

RF

TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
Ochsner Stove Sensor

ISSUED TO
Ochsner Clinic Foundation

1514 Jefferson Hwy. New Orleans, Louisiana 70121, United States



Tested by: Ye Hongji
Ye Hongji

Date: Nov. 05, 2021

Approved by: Toian Tu

Toian Tu
(Testing Director)

Date: Nov. 05, 2021

Report No.: BL-SZ2180917-601

EUT Name: Ochsner Stove Sensor

Model Name: Ochsner Stove Sensor1.0

Brand Name: Ochsner Health

Test Standard: 47 CFR Part 15 Subpart C
(refer section 3.1)

FCC ID: 2A2QP-OCHSTOVE

IC Number 27684-OCHSTOVE

Test Conclusion: Pass

Test Date: Sep. 02, 2021 ~ Sep. 07, 2021

Date of Issue: Nov. 05, 2021

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Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Nov. 05, 2021</u>	<u>Initial Issue</u>

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

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

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20°C to 25°C
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

- (1) The test report reference to the report template version v2.5.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Ochsner Clinic Foundation
Address	1514 Jefferson Hwy. New Orleans, Louisiana 70121, United States

2.2 Manufacturer Information

Manufacturer	Volansys Technologies Pvt Ltd
Address	Ratana Business Hub,207, 2nd Floor, Opp Bharat Petrol Pump, Sanathal Chokdi, Changodar Highway, Ahmedabad 382210, Gujarat, India

2.3 Factory Information

Factory	Volansys Technologies Pvt Ltd
Address	Ratana Business Hub,207, 2nd Floor, Opp Bharat Petrol Pump, Sanathal Chokdi, Changodar Highway, Ahmedabad 382210, Gujarat, India

2.4 General Description for Equipment under Test (EUT)

EUT Name	Ochsner Stove Sensor
Model Name Under Test	Ochsner Stove Sensor1.0
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	1.0
Software Version	test 1.0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

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

Modulation Type	2GFSK, 2FSK
Product Type	<input checked="" type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Frequency Range	902 MHz to 928 MHz
Tested Channel	Low (908.40 MHz), Middle (908.42 MHz), High (916.00 MHz)
Antenna Type	Flex Dipole Antenna
Antenna Gain	0.8 dBi (In test items related to antenna gain, the final results reflect this figure. This value is provided by the applicant.)

2.6 Additional Instructions

EUT Software Settings:

Mode	<input checked="" type="checkbox"/> Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.
------	--

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power level setup in software			
Test Software Version	ttpmacro		
Support Units (Software installation media)	Description	Manufacturer	Model
	Notebook	Lenovo	X220
Mode	Channel	Frequency (MHz)	Soft Set
2GFSK, 2FSK	Low	908.40	Power parameter Settings is 19
	Middle	908.42	
	High	916.00	

Run Software

```

COM13 - Tera Term VT
文件(F) 编辑(E) 设置(S) 控制(O) 窗口(W) 帮助(H)
No command found
>
>
> rx 0
{{{(rx)}}{Rx:Disabled}{Idle:Enabled}{Time:67153256}}
> setZuaveMode 1 3
{{{(setZuaveMode)}}{Zuave:Enabled}{Proniscuous:Enabled}{BeanDetect:Enabled}}
> setTxLength 20
{{{(setTxLength)}}{TxLength:20}{TxLength Written:20}}
> setTXPayload 7 20
{{{(setTXPayload)}}{len:20}{payload: 0x0f 0x0e 0x11 0x22 0x33 0x44 0x55 0x14 0x77 0x88 0x99 0xaa 0xbb 0xcc 0xdd 0xee 0x10 0x11 0x12 0x13}}
> setzuaveregion 1
{{{(setzuaveregion)}}{ZuaveRegion:US-United States}{ZuaveRegionIndex:1}}
> setPower 19 rau
{{{(setPower)}}{powerLevel:19}{power:-1}}
> setchannel 0
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> tx 0
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>
    
```


3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Intentional Radiators
2	RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus
3	RSS-210 Issue 10	Licence-Exempt Radio Apparatus: Category I Equipment
4	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	ISED Part No.	Test Result	Verdict	Remark
1	Antenna Requirement	15.203	RSS-Gen 6.8	--	Pass	Note ¹
2	20 dB and 99% Bandwidth	15.215(c)	RSS-Gen 6.7	ANNEX A.1	Pass	--
3	AC Conducted Emission	15.207	RSS-Gen 8.8	ANNEX A.2	N/A	--
4	Field Strength of Fundamental Emissions	15.249(a)	RSS-Gen 8.9	ANNEX A.3	Pass	
5	Radiated Emission Test Band Edge Measurement	15.249(a) 15.249(d) 15.209	RSS-210 B.10 RSS-Gen 8.9 RSS-Gen 8.10	ANNEX A.4	Pass	Note ²

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

Note²: the limit is 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 15.209

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

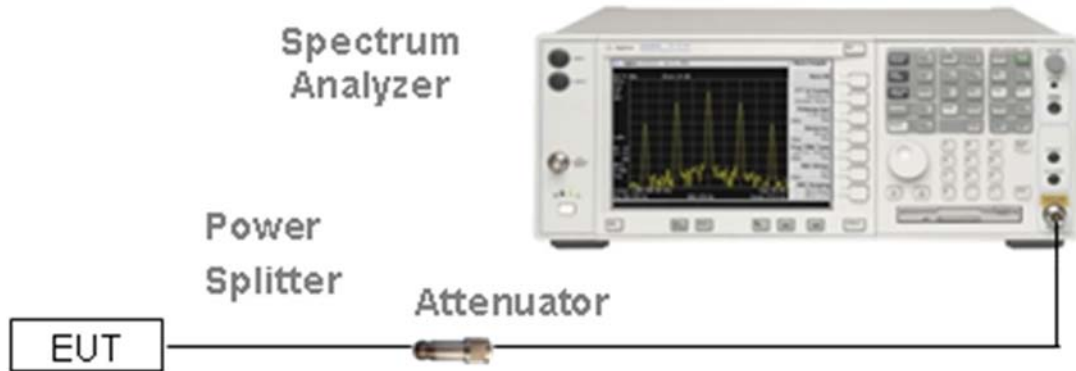
Relative Humidity	45% to 55%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22°C to +25°C
Working Voltage of the EUT	NV (Normal Voltage)	3.0 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2021.04.01	2022.03.31
Bluetooth Signaling Unit	ROHDE&SCHWARZ	CMW500	142028	2021.06.01	2022.05.31
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2021.06.01	2022.05.31
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2021.06.01	2022.05.31
LISN	SCHWARZBECK	NSLK 8127	8127-687	2021.06.01	2022.05.31
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2019.10.29	2021.10.28
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2019.07.02	2022.07.01
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1917	2019.07.02	2022.07.01
Test Antenna-Horn (18-40 GHz)	A-INFO	LB-180400KF	J211060273	2021.01.05	2023.01.04
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2022.02.20
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	N/A	2019.08.08	2022.08.07
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

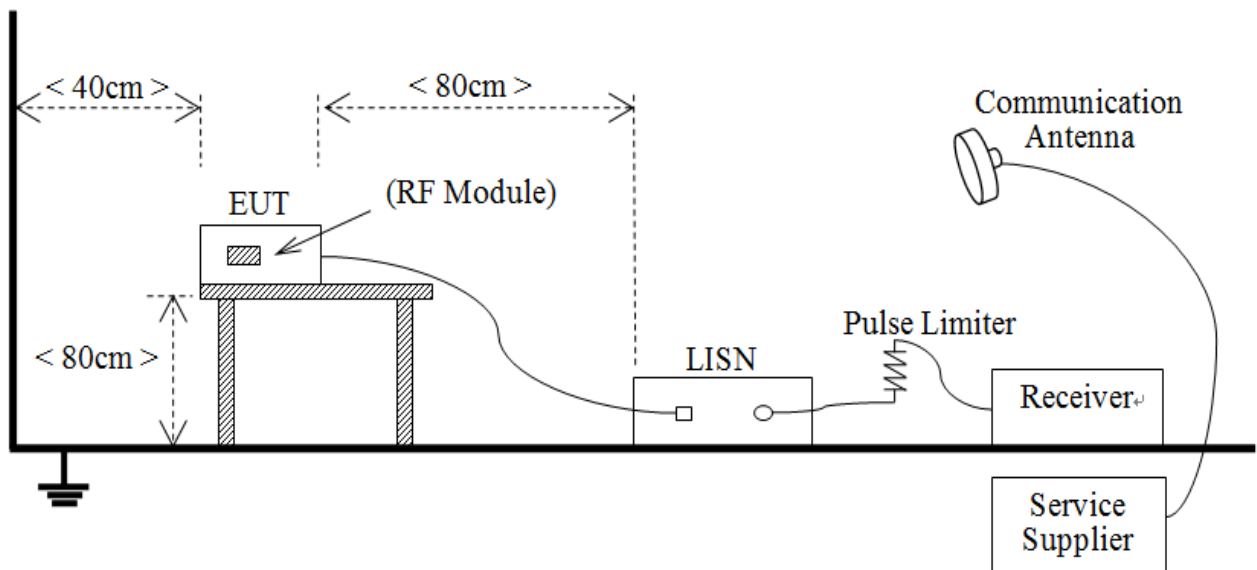
4.3 Description of Test Setup

4.3.1 For Antenna Port Test



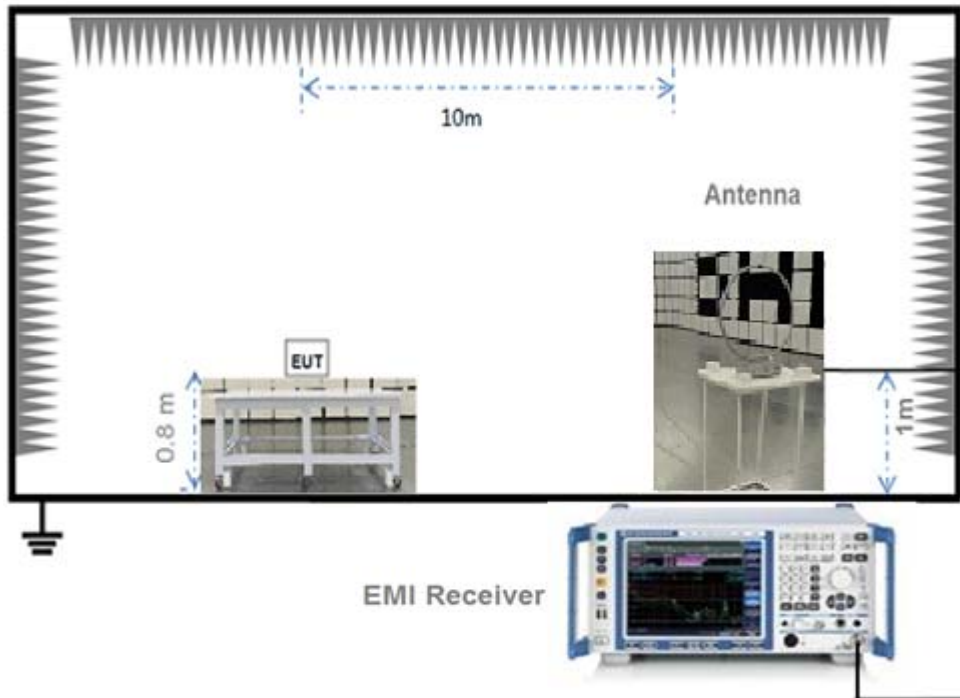
(Diagram 1)

4.3.2 For AC Power Supply Port Test



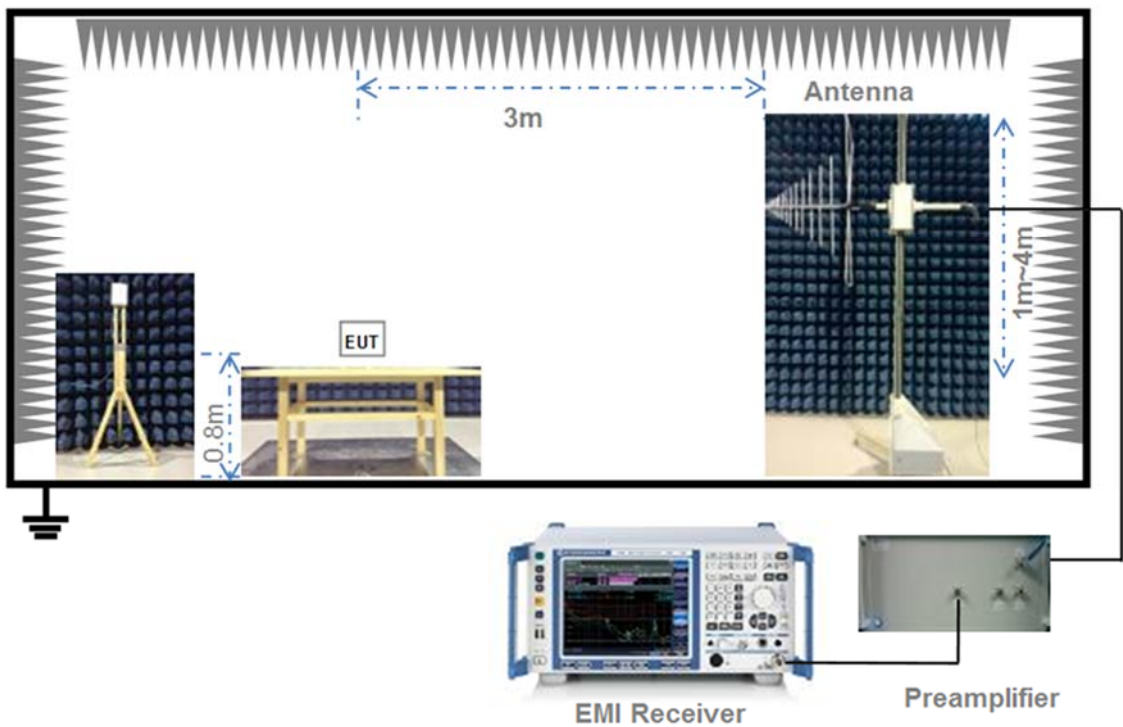
(Diagram 2)

4.3.3 For Radiated Test (Below 30 MHz)



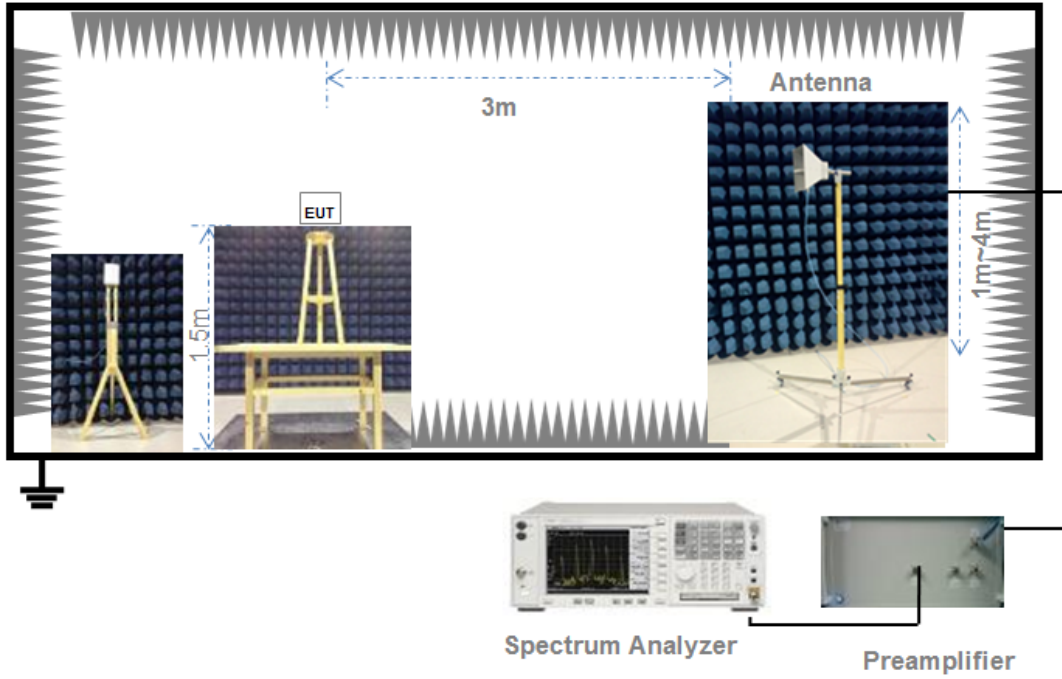
(Diagram 3)

4.3.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.3.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203; RSS-Gen, 6.8

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 20 dB and 99% Bandwidth

5.2.1 Limit

FCC §15.215(c); RSS-Gen, 6.7

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.2.2 Test Setups

See section 4.3.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW \geq 1% of the 20 dB bandwidth

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 AC Conducted Emission

5.3.1 Limit

FCC §15.207; RSS-Gen, 8.8

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

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

5.3.2 Test Setups

See section 4.3.2 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 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.

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.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 field strength of Fundamental emissions

5.4.1 Limit

FCC&15.249(a); RSS-Gen, 8.9

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

5.4.2 Test Setups

See section 4.3.3-4.3.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

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

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

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

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

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Radiated Spurious Emission and Bandedge Measurement

5.5.1 Limit

FCC §15.249(a); FCC §15.249(d); FCC §15.209; RSS-210, B.10; RSS-Gen, 8.9; RSS-Gen, 8.10

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (µV/m)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

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:

- 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 20 dB above the maximum permitted average limit.
- For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.5.2 Test Setups

See section 4.3.3-4.3.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

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

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

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

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

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.5.4 Test Result

Please refer to ANNEX A.4.

ANNEX A TEST RESULT

A.1 20dB bandwidth and 99% bandwidth

Test Data

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	908.40	0.145000	0.124500
Middle	908.42	0.144000	0.124480
High	916.00	0.173000	0.143750

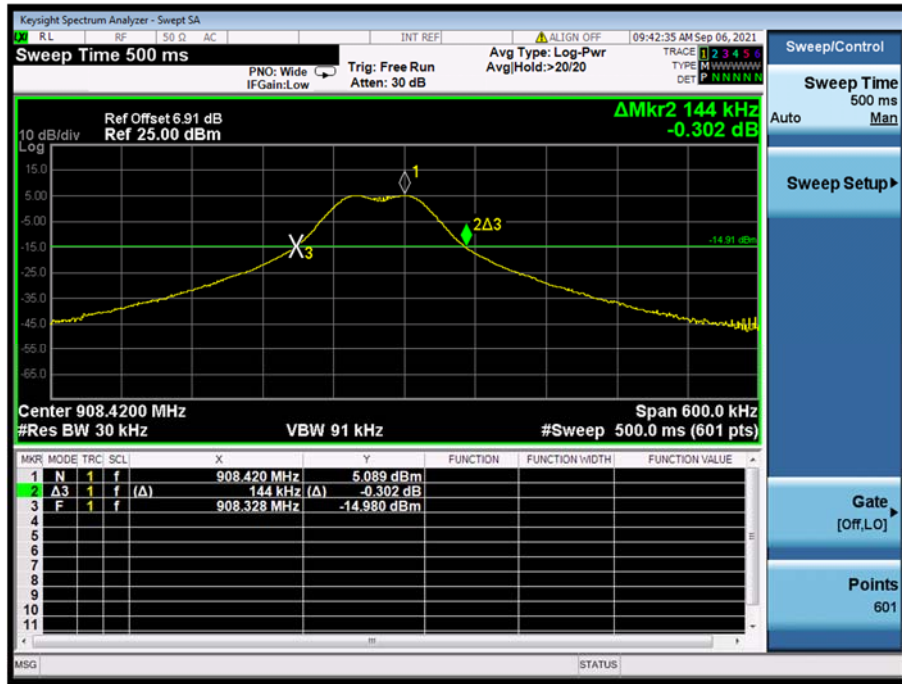
Test plots

20 dB Bandwidth

Low Channel



Middle Channel

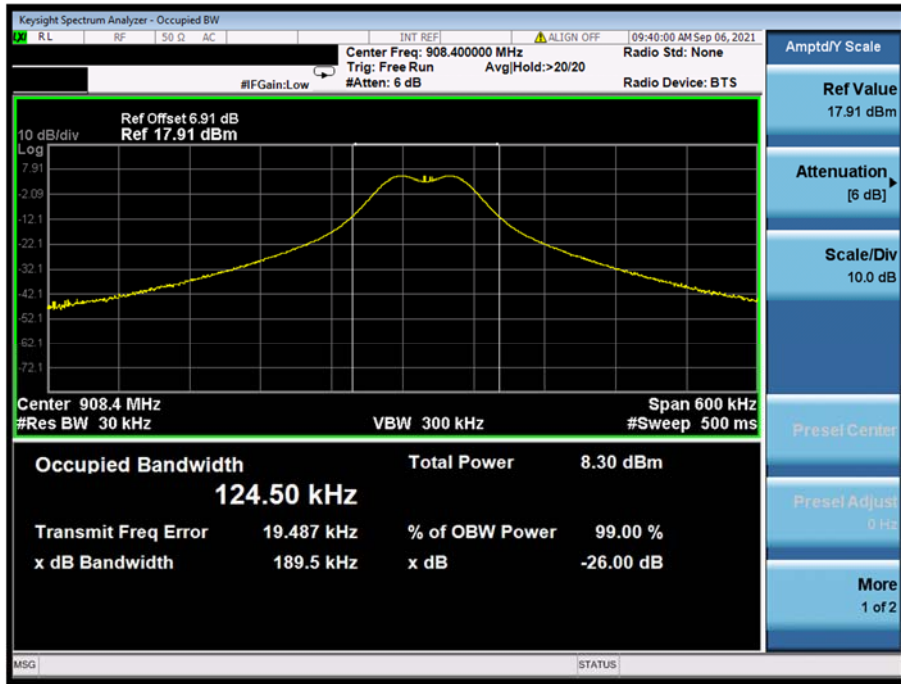


High Channel

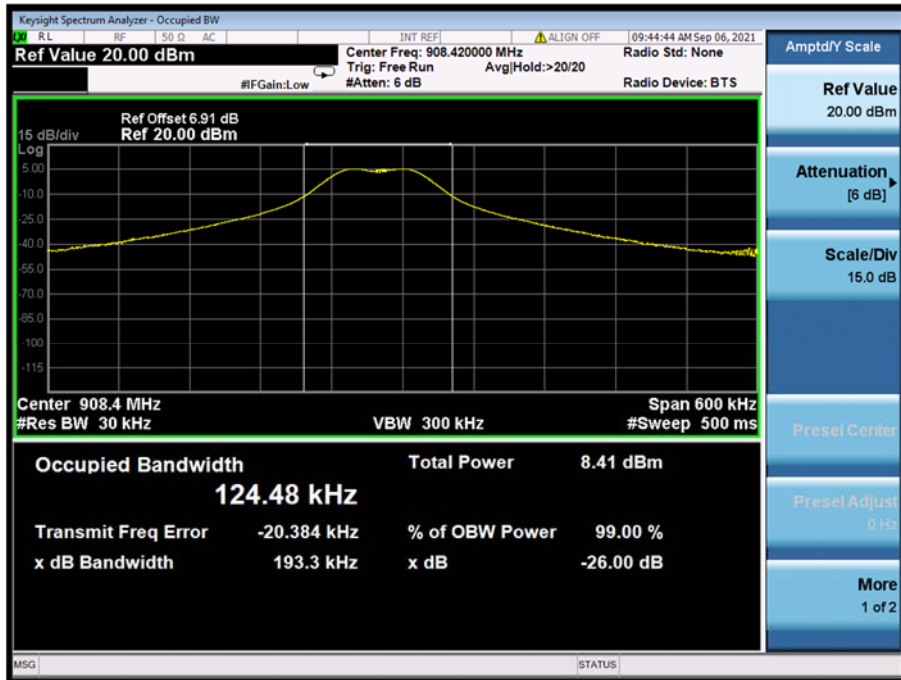


99% dB Bandwidth

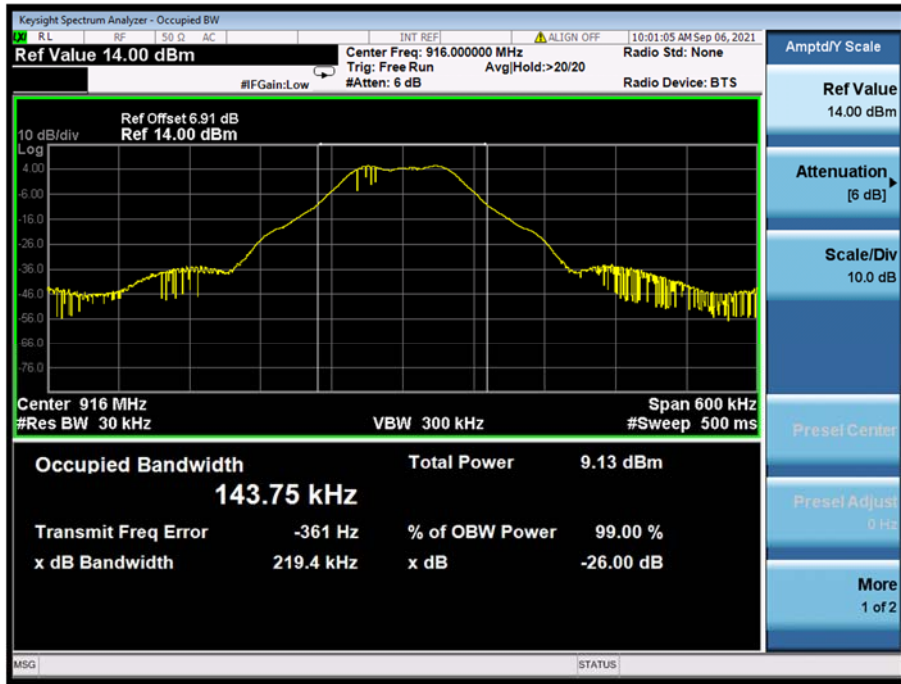
Low Channel



Middle Channel



High Channel



A.2 AC Conducted Emission

Note: The EUT only powered by battery, so the Conducted Emission test is not applicable.

A.3 Field Strength of Fundamental Emissions

Test Data

Operating Frequency (MHz)	Field Strength (dBuV/m)	Factor (dB)	Limit @3m (dBuV/m)	Antenna	Verdict
908.40	93.65	-11.33	94	Horizontal	Pass
	81.14	-11.33	94	Vertical	Pass
908.42	93.26	-11.31	94	Horizontal	Pass
	80.72	-11.31	94	Vertical	Pass
916.00	93.55	-10.72	94	Horizontal	Pass
	83.10	-10.72	94	Vertical	Pass

A.4 Radiated Emission and Bandedge Measurement

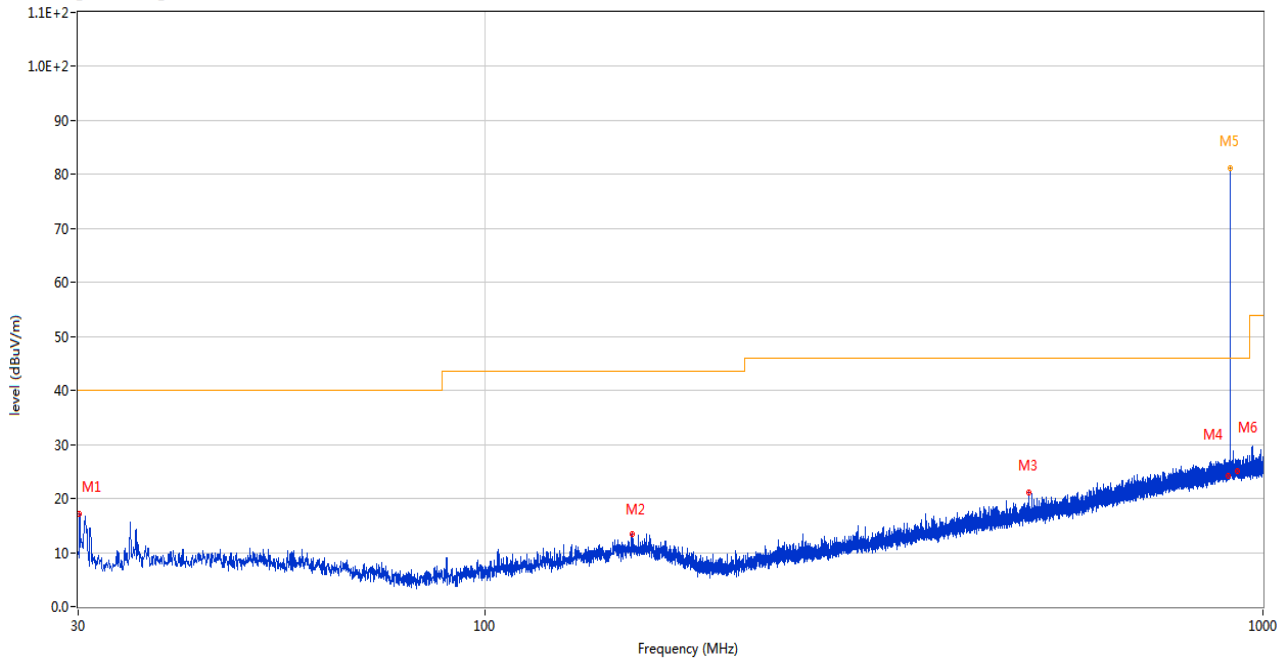
The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Test Data and Plots (30 MHz ~ 1 GHz)

Note: The bold frequency is the fundamental.

Low Channel 30 MHz to 1 GHz, ANT V

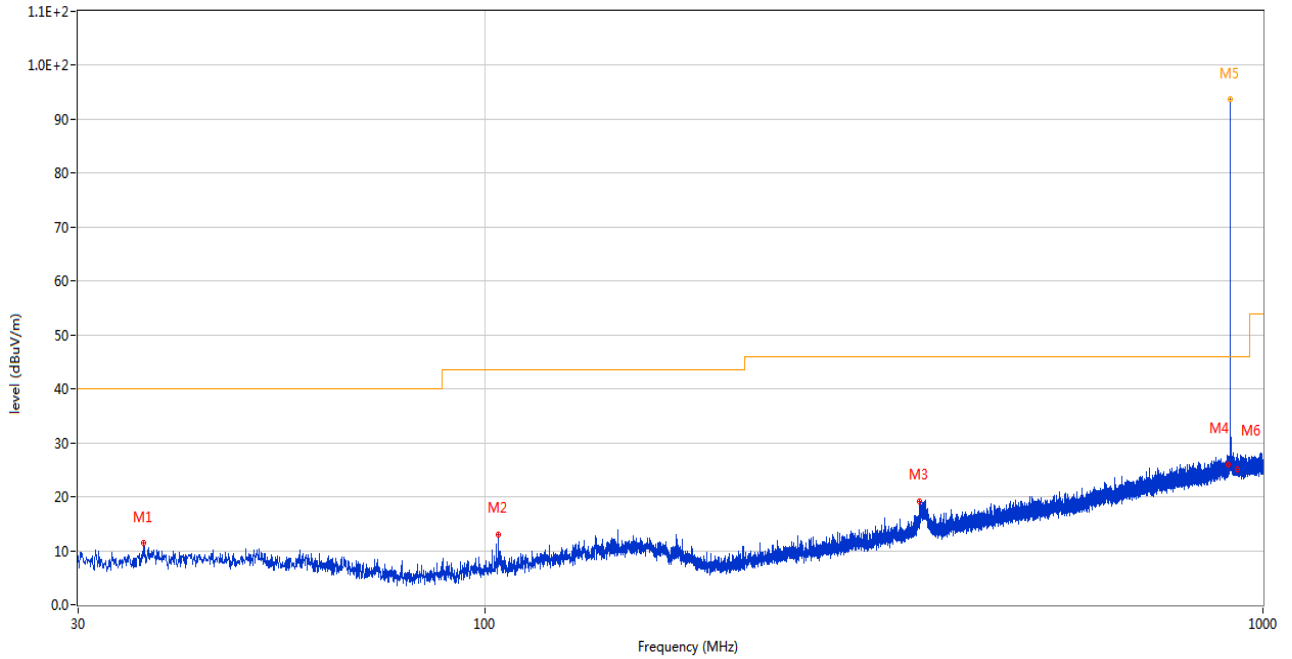
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.097	17.16	-27.33	40.0	-22.84	Peak	316.00	100	Vertical	Pass
2	154.839	13.39	-24.95	43.5	-30.11	Peak	149.00	100	Vertical	Pass
3	499.577	21.09	-19.01	46.0	-24.91	Peak	357.00	100	Vertical	Pass
4	902.000	24.16	-11.37	46.0	-21.84	Peak	220.87	100	Vertical	Pass
5*	908.400	81.14	-11.33	94.0	-12.86	QP	202.00	100	Vertical	N/A
6	928.000	24.99	-10.99	46.0	-21.01	Peak	210.53	100	Vertical	Pass

Low Channel 30 MHz to 1 GHz, ANT H

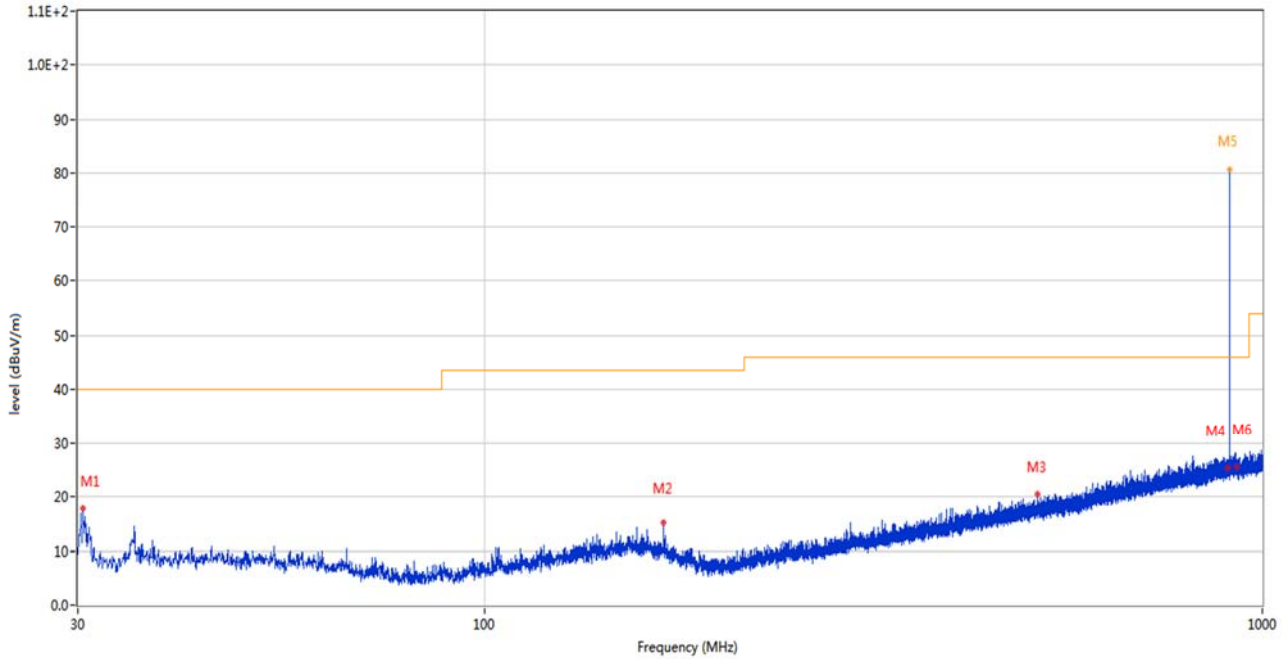
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	36.450	11.35	-26.53	40.0	-28.65	Peak	106.00	100	Horizontal	Pass
2	104.060	12.97	-28.83	43.5	-30.53	Peak	241.00	100	Horizontal	Pass
3	362.177	19.04	-22.39	46.0	-26.96	Peak	122.00	100	Horizontal	Pass
4	902.000	25.92	-11.37	46.0	-20.08	Peak	262.25	100	Horizontal	Pass
5*	908.400	93.65	-11.33	94.0	-0.35	QP	359.00	100	Horizontal	N/A
6	928.000	25.04	-10.99	46.0	-20.96	Peak	233.29	100	Horizontal	Pass

Middle Channel 30 MHz to 1 GHz, ANT V

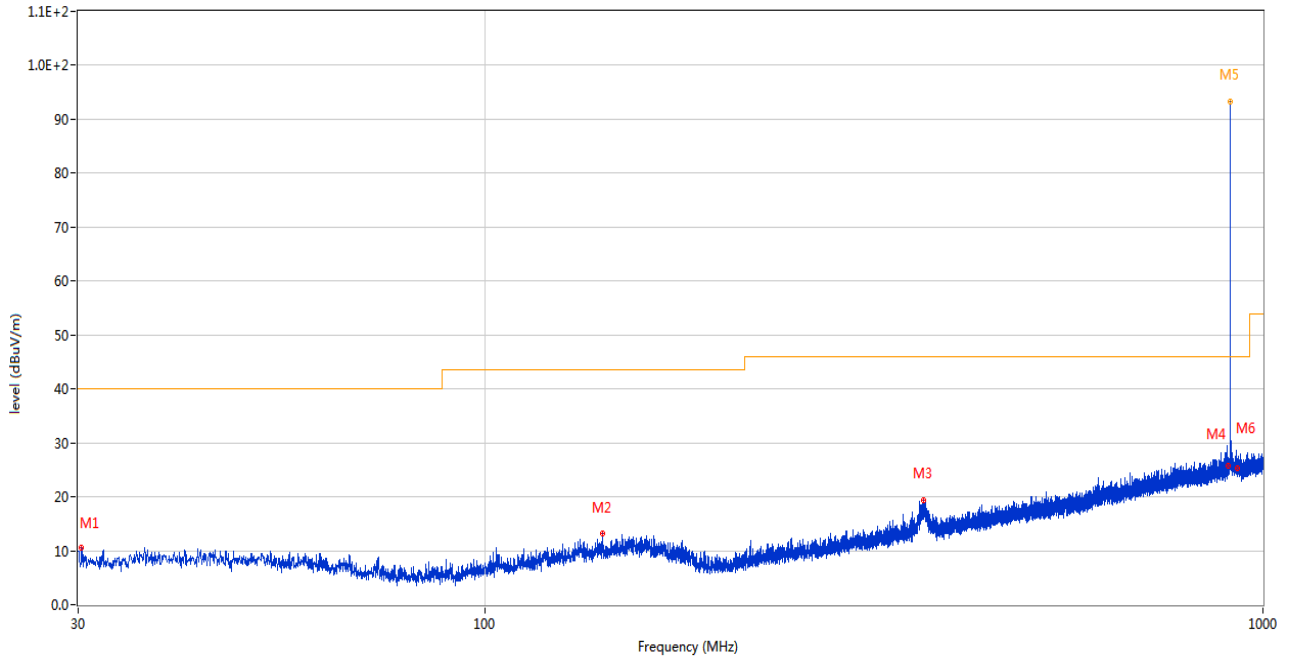
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.436	17.85	-27.27	40.0	-22.15	Peak	282.00	100	Vertical	Pass
2	169.680	15.09	-25.53	43.5	-28.41	Peak	360.00	100	Vertical	Pass
3	514.466	20.53	-18.33	46.0	-25.47	Peak	106.00	100	Vertical	Pass
4	902.000	25.20	-11.37	46.0	-20.80	Peak	8.00	100	Vertical	Pass
5*	908.420	80.72	-11.31	94.0	-13.28	QP	337.00	100	Vertical	N/A
6	928.000	25.53	-10.99	46.0	-20.47	Peak	298.98	100	Vertical	Pass

Middle Channel 30 MHz to 1 GHz, ANT H

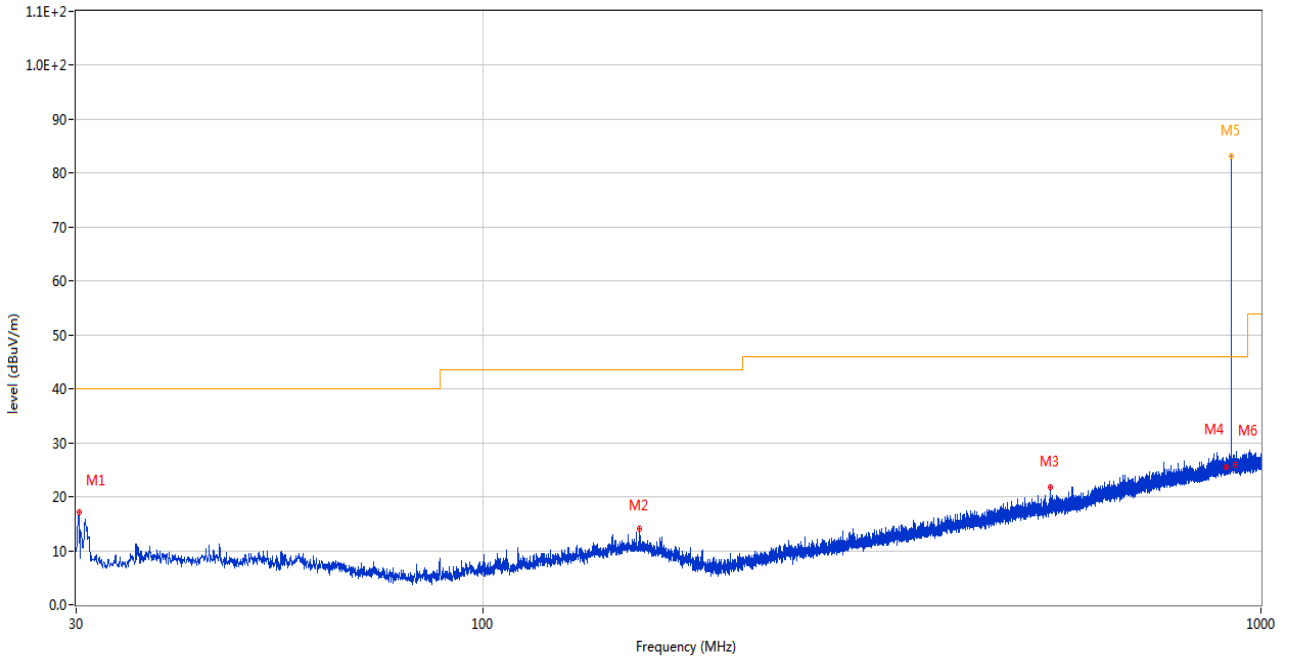
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.291	10.45	-27.29	40.0	-29.55	Peak	77.00	100	Horizontal	Pass
2	141.792	13.09	-25.66	43.5	-30.41	Peak	114.00	100	Horizontal	Pass
3	366.784	19.44	-22.33	46.0	-26.56	Peak	360.00	100	Horizontal	Pass
4	902.000	25.64	-11.37	46.0	-20.36	Peak	293.00	100	Horizontal	Pass
5*	908.420	93.26	-11.31	94.0	-0.74	QP	348.00	100	Horizontal	N/A
6	928.000	25.35	-10.99	46.0	-20.65	Peak	193.80	100	Horizontal	Pass

High Channel 30 MHz to 1 GHz, ANT V

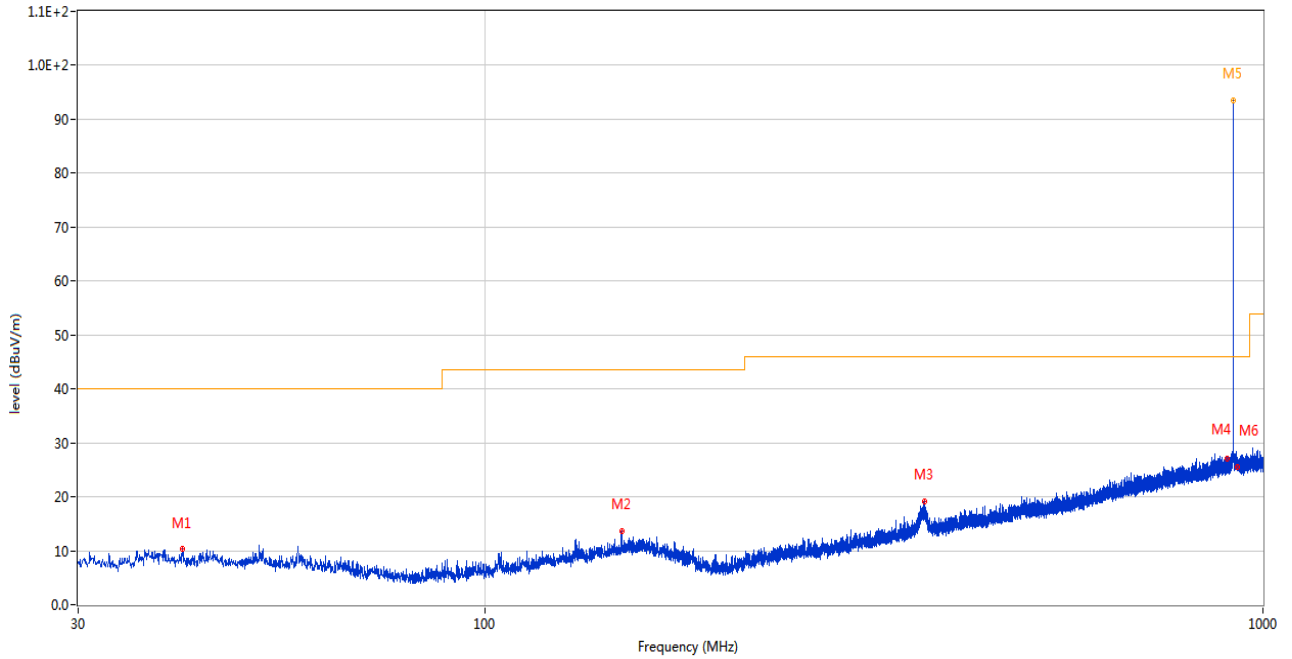
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.242	17.23	-27.30	40.0	-22.77	Peak	0.00	200	Vertical	Pass
2	159.107	14.03	-24.55	43.5	-29.47	Peak	0.00	200	Vertical	Pass
3	535.612	21.71	-17.71	46.0	-24.29	Peak	0.00	200	Vertical	Pass
4	902.000	25.43	-11.37	46.0	-20.57	Peak	194.88	100	Vertical	Pass
5*	916.000	83.10	-10.72	94.0	-10.90	QP	313.00	200	Vertical	N/A
6	928.000	26.03	-10.99	46.0	-19.97	Peak	93.39	200	Vertical	Pass

High Channel 30 MHz to 1 GHz, ANT H

RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	40.816	10.26	-26.21	40.0	-29.74	Peak	360.00	200	Horizontal	Pass
2	149.795	13.56	-24.97	43.5	-29.94	Peak	360.00	200	Horizontal	Pass
3	366.832	19.22	-22.33	46.0	-26.78	Peak	360.00	200	Horizontal	Pass
4	902.000	27.09	-11.37	46.0	-18.91	Peak	360.00	200	Horizontal	Pass
5*	916.000	93.55	-10.72	94.0	-0.45	QP	186.00	100	Horizontal	N/A
6	928.000	25.49	-10.99	46.0	-20.51	Peak	262.37	147	Horizontal	Pass

Test Data and Plots (1 GHz ~ 10th Harmonic)

Note¹: The marked is the harmonic signal.

Note²: Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

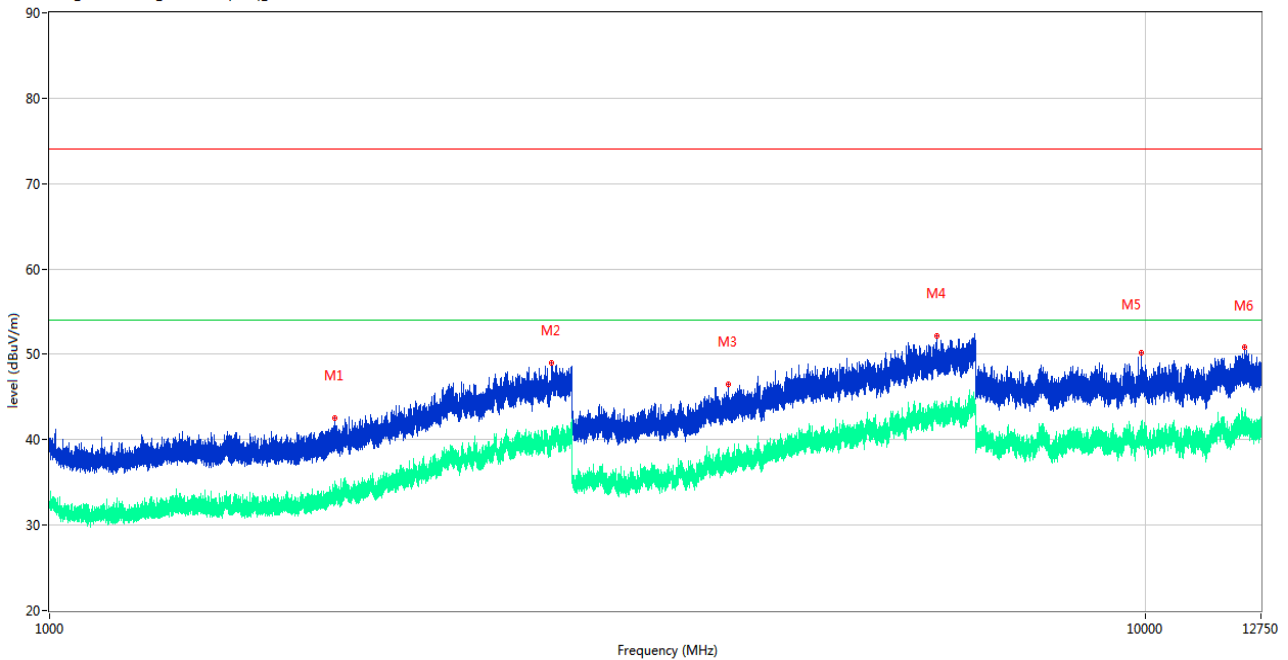
Note³: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Note⁴: Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Note⁵: Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

LOW CHANNEL 1 GHz to 10 GHz, ANT V

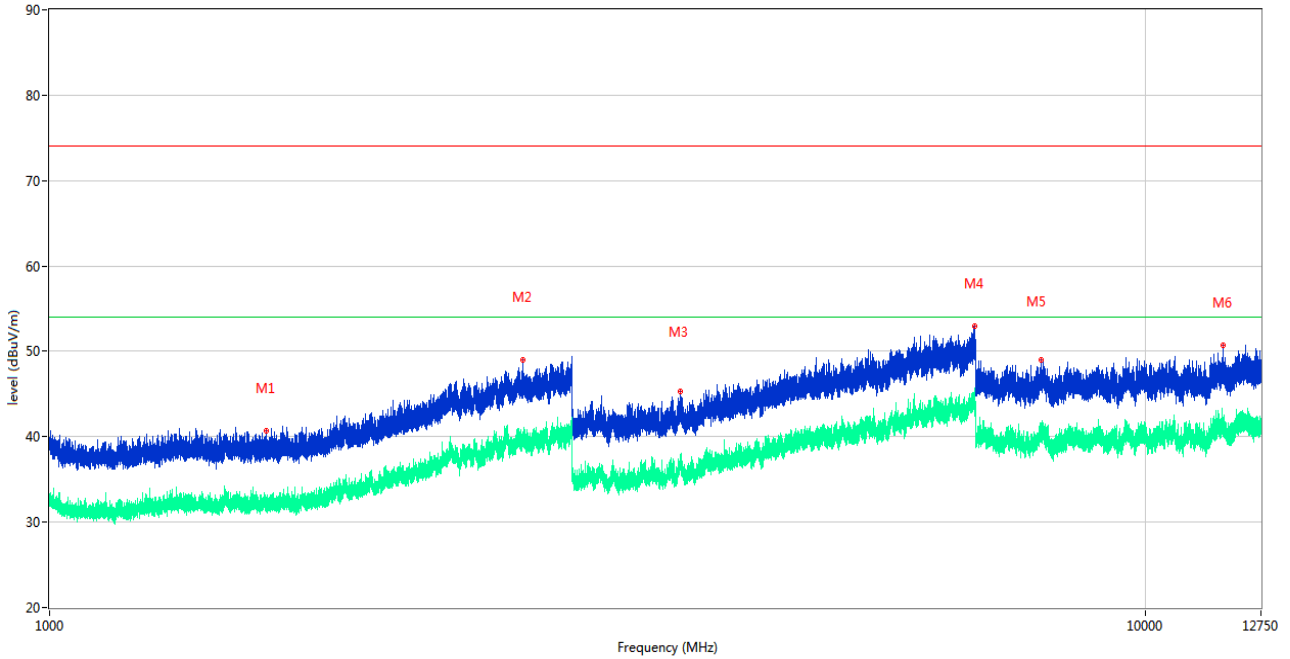
RE Test case_FCC Part 15C_FCC 15.247(2.4G)_1GHz-12.75GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1822.500	42.55	-10.69	74.0	-31.45	Peak	300.00	150	Vertical	Pass
1**	1822.500	33.24	-10.69	54.0	-20.76	AV	300.00	150	Vertical	Pass
2	2873.400	48.98	-3.31	74.0	-25.02	Peak	91.00	150	Vertical	Pass
2**	2873.400	40.00	-3.31	54.0	-14.00	AV	91.00	150	Vertical	Pass
3	4162.200	46.49	-3.49	74.0	-27.51	Peak	103.00	150	Vertical	Pass
3**	4162.200	37.49	-3.49	54.0	-16.51	AV	103.00	150	Vertical	Pass
4	6450.000	52.20	2.85	74.0	-21.80	Peak	0.00	150	Vertical	Pass
4**	6450.000	43.19	2.85	54.0	-10.81	AV	0.00	150	Vertical	Pass
5	9926.750	50.19	17.80	74.0	-23.81	Peak	63.00	150	Vertical	Pass
5**	9926.750	40.30	17.80	54.0	-13.70	AV	63.00	150	Vertical	Pass
6	12323.925	50.78	19.90	74.0	-23.22	Peak	29.00	150	Vertical	Pass
6**	12323.925	41.30	19.90	54.0	-12.70	AV	29.00	150	Vertical	Pass

LOW CHANNEL 1 GHz to 10 GHz, ANT H

RE Test case_FCC Part 15C_FCC 15.247(2.4G)_1GHz-12.75GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1575.400	40.65	-11.85	74.0	-33.35	Peak	281.00	150	Horizontal	Pass
1**	1575.400	31.85	-11.85	54.0	-22.15	AV	281.00	150	Horizontal	Pass
2	2702.600	48.95	-4.70	74.0	-25.05	Peak	71.00	150	Horizontal	Pass
2**	2702.600	39.19	-4.70	54.0	-14.81	AV	71.00	150	Horizontal	Pass
3	3766.000	45.27	-4.44	74.0	-28.73	Peak	128.00	150	Horizontal	Pass
3**	3766.000	36.96	-4.44	54.0	-17.04	AV	128.00	150	Horizontal	Pass
4	6981.000	52.92	4.82	74.0	-21.08	Peak	62.00	150	Horizontal	Pass
4**	6981.000	44.63	4.82	54.0	-9.37	AV	62.00	150	Horizontal	Pass
5	8033.275	48.99	18.22	74.0	-25.01	Peak	67.00	150	Horizontal	Pass
5**	8033.275	40.23	18.22	54.0	-13.77	AV	67.00	150	Horizontal	Pass
6	11764.163	50.69	18.82	74.0	-23.31	Peak	353.00	150	Horizontal	Pass
6**	11764.163	42.29	18.82	54.0	-11.71	AV	353.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT V

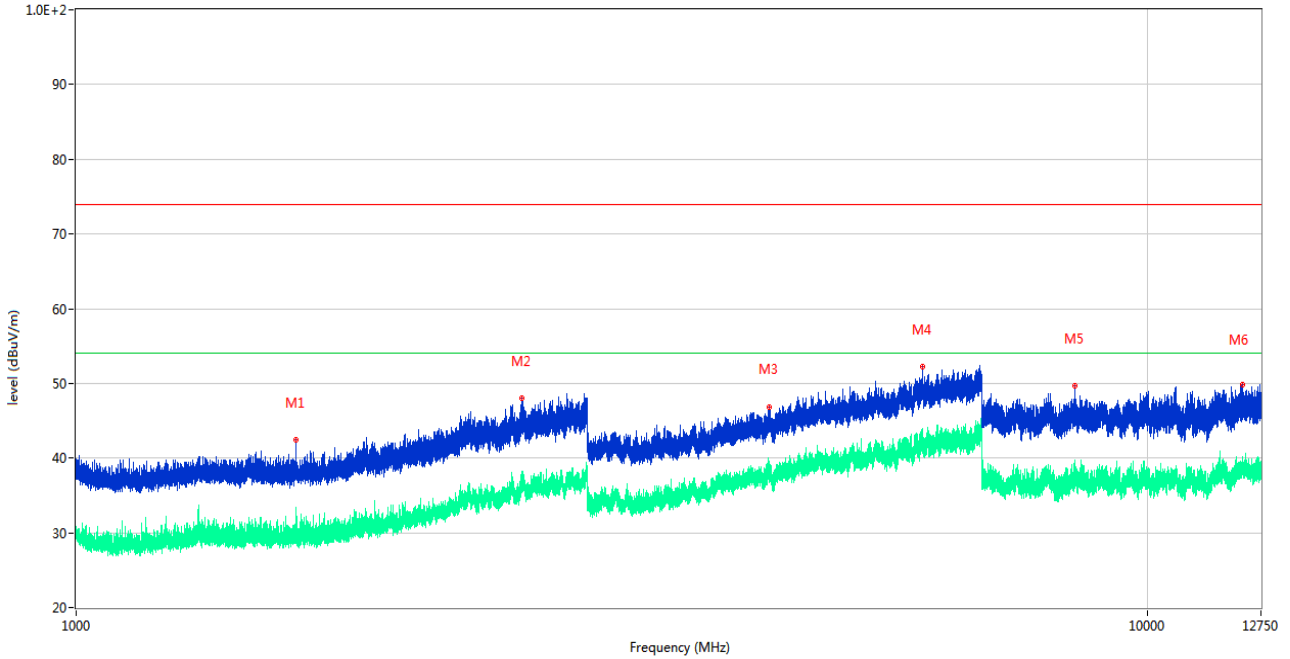
RE Test case_FCC Part 15C_FCC 15.247(2.4G)_1GHz-12.75GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1305.200	40.68	-11.17	74.0	-33.32	Peak	135.00	150	Horizontal	Pass
1**	1305.200	29.39	-11.17	54.0	-24.61	AV	135.00	150	Horizontal	Pass
2	2324.900	46.80	-5.92	74.0	-27.20	Peak	69.00	150	Horizontal	Pass
2**	2324.900	34.79	-5.92	54.0	-19.21	AV	69.00	150	Horizontal	Pass
3	2995.400	49.90	-2.60	74.0	-24.10	Peak	146.00	150	Horizontal	Pass
3**	2995.400	37.18	-2.60	54.0	-16.82	AV	146.00	150	Horizontal	Pass
4	5312.800	49.65	0.15	74.0	-24.35	Peak	19.00	150	Horizontal	Pass
4**	5312.800	39.67	0.15	54.0	-14.33	AV	19.00	150	Horizontal	Pass
5	6917.000	52.76	4.69	74.0	-21.24	Peak	162.00	150	Horizontal	Pass
5**	6917.000	43.24	4.69	54.0	-10.76	AV	162.00	150	Horizontal	Pass
6	12246.300	49.99	20.45	74.0	-24.01	Peak	284.00	150	Horizontal	Pass
6**	12246.300	39.16	20.45	54.0	-14.84	AV	284.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT H

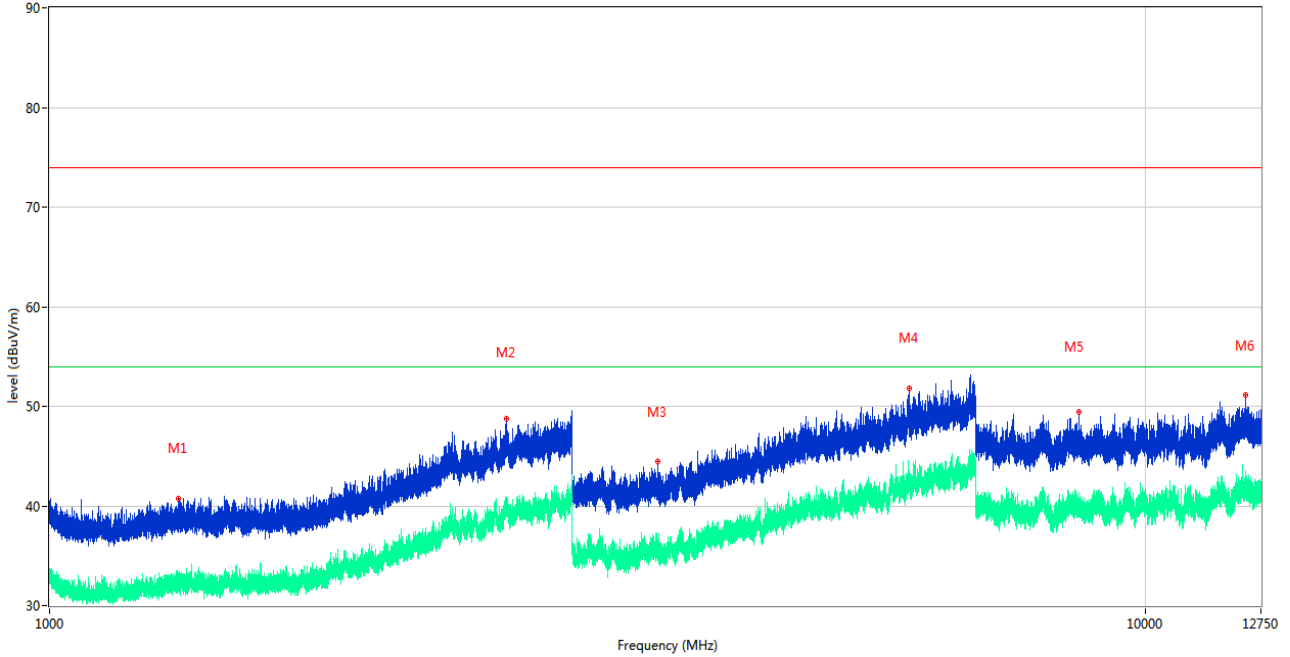
RE Test case_FCC Part 15C_FCC 15.247(2.4G)_1GHz-12.75GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1602.100	42.44	-11.74	74.0	-31.56	Peak	264.00	150	Vertical	Pass
1**	1602.100	29.72	-11.74	54.0	-24.28	AV	264.00	150	Vertical	Pass
2	2605.900	48.10	-4.19	74.0	-25.90	Peak	264.00	150	Vertical	Pass
2**	2605.900	36.25	-4.19	54.0	-17.75	AV	264.00	150	Vertical	Pass
3	4428.400	46.88	-2.13	74.0	-27.12	Peak	189.00	150	Vertical	Pass
3**	4428.400	38.37	-2.13	54.0	-15.63	AV	189.00	150	Vertical	Pass
4	6163.800	52.21	2.52	74.0	-21.79	Peak	0.00	150	Vertical	Pass
4**	6163.800	42.04	2.52	54.0	-11.96	AV	0.00	150	Vertical	Pass
5	8551.350	49.74	18.32	74.0	-24.26	Peak	186.00	150	Vertical	Pass
5**	8551.350	37.12	18.32	54.0	-16.88	AV	186.00	150	Vertical	Pass
6	12244.000	49.83	20.44	74.0	-24.17	Peak	13.00	150	Vertical	Pass
6**	12244.000	38.24	20.44	54.0	-15.76	AV	13.00	150	Vertical	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT V

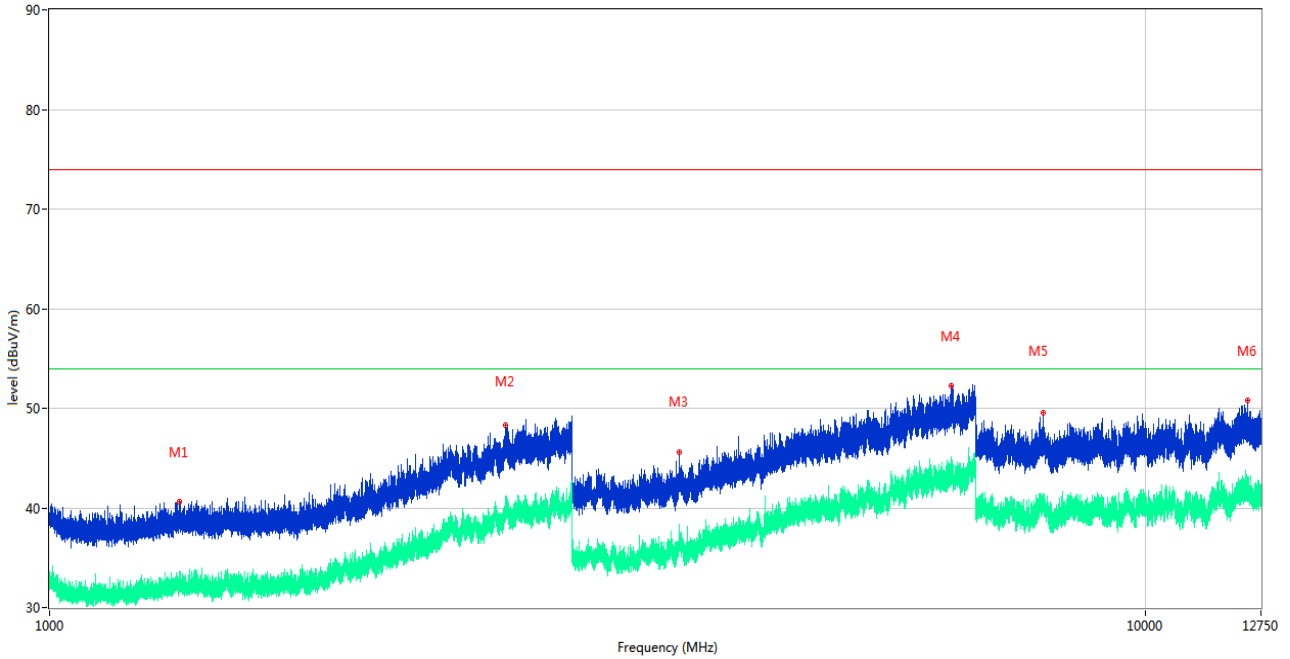
RE Test case_FCC Part 15C_FCC 15.247(2.4G)_1GHz-12.75GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1310.000	40.73	-11.29	74.0	-33.27	Peak	161.00	150	Horizontal	Pass
1**	1310.000	31.52	-11.29	54.0	-22.48	AV	161.00	150	Horizontal	Pass
2	2614.300	48.71	-4.17	74.0	-25.29	Peak	291.00	150	Horizontal	Pass
2**	2614.300	39.49	-4.17	54.0	-14.51	AV	291.00	150	Horizontal	Pass
3	3590.600	44.47	-5.81	74.0	-29.53	Peak	356.00	150	Horizontal	Pass
3**	3590.600	35.29	-5.81	54.0	-18.71	AV	356.00	150	Horizontal	Pass
4	6096.000	51.85	2.64	74.0	-22.15	Peak	130.00	150	Horizontal	Pass
4**	6096.000	42.34	2.64	54.0	-11.66	AV	130.00	150	Horizontal	Pass
5	8692.799	49.40	17.76	74.0	-24.60	Peak	219.00	150	Horizontal	Pass
5**	8692.799	40.02	17.76	54.0	-13.98	AV	219.00	150	Horizontal	Pass
6	12340.888	51.18	19.78	74.0	-22.82	Peak	231.00	150	Horizontal	Pass
6**	12340.888	41.53	19.78	54.0	-12.47	AV	231.00	150	Horizontal	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT H

RE Test case_FCC Part 15C_FCC 15.247(2.4G)_1GHz-12.75GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1314.700	40.59	-11.05	74.0	-33.41	Peak	358.00	150	Vertical	Pass
1**	1314.700	32.13	-11.05	54.0	-21.87	AV	358.00	150	Vertical	Pass
2	2604.000	48.31	-4.31	74.0	-25.69	Peak	262.00	150	Vertical	Pass
2**	2604.000	39.40	-4.31	54.0	-14.60	AV	262.00	150	Vertical	Pass
3	3758.000	45.55	-4.35	74.0	-28.45	Peak	282.00	150	Vertical	Pass
3**	3758.000	36.45	-4.35	54.0	-17.55	AV	282.00	150	Vertical	Pass
4	6650.600	52.23	4.58	74.0	-21.77	Peak	215.00	150	Vertical	Pass
4**	6650.600	43.06	4.58	54.0	-10.94	AV	215.00	150	Vertical	Pass
5	8064.325	49.60	18.26	74.0	-24.40	Peak	308.00	150	Vertical	Pass
5**	8064.325	40.43	18.26	54.0	-13.57	AV	308.00	150	Vertical	Pass
6	12390.050	50.84	19.30	74.0	-23.16	Peak	275.00	150	Vertical	Pass
6**	12390.050	41.73	19.30	54.0	-12.27	AV	275.00	150	Vertical	Pass

Test Data and Plots (Band edge)

Note¹: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

Note²: 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.

Note³: According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

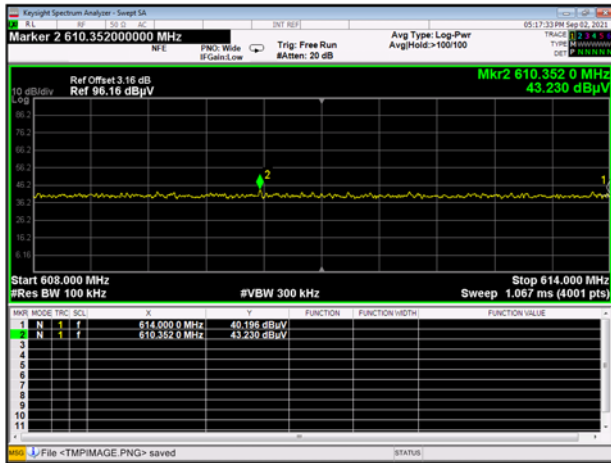
Note⁴: The Level (dBuV/m) has been corrected by factor.

Test Data

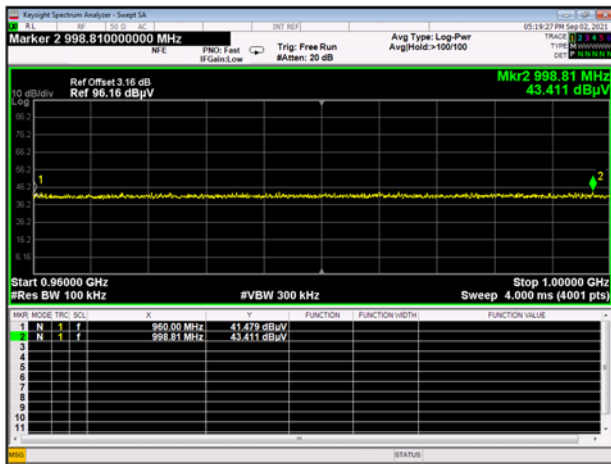
Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Factor (dB)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
ZWAVE	Low	614	43.230	3.16	46	-2.770	QP	Pass
	HIGH	960	48.093	28.00	54	-5.907	QP	Pass

Test plots

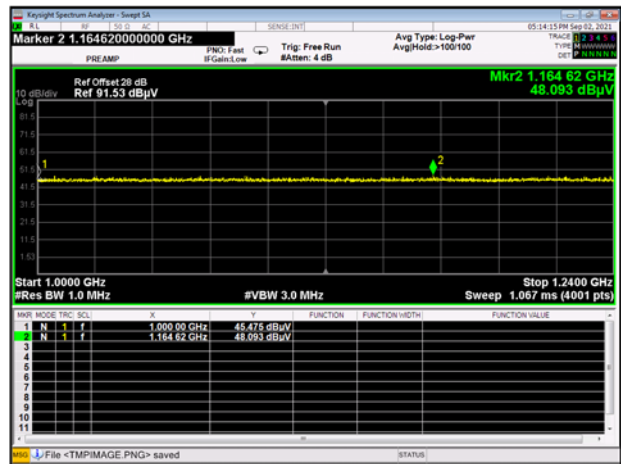
LOW CHANNEL, PEAK



HIGH CHANNEL, PEAK



HIGH CHANNEL, PEAK



ANNEX B TEST SETUP PHOTOS

Please refer the document "BL-SZ2180917-AR.PDF".

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document "BL-SZ2180917-AW.PDF".

ANNEX D EUT INTERNAL PHOTOS

Please refer the document "BL-SZ2180917-AI.PDF".

--END OF REPORT--