26	74.0	24.74	Peak	317.00	150	Horizontal	Pass
3**	4818.000	40.66	54.0	13.34	AV	317.00	150	Horizontal	Pass
4	7593.975	46.32	74.0	27.68	Peak	14.00	100	Horizontal	Pass
4**	7593.975	36.05	54.0	17.95	AV	14.00	100	Horizontal	Pass
5	12452.150	48.01	74.0	25.99	Peak	168.00	100	Horizontal	Pass
5**	12452.150	39.13	54.0	14.87	AV	168.00	100	Horizontal	Pass
6	16182.450	52.53	74.0	21.47	Peak	209.00	100	Horizontal	Pass
6**	16182.450	42.84	54.0	11.16	AV	209.00	100	Horizontal	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1000.300	44.83	74.0	29.17	Peak	0.00	200	Vertical	Pass
1**	1000.300	35.96	54.0	18.04	AV	0.00	200	Vertical	Pass
2	2479.200	96.70	--	--	Peak	157.00	200	Vertical	N/A
2**	2479.200	95.96	--	--	AV	157.00	200	Vertical	N/A
3	4943.000	48.92	74.0	25.08	Peak	37.00	150	Vertical	Pass
3**	4943.000	40.26	54.0	13.74	AV	37.00	150	Vertical	Pass
4	7551.425	45.87	74.0	28.13	Peak	118.00	300	Vertical	Pass
4**	7551.425	37.72	54.0	16.28	AV	118.00	300	Vertical	Pass
5	12607.400	48.53	74.0	25.47	Peak	118.00	150	Vertical	Pass
5**	12607.400	38.68	54.0	15.32	AV	118.00	150	Vertical	Pass
6	15792.113	51.95	74.0	22.05	Peak	211.00	100	Vertical	Pass
6**	15792.113	43.72	54.0	10.28	AV	211.00	100	Vertical	Pass

FPC Antenna

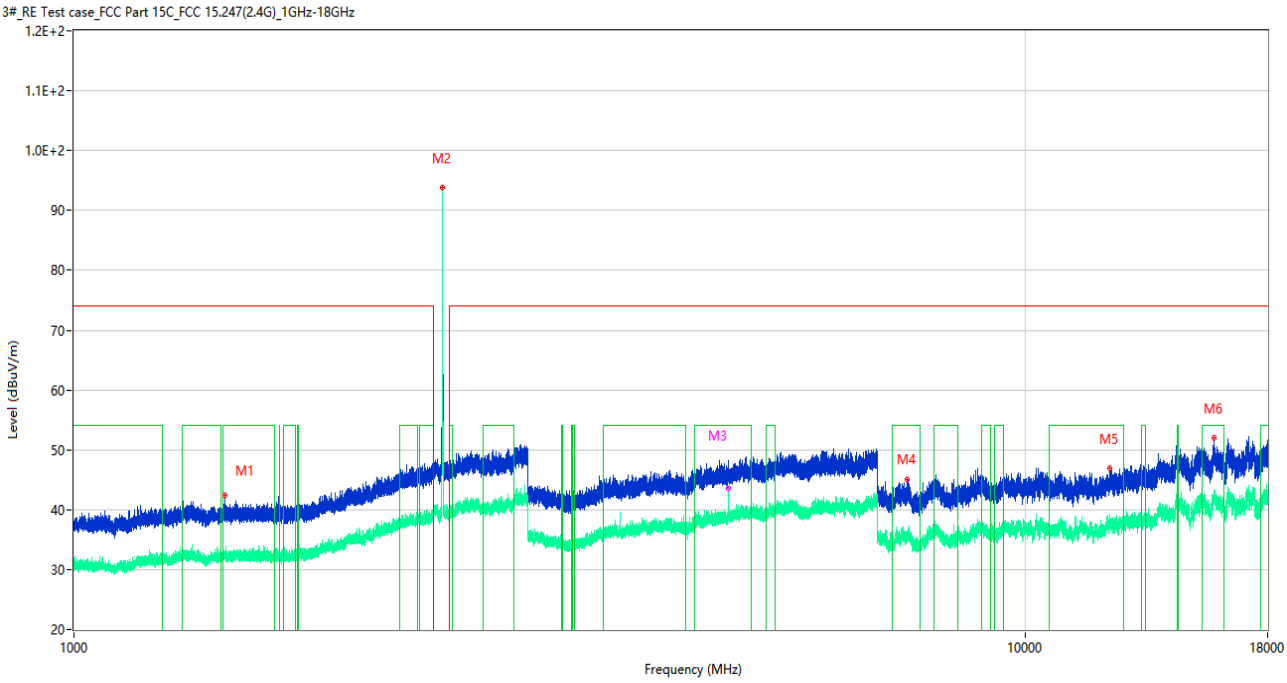
LOW CHANNEL 1 GHz to 18 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1526.300	41.59	74.0	32.41	Peak	165.00	150	Horizontal	Pass
1**	1526.300	32.28	54.0	21.72	AV	165.00	150	Horizontal	Pass
2	2403.200	93.47	--	--	Peak	343.00	200	Horizontal	N/A
2**	2403.200	93.09	--	--	AV	343.00	200	Horizontal	N/A
3	4806.600	48.66	74.0	25.34	Peak	182.00	150	Horizontal	Pass
3**	4806.600	44.40	54.0	9.60	AV	182.00	150	Horizontal	Pass
4	7430.100	45.43	74.0	28.57	Peak	277.00	100	Horizontal	Pass
4**	7430.100	36.47	54.0	17.53	AV	277.00	100	Horizontal	Pass
5	11325.725	46.85	74.0	27.15	Peak	119.00	150	Horizontal	Pass
5**	11325.725	36.93	54.0	17.07	AV	119.00	150	Horizontal	Pass
6	15804.975	50.94	74.0	23.06	Peak	248.00	400	Horizontal	Pass
6**	15804.975	42.92	54.0	11.08	AV	248.00	400	Horizontal	Pass

LOW CHANNEL 1 GHz to 18 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1327.600	43.98	74.0	30.02	Peak	117.00	400	Vertical	Pass
1**	1327.600	34.27	54.0	19.73	AV	117.00	400	Vertical	Pass
2	2403.200	86.47	--	--	Peak	213.00	200	Vertical	N/A
2**	2403.200	85.91	--	--	AV	213.00	200	Vertical	N/A
3	4957.800	48.55	74.0	25.45	Peak	249.00	150	Vertical	Pass
3**	4957.800	38.69	54.0	15.31	AV	249.00	150	Vertical	Pass
4	7512.325	44.96	74.0	29.04	Peak	360.00	300	Vertical	Pass
4**	7512.325	34.81	54.0	19.19	AV	360.00	300	Vertical	Pass
5	12300.925	47.02	74.0	26.98	Peak	344.00	150	Vertical	Pass
5**	12300.925	37.04	54.0	16.96	AV	344.00	150	Vertical	Pass
6	15808.912	50.42	74.0	23.58	Peak	152.00	150	Vertical	Pass
6**	15808.912	42.54	54.0	11.46	AV	152.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H

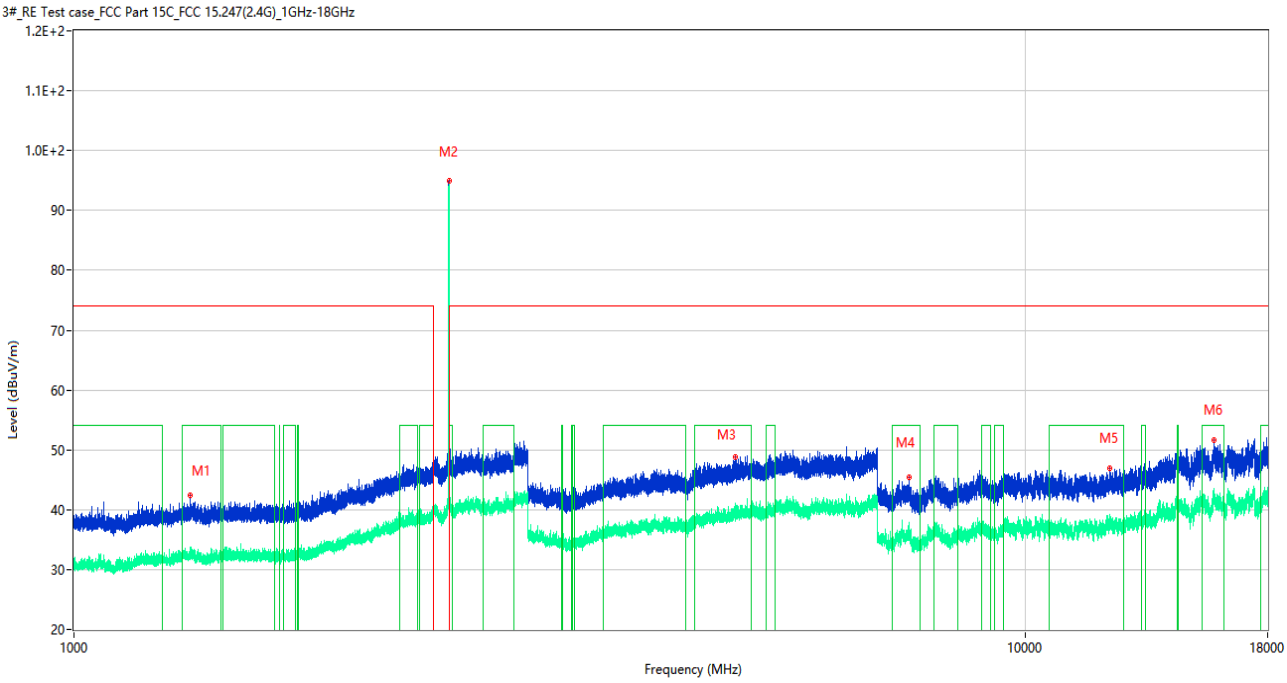


No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1442.900	42.42	74.0	31.58	Peak	115.00	100	Horizontal	Pass
1**	1442.900	32.12	54.0	21.88	AV	115.00	100	Horizontal	Pass
2	2440.800	93.78	--	--	Peak	349.00	100	Horizontal	N/A
2**	2440.800	92.59	--	--	AV	349.00	100	Horizontal	N/A
3	4881.800	47.68	74.0	26.32	Peak	306.00	150	Horizontal	Pass
3**	4881.800	43.59	54.0	10.41	AV	306.00	150	Horizontal	Pass
4	7519.513	45.00	74.0	29.00	Peak	31.00	100	Horizontal	Pass
4**	7519.513	35.14	54.0	18.86	AV	31.00	100	Horizontal	Pass
5	12273.613	46.87	74.0	27.13	Peak	344.00	150	Horizontal	Pass
5**	12273.613	37.35	54.0	16.65	AV	344.00	150	Horizontal	Pass
6	15801.300	51.99	74.0	22.01	Peak	0.00	300	Horizontal	Pass
6**	15801.300	42.49	54.0	11.51	AV	0.00	300	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V

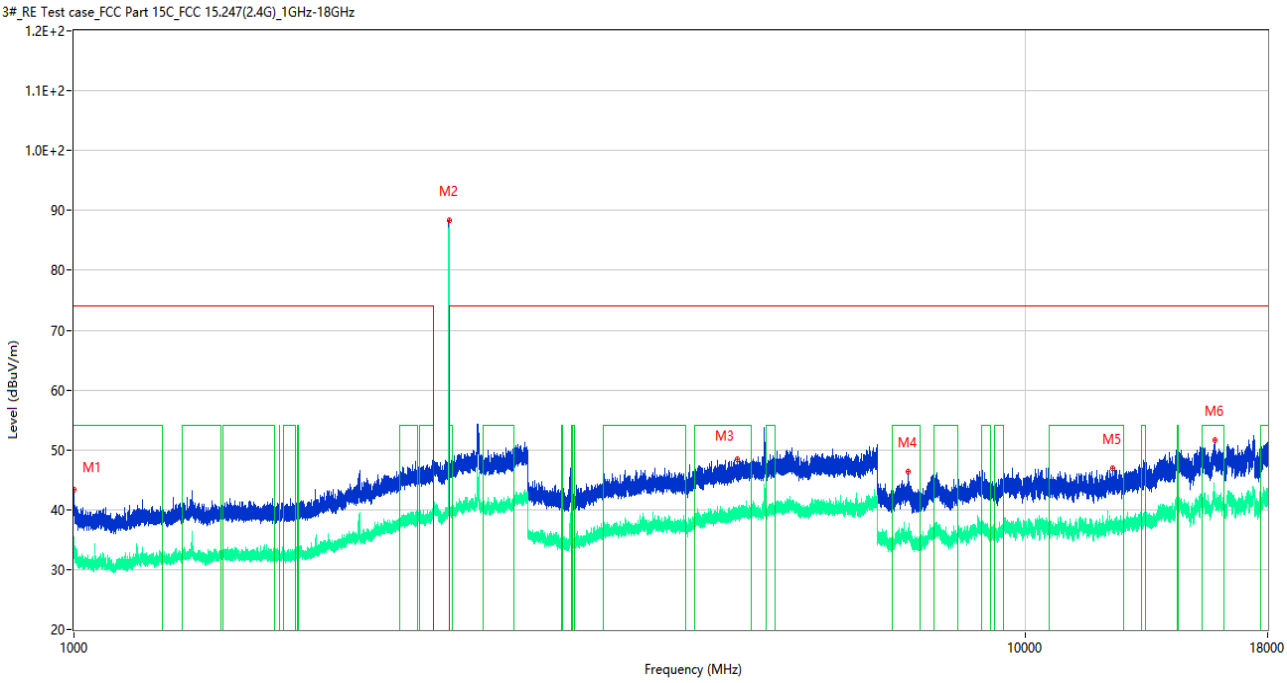
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.700	45.67	74.0	28.33	Peak	129.00	100	Vertical	Pass
1**	1331.700	36.69	54.0	17.31	AV	129.00	100	Vertical	Pass
2	2441.200	86.37	--	--	Peak	205.00	200	Vertical	N/A
2**	2441.200	85.95	--	--	AV	205.00	200	Vertical	N/A
3	4962.000	48.41	74.0	25.59	Peak	33.00	200	Vertical	Pass
3**	4962.000	39.81	54.0	14.19	AV	33.00	200	Vertical	Pass
4	7407.100	44.72	74.0	29.28	Peak	291.00	200	Vertical	Pass
4**	7407.100	35.45	54.0	18.55	AV	291.00	200	Vertical	Pass
5	10884.700	46.51	74.0	27.49	Peak	360.00	150	Vertical	Pass
5**	10884.700	37.52	54.0	16.48	AV	360.00	150	Vertical	Pass
6	15806.287	51.20	74.0	22.80	Peak	211.00	400	Vertical	Pass
6**	15806.287	42.26	54.0	11.74	AV	211.00	400	Vertical	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1326.400	42.35	74.0	31.65	Peak	41.00	200	Horizontal	Pass
1**	1326.400	32.19	54.0	21.81	AV	41.00	200	Horizontal	Pass
2	2479.200	94.93	--	--	Peak	284.00	150	Horizontal	N/A
2**	2479.200	94.56	--	--	AV	284.00	150	Horizontal	N/A
3	4957.200	48.78	74.0	25.22	Peak	50.00	100	Horizontal	Pass
3**	4957.200	40.62	54.0	13.38	AV	50.00	100	Horizontal	Pass
4	7557.750	45.42	74.0	28.58	Peak	360.00	100	Horizontal	Pass
4**	7557.750	35.59	54.0	18.41	AV	360.00	100	Horizontal	Pass
5	12287.988	47.01	74.0	26.99	Peak	239.00	100	Horizontal	Pass
5**	12287.988	37.60	54.0	16.40	AV	239.00	100	Horizontal	Pass
6	15817.050	51.71	74.0	22.29	Peak	229.00	100	Horizontal	Pass
6**	15817.050	41.62	54.0	12.38	AV	229.00	100	Horizontal	Pass

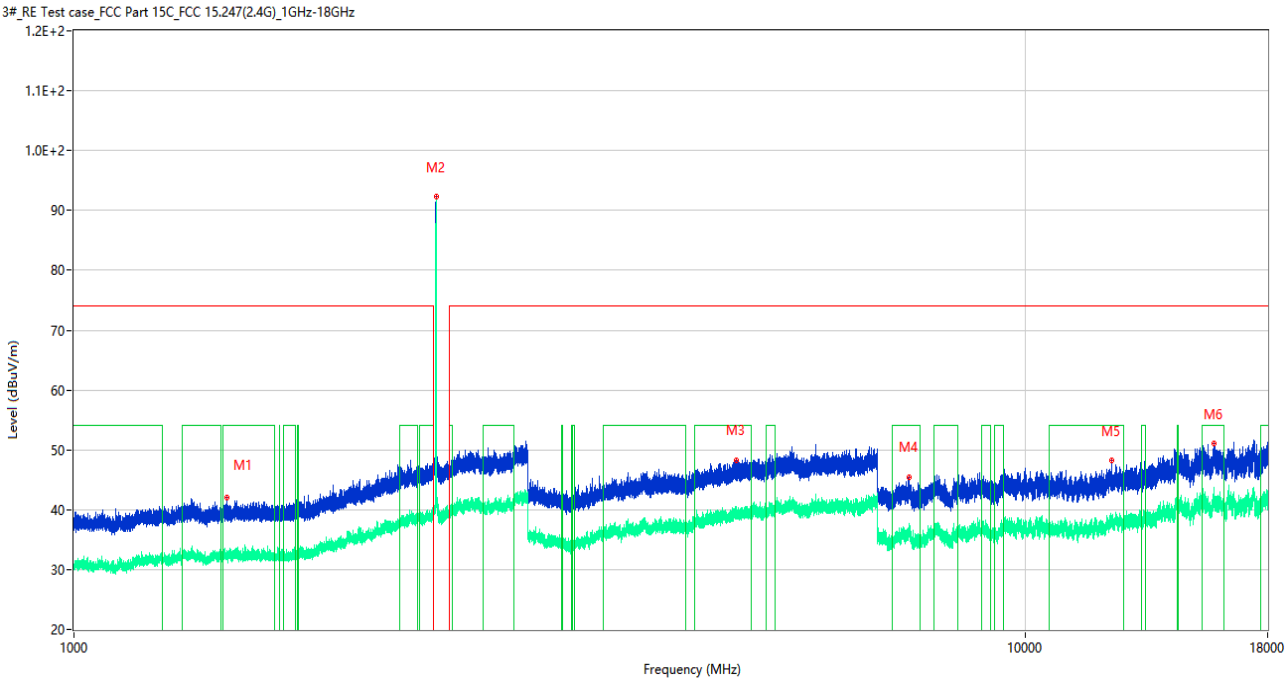
HIGH CHANNEL 1 GHz to 18 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1000.500	43.39	74.0	30.61	Peak	360.00	100	Vertical	Pass
1**	1000.500	33.03	54.0	20.97	AV	360.00	100	Vertical	Pass
2	2479.100	88.27	--	--	Peak	135.00	150	Vertical	N/A
2**	2479.100	87.68	--	--	AV	135.00	150	Vertical	N/A
3	4987.000	48.35	74.0	25.65	Peak	229.00	150	Vertical	Pass
3**	4987.000	39.50	54.0	14.50	AV	229.00	150	Vertical	Pass
4	7542.800	46.35	74.0	27.65	Peak	241.00	400	Vertical	Pass
4**	7542.800	36.54	54.0	17.46	AV	241.00	400	Vertical	Pass
5	12374.525	46.85	74.0	27.15	Peak	206.00	100	Vertical	Pass
5**	12374.525	36.65	54.0	17.35	AV	206.00	100	Vertical	Pass
6	15845.925	51.56	74.0	22.44	Peak	268.00	300	Vertical	Pass
6**	15845.925	42.12	54.0	11.88	AV	268.00	300	Vertical	Pass

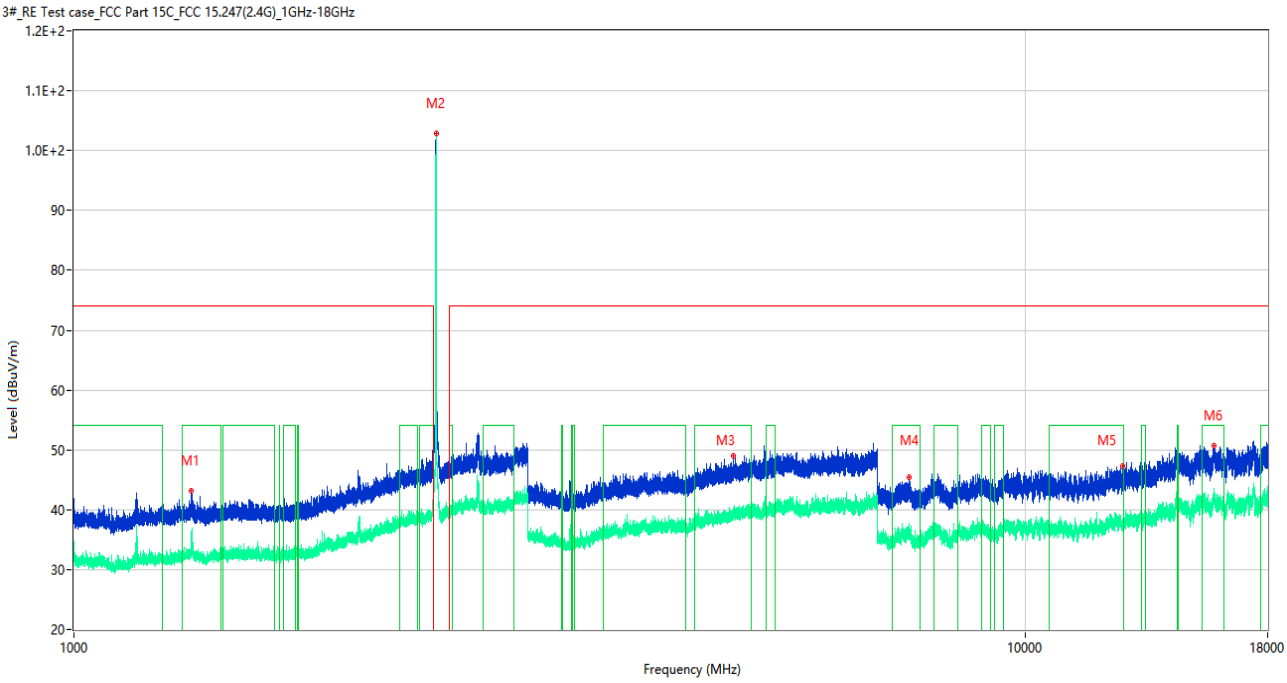
Fiberglass Omni-directional Antenna

LOW CHANNEL 1 GHz to 18 GHz, ANT H



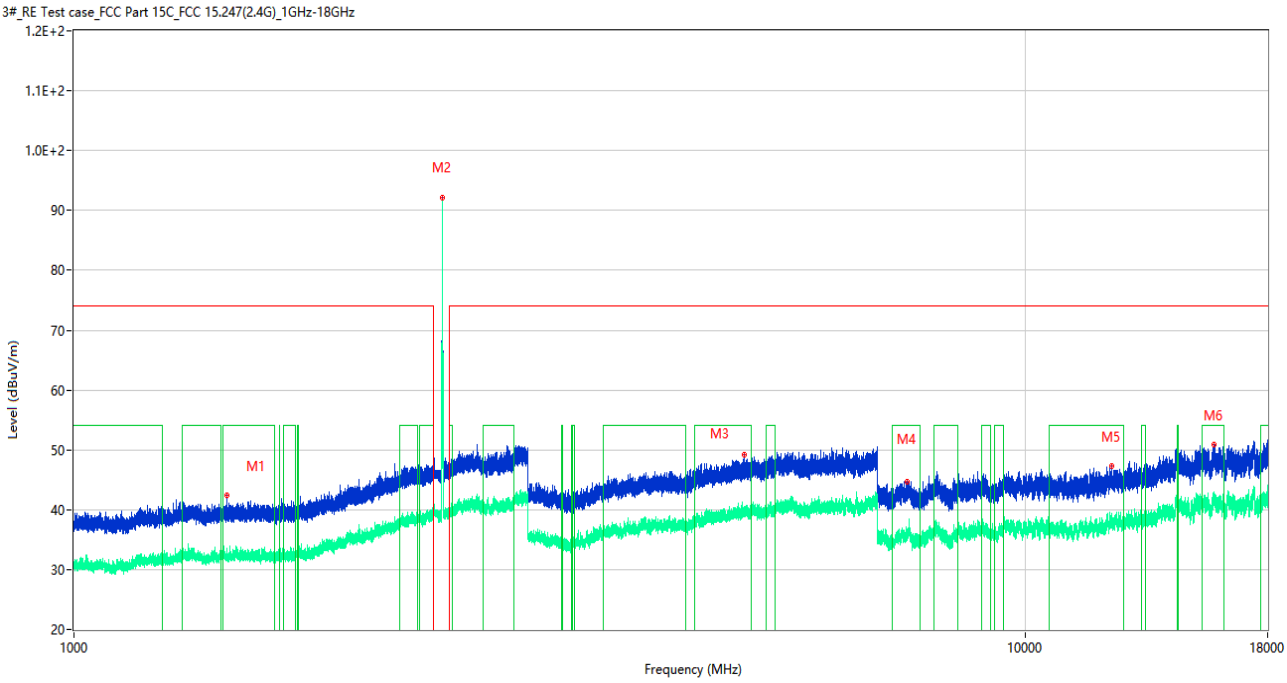
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1447.100	42.02	74.0	31.98	Peak	117.00	200	Horizontal	Pass
1**	1447.100	32.09	54.0	21.91	AV	117.00	200	Horizontal	Pass
2	2403.200	92.28	--	--	Peak	131.00	100	Horizontal	N/A
2**	2403.200	91.76	--	--	AV	131.00	100	Horizontal	N/A
3	4977.600	48.30	74.0	25.70	Peak	248.00	200	Horizontal	Pass
3**	4977.600	39.22	54.0	14.78	AV	248.00	200	Horizontal	Pass
4	7551.138	45.48	74.0	28.52	Peak	311.00	200	Horizontal	Pass
4**	7551.138	36.32	54.0	17.68	AV	311.00	200	Horizontal	Pass
5	12348.075	48.18	74.0	25.82	Peak	155.00	100	Horizontal	Pass
5**	12348.075	37.31	54.0	16.69	AV	155.00	100	Horizontal	Pass
6	15796.838	51.02	74.0	22.98	Peak	191.00	100	Horizontal	Pass
6**	15796.838	42.99	54.0	11.01	AV	191.00	100	Horizontal	Pass

LOW CHANNEL 1 GHz to 18 GHz, ANT V



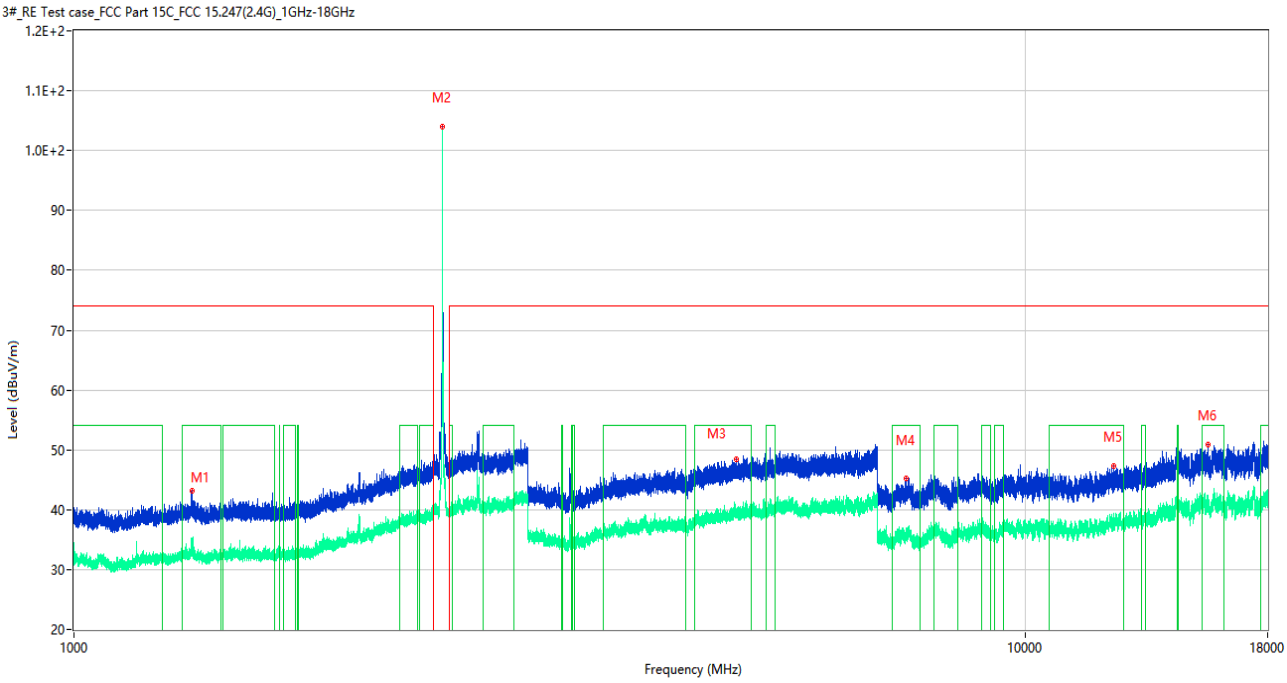
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1328.500	43.23	74.0	30.77	Peak	184.00	400	Vertical	Pass
1**	1328.500	34.78	54.0	19.22	AV	184.00	400	Vertical	Pass
2	2402.800	102.87	--	--	Peak	24.00	200	Vertical	N/A
2**	2402.800	101.42	--	--	AV	24.00	200	Vertical	N/A
3	4938.800	49.07	74.0	24.93	Peak	136.00	100	Vertical	Pass
3**	4938.800	38.78	54.0	15.22	AV	136.00	100	Vertical	Pass
4	7550.275	45.45	74.0	28.55	Peak	241.00	200	Vertical	Pass
4**	7550.275	36.61	54.0	17.39	AV	241.00	200	Vertical	Pass
5	12656.850	47.32	74.0	26.68	Peak	329.00	150	Vertical	Pass
5**	12656.850	38.00	54.0	16.00	AV	329.00	150	Vertical	Pass
6	15802.087	50.75	74.0	23.25	Peak	74.00	100	Vertical	Pass
6**	15802.087	42.55	54.0	11.45	AV	74.00	100	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H



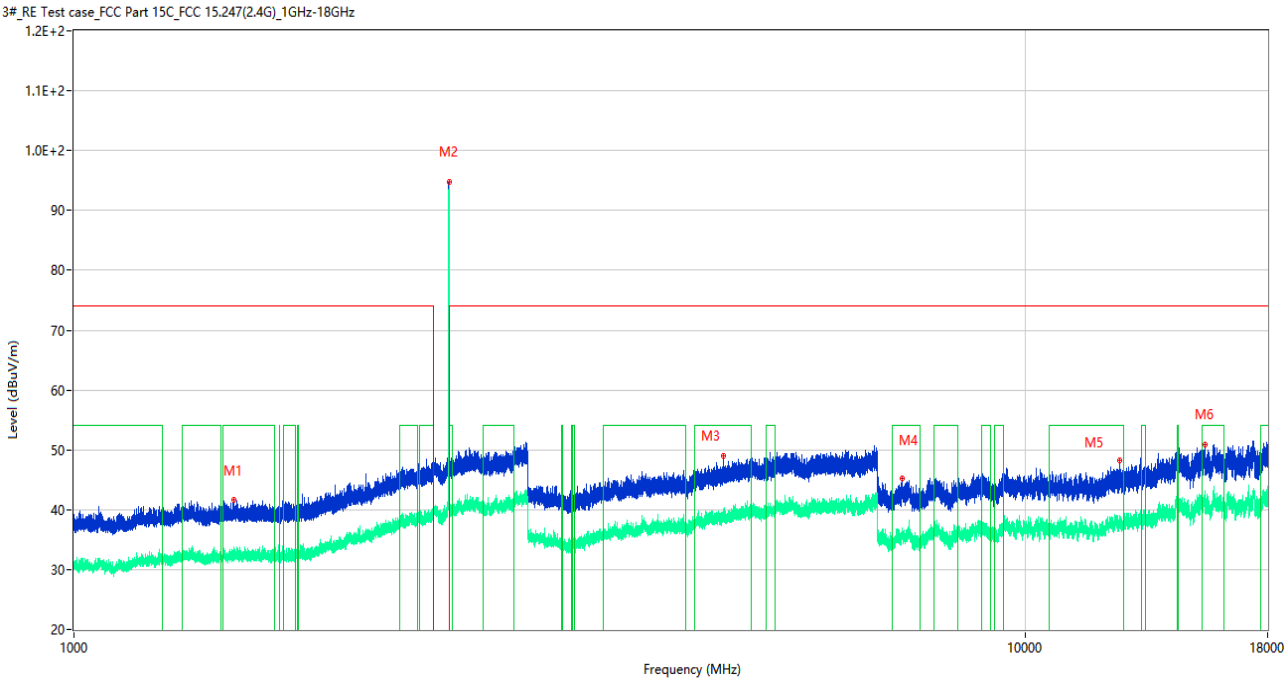
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1447.700	42.46	74.0	31.54	Peak	169.00	100	Horizontal	Pass
1**	1447.700	32.28	54.0	21.72	AV	169.00	100	Horizontal	Pass
2	2441.300	92.19	--	--	Peak	125.00	100	Horizontal	N/A
2**	2441.300	91.66	--	--	AV	125.00	100	Horizontal	N/A
3	5074.800	49.15	74.0	24.85	Peak	167.00	150	Horizontal	Pass
3**	5074.800	39.18	54.0	14.82	AV	167.00	150	Horizontal	Pass
4	7528.138	44.71	74.0	29.29	Peak	311.00	200	Horizontal	Pass
4**	7528.138	36.74	54.0	17.26	AV	311.00	200	Horizontal	Pass
5	12344.912	47.21	74.0	26.79	Peak	346.00	200	Horizontal	Pass
5**	12344.912	37.85	54.0	16.15	AV	346.00	200	Horizontal	Pass
6	15789.225	50.85	74.0	23.15	Peak	152.00	100	Horizontal	Pass
6**	15789.225	41.35	54.0	12.65	AV	152.00	100	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V



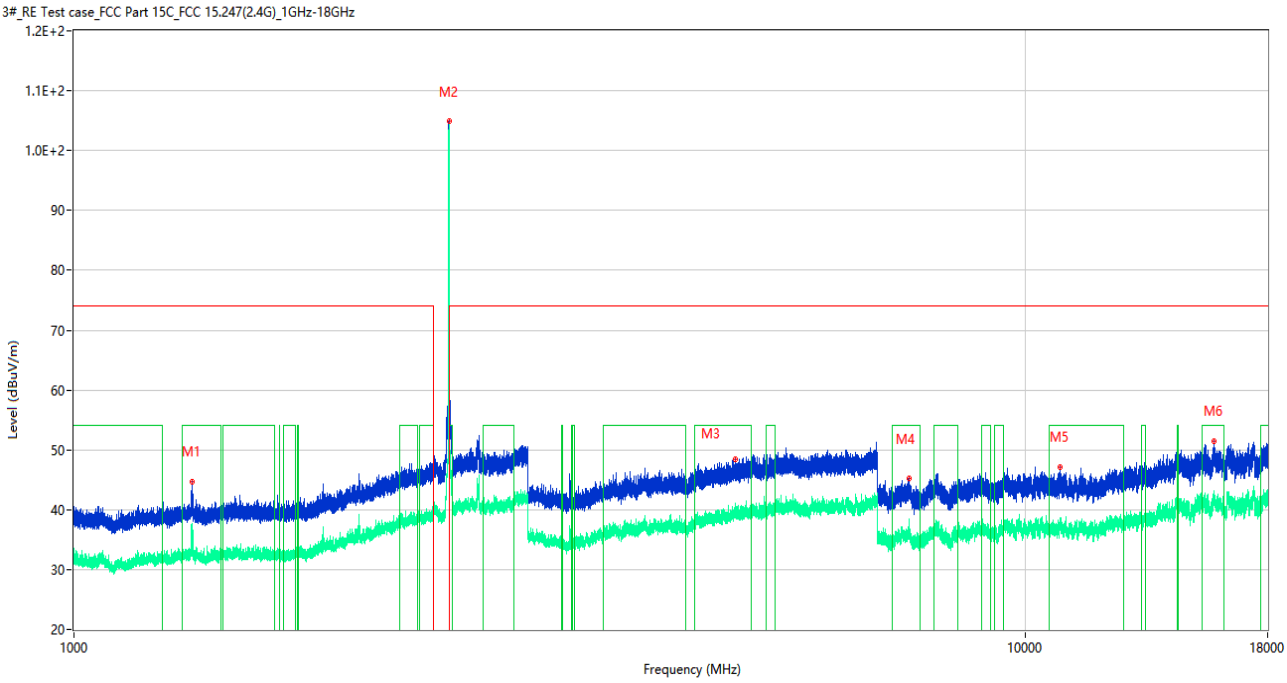
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.200	43.17	74.0	30.83	Peak	150.00	400	Vertical	Pass
1**	1330.200	35.16	54.0	18.84	AV	150.00	400	Vertical	Pass
2	2441.200	103.95	--	--	Peak	88.00	150	Vertical	N/A
2**	2441.200	103.61	--	--	AV	88.00	150	Vertical	N/A
3	4975.200	48.49	74.0	25.51	Peak	317.00	150	Vertical	Pass
3**	4975.200	39.40	54.0	14.60	AV	317.00	150	Vertical	Pass
4	7494.788	45.20	74.0	28.80	Peak	48.00	300	Vertical	Pass
4**	7494.788	36.04	54.0	17.96	AV	48.00	300	Vertical	Pass
5	12386.025	47.26	74.0	26.74	Peak	346.00	100	Vertical	Pass
5**	12386.025	37.30	54.0	16.70	AV	346.00	100	Vertical	Pass
6	15575.550	50.80	74.0	23.20	Peak	131.00	100	Vertical	Pass
6**	15575.550	42.00	54.0	12.00	AV	131.00	100	Vertical	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1471.300	41.61	74.0	32.39	Peak	61.00	400	Horizontal	Pass
1**	1471.300	31.96	54.0	22.04	AV	61.00	400	Horizontal	Pass
2	2479.200	94.83	--	--	Peak	92.00	200	Horizontal	N/A
2**	2479.200	93.88	--	--	AV	92.00	200	Horizontal	N/A
3	4817.600	49.05	74.0	24.95	Peak	98.00	100	Horizontal	Pass
3**	4817.600	38.30	54.0	15.70	AV	98.00	100	Horizontal	Pass
4	7428.663	45.20	74.0	28.80	Peak	32.00	300	Horizontal	Pass
4**	7428.663	35.82	54.0	18.18	AV	32.00	300	Horizontal	Pass
5	12591.875	48.33	74.0	25.67	Peak	225.00	150	Horizontal	Pass
5**	12591.875	37.77	54.0	16.23	AV	225.00	150	Horizontal	Pass
6	15456.638	50.97	74.0	23.03	Peak	307.00	400	Horizontal	Pass
6**	15456.638	41.79	54.0	12.21	AV	307.00	400	Horizontal	Pass

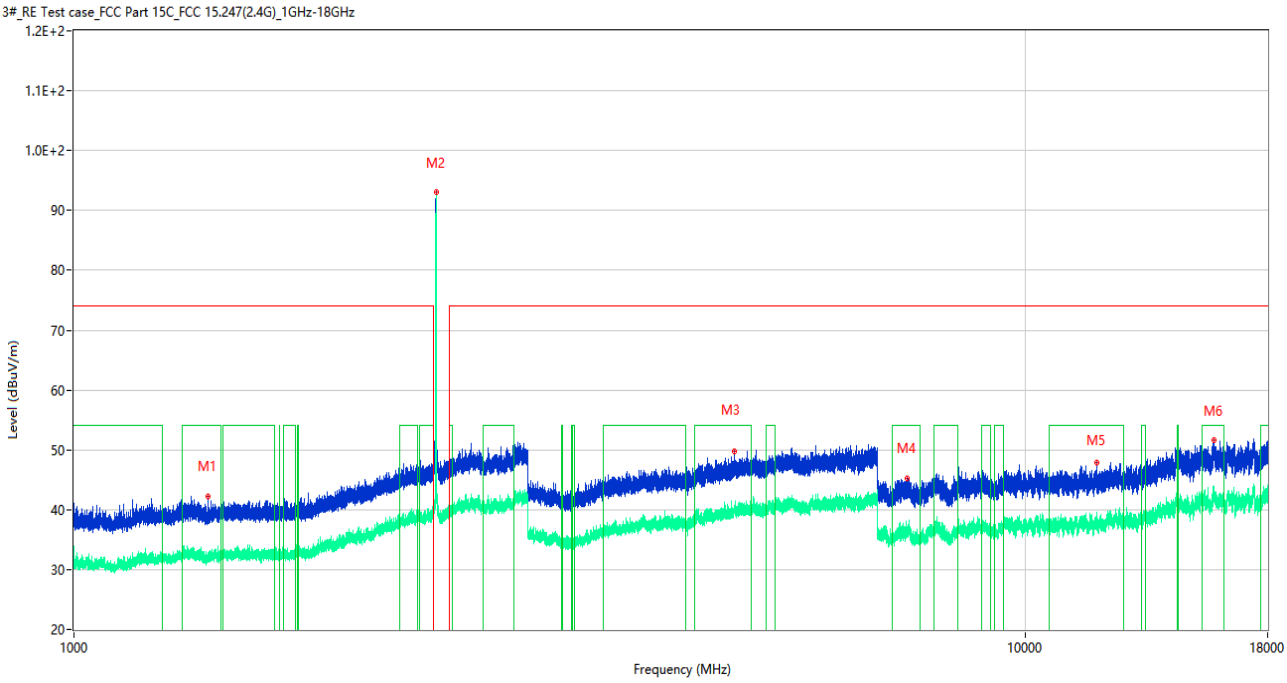
HIGH CHANNEL 1 GHz to 18 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.200	44.71	74.0	29.29	Peak	150.00	100	Vertical	Pass
1**	1331.200	32.50	54.0	21.50	AV	150.00	100	Vertical	Pass
2	2479.200	104.87	--	--	Peak	88.00	200	Vertical	N/A
2**	2479.200	104.23	--	--	AV	88.00	200	Vertical	N/A
3	4954.600	48.41	74.0	25.59	Peak	275.00	200	Vertical	Pass
3**	4954.600	39.38	54.0	14.62	AV	275.00	200	Vertical	Pass
4	7558.612	45.22	74.0	28.78	Peak	13.00	400	Vertical	Pass
4**	7558.612	35.59	54.0	18.41	AV	13.00	400	Vertical	Pass
5	10888.150	47.15	74.0	26.85	Peak	99.00	150	Vertical	Pass
5**	10888.150	37.37	54.0	16.63	AV	99.00	150	Vertical	Pass
6	15803.400	51.54	74.0	22.46	Peak	0.00	400	Vertical	Pass
6**	15803.400	42.06	54.0	11.94	AV	0.00	400	Vertical	Pass

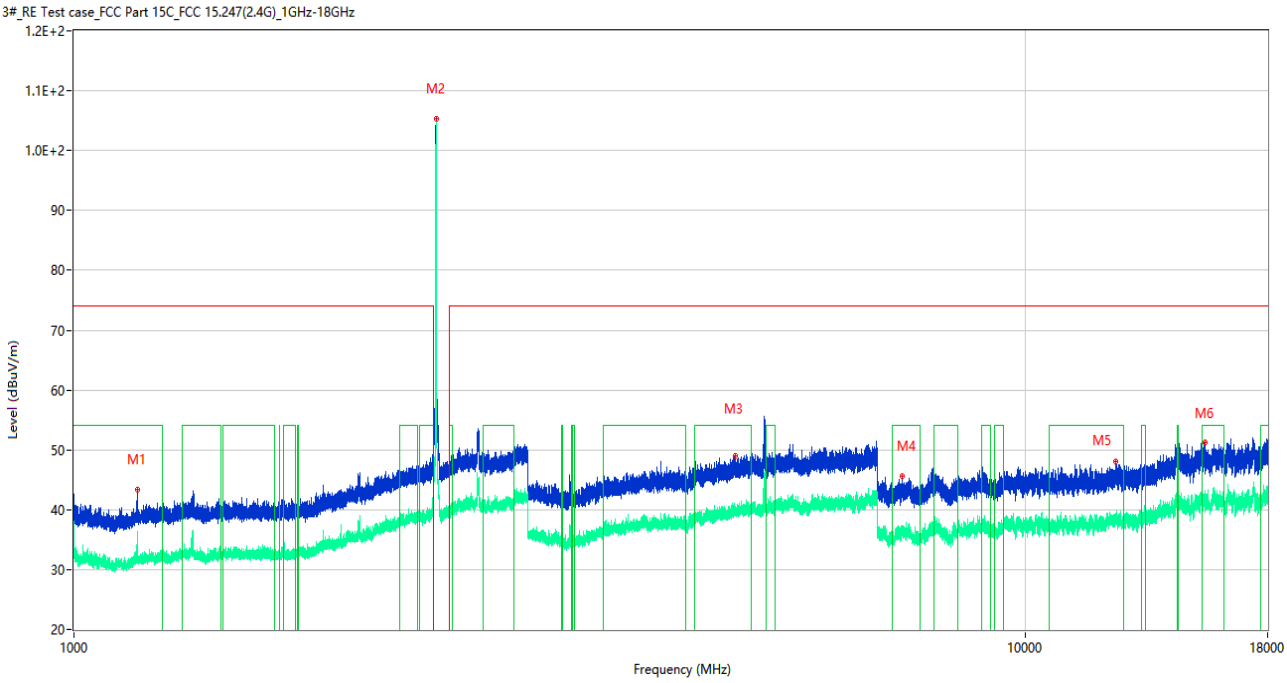
Dipole Antenna

LOW CHANNEL 1 GHz to 18 GHz, ANT H



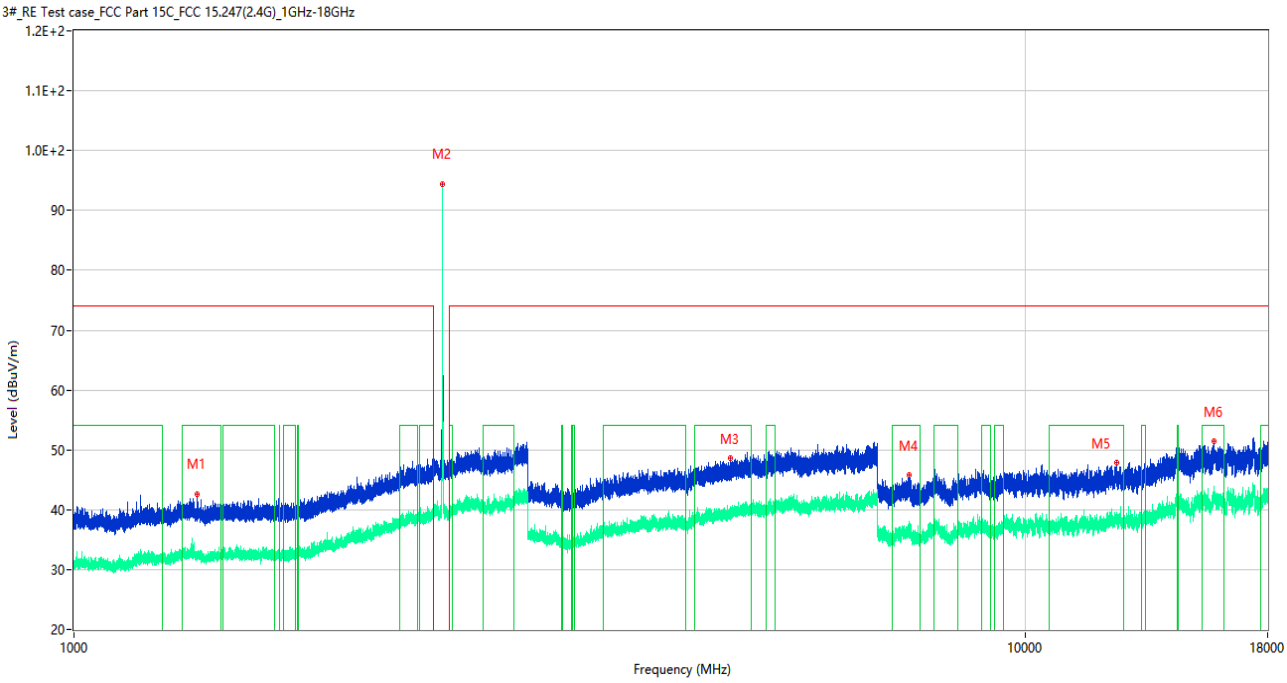
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1384.400	42.28	74.0	31.72	Peak	196.00	200	Horizontal	Pass
1**	1384.400	32.13	54.0	21.87	AV	196.00	200	Horizontal	Pass
2	2403.200	93.04	--	--	Peak	239.00	100	Horizontal	N/A
2**	2403.200	92.28	--	--	AV	239.00	100	Horizontal	N/A
3	4948.200	49.82	74.0	24.18	Peak	110.00	100	Horizontal	Pass
3**	4948.200	40.21	54.0	13.79	AV	110.00	100	Horizontal	Pass
4	7517.788	45.28	74.0	28.72	Peak	189.00	100	Horizontal	Pass
4**	7517.788	35.67	54.0	18.33	AV	189.00	100	Horizontal	Pass
5	11888.650	47.96	74.0	26.04	Peak	189.00	150	Horizontal	Pass
5**	11888.650	38.06	54.0	15.94	AV	189.00	150	Horizontal	Pass
6	15795.000	51.55	74.0	22.45	Peak	132.00	200	Horizontal	Pass
6**	15795.000	42.84	54.0	11.16	AV	132.00	200	Horizontal	Pass

LOW CHANNEL 1 GHz to 18 GHz, ANT V



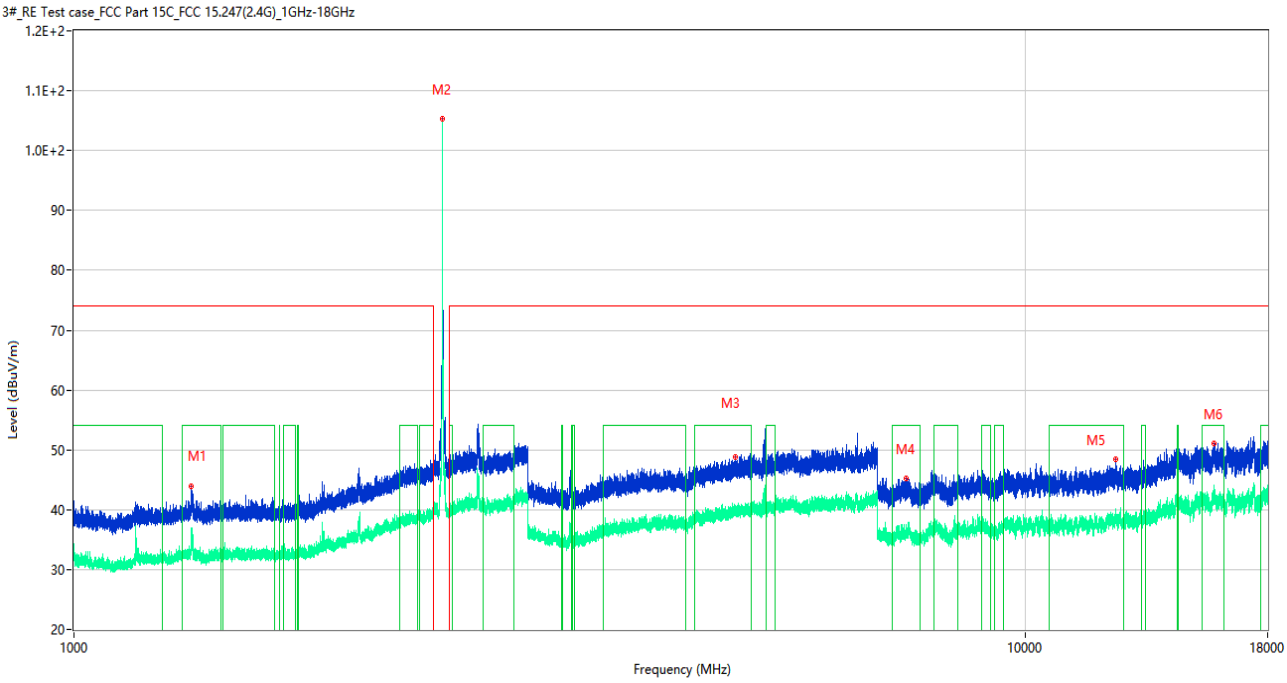
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1165.900	43.39	74.0	30.61	Peak	18.00	100	Vertical	Pass
1**	1165.900	32.01	54.0	21.99	AV	18.00	100	Vertical	Pass
2	2402.800	105.34	--	--	Peak	94.00	150	Vertical	N/A
2**	2402.800	104.06	--	--	AV	94.00	150	Vertical	N/A
3	4955.800	48.99	74.0	25.01	Peak	32.00	150	Vertical	Pass
3**	4955.800	39.37	54.0	14.63	AV	32.00	150	Vertical	Pass
4	7421.763	45.52	74.0	28.48	Peak	122.00	200	Vertical	Pass
4**	7421.763	37.23	54.0	16.77	AV	122.00	200	Vertical	Pass
5	12464.513	47.97	74.0	26.03	Peak	105.00	200	Vertical	Pass
5**	12464.513	38.58	54.0	15.42	AV	105.00	200	Vertical	Pass
6	15459.262	51.22	74.0	22.78	Peak	94.00	100	Vertical	Pass
6**	15459.262	41.61	54.0	12.39	AV	94.00	100	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H



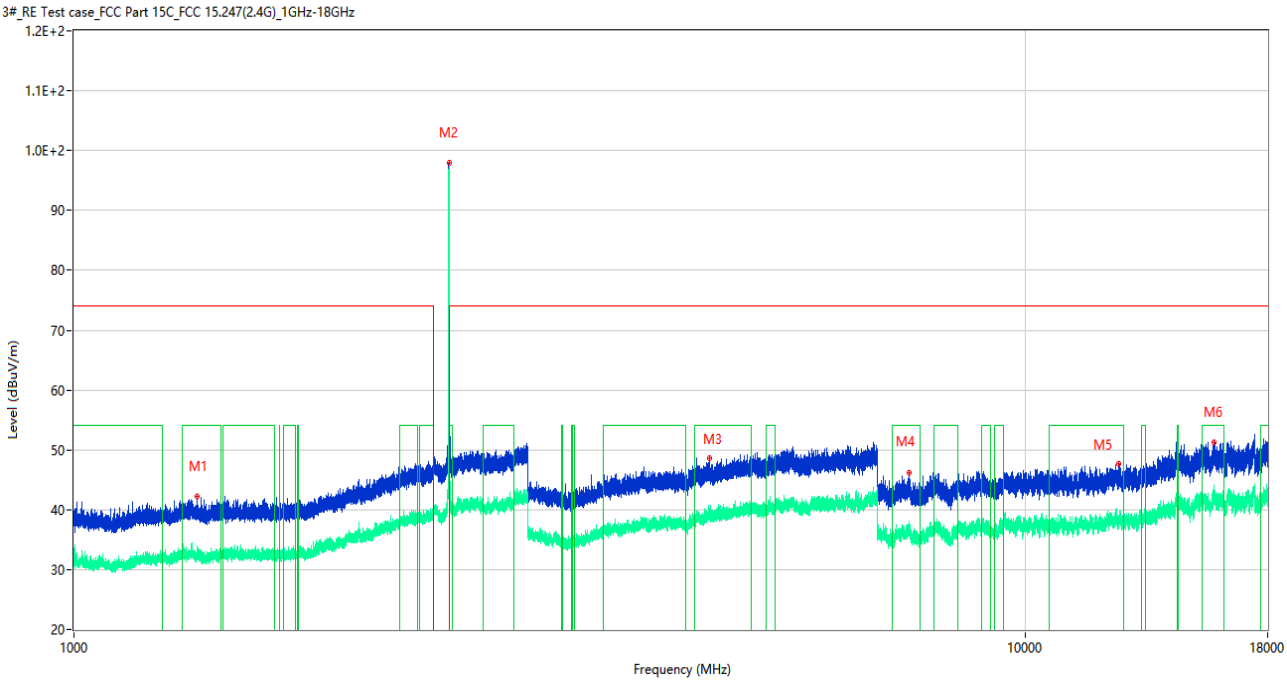
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1348.900	42.61	74.0	31.39	Peak	187.00	200	Horizontal	Pass
1**	1348.900	32.59	54.0	21.41	AV	187.00	200	Horizontal	Pass
2	2440.800	94.39	--	--	Peak	219.00	200	Horizontal	N/A
2**	2440.800	93.63	--	--	AV	219.00	200	Horizontal	N/A
3	4903.600	48.62	74.0	25.38	Peak	33.00	100	Horizontal	Pass
3**	4903.600	39.19	54.0	14.81	AV	33.00	100	Horizontal	Pass
4	7553.725	45.74	74.0	28.26	Peak	52.00	100	Horizontal	Pass
4**	7553.725	36.83	54.0	17.17	AV	52.00	100	Horizontal	Pass
5	12481.475	47.87	74.0	26.13	Peak	259.00	100	Horizontal	Pass
5**	12481.475	39.56	54.0	14.44	AV	259.00	100	Horizontal	Pass
6	15817.838	51.38	74.0	22.62	Peak	326.00	400	Horizontal	Pass
6**	15817.838	43.03	54.0	10.97	AV	326.00	400	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V



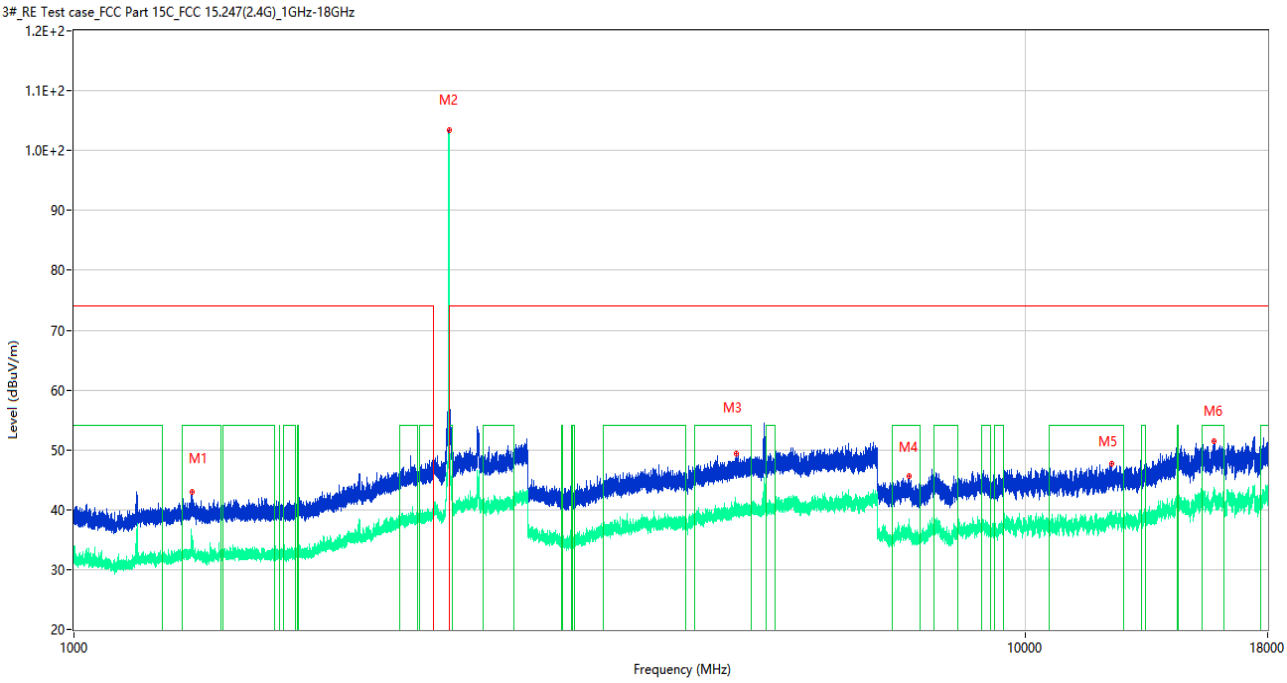
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1328.300	43.97	74.0	30.03	Peak	68.00	400	Vertical	Pass
1**	1328.300	34.16	54.0	19.84	AV	68.00	400	Vertical	Pass
2	2440.800	105.28	--	--	Peak	98.00	150	Vertical	N/A
2**	2440.800	103.90	--	--	AV	98.00	150	Vertical	N/A
3	4961.000	48.75	74.0	25.25	Peak	180.00	150	Vertical	Pass
3**	4961.000	39.12	54.0	14.88	AV	180.00	150	Vertical	Pass
4	7505.713	45.19	74.0	28.81	Peak	35.00	300	Vertical	Pass
4**	7505.713	35.90	54.0	18.10	AV	35.00	300	Vertical	Pass
5	12445.825	48.47	74.0	25.53	Peak	156.00	200	Vertical	Pass
5**	12445.825	38.68	54.0	15.32	AV	156.00	200	Vertical	Pass
6	15804.713	51.06	74.0	22.94	Peak	73.00	100	Vertical	Pass
6**	15804.713	43.84	54.0	10.16	AV	73.00	100	Vertical	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1347.100	42.23	74.0	31.77	Peak	183.00	300	Horizontal	Pass
1**	1347.100	31.88	54.0	22.12	AV	183.00	300	Horizontal	Pass
2	2479.200	98.02	--	--	Peak	213.00	200	Horizontal	N/A
2**	2479.200	97.54	--	--	AV	213.00	200	Horizontal	N/A
3	4655.000	48.69	74.0	25.31	Peak	271.00	100	Horizontal	Pass
3**	4655.000	38.72	54.0	15.28	AV	271.00	100	Horizontal	Pass
4	7548.550	46.21	74.0	27.79	Peak	69.00	300	Horizontal	Pass
4**	7548.550	37.53	54.0	16.47	AV	69.00	300	Horizontal	Pass
5	12564.275	47.61	74.0	26.39	Peak	173.00	100	Horizontal	Pass
5**	12564.275	38.10	54.0	15.90	AV	173.00	100	Horizontal	Pass
6	15800.776	51.29	74.0	22.71	Peak	17.00	100	Horizontal	Pass
6**	15800.776	42.86	54.0	11.14	AV	17.00	100	Horizontal	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.900	43.02	74.0	30.98	Peak	127.00	200	Vertical	Pass
1**	1331.900	33.28	54.0	20.72	AV	127.00	200	Vertical	Pass
2	2479.200	103.46	--	--	Peak	332.00	100	Vertical	N/A
2**	2479.200	102.82	--	--	AV	332.00	100	Vertical	N/A
3	4978.200	49.45	74.0	24.55	Peak	292.00	200	Vertical	Pass
3**	4978.200	39.74	54.0	14.26	AV	292.00	200	Vertical	Pass
4	7554.013	45.60	74.0	28.40	Peak	18.00	400	Vertical	Pass
4**	7554.013	36.64	54.0	17.36	AV	18.00	400	Vertical	Pass
5	12326.225	47.69	74.0	26.31	Peak	242.00	100	Vertical	Pass
5**	12326.225	38.17	54.0	15.83	AV	242.00	100	Vertical	Pass
6	15806.026	51.49	74.0	22.51	Peak	131.00	300	Vertical	Pass
6**	15806.026	43.53	54.0	10.47	AV	131.00	300	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 C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

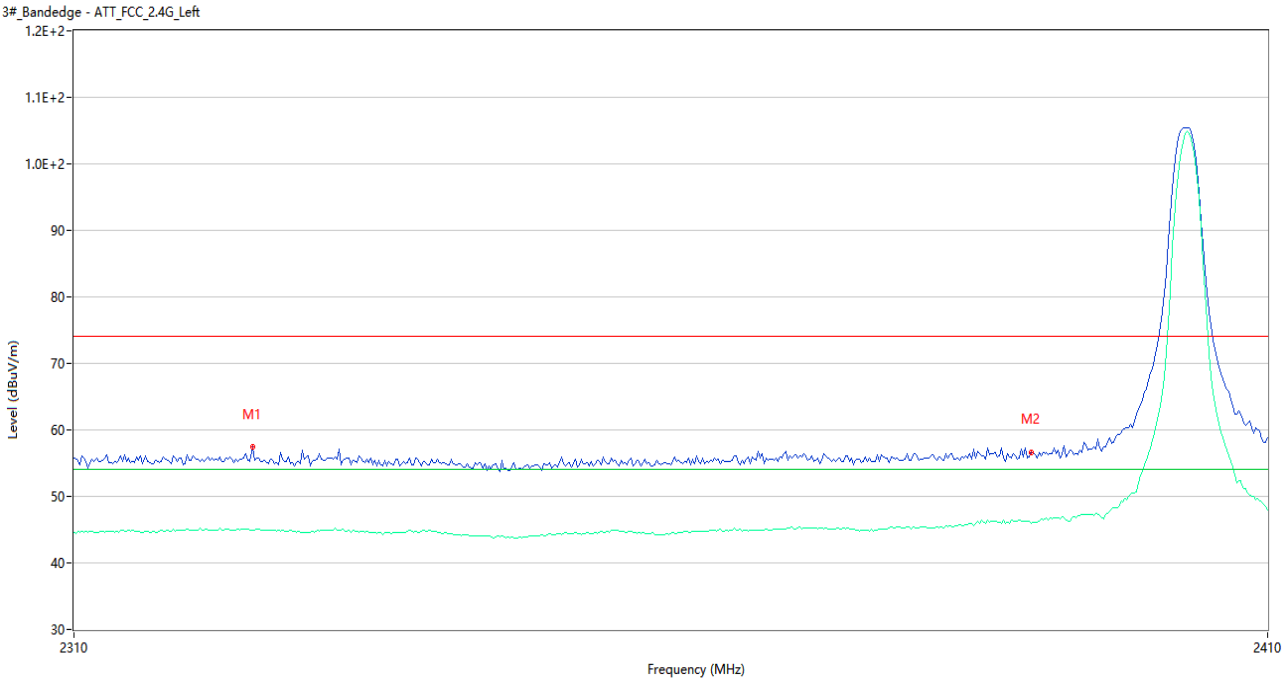
Note [4]: The Level (dBuV/m) has been corrected by factor.

Note [5]: Both horizontal and vertical directions were pre tested, only the worst configuration has been reported in this report.

Test Data and Plots

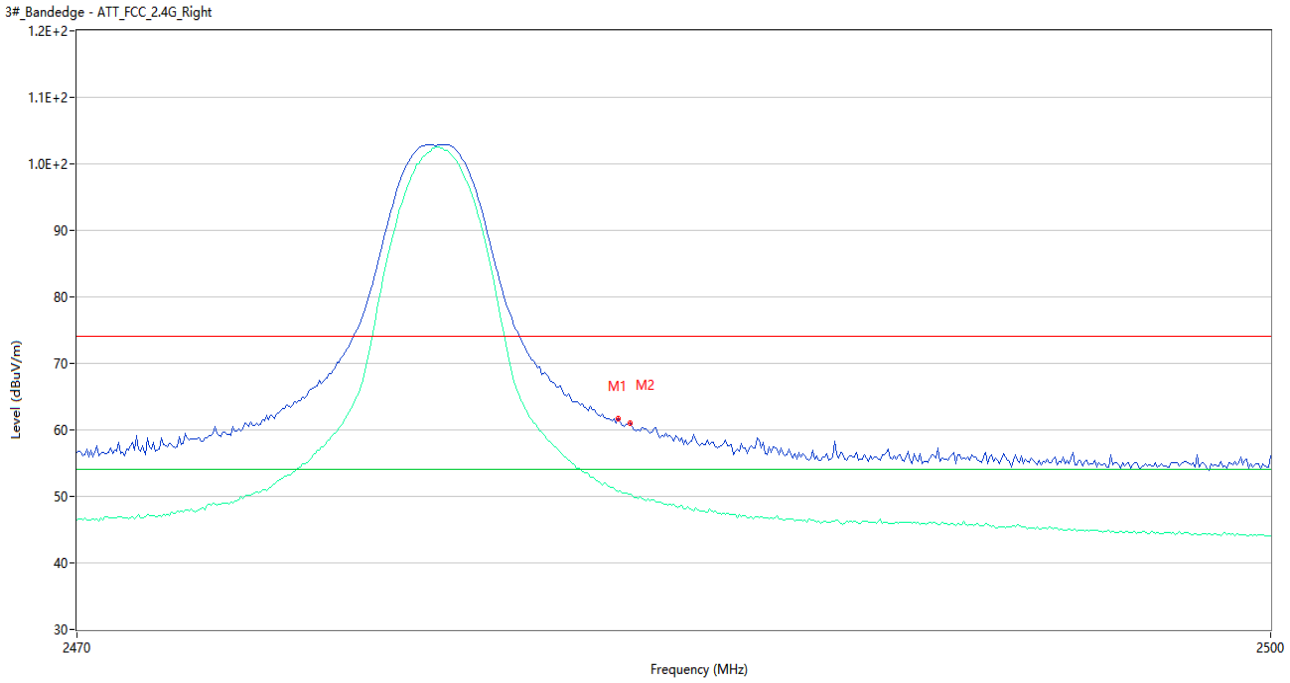
Helical Antenna

LOW CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2324.667	57.39	74.0	16.61	Peak	123.00	150	Horizontal	Pass
1**	2324.667	44.95	54.0	9.05	AV	123.00	150	Horizontal	Pass
2	2389.833	56.63	74.0	17.37	Peak	262.00	150	Horizontal	Pass
2**	2389.833	45.92	54.0	8.08	AV	262.00	150	Horizontal	Pass

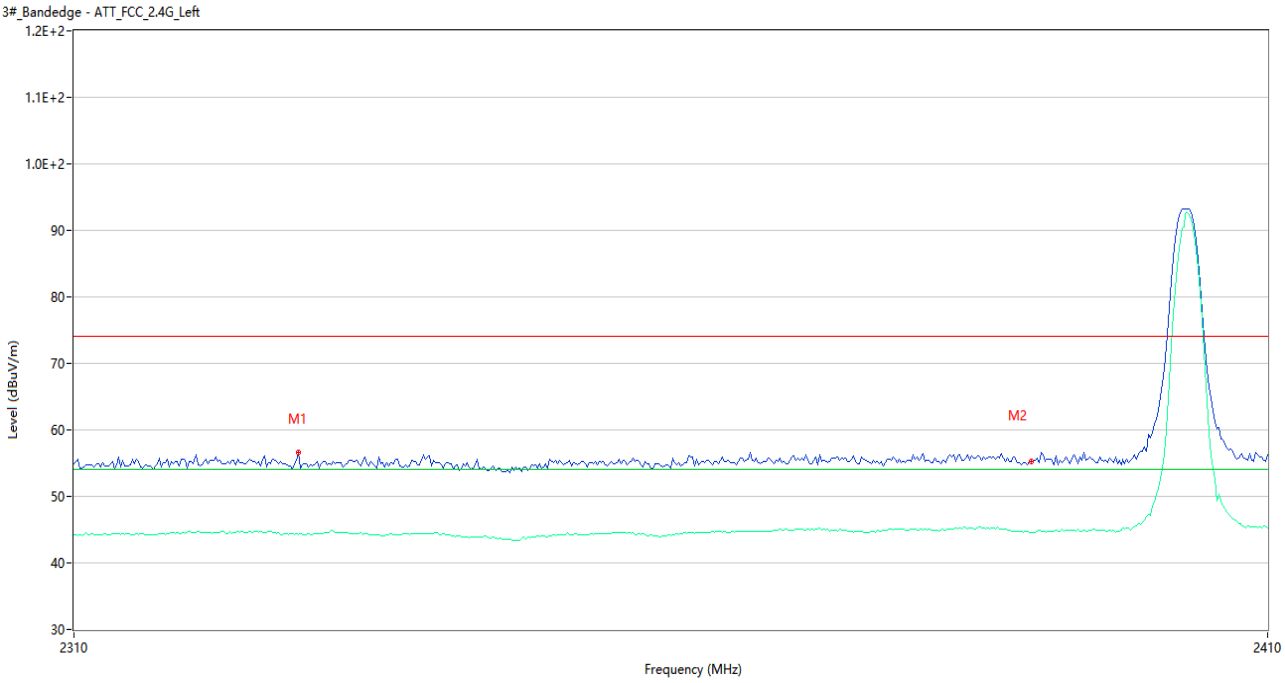
HIGH CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.550	62.12	74.0	11.88	Peak	90.00	100	Horizontal	Pass
1**	2483.550	50.93	54.0	3.07	AV	90.00	100	Horizontal	Pass
2	2483.850	61.37	74.0	12.63	Peak	95.00	100	Horizontal	Pass
2**	2483.850	50.75	54.0	3.25	AV	95.00	100	Horizontal	Pass

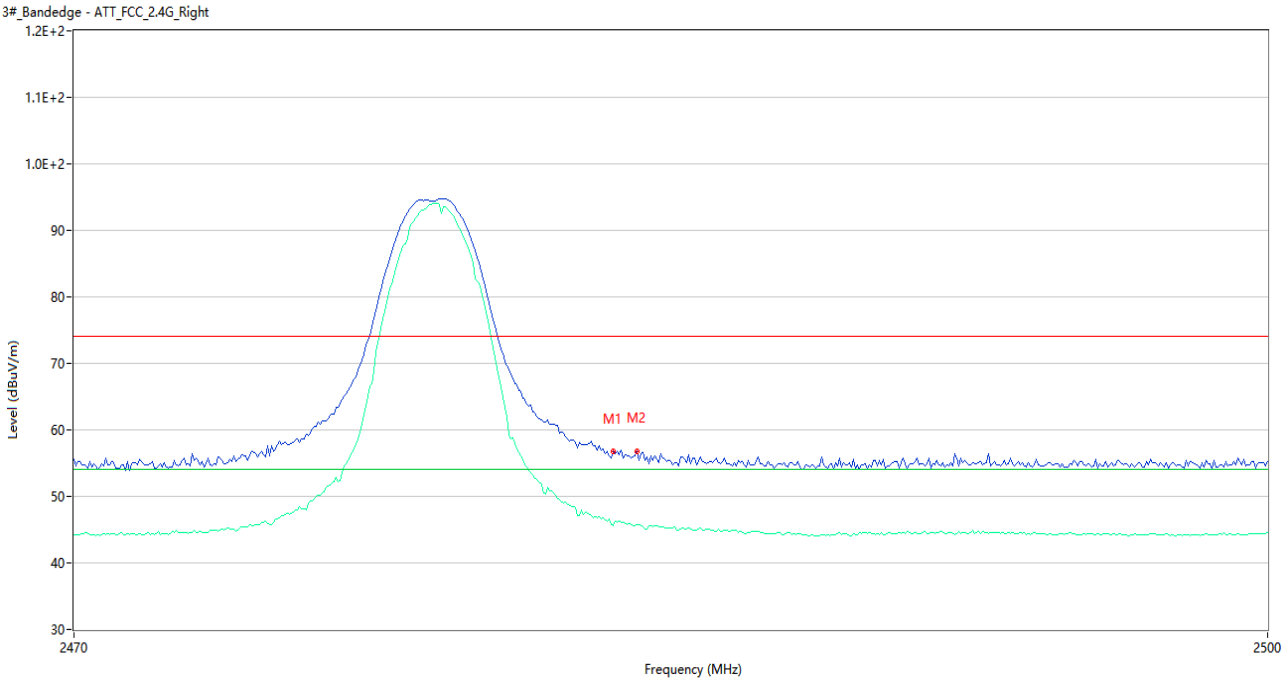
FPC Antenna

LOW CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2328.500	56.66	74.0	17.34	Peak	290.00	100	Horizontal	Pass
1**	2328.500	44.27	54.0	9.73	AV	290.00	100	Horizontal	Pass
2	2389.833	55.25	74.0	18.75	Peak	164.00	100	Horizontal	Pass
2**	2389.833	44.65	54.0	9.35	AV	164.00	100	Horizontal	Pass

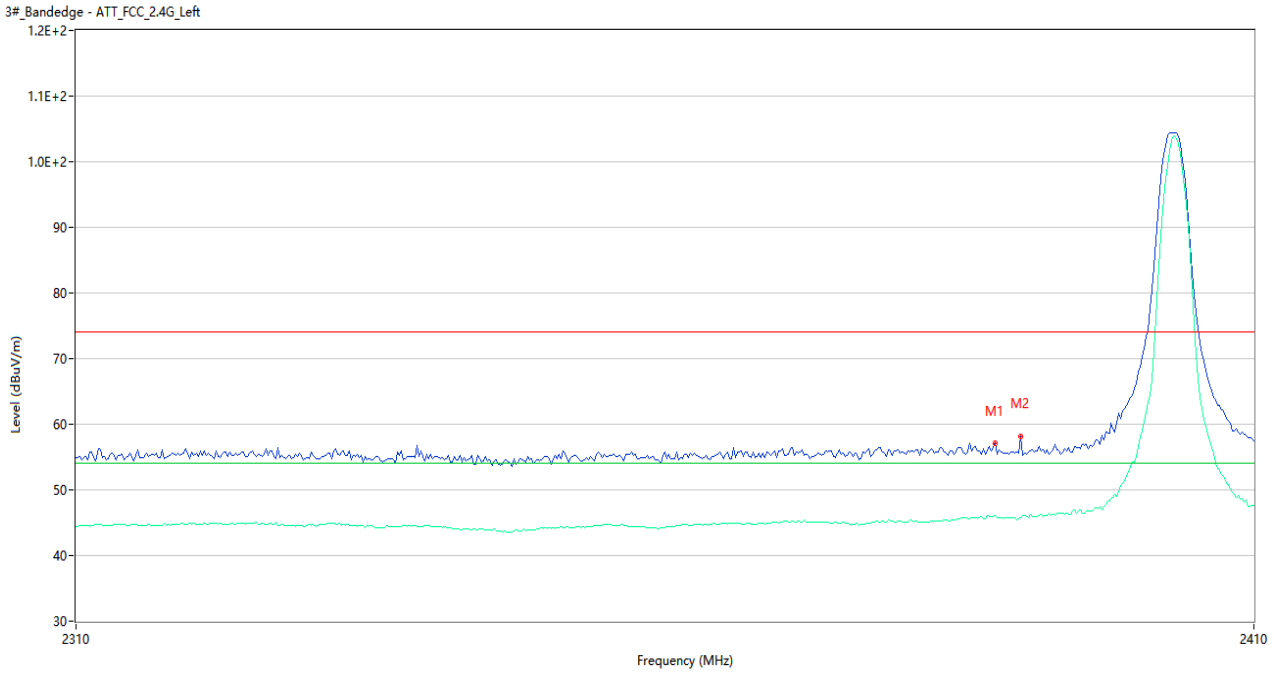
HIGH CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	56.74	74.0	17.26	Peak	213.00	200	Horizontal	Pass
1**	2483.500	45.62	54.0	8.38	AV	213.00	200	Horizontal	Pass
2	2484.100	56.86	74.0	17.14	Peak	303.00	150	Horizontal	Pass
2**	2484.100	45.79	54.0	8.21	AV	303.00	150	Horizontal	Pass

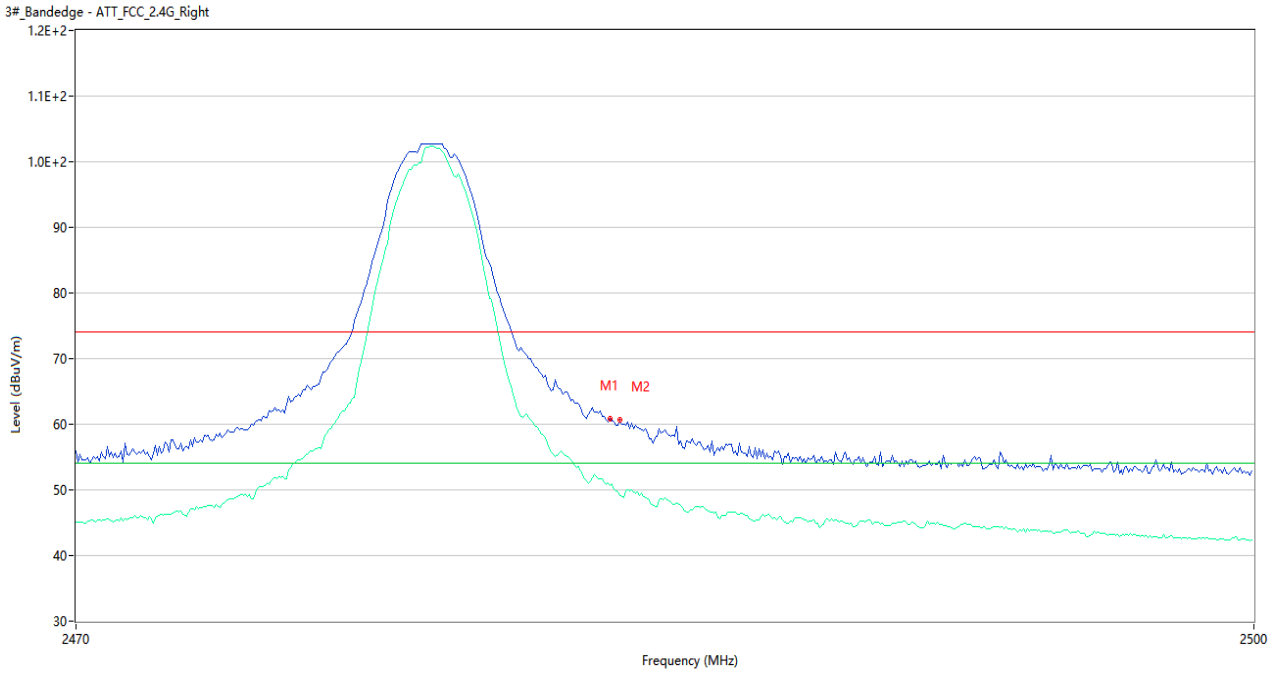
Fiberglass Omni-directional Antenna

LOW CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2387.667	57.11	74.0	16.89	Peak	178.00	200	Vertical	Pass
1**	2387.667	46.08	54.0	7.92	AV	178.00	200	Vertical	Pass
2	2389.833	58.18	74.0	15.82	Peak	340.00	100	Vertical	Pass
2**	2389.833	45.81	54.0	8.19	AV	340.00	100	Vertical	Pass

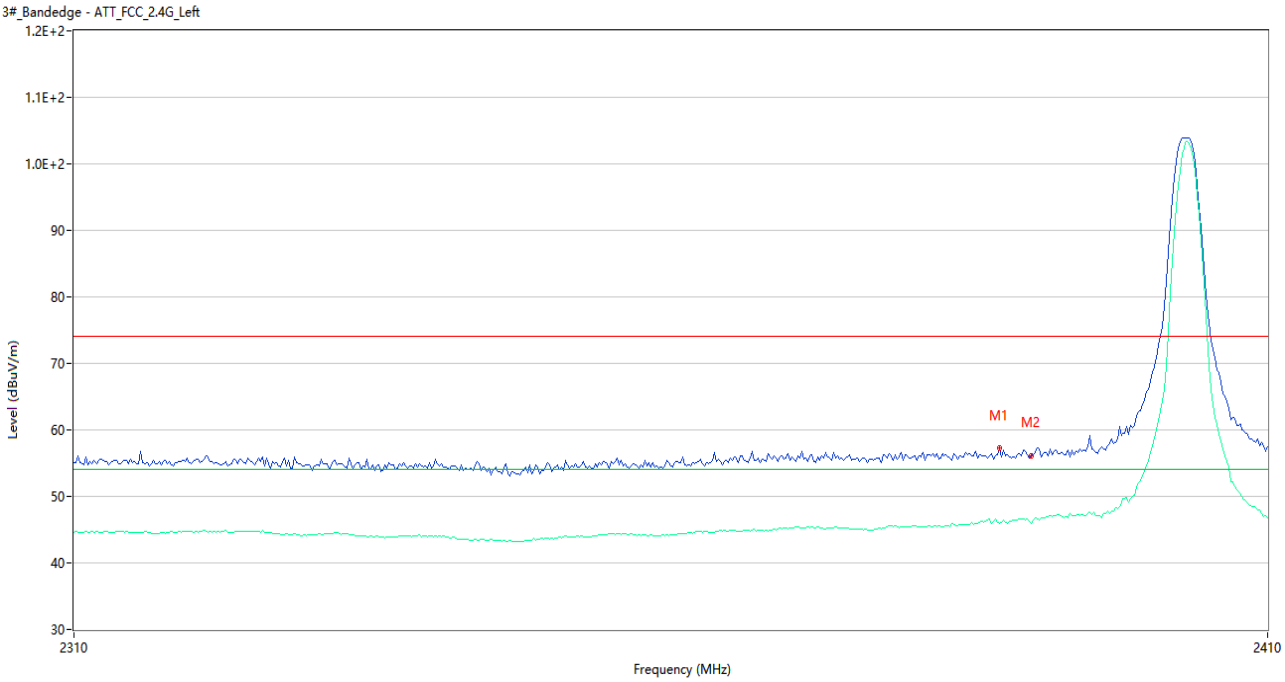
HIGH CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.550	62.93	74.0	11.07	Peak	348.00	150	Horizontal	Pass
1**	2483.550	50.73	54.0	3.27	AV	348.00	150	Horizontal	Pass
2	2483.800	62.61	74.0	11.39	Peak	337.00	200	Horizontal	Pass
2**	2483.800	39.08	54.0	4.92	AV	337.00	200	Horizontal	Pass

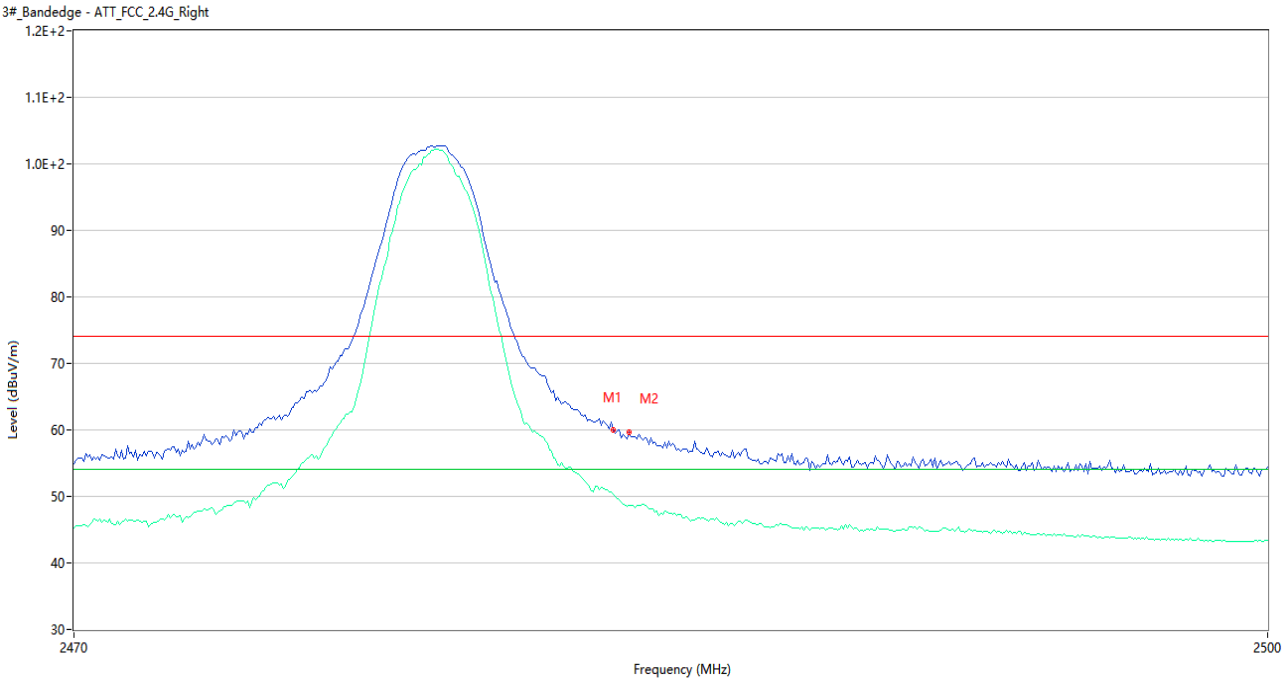
Dipole Antenna

LOW CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2387.167	57.27	74.0	16.73	Peak	62.00	100	Vertical	Pass
1**	2387.167	45.95	54.0	8.05	AV	62.00	100	Vertical	Pass
2	2389.833	56.12	74.0	17.88	Peak	106.00	200	Vertical	Pass
2**	2389.833	46.01	54.0	7.99	AV	106.00	200	Vertical	Pass

HIGH CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	60.09	74.0	13.91	Peak	97.00	200	Vertical	Pass
1**	2483.500	50.38	54.0	3.62	AV	97.00	200	Vertical	Pass
2	2483.900	59.71	74.0	14.29	Peak	338.00	150	Vertical	Pass
2**	2483.900	49.70	54.0	4.30	AV	338.00	150	Vertical	Pass

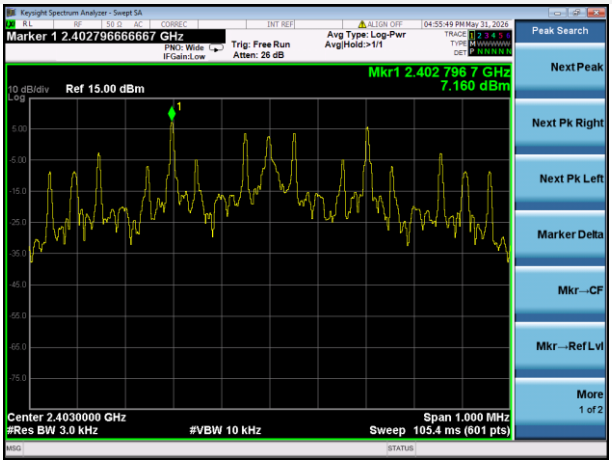
A.8 Power Spectral Density (PSD)

Test Data

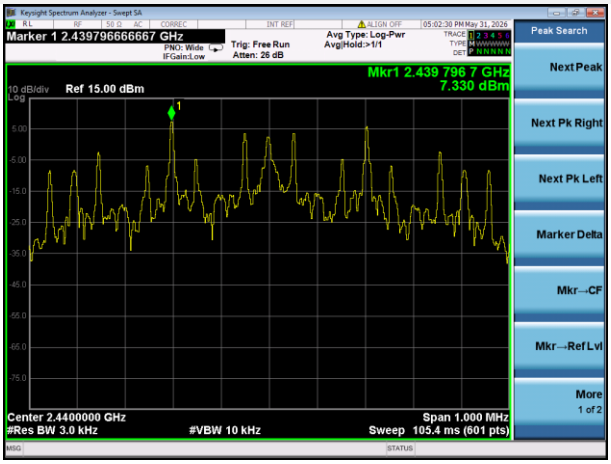
Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
Low Channel	7.16	8	Pass
Middle Channel	7.33	8	Pass
High Channel	7.51	8	Pass

Test Plots

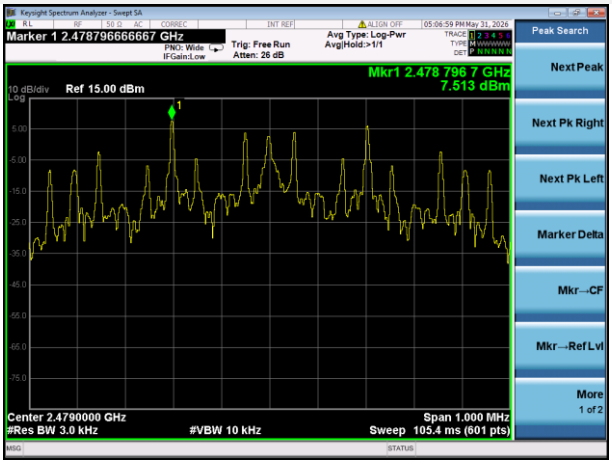
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



ANNEX B TEST SETUP PHOTOS

Please refer the document “Ti-EE26050398-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “Ti-EE26050398-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “Ti-EE26050398-AI.PDF”.

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