

TEST REPORT

Applicant: Bang & Olufsen a/s
Address: Bang og Olufsen Alle 1, 7600 Struer, Denmark
Equipment Type: Wireless Audio Transmitter
Model Name: Beoconnect Core
Brand Name: Bang & Olufsen
FCC ID: TTUBCCORE
Test Standard: 47 CFR Part 15 Subpart F
(refer to section 3.1)
Sample Arrival Date: Sep. 08, 2023
Test Date: Sep. 13, 2023 - Sep. 27, 2023
Date of Issue: Nov. 22, 2023

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Julie Zhu

Checked by: Ye Hongji

Approved by: Liao Jianming
(Technical Director)

Julie Zhu

Ye Hongji

Liao Jianming

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Nov. 15, 2023</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Nov. 22, 2023</u>	<u>Added the frequency of the maximum emission level observed f(M) in Section A.2.</u>

TABLE OF CONTENTS

1	GENERAL INFORMATION	4
1.1	Test Laboratory	4
1.2	Test Location.....	4
2	PRODUCT INFORMATION.....	5
2.1	Applicant Information.....	5
2.2	Manufacturer Information	5
2.3	General Description for Equipment under Test (EUT)	5
2.4	Technical Information	5
3	SUMMARY OF TEST RESULTS.....	6
3.1	Test Standards	6
3.2	Test Verdict	6
4	GENERAL TEST CONFIGURATIONS.....	7
4.1	Test Environments	7
4.2	Test Equipment List.....	7
4.3	Measurement Uncertainty	8
4.4	Description of Test Setup	8
5	TEST ITEMS.....	11
5.1	Antenna Requirements.....	11
5.2	Conducted Emission	12
5.3	UWB Bandwidth	13
5.4	Radiated Emissions.....	14
5.5	Radiated Emissions in GPS Bands	16
5.6	Peak Emissions within a 50MHz Bandwidth	17

ANNEX A	TEST RESULT	18
A.1	Conducted Emissions.....	18
A.2	UWB Bandwidth	22
A.3	Radiated Emissions.....	23
A.4	Radiated Emissions in GPS Bands	31
A.5	Peak Emissions within a 50MHz Bandwidth	35
ANNEX B	TEST SETUP PHOTOS	39
ANNEX C	EUT EXTERNAL PHOTOS	39
ANNEX D	EUT INTERNAL PHOTOS	39

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	Bang & Olufsen a/s
Address	Bang og Olufsen Alle 1, 7600 Struer, Denmark

2.2 Manufacturer Information

Manufacturer	Bang & Olufsen a/s
Address	Bang og Olufsen Alle 1, 7600 Struer, Denmark

2.3 General Description for Equipment under Test (EUT)

EUT Name	Wireless Audio Transmitter
Model Name Under Test	Beoconnect Core
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	UWB
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The requirement for the following technical information of the EUT was tested in this report:

Modulation Type	BPM-BPSK
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Operating Frequency	3100MHz - 10600MHz
Antenna Type	PCB Antenna
Antenna Gain	5.75 dBi

All channel was listed on the following table:

Channel Number	Frequency
CH5	6489.6MHz
CH9	7987.2MHz

Note: The above EUT information in section 2.3 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 F	Ultra - Wideband Operation
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
3	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3.2 Test Verdict

No.	Description	FCC Part No.	Test Result	Verdict	Remark
1	Antenna Requirement	15.203	--	Pass	Note
2	Conducted Emission	15.207	ANNEX A.1	Pass	--
3	UWB Bandwidth	15.517(b)	ANNEX A.2	Pass	--
4	Radiated Emissions	15.517(c)/15.209	ANNEX A.3	Pass	--
5	Radiated Emissions in GPS Bands	15.517(d)	ANNEX A.4	Pass	--
6	Peak Emissions within a 50 MHz Bandwidth	15.517(e)	ANNEX A.5	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	54% to 55%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+ 23.9°C to +25.9°C
Working Voltage of the EUT	NV (Normal Voltage)	120 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2022.12.28	2023.12.27
Spectrum Analyzer	KEYSIGHT	N9020A	MY52510065	2023.09.05	2024.09.04
Signaling Unit	ROHDE&SCHWARZ	CMW500	171150	2023.06.19	2024.06.18
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	01631	2022.02.03	2025.02.02
Test Antenna-Horn	A-INFO	LB-180400KF	J211060273	2021.07.02	2024.07.01
Anechoic Chamber	RAINFORD	9m*6m*6m	144	2022.02.19	2024.09.03
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2023.09.05	2024.09.04
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	00883	2022.04.01	2025.03.31
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	130	2021.08.15	2024.08.14
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2023.09.05	2024.09.04
LISN	SCHWARZBECK	NSLK 8127	8127-687	2023.05.16	2024.05.15
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	112	2022.02.19	2025.02.18

4.3 Measurement Uncertainty

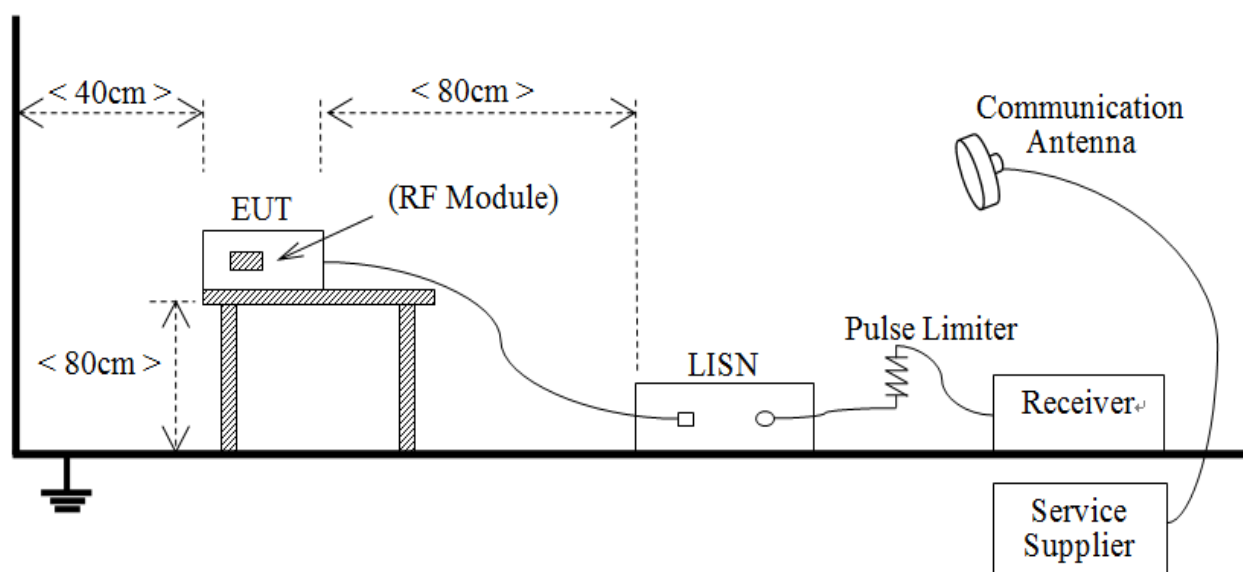
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

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%

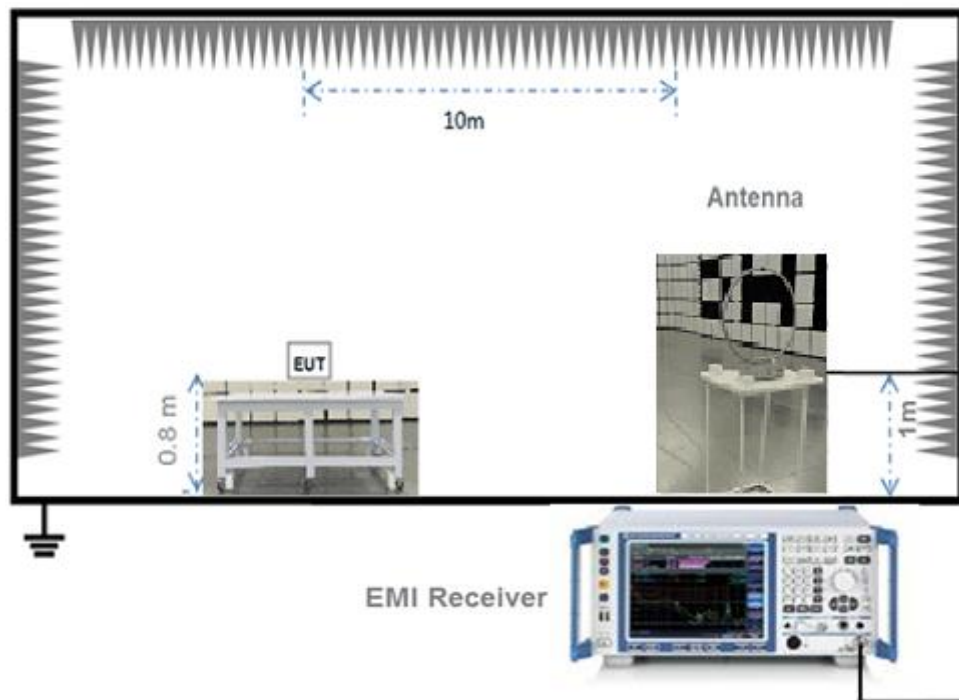
4.4 Description of Test Setup

4.4.1 For AC Power Supply Port Test



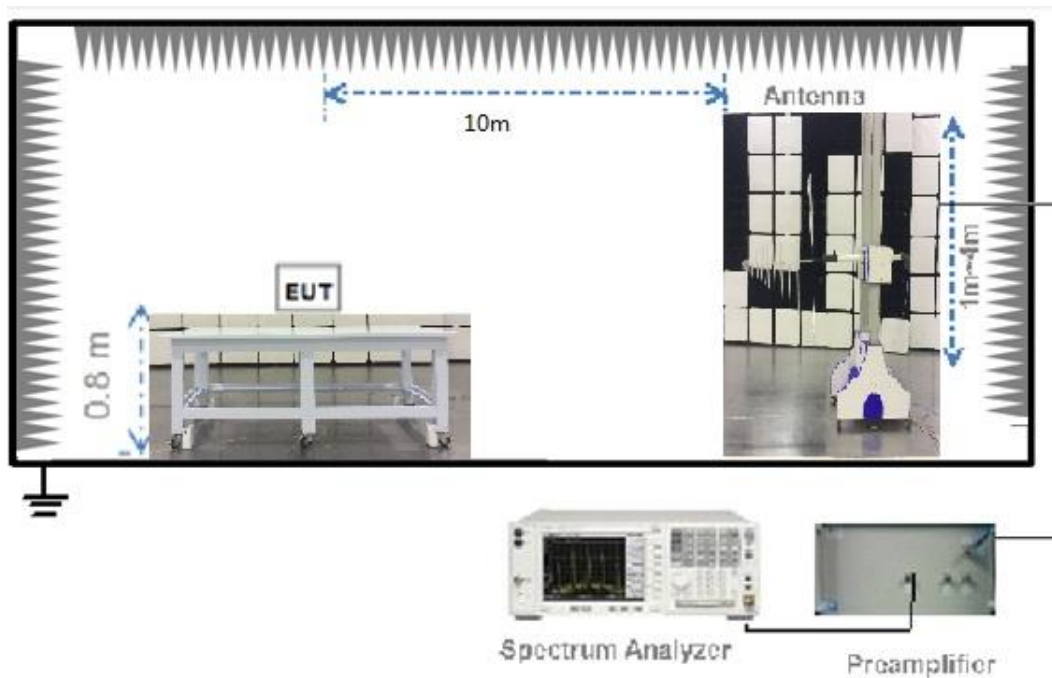
(Diagram 1)

4.4.2 For Radiated Test (Below 30 MHz)



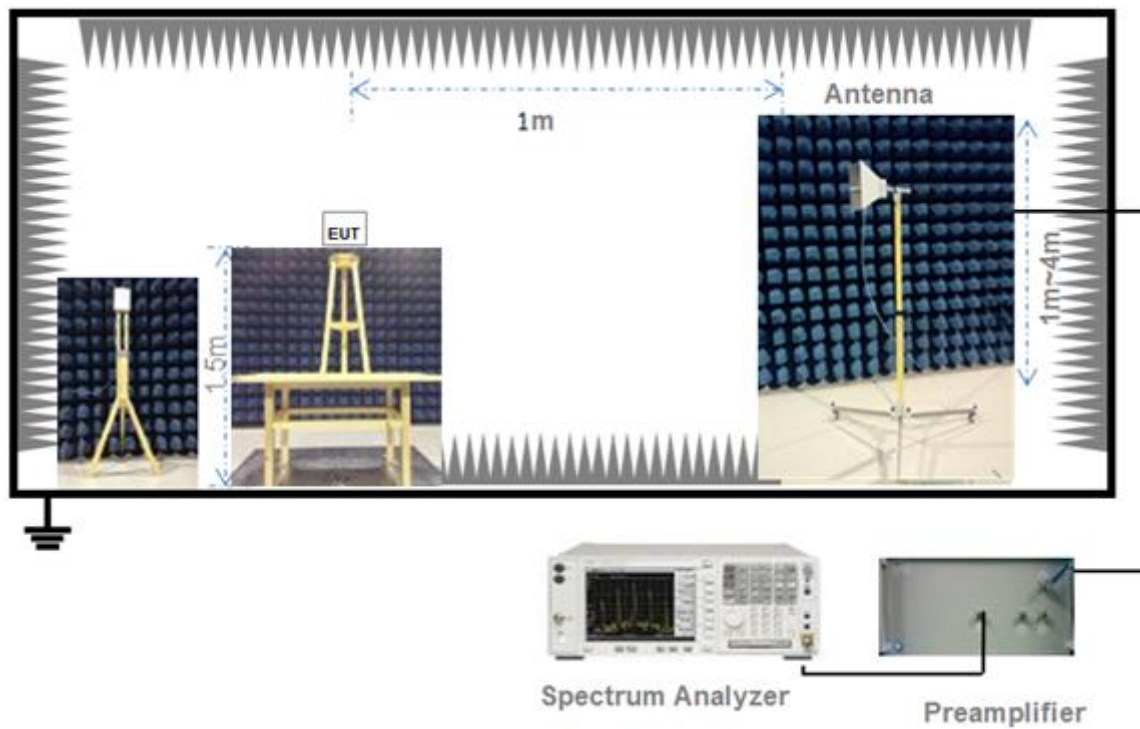
(Diagram 2)

4.4.3 For Radiated Test (30 MHz-1 GHz)



(Diagram 3)

4.4.4 For Radiated Test (Above 960MHz)



(Diagram 4)

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.

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.

5.2 Conducted Emission

5.2.1 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

5.2.2 Test Setup

See section 4.4.1 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.2.3 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.

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 UWB Bandwidth

5.3.1 Limit

FCC §15.503(d)

Ultra-wideband (UWB) transmitter. An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

FCC §15.517(b)

The UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

5.3.2 Test Setups

See section 4.4.4 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:

RBW = 1 MHz

VBW $\geq$ 3 MHz

Sweep = auto

Detector function = RMS

Trace = max hold

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Radiated Emissions

5.4.1 Limit

FCC §15.517(c)

The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIPR in dBm
960–1610	-75.3
1610–1990	-53.3
1990–3100	-51.3
3100–10600	-41.3
Above 10600	-51.3

FCC §15.209

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

5.4.2 Test Setups

See section 4.4.2 to 4.4.4 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

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. The height of the antenna was varied from 1 to 4 meters. For each suspected emissions, the antenna tower was scan (from 1m to 4m) and the the turntables was turned (from 0° to 360°) to find the maximum reading.

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:

9 kHz to 960 MHz:

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz

VBW = 300 kHz

Sweep time = auto

Detector function = peak(Margin which is less than 3 dB will be repeated one by one using the quasi-peak)

Trace = max hold

960 MHz to 40 GHz:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

VBW = 3 MHz

Sweep time = 1s

Detector function = RMS

Trace = max hold

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Radiated Emissions in GPS Bands

5.5.1 Limit

FCC §15.517(d)

In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency in MHz	EIPR in dBm
1164–1240	-85.3
1559–1610	-85.3

5.5.2 Test Setups

See section 4.4.4 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

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. The height of the antenna was varied from 1 to 4 meters. For each suspected emissions, the antenna tower was scan (from 1m to 4m) and the the turntables was turned (from 0° to 360°) to find the maximum reading.

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 kHz

VBW = 3 kHz

Sweep time = 1s

Detector function = RMS

Trace = max hold

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Peak Emissions within a 50MHz Bandwidth

5.6.1 Limit

FCC §15.517(e)

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in §15.521.

It is acceptable to employ an RBW of less than 50 MHz (but no less than 1 MHz) when performing the required peak power measurements. When this approach is employed, the peak emissions EIRP limit (0 dBm / 50 MHz) is converted to a limit commensurate with the RBW by employing a $[20 \log (RBW/50 \text{ MHz})]$ relationship. For example, the peak power limit could be expressed in a 1 MHz bandwidth as follows in Equation :

$$\text{EIRP}_{1 \text{ MHz}} = \text{EIRP}_{50 \text{ MHz}} + 20 \log (1 \text{ MHz} / 50 \text{ MHz}) = 0 \text{ dBm} + (- 34 \text{ dBm}) = -34 \text{ dBm}$$

5.6.2 Test Setups

See section 4.4.4 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

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. The height of the antenna was varied from 1 to 4 meters. For each suspected emissions, the antenna tower was scan (from 1m to 4m) and the the turntables was turned (from 0° to 360°) to find the maximum reading.

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:

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

VBW = 3 MHz

Sweep = auto

Detector function = peak

Trace = max hold

5.6.4 Test Result

Please refer to ANNEX A.5.

ANNEX A TEST RESULT

A.1 Conducted Emissions

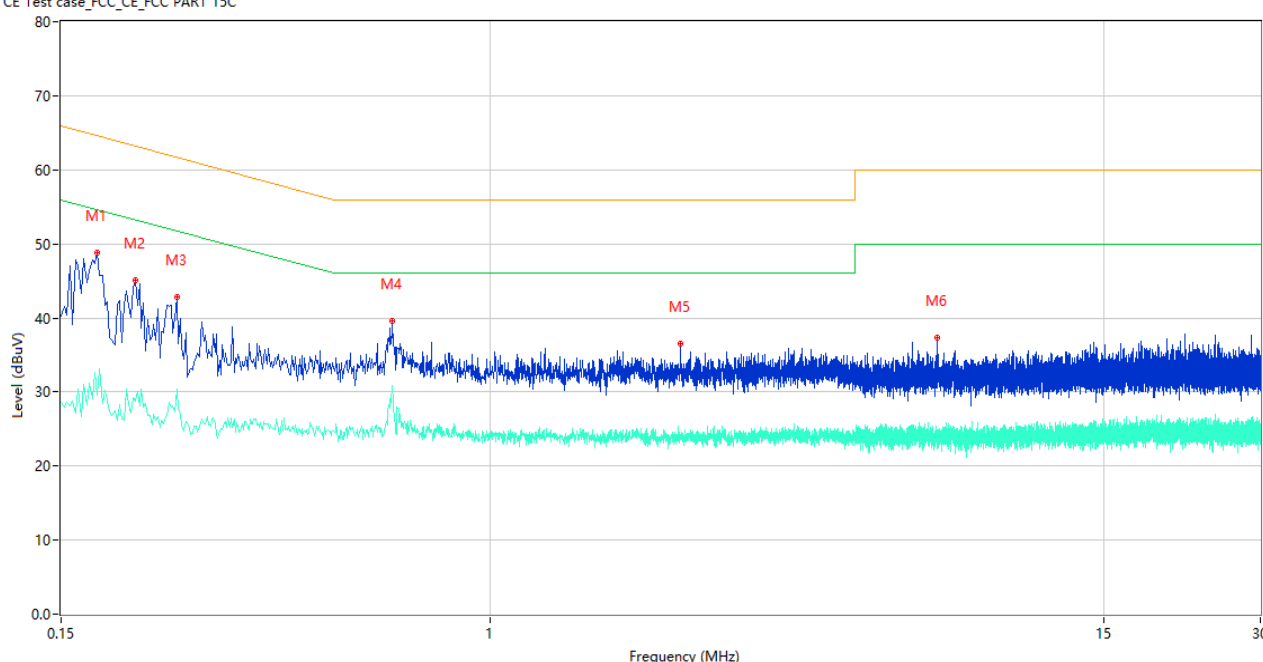
Note ¹: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.

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.

Test Data and Plots

6489.6MHz, PHASE L

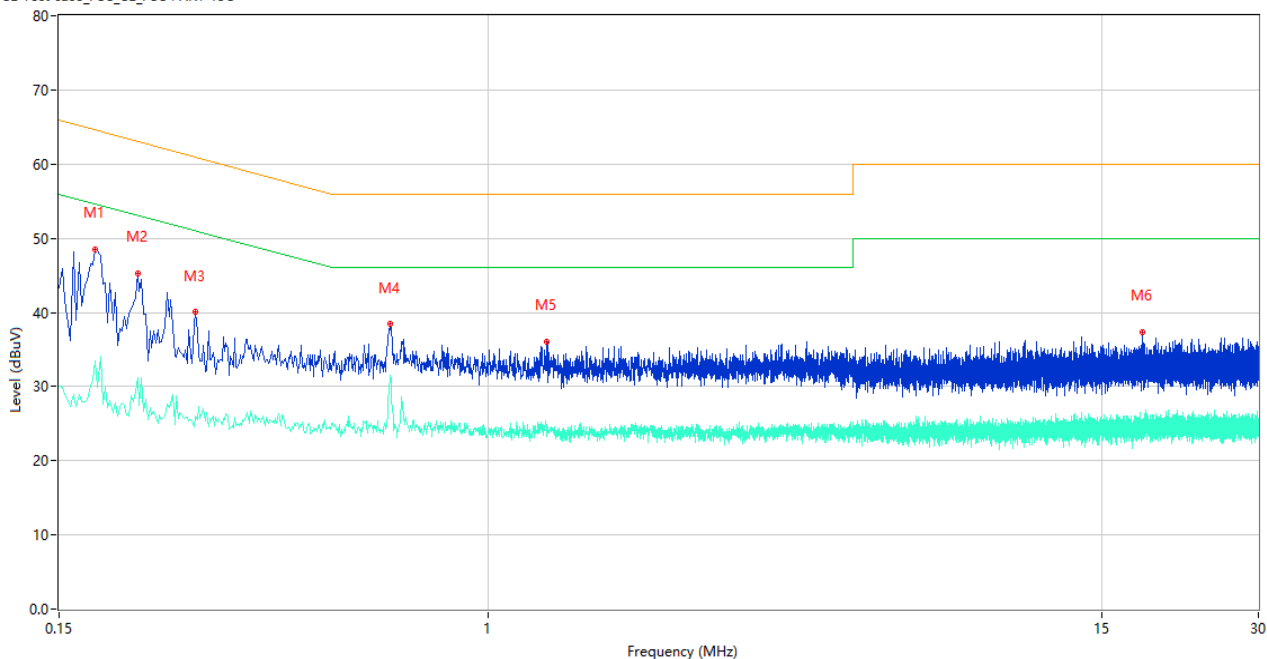
CE Test case_FCC_CE_FCC PART 15C



No.	Frequency (MHz)	Results (dBUV)	Factor (dB)	Limit (dBUV)	Margin (dB)	Detector	Line	Verdict
1	0.176	48.78	9.78	64.67	15.89	Peak	L	Pass
1**	0.176	29.59	9.78	54.67	25.08	AV	L	Pass
2	0.208	45.09	9.77	63.28	18.19	Peak	L	Pass
2**	0.208	28.71	9.77	53.28	24.57	AV	L	Pass
3	0.250	42.79	9.77	61.76	18.97	Peak	L	Pass
3**	0.250	30.46	9.77	51.76	21.30	AV	L	Pass
4	0.648	39.59	10.21	56.00	16.41	Peak	L	Pass
4**	0.648	30.23	10.21	46.00	15.77	AV	L	Pass
5	2.318	36.52	10.19	56.00	19.48	Peak	L	Pass
5**	2.318	24.04	10.19	46.00	21.96	AV	L	Pass
6	7.212	37.41	10.43	60.00	22.59	Peak	L	Pass
6**	7.212	24.58	10.43	50.00	25.42	AV	L	Pass

6489.6MHz, PHASE N

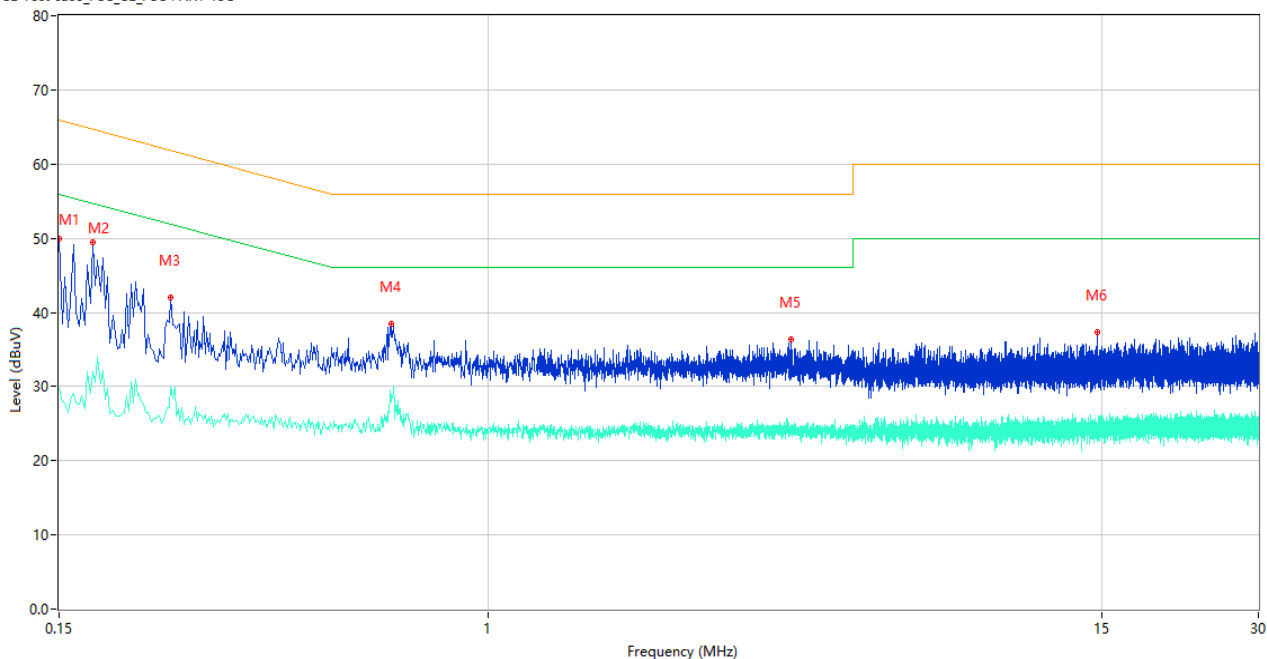
CE Test case_FCC_CE_FCC PART 15C



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.176	48.52	9.78	64.67	16.15	Peak	N	Pass
1**	0.176	33.40	9.78	54.67	21.27	AV	N	Pass
2	0.212	45.28	9.77	63.13	17.85	Peak	N	Pass
2**	0.212	31.26	9.77	53.13	21.87	AV	N	Pass
3	0.274	40.03	9.76	61.00	20.97	Peak	N	Pass
3**	0.274	26.10	9.76	51.00	24.90	AV	N	Pass
4	0.646	38.39	10.21	56.00	17.61	Peak	N	Pass
4**	0.646	30.98	10.21	46.00	15.02	AV	N	Pass
5	1.294	36.05	10.51	56.00	19.95	Peak	N	Pass
5**	1.294	24.59	10.51	46.00	21.41	AV	N	Pass
6	17.968	37.29	10.76	60.00	22.71	Peak	N	Pass
6**	17.968	24.65	10.76	50.00	25.35	AV	N	Pass

7987.2MHz, PHASE L

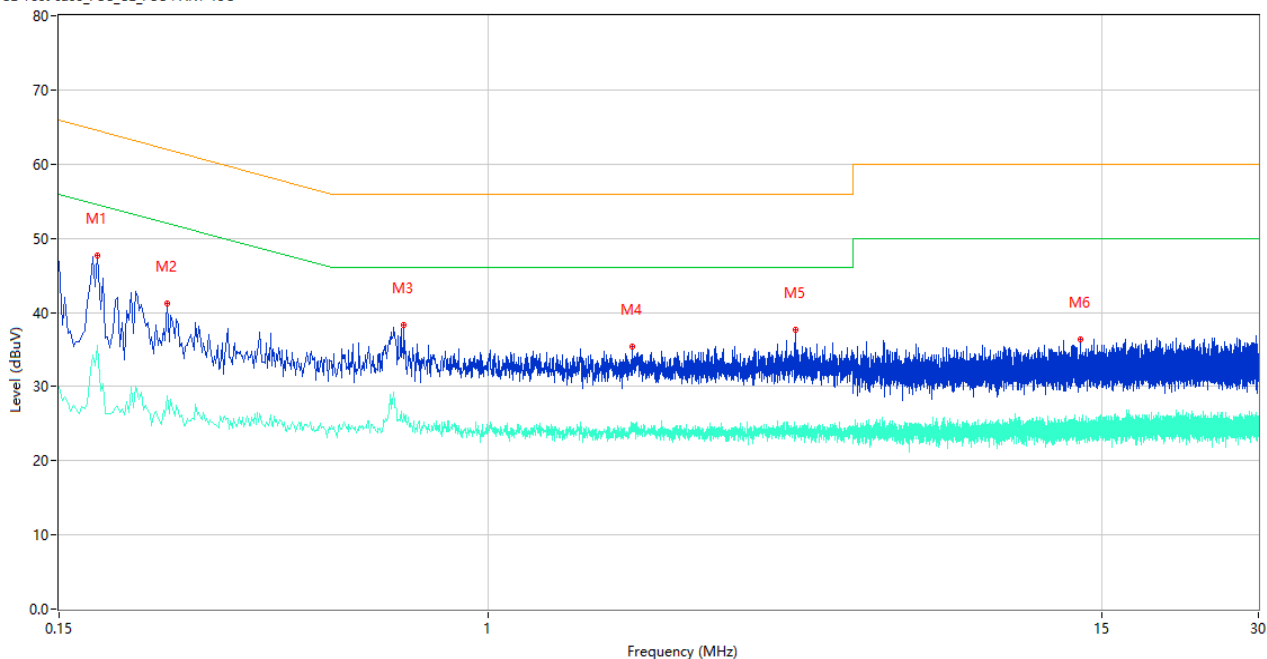
CE Test case_FCC_CE_FCC PART 15C



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.150	49.92	9.78	66.00	16.08	Peak	L	Pass
1**	0.150	29.72	9.78	56.00	26.28	AV	L	Pass
2	0.174	49.38	9.78	64.77	15.39	Peak	L	Pass
2**	0.174	31.96	9.78	54.77	22.81	AV	L	Pass
3	0.246	41.97	9.77	61.89	19.92	Peak	L	Pass
3**	0.246	30.03	9.77	51.89	21.86	AV	L	Pass
4	0.652	38.43	10.23	56.00	17.57	Peak	L	Pass
4**	0.652	27.95	10.23	46.00	18.05	AV	L	Pass
5	3.808	36.41	10.33	56.00	19.59	Peak	L	Pass
5**	3.808	24.47	10.33	46.00	21.53	AV	L	Pass
6	14.732	37.32	10.38	60.00	22.68	Peak	L	Pass
6**	14.732	23.85	10.38	50.00	26.15	AV	L	Pass

7987.2MHz, 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	0.178	47.66	9.78	64.58	16.92	Peak	N	Pass
1**	0.178	35.49	9.78	54.58	19.09	AV	N	Pass
2	0.242	41.27	9.77	62.03	20.76	Peak	N	Pass
2**	0.242	28.77	9.77	52.03	23.26	AV	N	Pass
3	0.688	38.30	10.56	56.00	17.70	Peak	N	Pass
3**	0.688	26.27	10.56	46.00	19.73	AV	N	Pass
4	1.890	35.34	10.65	56.00	20.66	Peak	N	Pass
4**	1.890	23.91	10.65	46.00	22.09	AV	N	Pass
5	3.884	37.60	10.32	56.00	18.40	Peak	N	Pass
5**	3.884	24.00	10.32	46.00	22.00	AV	N	Pass
6	13.674	36.42	10.74	60.00	23.58	Peak	N	Pass
6**	13.674	24.51	10.74	50.00	25.49	AV	N	Pass

A.2 UWB Bandwidth

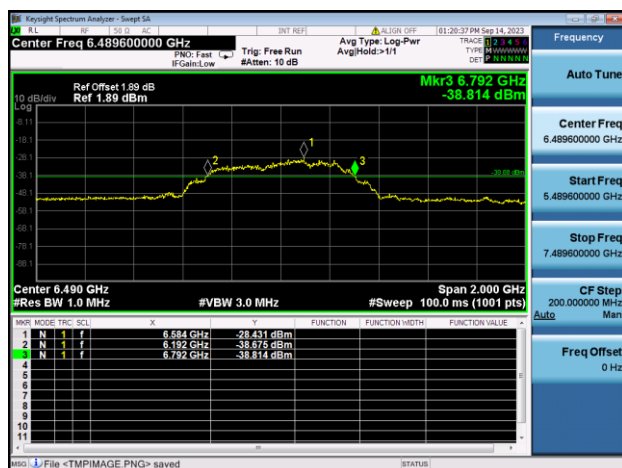
Test Data

Channel	F _M (MHz)	F _L (MHz)	F _H (MHz)	UWB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Verdict
CH5	6584.00	6192.00	6792.00	600.00	735.33	UWB Bandwidth ≥ 500 MHz 10 dB bandwidth contained between 6500 to 8000 MHz	Pass
CH9	8143.00	7701.00	8293.00	592.00	715.07		Pass

Test Plots

10 dB Bandwidth

6489.6MHz



7987.2MHz



99% Bandwidth

6489.6MHz



7987.2MHz



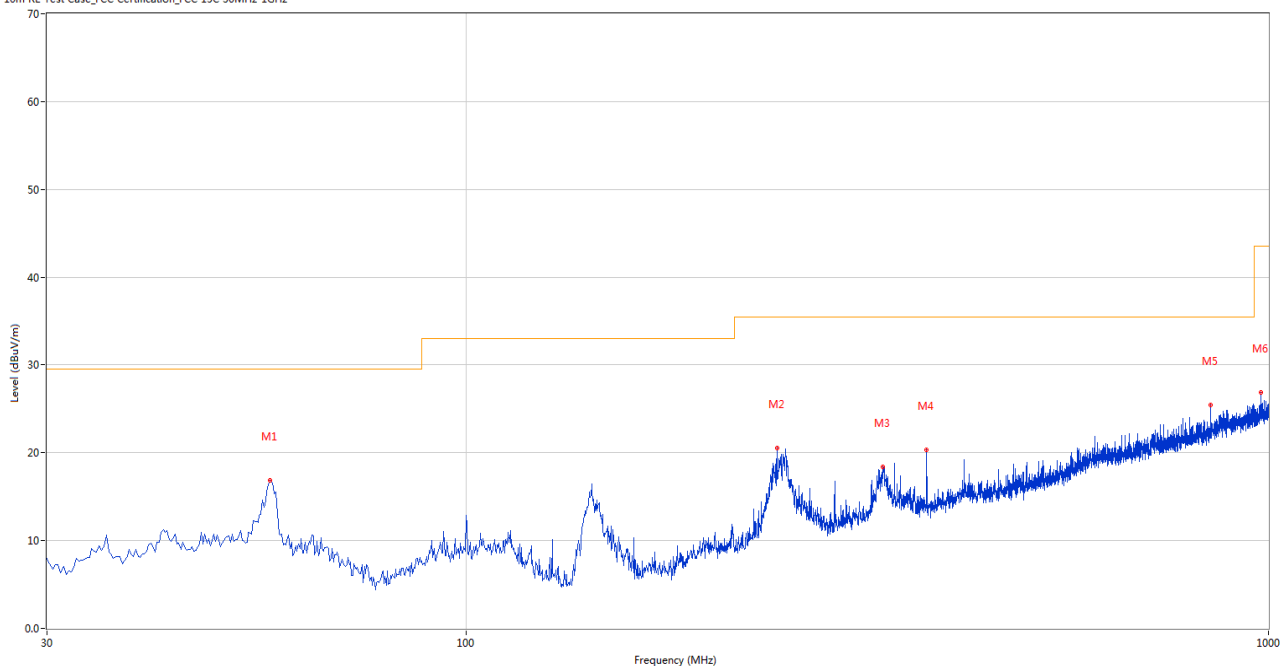
A.3 Radiated Emissions

Note: 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 15.209 was not reported.

Test Data and Plots

6489.6MHz, 30 MHz to 1 GHz, ANT H

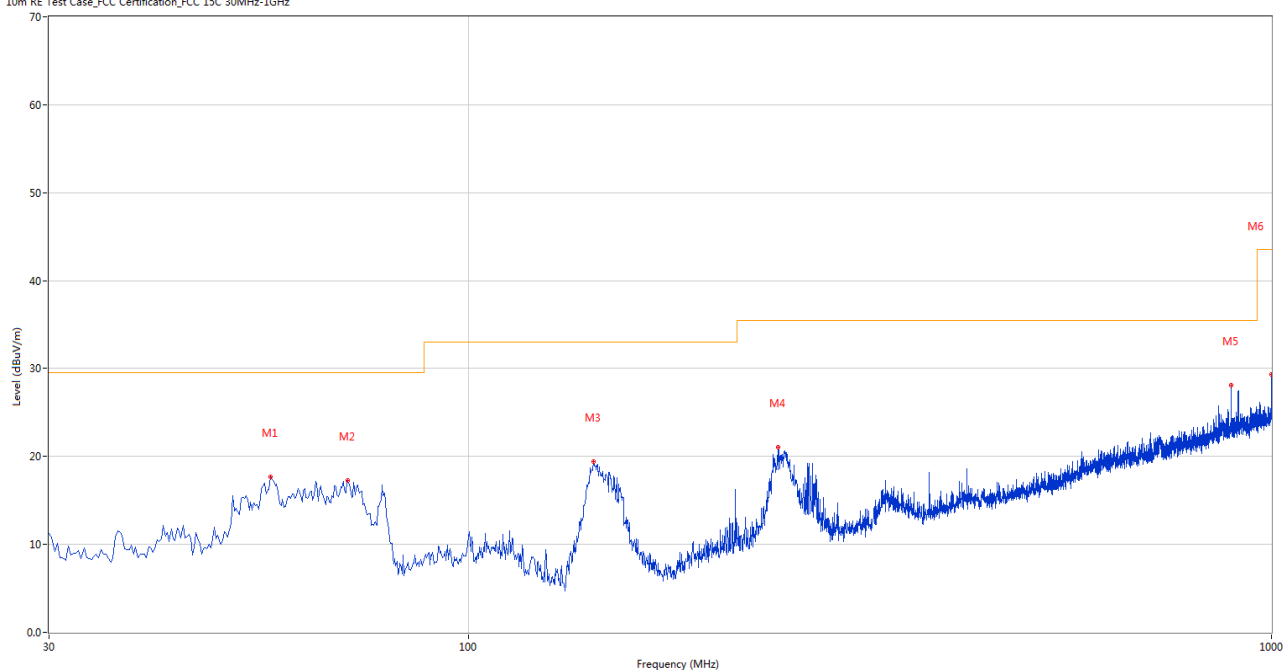
10m RE Test Case_FCC Certification_FCC 15C 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	56.911	16.83	-27.06	29.5	12.67	Peak	211.00	100	Horizontal	Pass
2	244.074	20.52	-26.72	35.5	14.98	Peak	286.00	200	Horizontal	Pass
3	330.625	18.44	-24.11	35.5	17.06	Peak	279.00	200	Horizontal	Pass
4	374.991	20.38	-23.22	35.5	15.12	Peak	348.00	200	Horizontal	Pass
5	846.536	25.44	-13.84	35.5	10.06	Peak	326.00	200	Horizontal	Pass
6	977.938	26.84	-11.77	43.5	16.66	Peak	0.00	200	Horizontal	Pass

6489.6MHz, 30 MHz to 1 GHz, ANT V

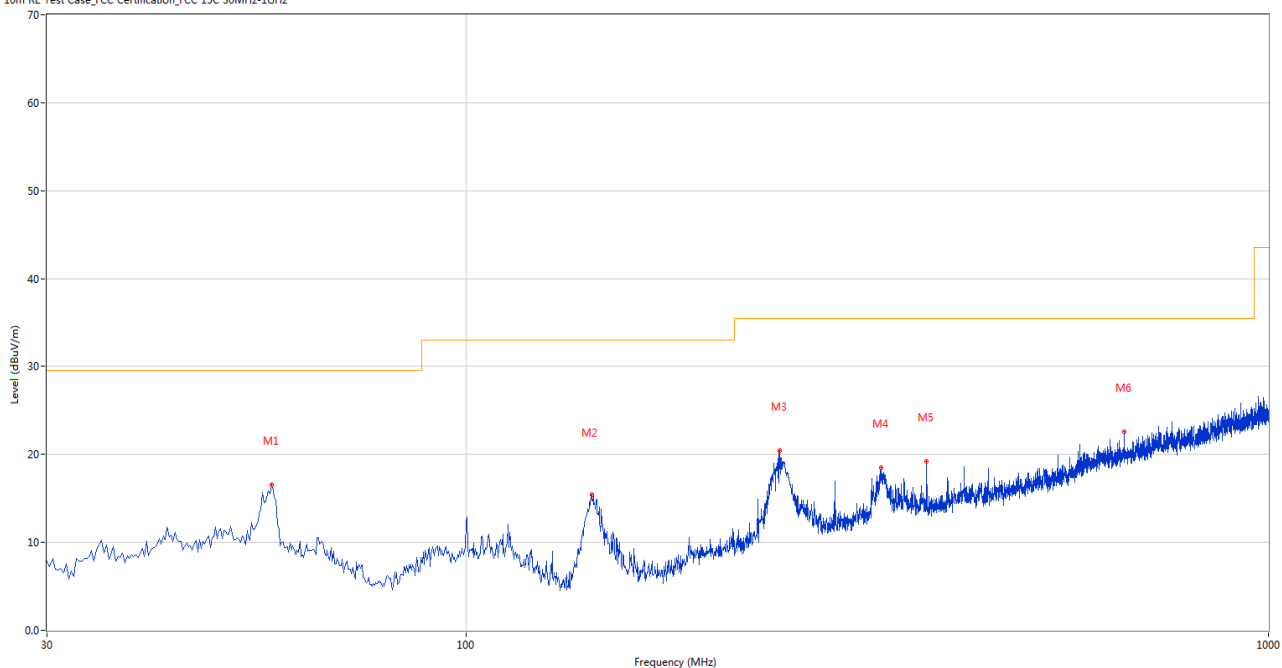
10m RE Test Case_FCC Certification_FCC 15C 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	56.668	17.69	-26.99	29.5	11.81	Peak	167.00	100	Vertical	Pass
2	70.730	17.24	-30.82	29.5	12.26	Peak	13.00	200	Vertical	Pass
3	142.977	19.42	-31.63	33.0	13.58	Peak	266.00	100	Vertical	Pass
4	243.104	21.08	-26.64	35.5	14.42	Peak	266.00	100	Vertical	Pass
5	890.902	28.15	-12.37	35.5	7.35	Peak	152.00	200	Vertical	Pass
6	1000.000	29.30	-11.26	43.5	14.20	Peak	0.00	200	Vertical	Pass

7987.2MHz, 30 MHz to 1 GHz, ANT H

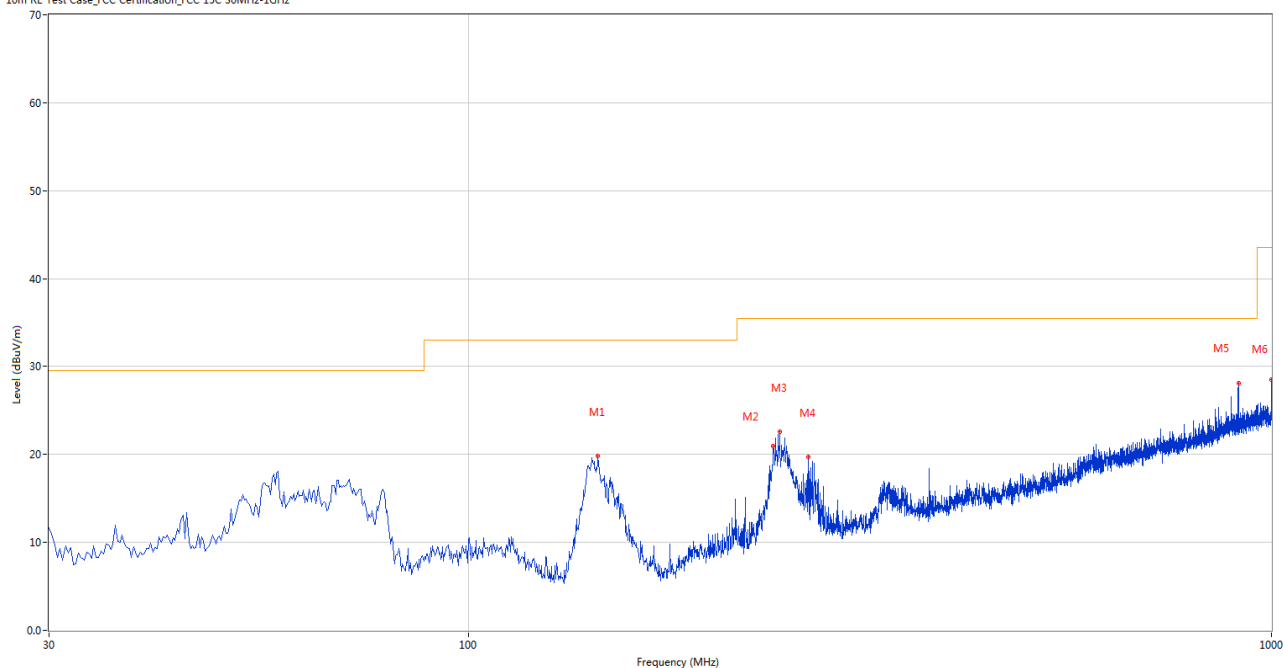
10m RE Test Case_FCC Certification_FCC 15C 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	57.153	16.54	-27.13	29.5	12.96	Peak	329.00	200	Horizontal	Pass
2	143.219	15.48	-31.62	33.0	17.52	Peak	320.00	200	Horizontal	Pass
3	245.771	20.40	-26.63	35.5	15.10	Peak	286.00	200	Horizontal	Pass
4	328.685	18.47	-24.34	35.5	17.03	Peak	301.00	200	Horizontal	Pass
5	374.991	19.23	-23.22	35.5	16.27	Peak	0.00	200	Horizontal	Pass
6	661.312	22.59	-16.88	35.5	12.91	Peak	230.00	100	Horizontal	Pass

7987.2MHz, 30 MHz to 1 GHz, ANT V

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

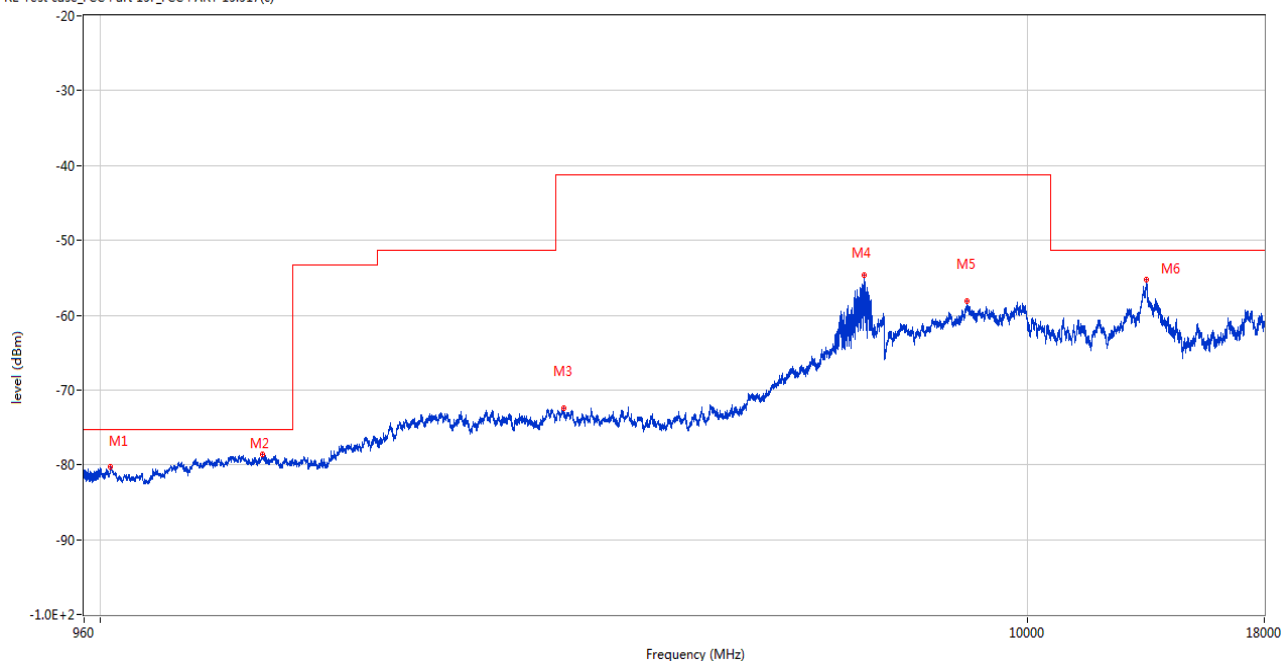


No.	Frequency (MHz)	Results (dBUV/m)	Factor (dB)	Limit (dBUV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	144.916	19.84	-31.56	33.0	13.16	Peak	254.00	100	Vertical	Pass
2	239.468	20.98	-26.67	35.5	14.52	Peak	257.00	100	Vertical	Pass
3	244.074	22.60	-26.72	35.5	12.90	Peak	276.00	100	Vertical	Pass
4	265.166	19.76	-25.85	35.5	15.74	Peak	180.00	100	Vertical	Pass
5	909.328	28.12	-12.69	35.5	7.38	Peak	177.00	200	Vertical	Pass
6	1000.000	28.55	-11.26	43.5	14.95	Peak	0.00	200	Vertical	Pass

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

6489.6MHz, 960 MHz to 18 GHz, ANT H

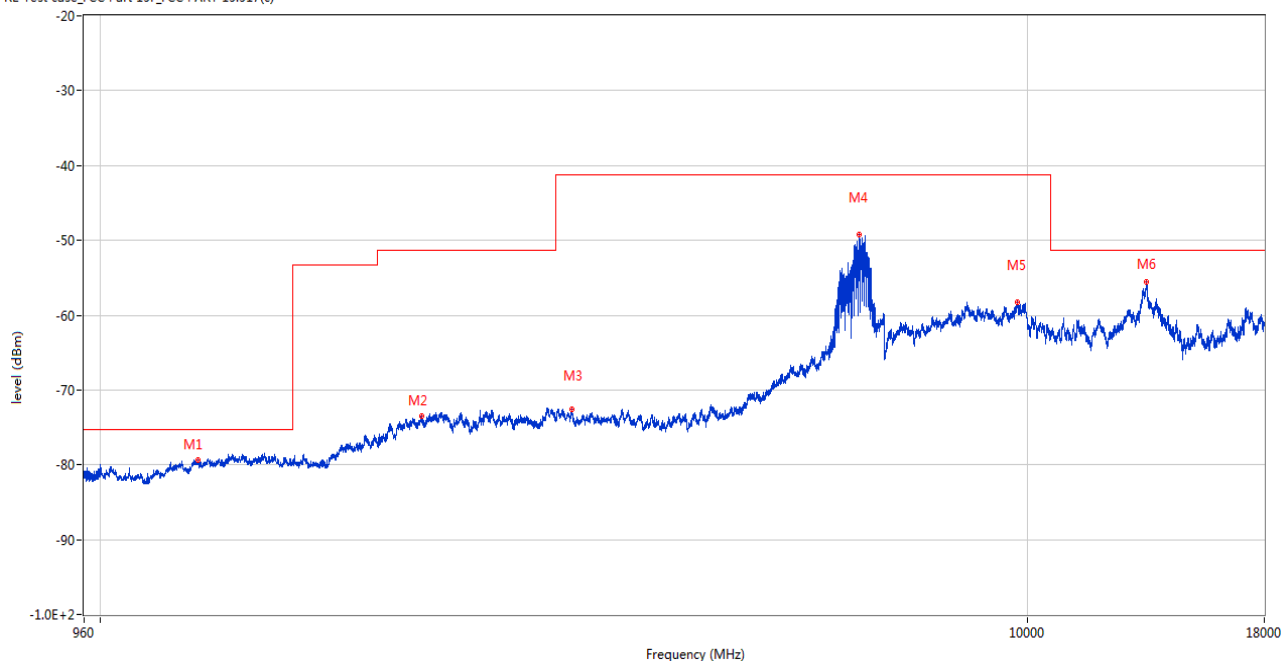
RE Test case_FCC Part 15F_FCC PART 15.517(c)



Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1025.500	-80.22	-17.92	-75.3	4.92	77.00	Horizontal	Horizontal	Pass
1495.500	-78.68	-17.33	-75.3	3.38	347.00	Horizontal	Horizontal	Pass
3164.000	-72.50	-8.99	-41.3	31.20	20.00	Horizontal	Horizontal	Pass
6669.000	-54.63	1.37	-41.3	13.33	309.00	Horizontal	Horizontal	Pass
8604.250	-58.09	5.89	-41.3	16.79	105.00	Horizontal	Horizontal	Pass
13424.625	-55.30	6.05	-51.3	4.00	0.00	Horizontal	Horizontal	Pass

6489.6MHz, 960 MHz to 18 GHz, ANT V

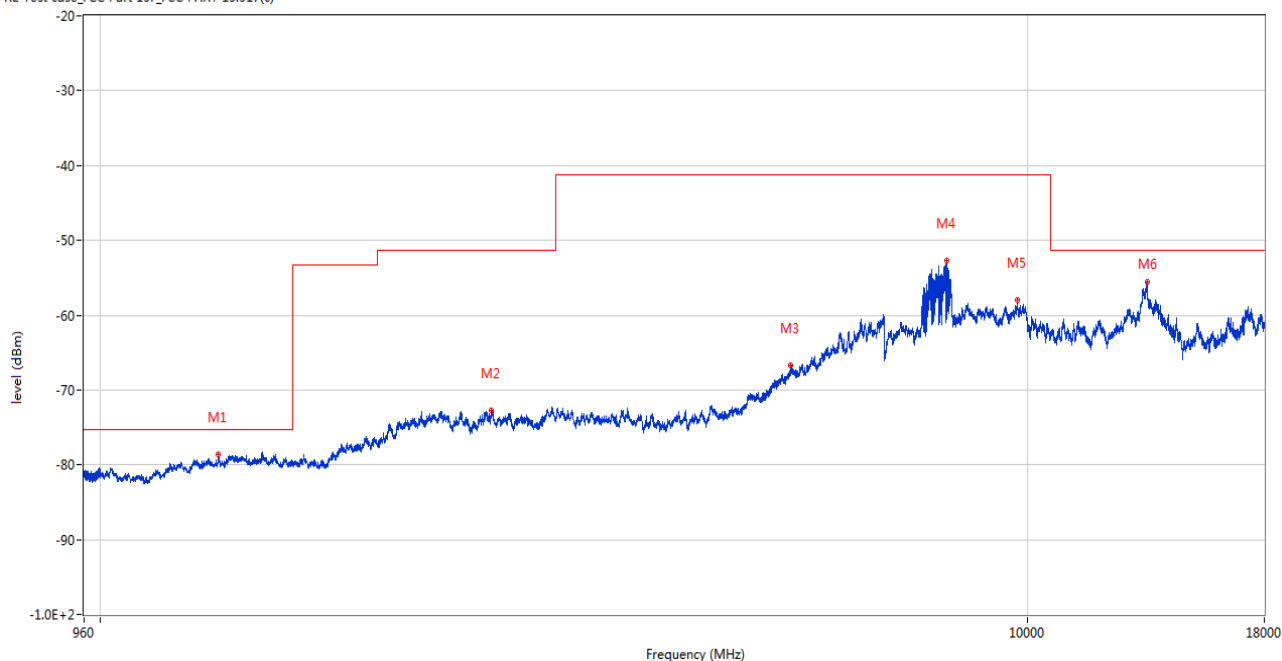
RE Test case_FCC Part 15F_FCC PART 15.517(c)



Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1273.500	-79.33	-17.68	-75.3	4.03	310.00	Vertical	Horizontal	Pass
2220.500	-73.51	-11.73	-51.3	22.21	141.00	Vertical	Horizontal	Pass
3222.000	-72.61	-8.51	-41.3	31.31	155.00	Vertical	Horizontal	Pass
6576.000	-49.21	-0.08	-41.3	7.91	328.00	Vertical	Horizontal	Pass
9751.375	-58.31	7.41	-41.3	17.01	4.00	Vertical	Horizontal	Pass
13446.938	-55.51	6.45	-51.3	4.21	28.00	Vertical	Horizontal	Pass

7987.2MHz, 960 MHz to 18 GHz, ANT H

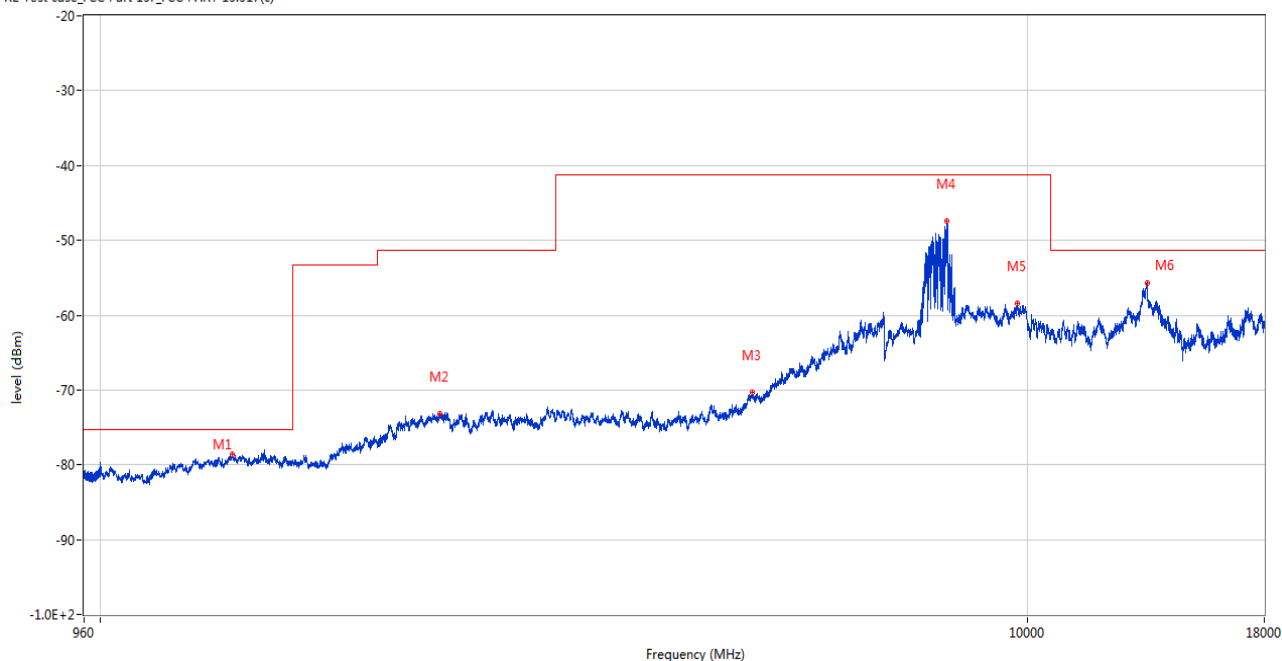
RE Test case_FCC Part 15F_FCC PART 15.517(c)



Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1339.500	-78.56	-17.48	-75.3	3.26	168.00	Horizontal	Horizontal	Pass
2639.000	-72.78	-10.60	-51.3	21.48	360.00	Horizontal	Horizontal	Pass
5546.000	-66.78	-4.11	-41.3	25.48	190.00	Horizontal	Horizontal	Pass
8173.000	-52.72	4.45	-41.3	11.42	308.00	Horizontal	Horizontal	Pass
9749.937	-58.02	7.40	-41.3	16.72	308.00	Horizontal	Horizontal	Pass
13449.562	-55.53	6.51	-51.3	4.23	246.00	Horizontal	Horizontal	Pass

7987.2MHz, 960 MHz to 18 GHz, ANT V

RE Test case_FCC Part 15F_FCC PART 15.517(c)



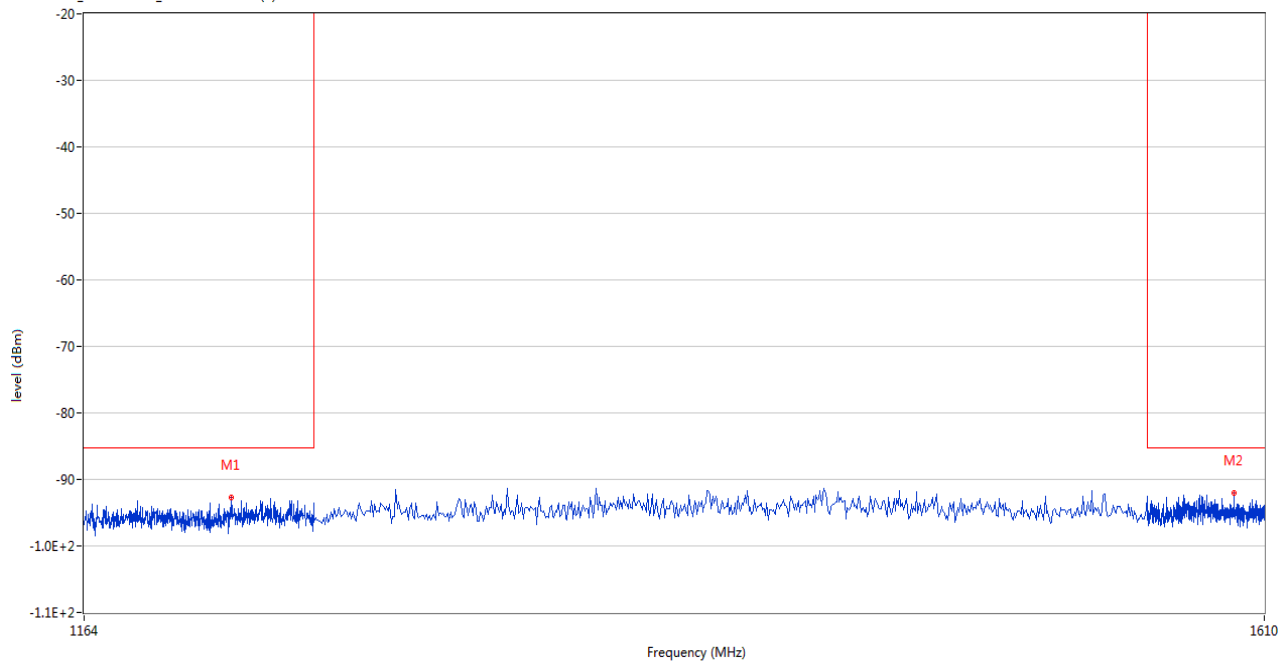
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1386.500	-78.64	-17.20	-75.3	3.34	338.00	Vertical	Horizontal	Pass
2322.000	-73.17	-11.26	-51.3	21.87	333.00	Vertical	Horizontal	Pass
5053.000	-70.28	-7.21	-41.3	28.98	263.00	Vertical	Horizontal	Pass
8183.063	-47.49	4.57	-41.3	6.19	43.00	Vertical	Horizontal	Pass
9742.750	-58.47	7.29	-41.3	17.17	36.00	Vertical	Horizontal	Pass
13449.562	-55.65	6.51	-51.3	4.35	345.00	Vertical	Horizontal	Pass

A.4 Radiated Emissions in GPS Bands

Test Data and Plots

6489.6MHz, 1.164 GHz to 1.61 GHz, ANT H

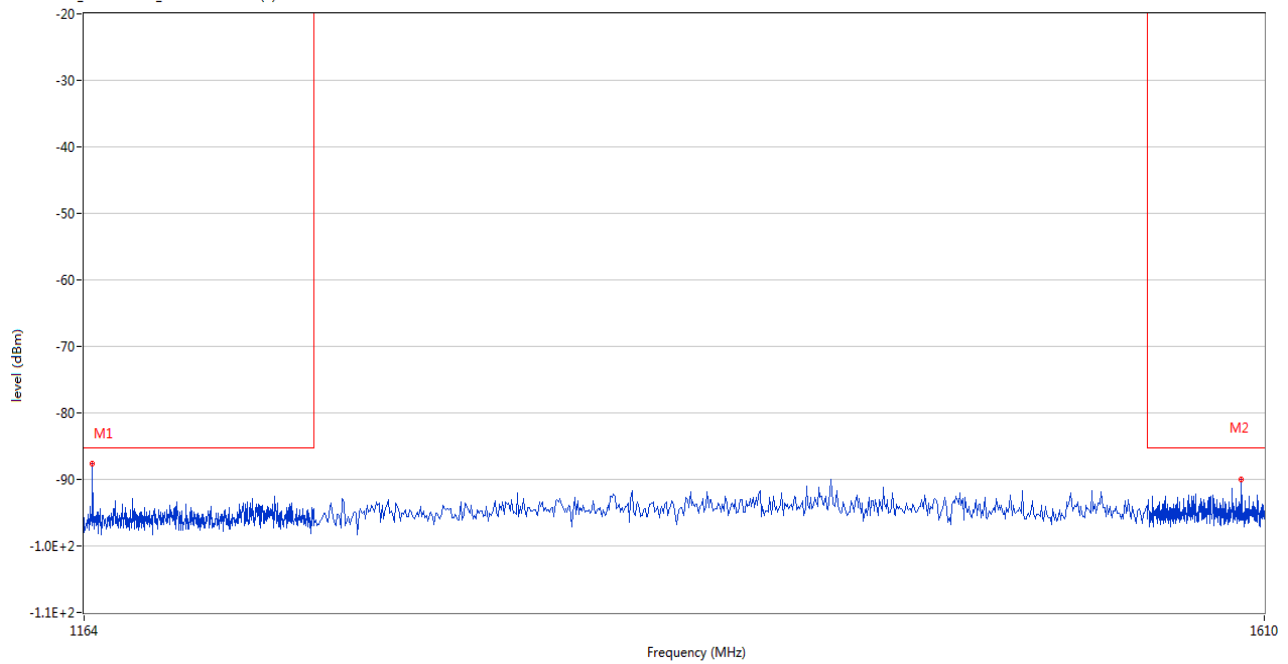
RE Test case_FCC Part 15F_FCC PART 15.517(d)



Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1212.133	-92.75	-6.44	-85.3	7.45	149.00	Horizontal	Horizontal	Pass
1596.570	-92.03	-6.28	-85.3	6.73	199.00	Horizontal	Horizontal	Pass

6489.6MHz, 1.164 GHz to 1.61 GHz, ANT V

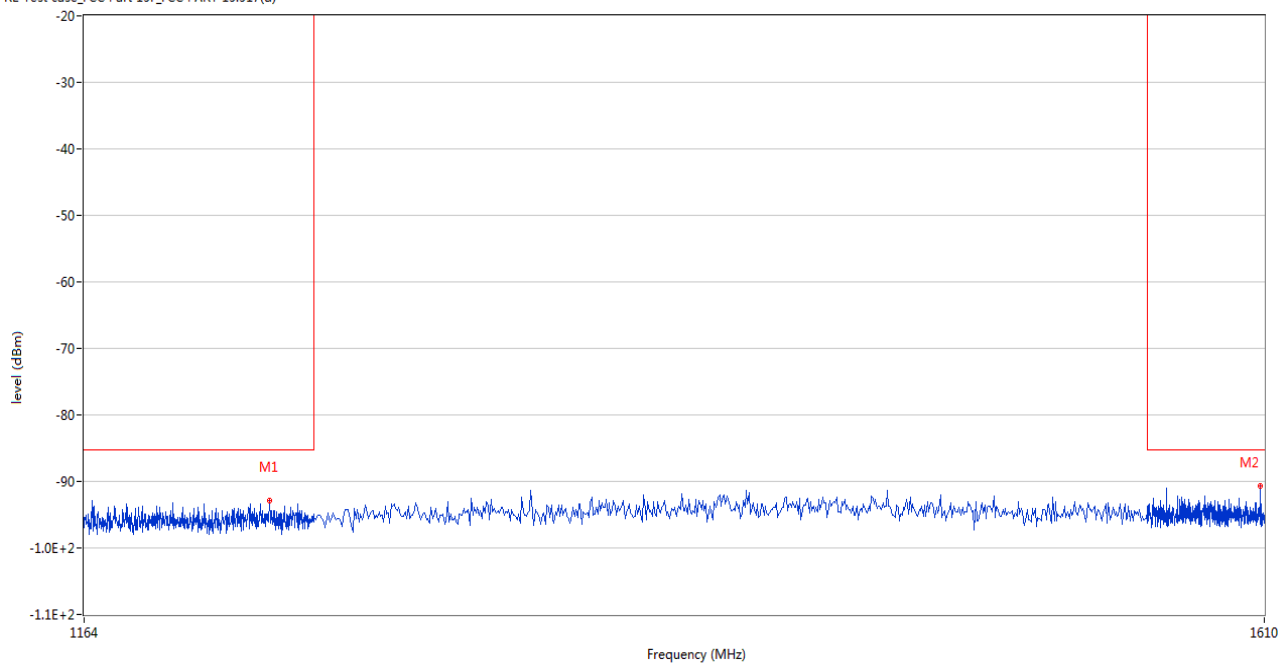
RE Test case_FCC Part 15F_FCC PART 15.517(d)



Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1166.660	-87.60	-6.57	-85.3	2.30	156.00	Vertical	Horizontal	Pass
1599.970	-89.97	-6.32	-85.3	4.67	145.00	Vertical	Horizontal	Pass

7987.2MHz, 1.164 GHz to 1.61 GHz, ANT H

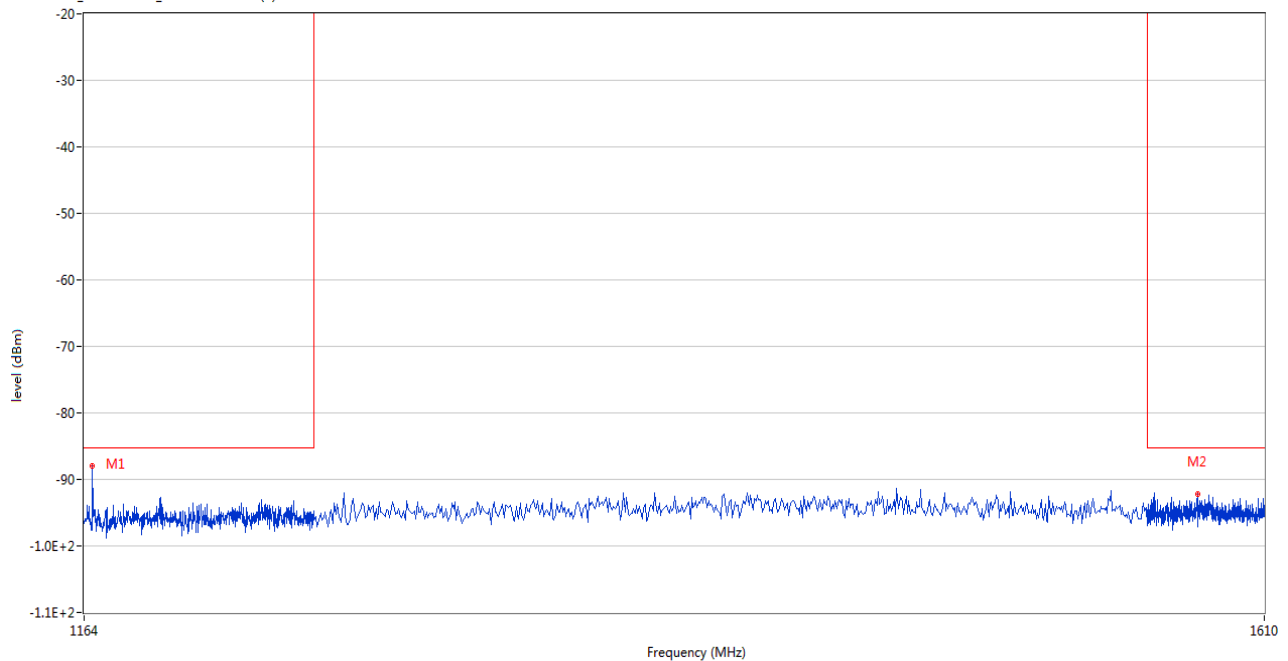
RE Test case_FCC Part 15F_FCC PART 15.517(d)



Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1224.800	-92.87	-6.33	-85.3	7.57	6.00	Horizontal	Horizontal	Pass
1608.215	-90.70	-6.32	-85.3	5.40	202.00	Horizontal	Horizontal	Pass

7987.2MHz, 1.164 GHz to 1.61 GHz, ANT V

RE Test case_FCC Part 15F_FCC PART 15.517(d)



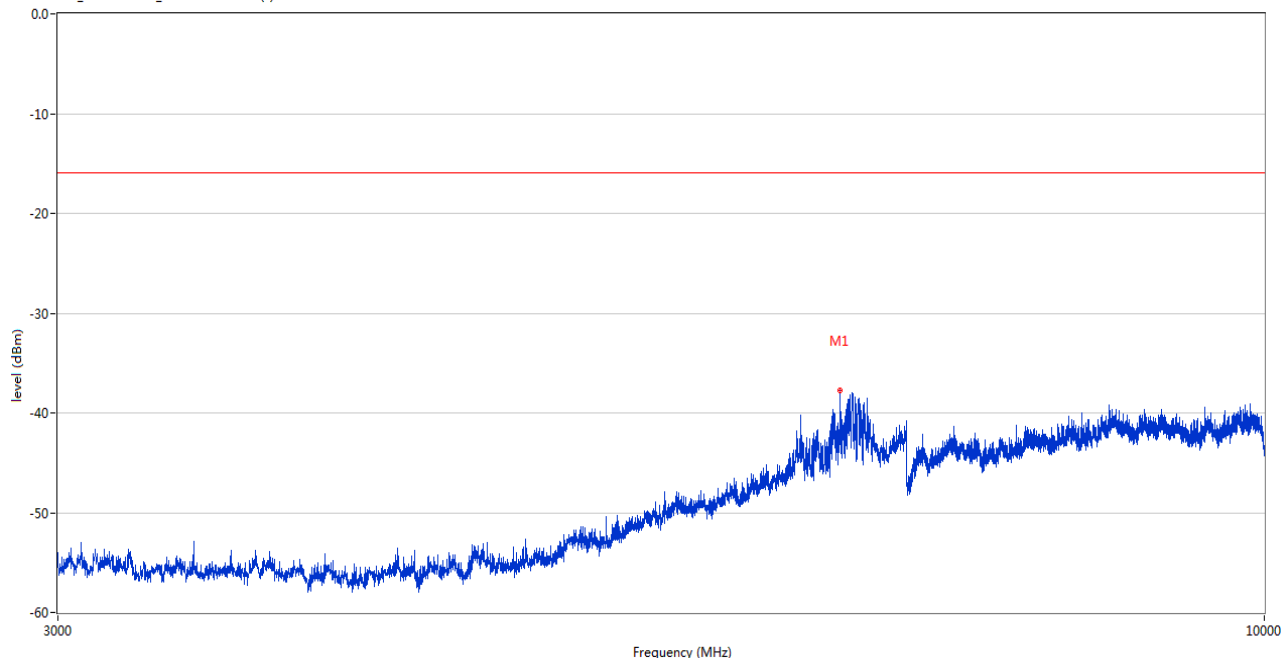
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1166.660	-87.93	-6.57	-85.3	2.63	157.00	Vertical	Horizontal	Pass
1580.930	-92.18	-5.80	-85.3	6.88	352.00	Vertical	Horizontal	Pass

A.5 Peak Emissions within a 50MHz Bandwidth

Test Data and Plot

6489.6MHz, 3 GHz to 10 GHz, ANT H

RE Test case_FCC Part 15F_FCC PART 15.517(c) - PSD



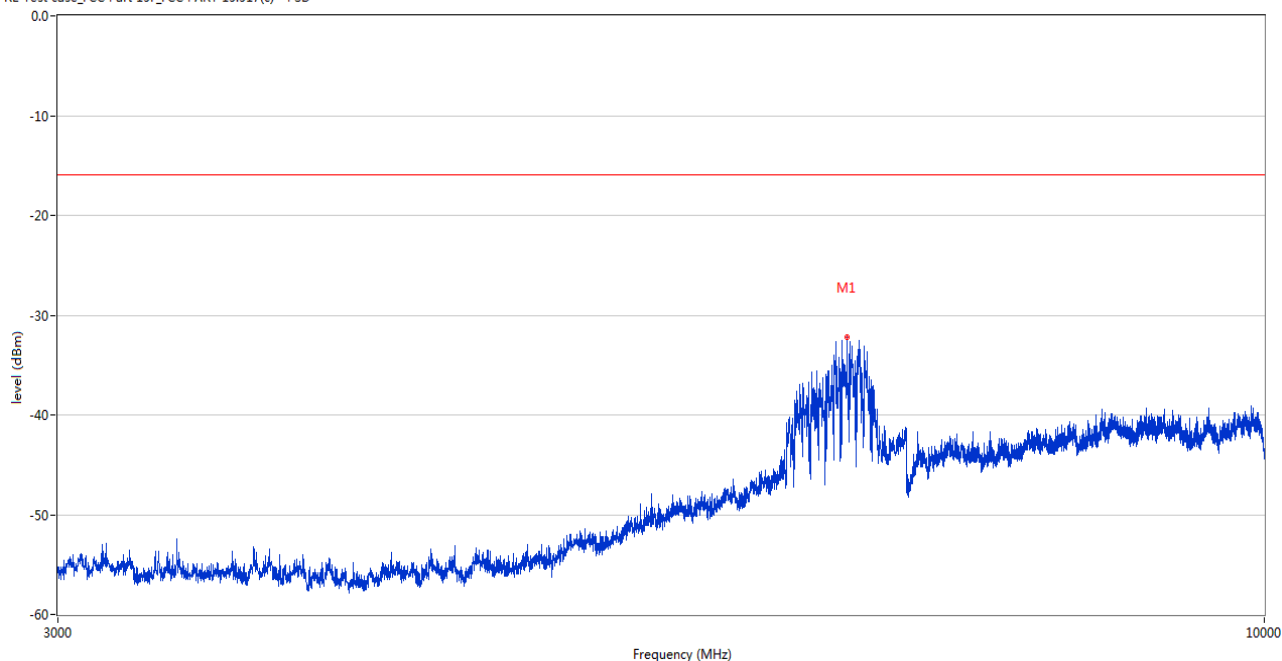
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
6550.000	-37.79	-0.21	-15.9	21.89	309.00	Horizontal	Horizontal	Pass

Note: $EIRP_{50\text{ MHz}} = EIRP_{8\text{ MHz}} + 20\log(8\text{ MHz}/50\text{ MHz})$

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm/50 MHz)	Margin (dB)	Table (o)	ANT	EUT	Verdict
6550.000	-21.89	-0.21	0	21.89	309.00	Horizontal	Horizontal	Pass

6489.6MHz, 3 GHz to 10 GHz, ANT V

RE Test case_FCC Part 15F_FCC PART 15.517(c) - PSD



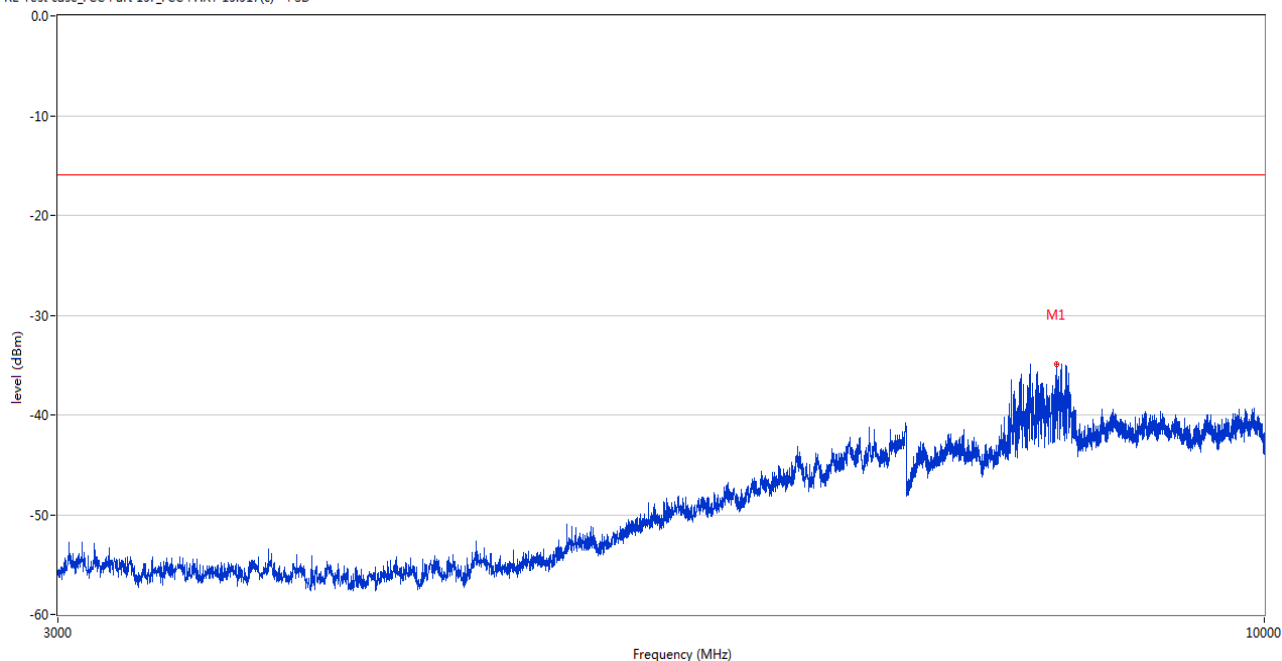
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
6596.000	-32.20	0.79	-15.9	16.30	326.00	Vertical	Horizontal	Pass

Note: $EIRP_{50\text{ MHz}} = EIRP_{8\text{ MHz}} + 20\log(8\text{ MHz}/50\text{ MHz})$

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm/50 MHz)	Margin (dB)	Table (o)	ANT	EUT	Verdict
6596.000	-16.30	0.79	0	16.30	326.00	Vertical	Horizontal	Pass

7987.2MHz, 3 GHz to 10 GHz, ANT H

RE Test case_FCC Part 15F_FCC PART 15.517(c) - PSD



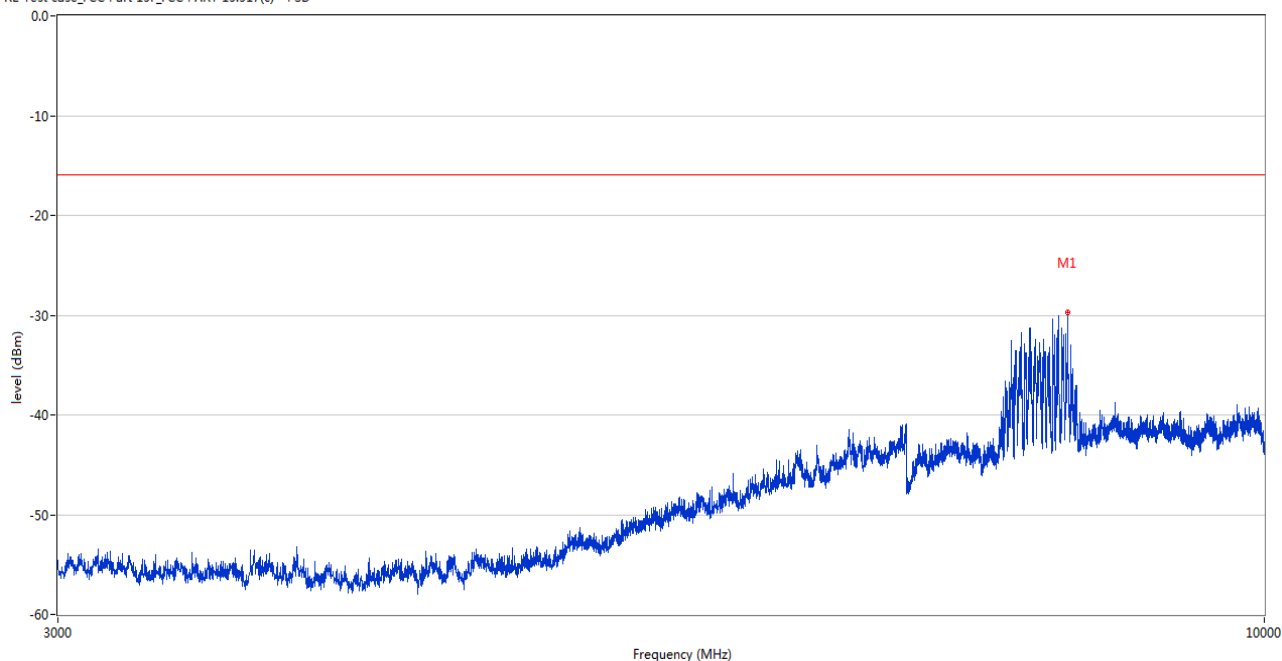
Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
8130.250	-34.92	4.22	-15.9	19.02	310.00	Horizontal	Horizontal	Pass

Note: $EIRP_{50\text{ MHz}} = EIRP_{8\text{ MHz}} + 20\log(8\text{ MHz}/50\text{ MHz})$

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm/50 MHz)	Margin (dB)	Table (o)	ANT	EUT	Verdict
8130.250	-19.02	4.22	0	19.02	310.00	Horizontal	Horizontal	Pass

7987.2MHz, 3 GHz to 10 GHz, ANT V

RE Test case_FCC Part 15F_FCC PART 15.517(c) - PSD



Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
8218.750	-29.69	5.81	-15.9	13.79	36.00	Vertical	Horizontal	Pass

Note: $EIRP_{50\text{ MHz}} = EIRP_{8\text{ MHz}} + 20\log(8\text{ MHz}/50\text{ MHz})$

Frequency (MHz)	Result (dBm)	Factor (dB)	Limit (dBm/50 MHz)	Margin (dB)	Table (o)	ANT	EUT	Verdict
8218.750	-13.79	5.81	0	13.79	36.00	Vertical	Horizontal	Pass

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2390335-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2390335-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2390335-AI.PDF”.

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--END OF REPORT--