

RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
Zwave 700 Mikrobus Module

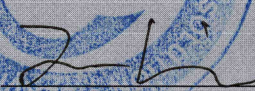
ISSUED TO
Volansys Technologies Pvt Ltd

Block A-7th Floor, Safal Profitaire, Corporate Road, Prahladnagar,
Ahmedabad-380015, Gujarat, India



Tested by: 
Ye Hongji

Date: Jul. 29, 2021

Approved by: 

Liao Jianming

(Technical Director)

Date: Jul. 29, 2021

Report No.: BL-SZ2141004-601

EUT Name: Zwave 700 Mikrobus Module

Model Name: MS-ZGM130S

Brand Name: Volansys

Test Standard: 47 CFR Part 15 Subpart C

RSS-210 Issue 10

RSS-Gen Issue 5

FCC ID: 2AKNO-ZW700

ISED Number: 22256-ZW700

Test Conclusion: Pass

Test Date: Jun. 25, 2021 ~ Jul. 26, 2021

Date of Issue: Jul. 29, 2021

NOTE: This test report of test results only related to testing samples, which can be duplicated completely for the legal use with the approval of the applicant; it shall not be reproduced except in full, without the written approval of Shenzhen BALUN Technology Co., Ltd. Any objections should be raised within thirty days from the date of issue. To validate the report, please contact us.

Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Jul. 29, 2021</u>	<u>Initial Issue</u>

TABLE OF CONTENTS

1	ADMINISTRATIVE DATA (GENERAL INFORMATION)	4
1.1	Identification of the Testing Laboratory	4
1.2	Identification of the Responsible Testing Location	4
1.3	Laboratory Condition	4
1.4	Announce	4
2	PRODUCT INFORMATION	5
2.1	Applicant Information	5
2.2	Manufacturer Information	5
2.3	Factory Information	5
2.4	General Description for Equipment under Test (EUT)	5
2.5	Technical Information	5
2.6	Additional Instructions	6
3	SUMMARY OF TEST RESULTS	7
3.1	Test Standards	7
3.2	Verdict	7
4	GENERAL TEST CONFIGURATIONS	8
4.1	Test Environments	8
4.2	Test Equipment List	8
4.3	Description of Test Setup	9
4.3.1	For Antenna Port Test	9
4.3.2	For AC Power Supply Port Test	9
4.3.3	For Radiated Test (Below 30 MHz)	10
4.3.4	For Radiated Test (30 MHz-1 GHz)	10
4.3.5	For Radiated Test (Above 1 GHz)	11
5	TEST ITEMS	12
5.1	Antenna Requirements	12
5.1.1	Relevant Standards	12

5.1.2	Antenna Anti-Replacement Construction	12
5.1.3	Antenna Gain	12
5.2	20 dB and 99% Bandwidth	13
5.2.1	Limit.....	13
5.2.2	Test Setups	13
5.2.3	Test Procedure.....	13
5.2.4	Test Result	13
5.3	AC Conducted Emission	14
5.3.1	Limit.....	14
5.3.2	Test Setups	14
5.3.3	Test Procedure.....	14
5.3.4	Test Result	14
5.4	field strength of Fundamental emissions.....	15
5.4.1	Limit.....	15
5.4.2	Test Setups	15
5.4.3	Test Procedure.....	15
5.4.4	Test Result	15
5.5	Radiated Spurious Emission and Bandedge Measurement.....	16
5.5.1	Limit.....	16
5.5.2	Test Setups	16
5.5.3	Test Procedure.....	16
5.5.4	Test Result	17
ANNEX A	TEST RESULT	18
A.1	20dB bandwidth and 99% bandwidth.....	18
A.2	AC Conducted Emission	22
A.3	Field Strength of Fundamental Emissions	26
A.4	Radiated Emission and Bandedge Measurement.....	27
ANNEX B	TEST SETUP PHOTOS	47
ANNEX C	EUT EXTERNAL PHOTOS	47
ANNEX D	EUT INTERNAL PHOTOS	47

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 an 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	Volansys Technologies Pvt Ltd
Address	Block A-7th Floor, Safal Profitaire, Corporate Road, Prahladnagar, Ahmedabad-380015, Gujarat, India

2.2 Manufacturer Information

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

2.4 General Description for Equipment under Test (EUT)

EUT Name	Zwave 700 Mikrobus Module
Model Name Under Test	MS-ZGM130S
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	2.0
Software Version	2.0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

Network and Wireless connectivity	Z-Wave
-----------------------------------	--------

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

Modulation Type	FSK
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Frequency Range	908.40 MHz to 916.00 MHz
Tested Channel	Low (908.40 MHz), Middle (908.42 MHz), High (916.00 MHz)
Antenna Type	Flex Patch Antenna
Antenna Gain	1.0 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

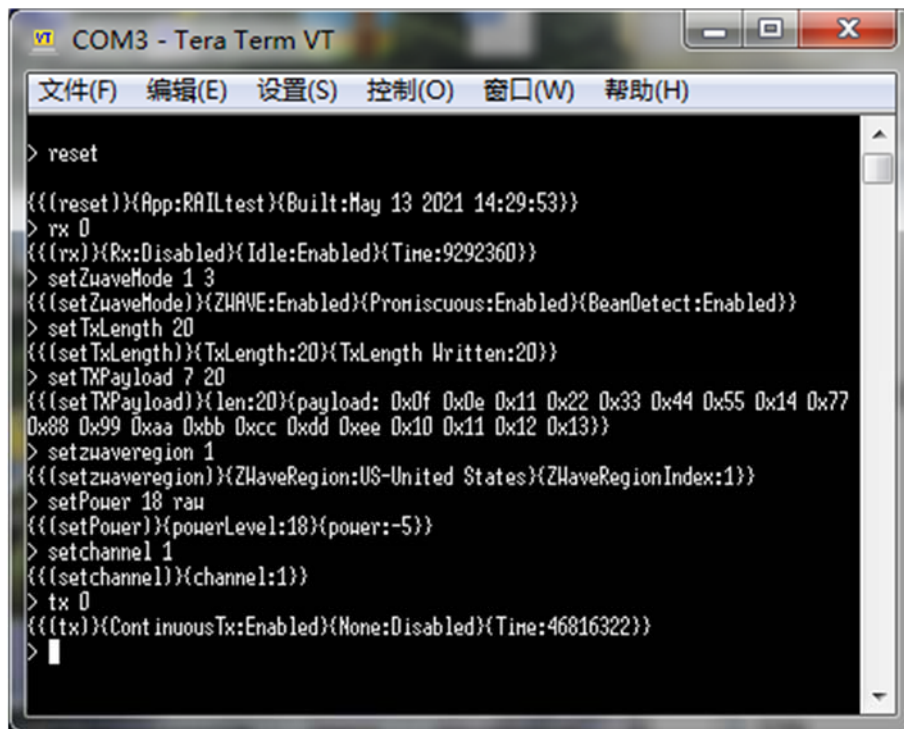
EUT Software Settings:

Mode	☒ 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	Tera Term		
Support Units (Software installation media)	Description	Manufacturer	Model
	Notebook	Lenovo	X220
Mode	Channel	Frequency (MHz)	Soft Set
FSK	Low	908.40	Power parameter Settings is 18
	Middle	908.42	
	High	916.00	

Run Software



```

> reset
{{{reset}}}{App:RAILtest}{Built:May 13 2021 14:29:53}}
> rx 0
{{{rx}}}{Rx:Disabled}{Idle:Enabled}{Time:9292360}}
> setZuaveMode 1 3
{{{setZuaveMode}}}{ZHAVE:Enabled}{Promiscuous:Enabled}{BeamDetect: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}}}{ZHaveRegion:US-United States}{ZHaveRegionIndex:1}}
> setPower 18 rau
{{{setPower}}}{powerLevel:18}{power:-5}}
> setchannel 1
{{{setchannel}}}{channel:1}}
> tx 0
{{{tx}}}{Cont inuousTx:Enabled}{None:Disabled}{Time:46816322}}
>

```

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	Pass	--
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

Note³: This product has two kinds of antenna match circuits about ZWAVE module, these two circuits have been tested in this report.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

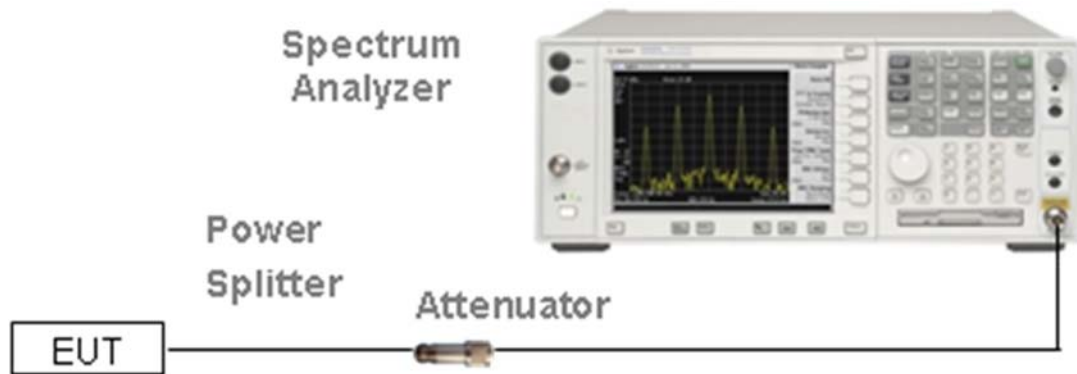
Relative Humidity	45% to 55%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22°C to +25°C
Working Voltage of the EUT	NV (Normal Voltage)	3.3 V

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	2018.08.08	2021.08.07
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

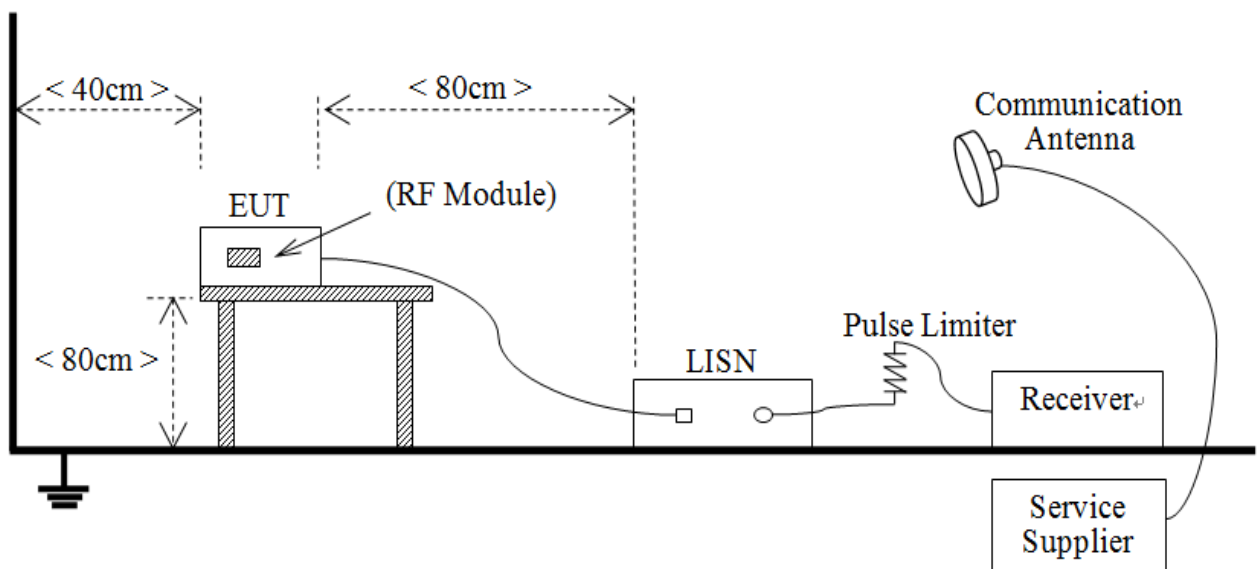
4.3 Description of Test Setup

4.3.1 For Antenna Port Test



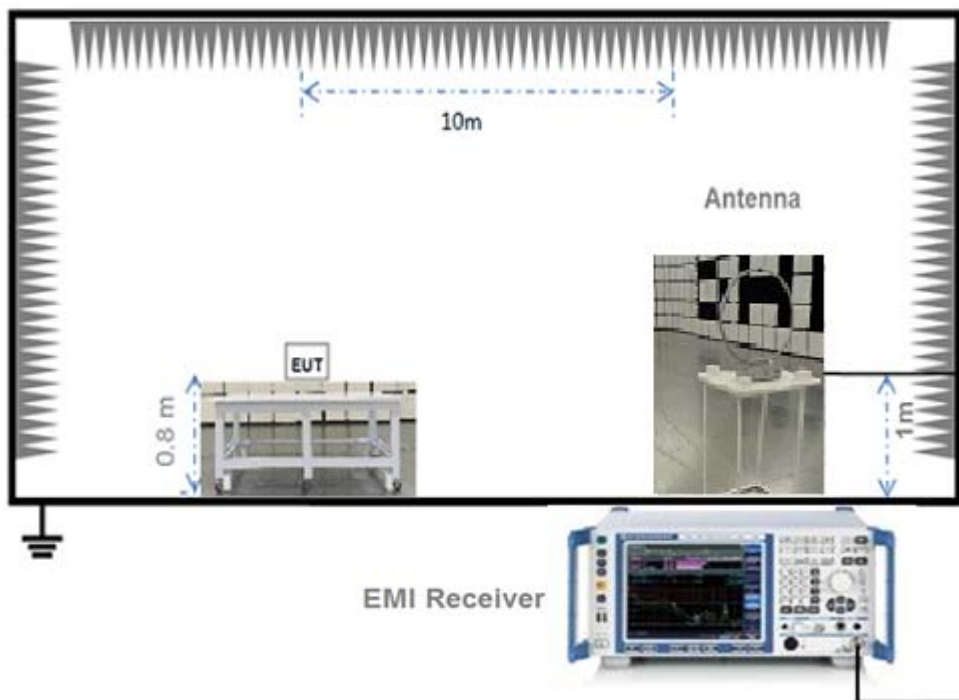
(Diagram 1)

4.3.2 For AC Power Supply Port Test



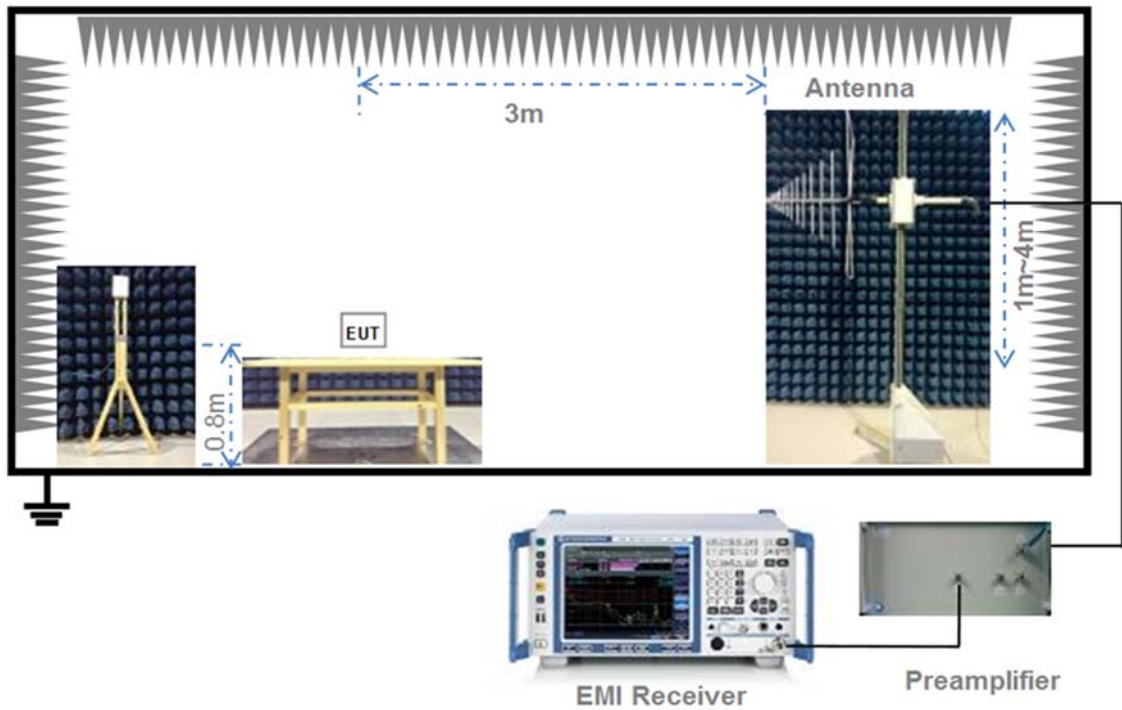
(Diagram 2)

4.3.3 For Radiated Test (Below 30 MHz)



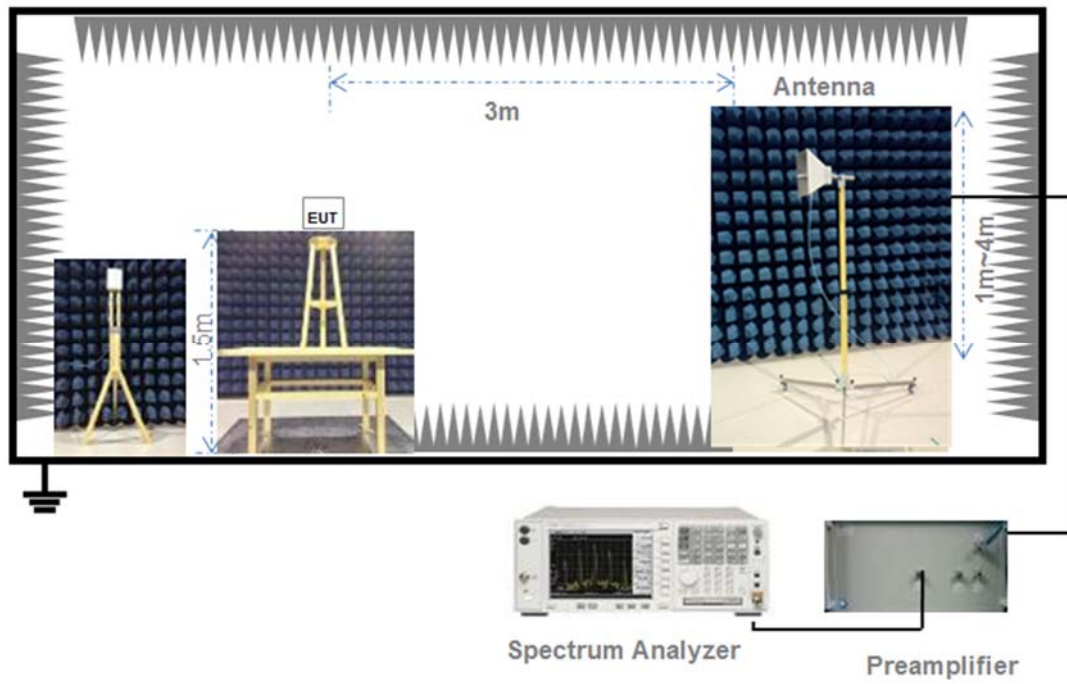
(Diagram 3)

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 4.1.1 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 4.1.1 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 4.1.2-4.4.5 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:

1. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
2. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.5.2 Test Setups

See section 4.1.2-4.4.5 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.

[illegible]

Keysight Spectrum Analyzer - Swept SA

RL RF 50 Ω AC INT REF ALIGN OFF 03:03:36 AM Jul 26, 2021

Center Freq 916.000000 MHz PNO: Wide IFGain:Low Trig: Free Run Avg Type: Log-Pwr Avg/Hold: >20/20 TRACE 1 2 3 4 5 6 TYPE M wwwwww DET P N N N N N

Ref Offset 6.91 dB Ref 25.00 dBm

10 dB/div Log

ΔMkr2 172 kHz 0.190 dB

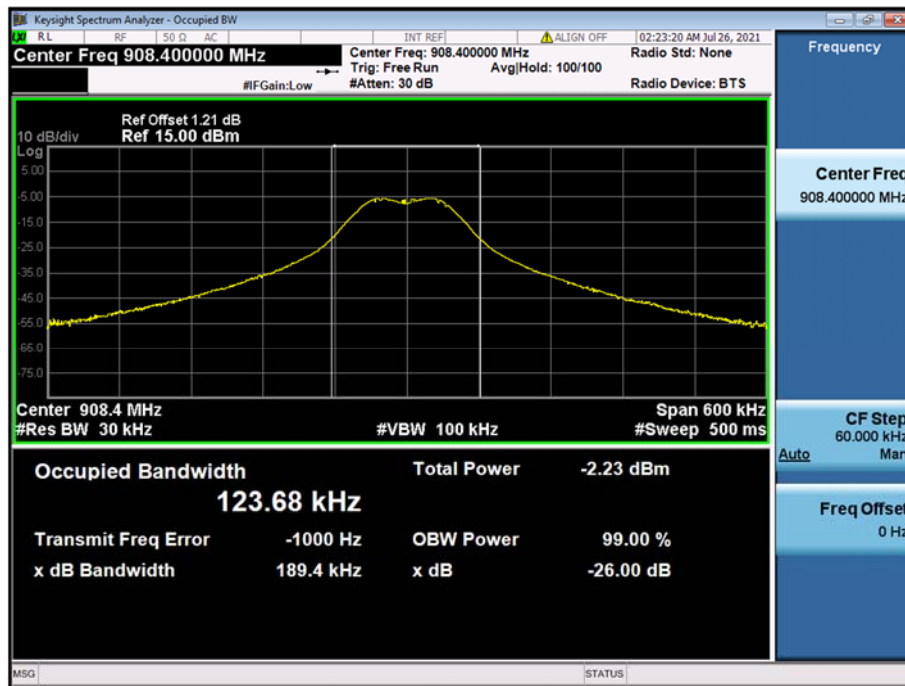
Center 916.0000 MHz Span 600.0 kHz
#Res BW 30 kHz VBW 91 kHz #Sweep 500.0 ms (601 pts)

MARK	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	916.027 MHz	0.275 dBm			
2	Δ3	1	f (Δ)	172 kHz (Δ)	0.190 dB			
3	F	1	f	915.913 MHz	-19.982 dBm			

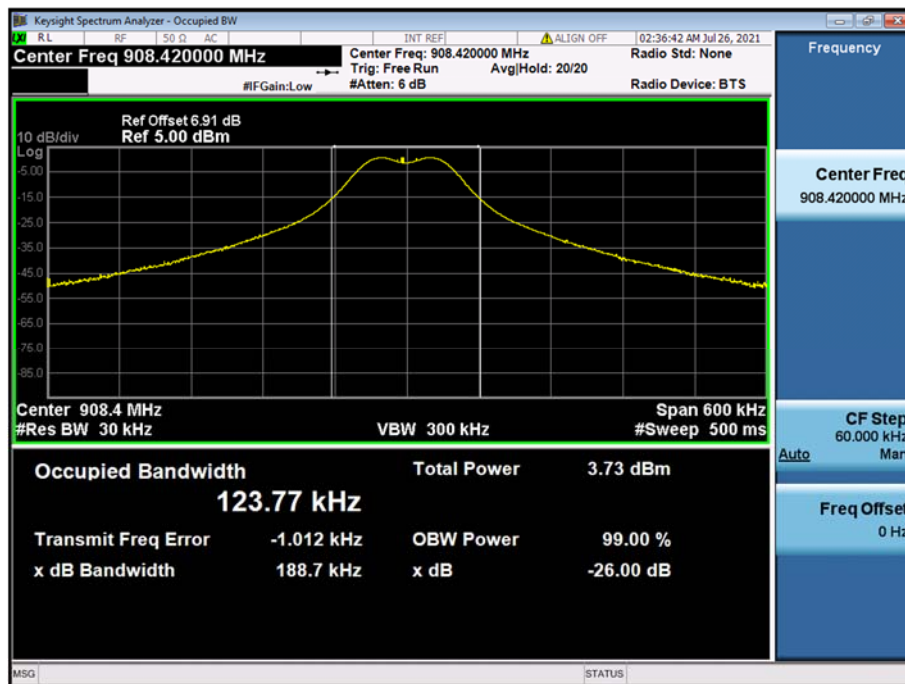
MSG STATUS

99% dB Bandwidth

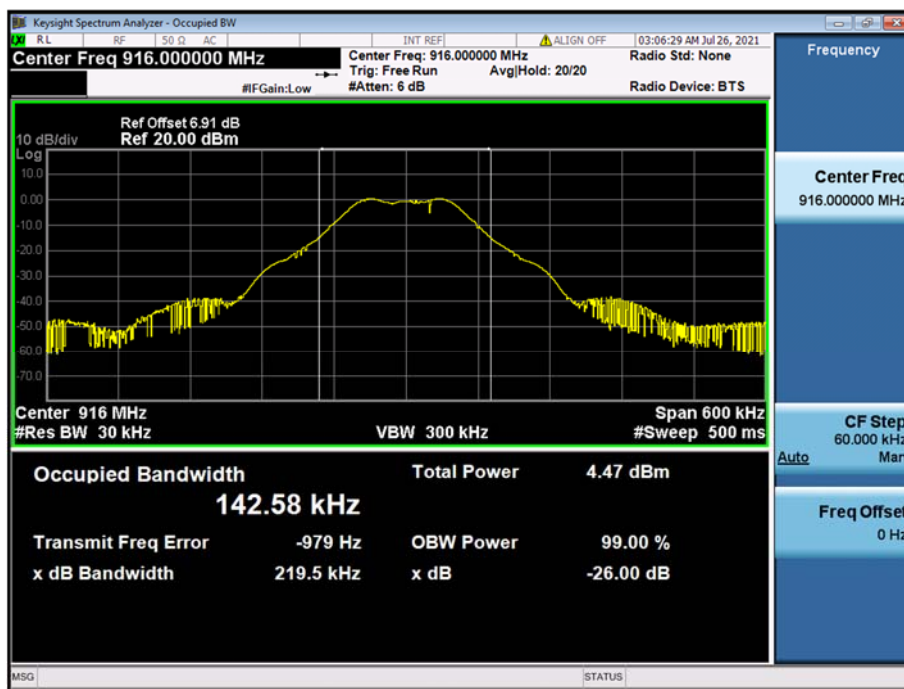
Low Channel



Middle Channel



High Channel



A.2 AC Conducted Emission

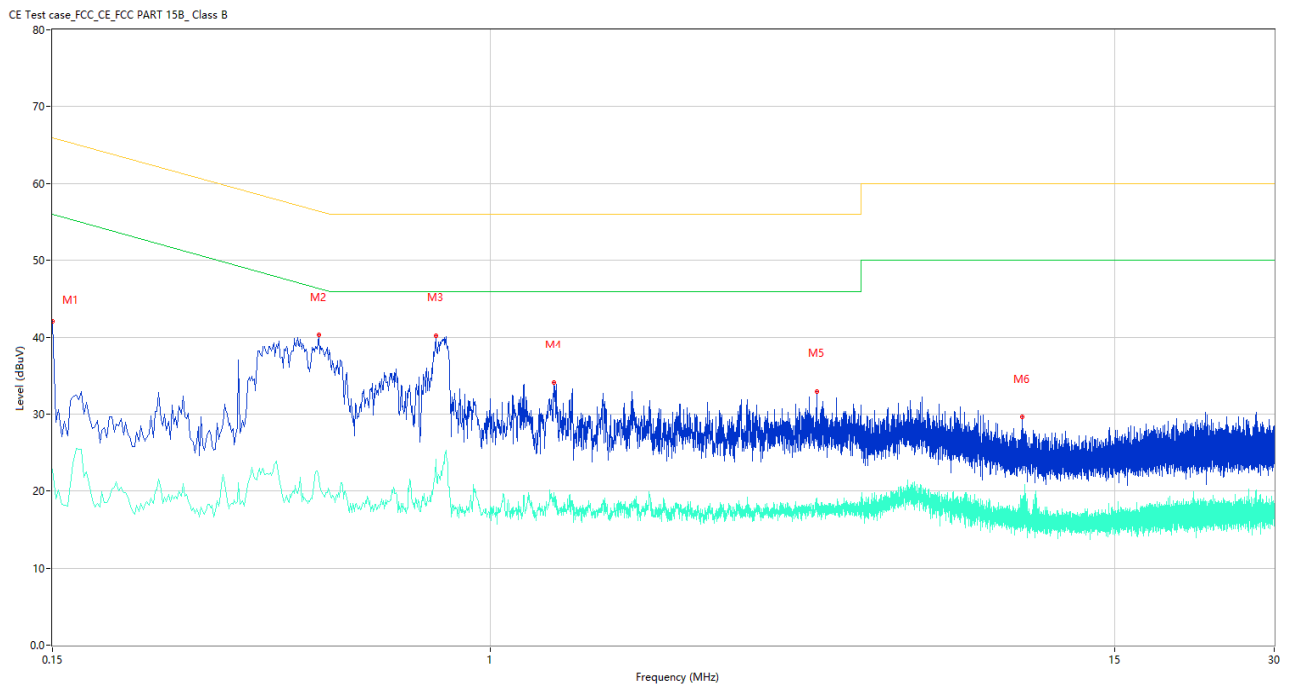
Note¹: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.
 Note²: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

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

Test Data and Plots

1# circuit

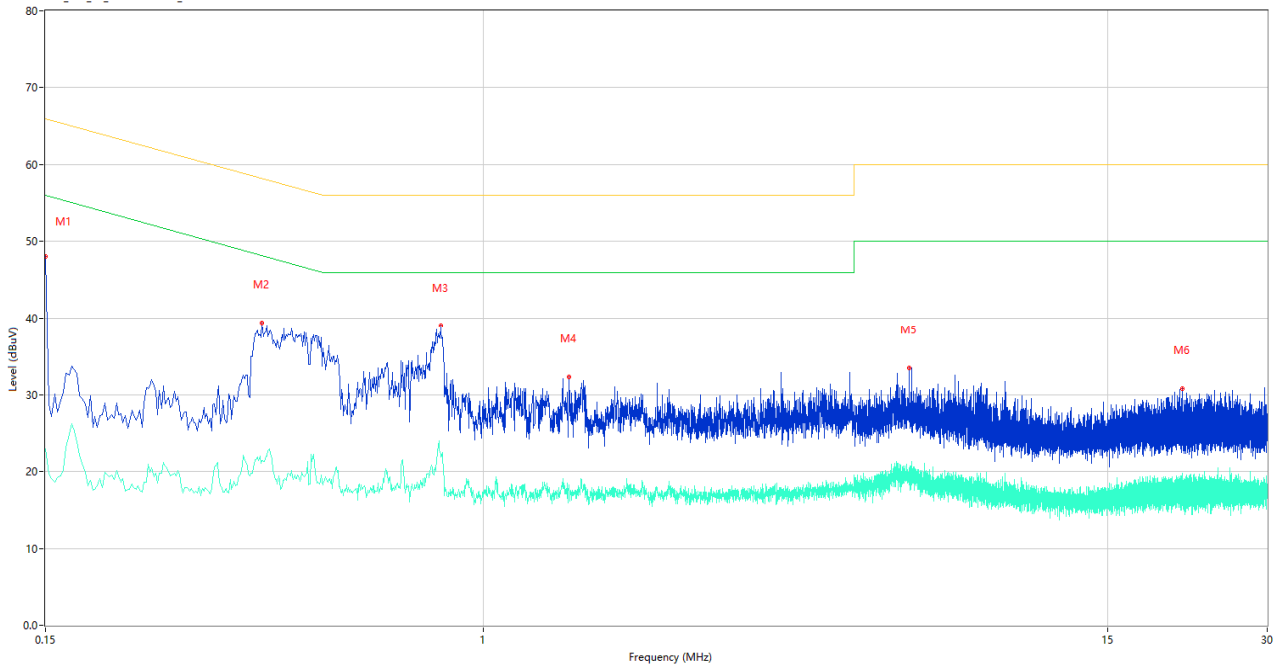
PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	42.11	10.41	66.00	-23.89	Peak	L	Pass
1**	0.150	22.85	10.41	56.00	-33.15	AV	L	Pass
2	0.476	40.32	10.29	56.41	-16.09	Peak	L	Pass
2**	0.476	21.46	10.29	46.41	-24.95	AV	L	Pass
3	0.790	40.27	10.27	56.00	-15.73	Peak	L	Pass
3**	0.790	24.10	10.27	46.00	-21.90	AV	L	Pass
4	1.320	34.01	10.24	56.00	-21.99	Peak	L	Pass
4**	1.320	19.78	10.24	46.00	-26.22	AV	L	Pass
5	4.122	32.87	10.31	56.00	-23.13	Peak	L	Pass
5**	4.122	19.09	10.31	46.00	-26.91	AV	L	Pass
6	10.042	29.57	10.37	60.00	-30.43	Peak	L	Pass
6**	10.042	17.37	10.37	50.00	-32.63	AV	L	Pass

PHASE N

CE Test case_FCC_CE_FCC PART 15B_Class B

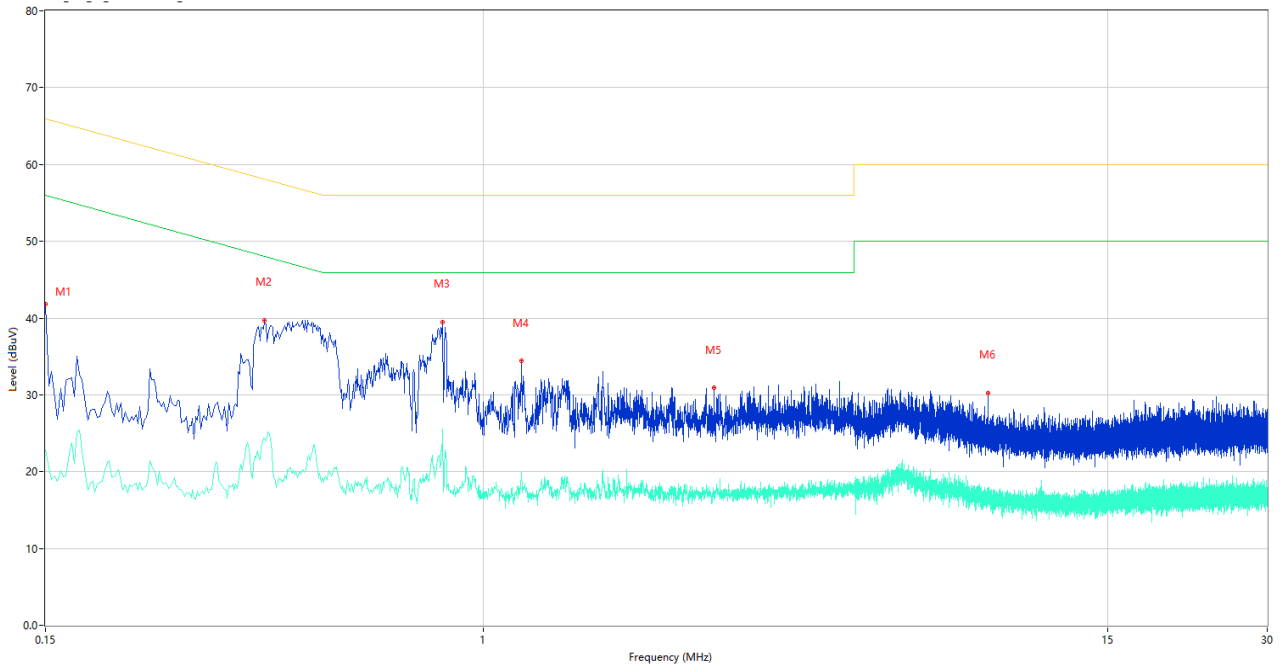


No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	48.08	10.41	66.00	-17.92	Peak	N	Pass
1**	0.150	22.90	10.41	56.00	-33.10	AV	N	Pass
2	0.384	39.45	10.30	58.19	-18.74	Peak	N	Pass
2**	0.384	21.44	10.30	48.19	-26.75	AV	N	Pass
3	0.832	39.02	10.26	56.00	-16.98	Peak	N	Pass
3**	0.832	22.26	10.26	46.00	-23.74	AV	N	Pass
4	1.454	32.27	10.25	56.00	-23.73	Peak	N	Pass
4**	1.454	18.22	10.25	46.00	-27.78	AV	N	Pass
5	6.356	33.42	10.33	60.00	-26.58	Peak	N	Pass
5**	6.356	20.42	10.33	50.00	-29.58	AV	N	Pass
6	20.768	30.79	10.57	60.00	-29.21	Peak	N	Pass
6**	20.768	18.04	10.57	50.00	-31.96	AV	N	Pass

2# circuit

PHASE L

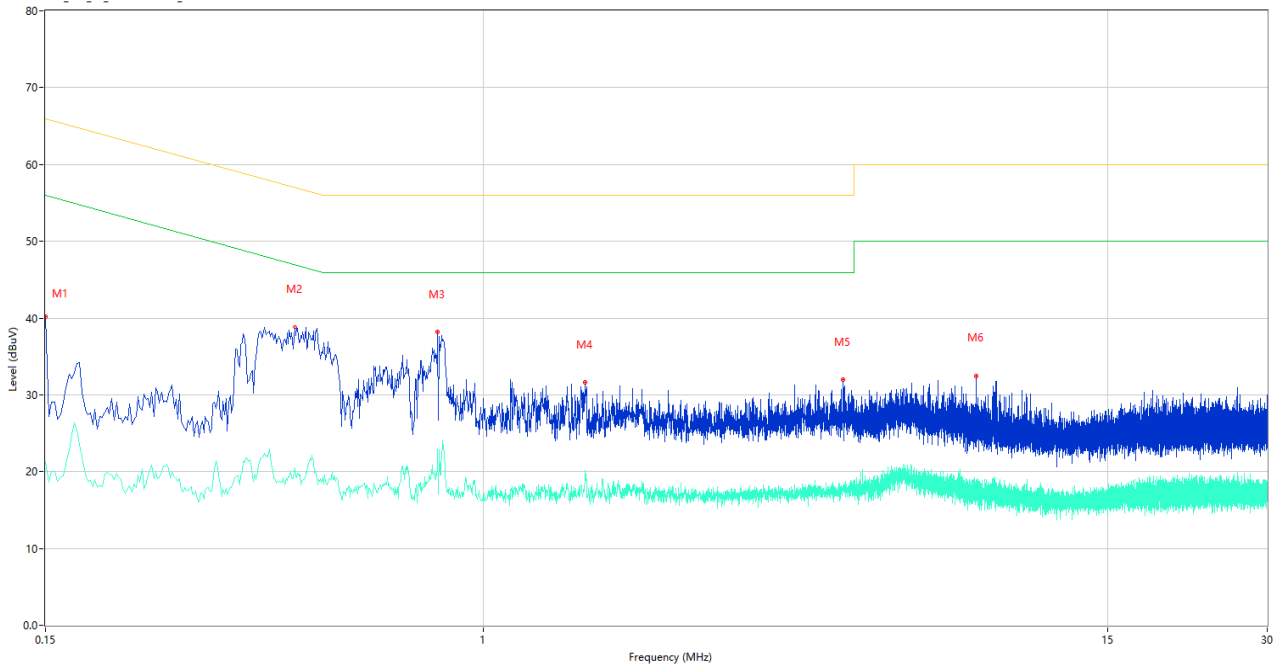
CE Test case_FCC_CE_FCC PART 15B_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	41.84	10.41	66.00	-24.16	Peak	L	Pass
1**	0.150	22.77	10.41	56.00	-33.23	AV	L	Pass
2	0.388	39.77	10.30	58.11	-18.34	Peak	L	Pass
2**	0.388	24.33	10.30	48.11	-23.78	AV	L	Pass
3	0.840	39.52	10.25	56.00	-16.48	Peak	L	Pass
3**	0.840	25.44	10.25	46.00	-20.56	AV	L	Pass
4	1.180	34.38	10.24	56.00	-21.62	Peak	L	Pass
4**	1.180	19.91	10.24	46.00	-26.09	AV	L	Pass
5	2.722	30.84	10.28	56.00	-25.16	Peak	L	Pass
5**	2.722	16.26	10.28	46.00	-29.74	AV	L	Pass
6	8.926	30.22	10.36	60.00	-29.78	Peak	L	Pass
6**	8.926	17.67	10.36	50.00	-32.33	AV	L	Pass

PHASE N

CE Test case_FCC_CE_FCC PART 15B_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	40.21	10.41	66.00	-25.79	Peak	N	Pass
1**	0.150	21.19	10.41	56.00	-34.81	AV	N	Pass
2	0.442	38.84	10.31	57.02	-18.18	Peak	N	Pass
2**	0.442	20.43	10.31	47.02	-26.59	AV	N	Pass
3	0.822	38.11	10.26	56.00	-17.89	Peak	N	Pass
3**	0.822	22.97	10.26	46.00	-23.03	AV	N	Pass
4	1.560	31.53	10.24	56.00	-24.47	Peak	N	Pass
4**	1.560	20.13	10.24	46.00	-25.87	AV	N	Pass
5	4.766	31.97	10.31	56.00	-24.03	Peak	N	Pass
5**	4.766	17.95	10.31	46.00	-28.05	AV	N	Pass
6	8.500	32.36	10.36	60.00	-27.64	Peak	N	Pass
6**	8.500	18.05	10.36	50.00	-31.95	AV	N	Pass

A.3 Field Strength of Fundamental Emissions

Test Data

1# circuit

Operating Frequency (MHz)	Field Strength (dBuV/m)	Factor (dB)	Limit @3m (dBuV/m)	Antenna	Verdict
908.40	92.52	-11.33	94	Horizontal	Pass
	89.05	-11.33	94	Vertical	Pass
908.42	92.05	-11.33	94	Horizontal	Pass
	89.52	-11.33	94	Vertical	Pass
916.00	93.56	-10.72	94	Horizontal	Pass
	88.72	-10.72	94	Vertical	Pass

2# circuit

Operating Frequency (MHz)	Field Strength (dBuV/m)	Factor (dB)	Limit @3m (dBuV/m)	Antenna	Verdict
908.40	90.58	-11.33	94	Horizontal	Pass
	84.85	-11.33	94	Vertical	Pass
908.42	91.16	-11.31	94	Horizontal	Pass
	84.41	-11.31	94	Vertical	Pass
916.00	93.64	-10.72	94	Horizontal	Pass
	89.45	-10.72	94	Vertical	Pass

A.4 Radiated Emission and Bandedge Measurement

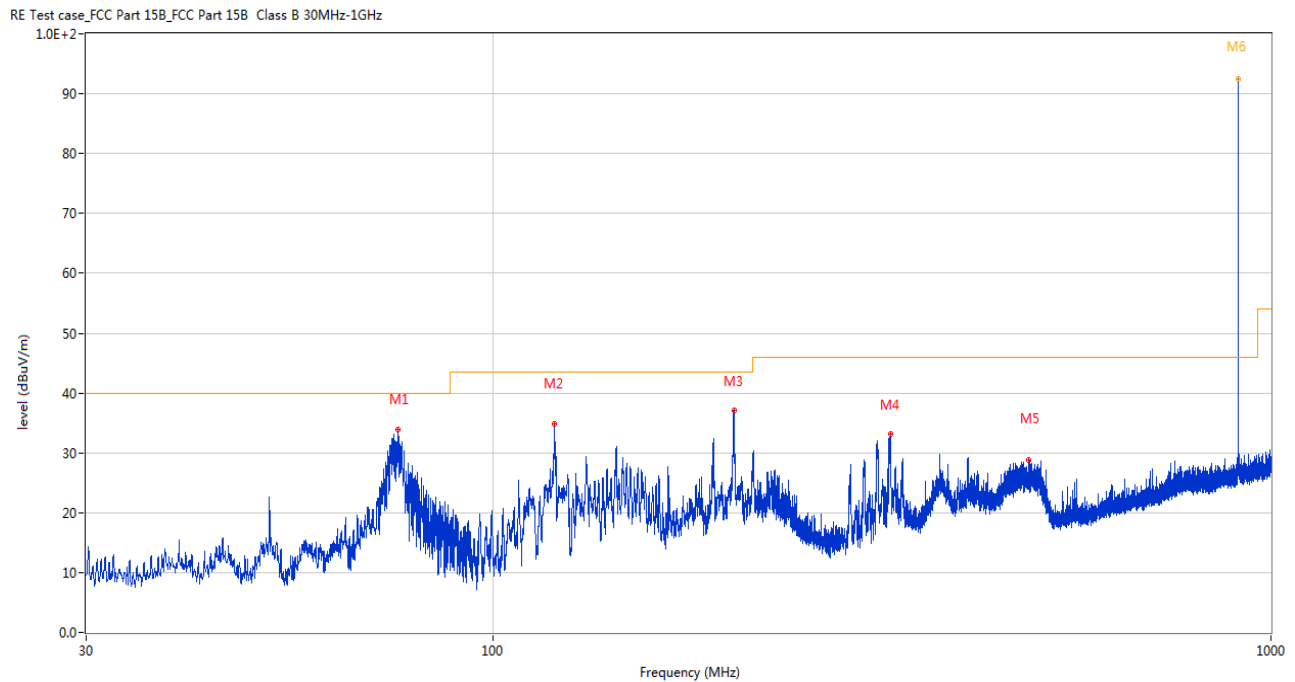
The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Test Data and Plots (30 MHz ~ 1 GHz)

Note: The bold frequency is the fundamental.

1# circuit

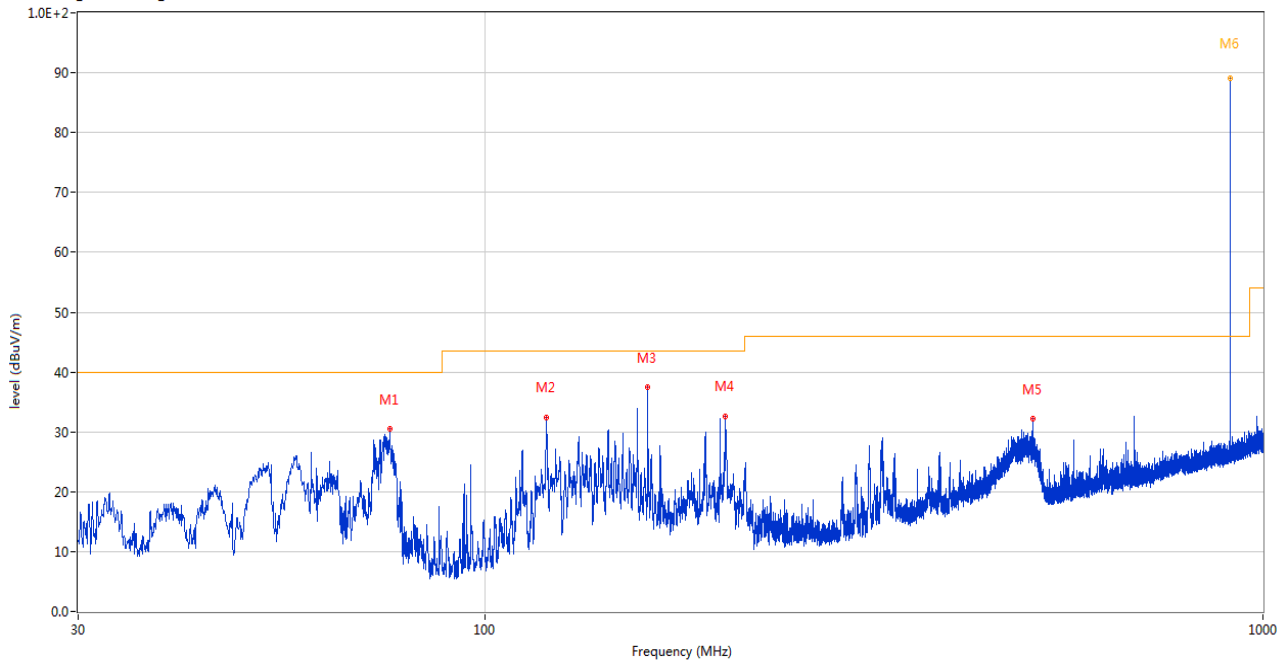
Low Channel 30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	75.590	33.99	-29.91	40.0	-6.01	Peak	360.00	200	Horizontal	Pass
2	119.919	34.87	-27.16	43.5	-8.63	Peak	151.00	200	Horizontal	Pass
3	204.018	37.03	-28.57	43.5	-6.47	Peak	360.00	200	Horizontal	Pass
4	324.153	33.09	-23.52	46.0	-12.91	Peak	243.00	100	Horizontal	Pass
5	488.131	28.81	-18.98	46.0	-17.19	Peak	222.00	200	Horizontal	Pass
6*	908.397	92.52	-11.33	94.0	-1.48	QP	23.00	100	Horizontal	Pass

Low Channel 30 MHz to 1 GHz, ANT V

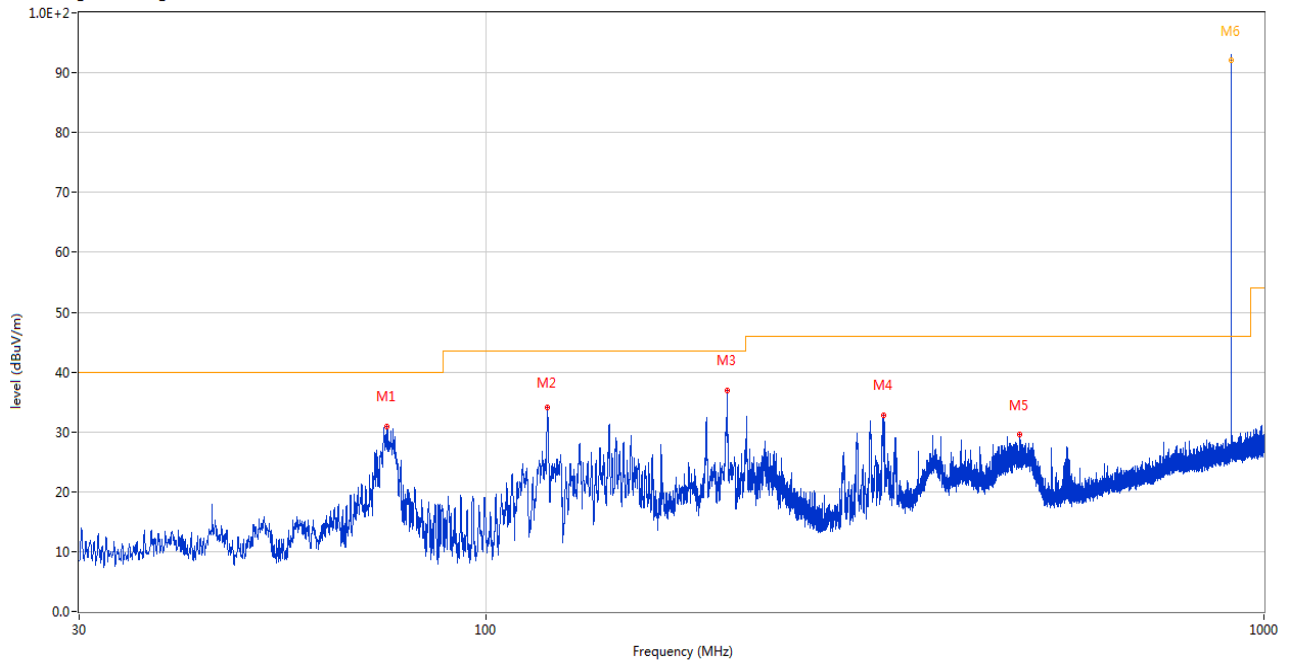
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	75.493	30.56	-29.90	40.0	-9.44	Peak	24.00	100	Vertical	Pass
2	119.967	32.32	-27.16	43.5	-11.18	Peak	238.00	100	Vertical	Pass
3	161.969	37.45	-24.80	43.5	-6.05	Peak	136.00	100	Vertical	Pass
4	203.921	32.62	-28.57	43.5	-10.88	Peak	360.00	200	Vertical	Pass
5	506.415	32.12	-18.65	46.0	-13.88	Peak	343.00	100	Vertical	Pass
6*	908.397	89.05	-11.33	94.0	-4.95	QP	304.00	100	Vertical	Pass

Middle Channel 30 MHz to 1 GHz, ANT H

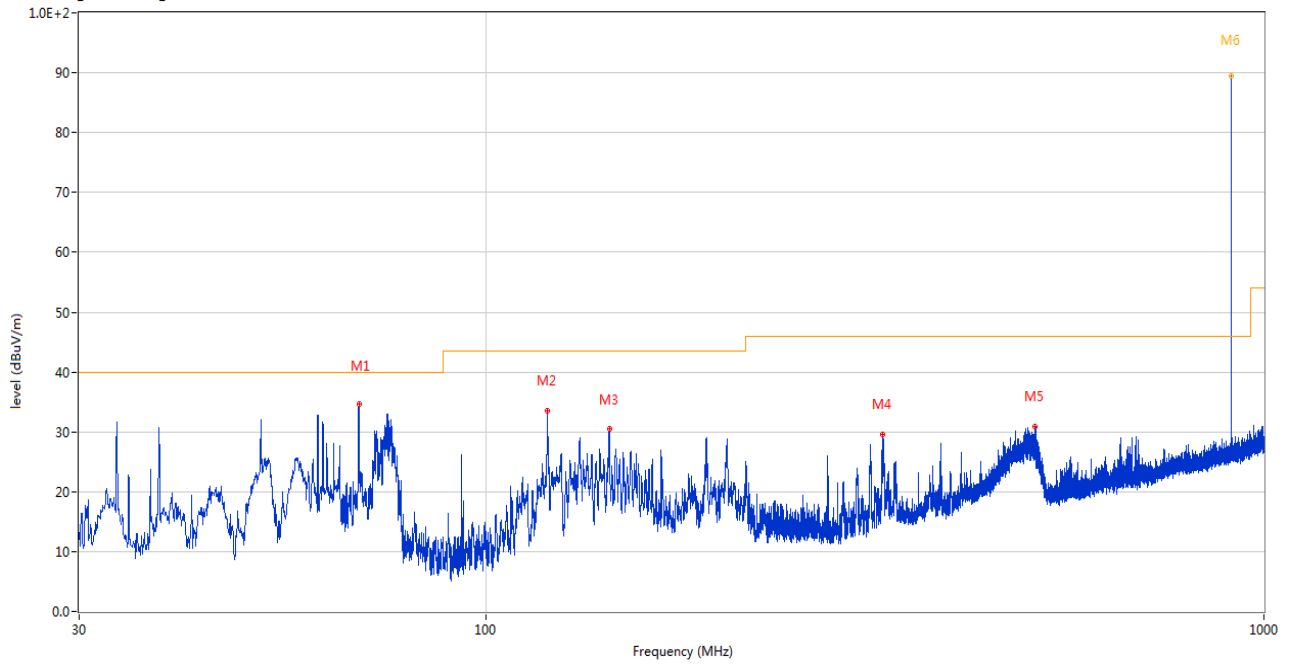
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	74.669	30.81	-29.85	40.0	-9.19	Peak	0.00	200	Horizontal	Pass
2	120.016	34.14	-27.16	43.5	-9.36	Peak	164.00	200	Horizontal	Pass
3	204.164	36.92	-28.57	43.5	-6.58	Peak	0.00	200	Horizontal	Pass
4	324.007	32.71	-23.54	46.0	-13.29	Peak	0.00	200	Horizontal	Pass
5	485.027	29.54	-19.04	46.0	-16.46	Peak	243.00	200	Horizontal	Pass
6*	908.432	92.05	-11.33	94.0	-1.95	QP	3.00	100	Horizontal	Pass

Middle Channel 30 MHz to 1 GHz, ANT V

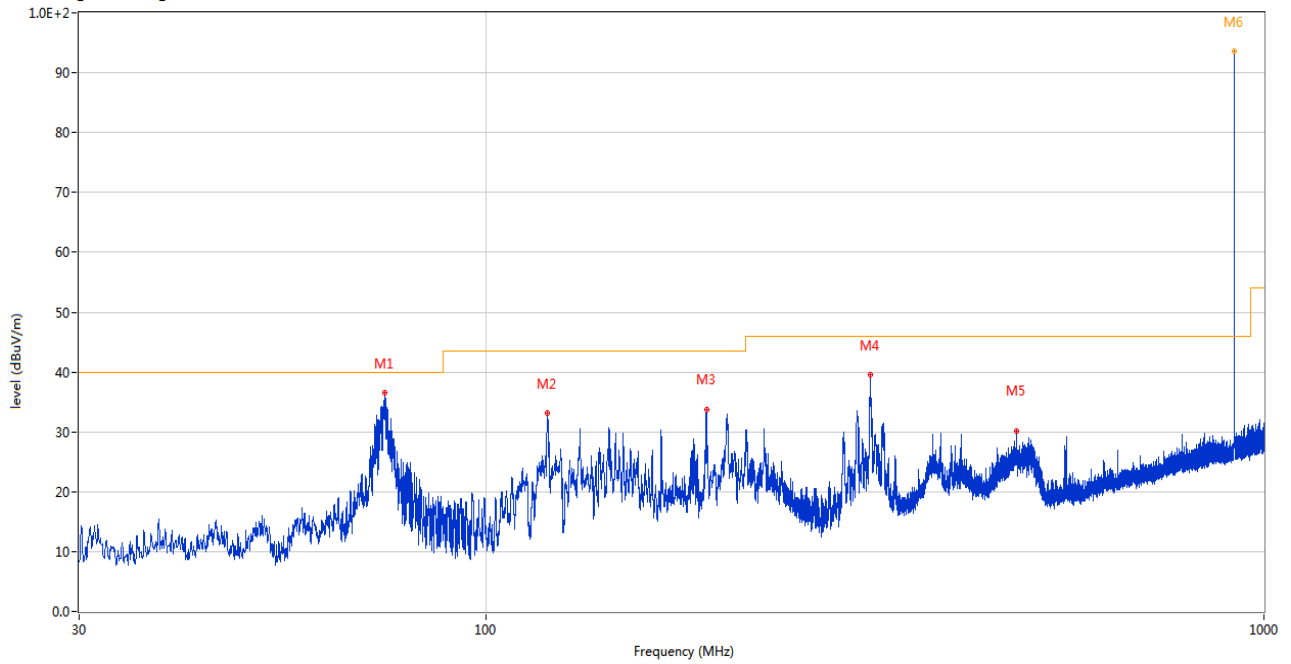
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	68.655	34.57	-28.81	40.0	-5.43	Peak	125.00	200	Vertical	Pass
2	120.016	33.44	-27.16	43.5	-10.06	Peak	316.00	100	Vertical	Pass
3	144.024	30.49	-25.39	43.5	-13.01	Peak	316.00	100	Vertical	Pass
4	323.958	29.57	-23.54	46.0	-16.43	Peak	360.00	100	Vertical	Pass
5	508.113	30.91	-18.49	46.0	-15.09	Peak	316.00	100	Vertical	Pass
6*	908.432	89.52	-11.33	94.0	-4.48	QP	297.00	100	Vertical	Pass

High Channel 30 MHz to 1 GHz, ANT H

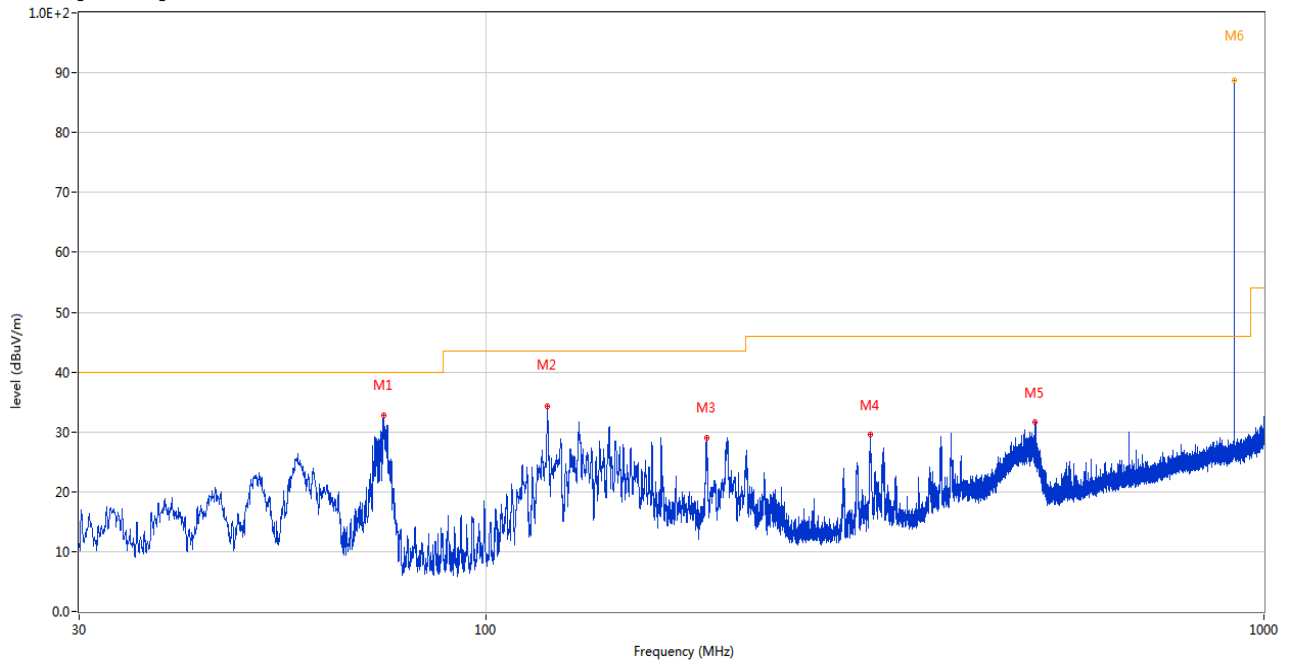
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	74.232	36.50	-29.75	40.0	-3.50	Peak	169.00	100	Horizontal	Pass
2	120.016	33.13	-27.16	43.5	-10.37	Peak	311.00	200	Horizontal	Pass
3	191.990	33.69	-28.28	43.5	-9.81	Peak	153.00	200	Horizontal	Pass
4	312.027	39.51	-23.92	46.0	-6.49	Peak	0.00	200	Horizontal	Pass
5	481.341	30.18	-19.10	46.0	-15.82	Peak	251.00	200	Horizontal	Pass
6*	915.999	93.56	-10.72	94.0	-0.44	QP	19.00	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

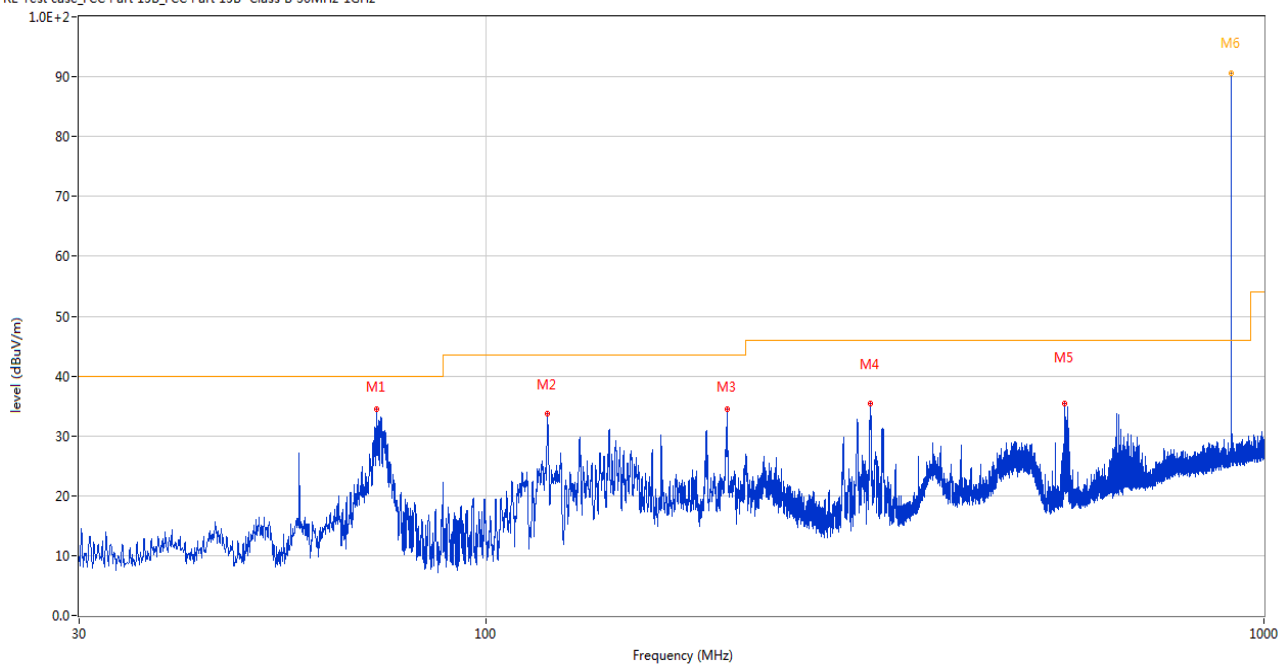


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.796	32.81	-29.60	40.0	-7.19	Peak	243.00	100	Vertical	Pass
2	120.016	34.34	-27.16	43.5	-9.16	Peak	118.00	100	Vertical	Pass
3	191.990	29.01	-28.28	43.5	-14.49	Peak	226.00	100	Vertical	Pass
4	311.930	29.54	-23.93	46.0	-16.46	Peak	32.00	200	Vertical	Pass
5	508.501	31.56	-18.52	46.0	-14.44	Peak	309.00	100	Vertical	Pass
6*	915.998	88.72	-10.72	94.0	-5.28	QP	216.00	102	Vertical	Pass

2# circuit

Low Channel 30 MHz to 1 GHz, ANT H

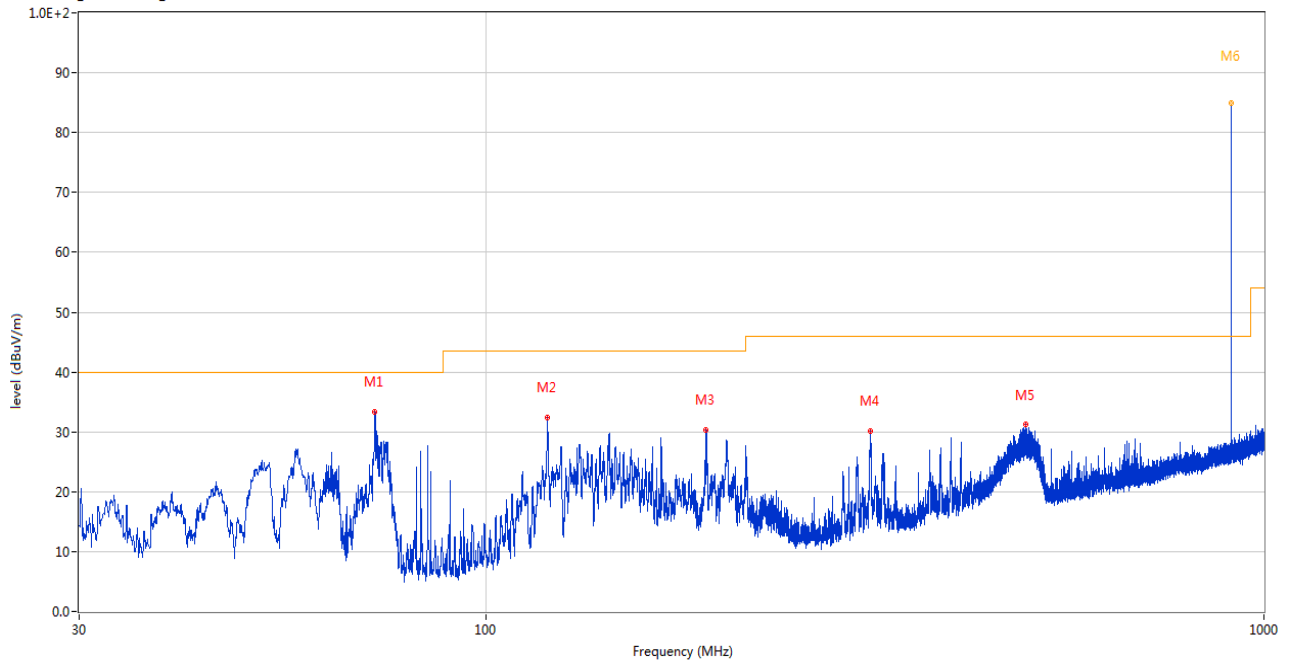
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	72.389	34.41	-29.10	40.0	-5.59	Peak	151.00	200	Horizontal	Pass
2	120.016	33.69	-27.16	43.5	-9.81	Peak	138.00	200	Horizontal	Pass
3	204.018	34.48	-28.57	43.5	-9.02	Peak	360.00	200	Horizontal	Pass
4	312.027	35.37	-23.92	46.0	-10.63	Peak	267.00	100	Horizontal	Pass
5	553.606	35.50	-17.55	46.0	-10.50	Peak	0.00	200	Horizontal	Pass
6*	908.399	90.58	-11.33	94.0	-3.42	QP	160.00	100	Horizontal	Pass

Low Channel 30 MHz to 1 GHz, ANT V

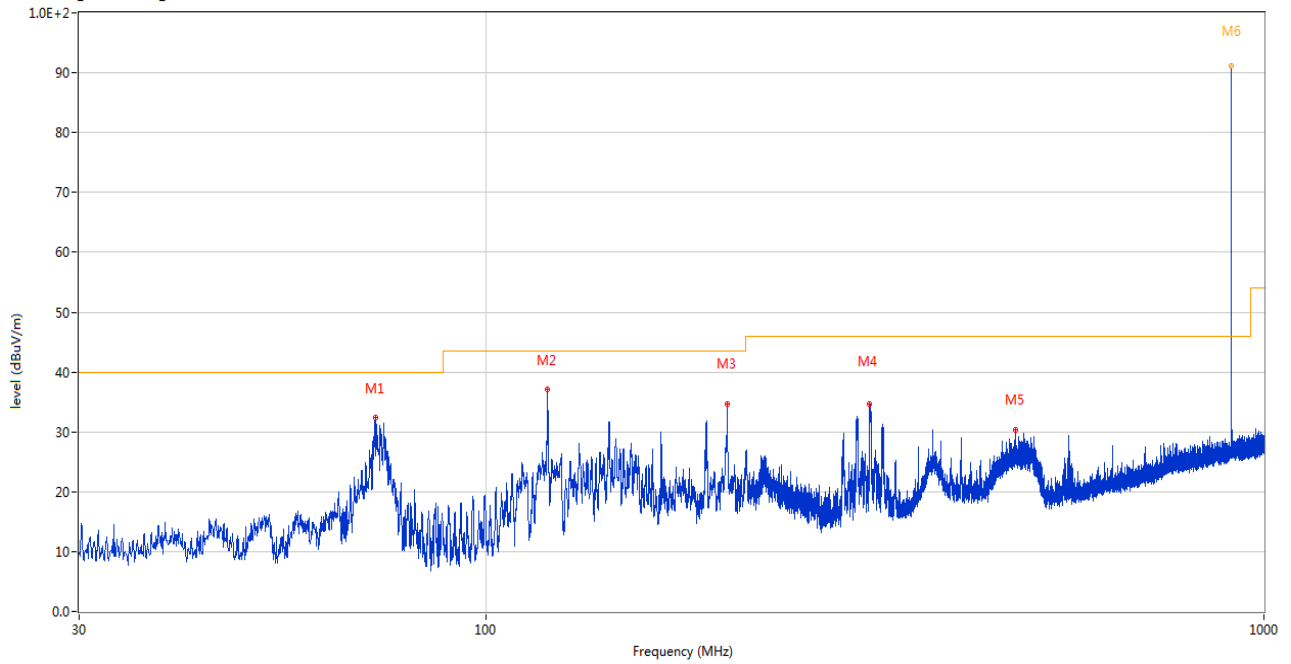
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	72.001	33.39	-29.10	40.0	-6.61	Peak	307.00	100	Vertical	Pass
2	119.967	32.32	-27.16	43.5	-11.18	Peak	277.00	100	Vertical	Pass
3	191.942	30.24	-28.27	43.5	-13.26	Peak	360.00	200	Vertical	Pass
4	312.367	30.21	-23.88	46.0	-15.79	Peak	360.00	200	Vertical	Pass
5	493.757	31.31	-18.75	46.0	-14.69	Peak	321.00	100	Vertical	Pass
6*	908.399	84.85	-11.33	94.0	-9.15	QP	147.00	100	Vertical	Pass

Middle Channel 30 MHz to 1 GHz, ANT H

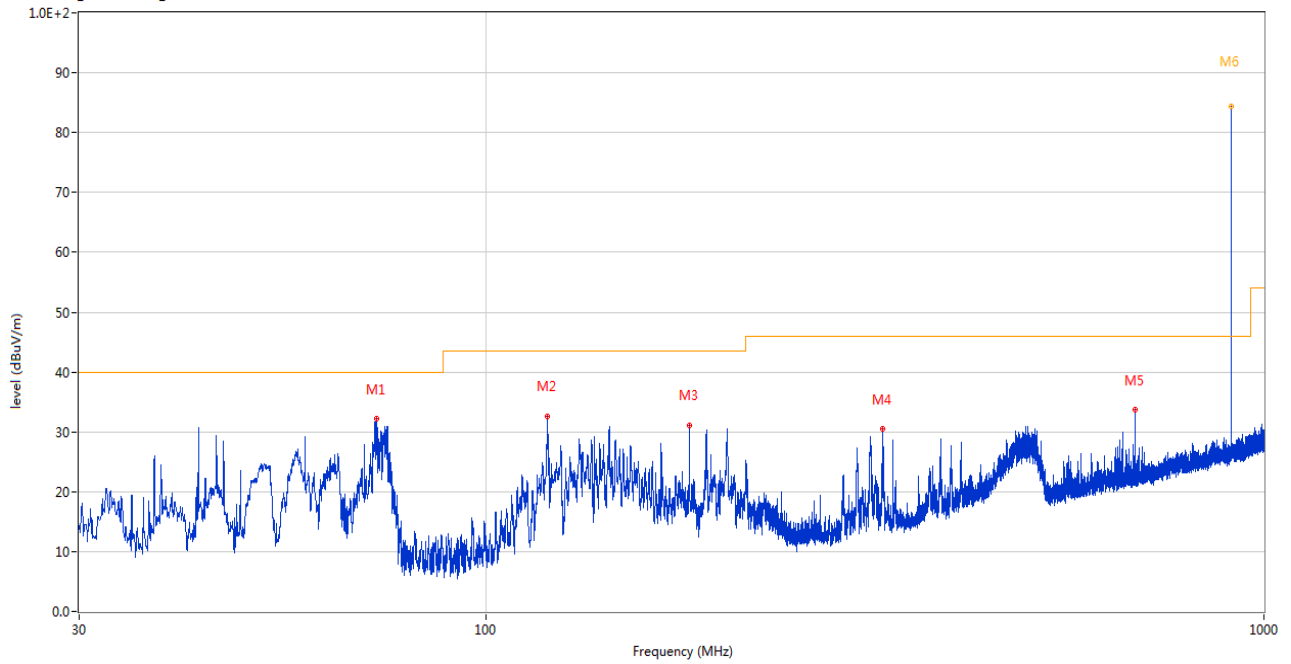
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	72.049	32.44	-29.10	40.0	-7.56	Peak	142.00	200	Horizontal	Pass
2	120.016	37.10	-27.16	43.5	-6.40	Peak	100.00	200	Horizontal	Pass
3	204.066	34.65	-28.57	43.5	-8.85	Peak	360.00	200	Horizontal	Pass
4	311.106	34.65	-24.01	46.0	-11.35	Peak	274.00	100	Horizontal	Pass
5	479.304	30.27	-18.97	46.0	-15.73	Peak	228.00	200	Horizontal	Pass
6*	908.419	91.16	-11.31	94.0	-2.84	QP	151.00	100	Horizontal	Pass

Middle Channel 30 MHz to 1 GHz, ANT V

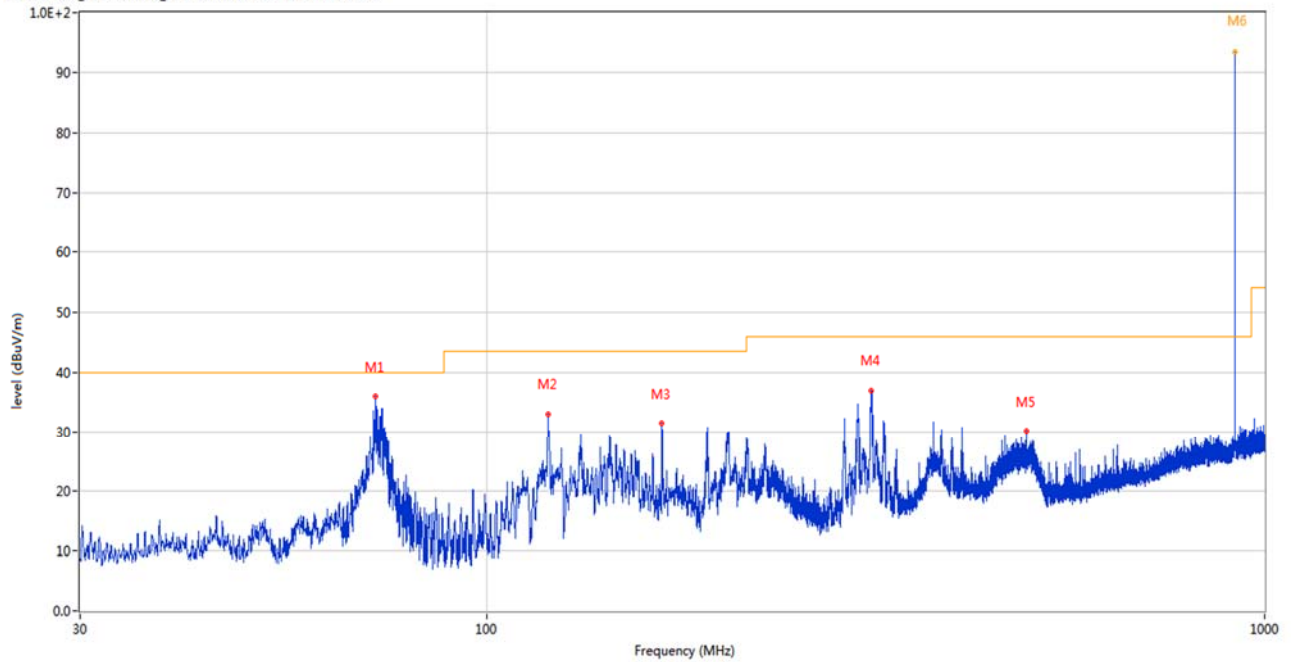
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	72.389	32.25	-29.10	40.0	-7.75	Peak	0.00	100	Vertical	Pass
2	119.967	32.59	-27.16	43.5	-10.91	Peak	307.00	100	Vertical	Pass
3	182.436	31.01	-27.11	43.5	-12.49	Peak	294.00	100	Vertical	Pass
4	323.716	30.51	-23.57	46.0	-15.49	Peak	360.00	200	Vertical	Pass
5	683.634	33.72	-14.90	46.0	-12.28	Peak	111.00	100	Vertical	Pass
6*	908.419	84.41	-11.31	94.0	-9.59	QP	155.00	100	Vertical	Pass

High Channel 30 MHz to 1 GHz, ANT H

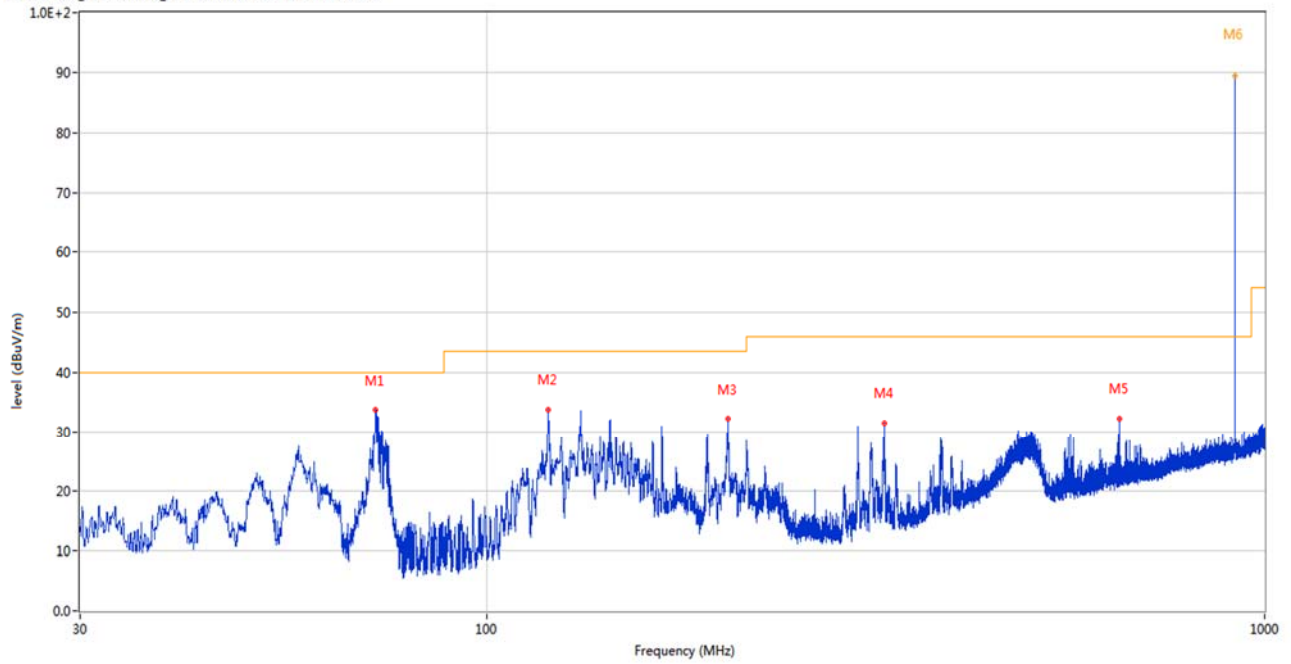
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	72.001	36.34	-29.10	40.0	-3.66	Peak	164.00	100	Horizontal	Pass
2	120.016	32.93	-27.16	43.5	-10.57	Peak	137.00	200	Horizontal	Pass
3	167.982	31.49	-25.34	43.5	-12.01	Peak	339.00	200	Horizontal	Pass
4	312.415	36.83	-23.88	46.0	-9.17	Peak	0.00	200	Horizontal	Pass
5	493.806	30.11	-18.76	46.0	-15.89	Peak	242.00	200	Horizontal	Pass
6*	916.000	93.64	-10.72	94.0	-0.36	QP	331.00	167	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)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	72.001	33.64	-29.10	40.0	-6.36	Peak	188.00	100	Vertical	Pass
2	119.967	33.63	-27.16	43.5	-9.87	Peak	111.00	100	Vertical	Pass
3	203.970	32.20	-28.57	43.5	-11.30	Peak	231.00	100	Vertical	Pass
4	324.007	31.53	-23.54	46.0	-14.47	Peak	0.00	200	Vertical	Pass
5	650.752	32.16	-15.47	46.0	-13.84	Peak	0.00	200	Vertical	Pass
6*	916.000	89.45	-10.72	94.0	-4.55	QP	204.00	113	Vertical	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.

1# circuit

LOW CHANNEL 1 GHz to 12.75 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1800.400	41.75	-10.91	74.0	-32.25	Peak	322.00	150	Horizontal	Pass
1**	1800.400	31.86	-10.91	54.0	-22.14	AV	322.00	150	Horizontal	Pass
2	2939.600	48.66	-3.53	74.0	-25.34	Peak	126.00	150	Horizontal	Pass
2**	2939.600	38.42	-3.53	54.0	-15.58	AV	126.00	150	Horizontal	Pass
3	4432.800	46.30	-2.18	74.0	-27.70	Peak	268.00	150	Horizontal	Pass
3**	4432.800	38.01	-2.18	54.0	-15.99	AV	268.00	150	Horizontal	Pass
4	6418.000	52.39	3.97	74.0	-21.61	Peak	204.00	150	Horizontal	Pass
4**	6418.000	42.49	3.97	54.0	-11.51	AV	204.00	150	Horizontal	Pass
5	8004.525	49.06	18.39	74.0	-24.94	Peak	202.00	150	Horizontal	Pass
5**	8004.525	36.77	18.39	54.0	-17.23	AV	202.00	150	Horizontal	Pass
6	11605.175	50.87	20.16	74.0	-23.13	Peak	138.00	150	Horizontal	Pass
6**	11605.175	39.09	20.16	54.0	-14.91	AV	138.00	150	Horizontal	Pass

LOW CHANNEL 1 GHz to 12.75 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1799.800	41.48	-10.91	74.0	-32.52	Peak	329.00	150	Vertical	Pass
1**	1799.800	34.18	-10.91	54.0	-19.82	AV	329.00	150	Vertical	Pass
2	2669.000	48.94	-4.67	74.0	-25.06	Peak	356.00	150	Vertical	Pass
2**	2669.000	35.76	-4.67	54.0	-18.24	AV	356.00	150	Vertical	Pass
3	3951.800	45.14	-4.71	74.0	-28.86	Peak	191.00	150	Vertical	Pass
3**	3951.800	35.39	-4.71	54.0	-18.61	AV	191.00	150	Vertical	Pass
4	6425.800	51.46	3.57	74.0	-22.54	Peak	269.00	150	Vertical	Pass
4**	6425.800	43.06	3.57	54.0	-10.94	AV	269.00	150	Vertical	Pass
5	8033.275	49.21	18.22	74.0	-24.79	Peak	24.00	150	Vertical	Pass
5**	8033.275	37.44	18.22	54.0	-16.56	AV	24.00	150	Vertical	Pass
6	11807.863	49.86	18.49	74.0	-24.14	Peak	335.00	150	Vertical	Pass
6**	11807.863	37.58	18.49	54.0	-16.42	AV	335.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 12.75 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1563.000	40.05	-11.79	74.0	-33.95	Peak	223.00	150	Horizontal	Pass
1**	1563.000	28.79	-11.79	54.0	-25.21	AV	223.00	150	Horizontal	Pass
2	2737.100	48.32	-4.36	74.0	-25.68	Peak	312.00	150	Horizontal	Pass
2**	2737.100	36.06	-4.36	54.0	-17.94	AV	312.00	150	Horizontal	Pass
3	3618.600	43.14	-6.15	74.0	-30.86	Peak	289.00	150	Horizontal	Pass
3**	3618.600	35.53	-6.15	54.0	-18.47	AV	289.00	150	Horizontal	Pass
4	6481.000	51.82	2.99	74.0	-22.18	Peak	362.00	150	Horizontal	Pass
4**	6481.000	42.42	2.99	54.0	-11.58	AV	362.00	150	Horizontal	Pass
5	8046.213	49.54	18.16	74.0	-24.46	Peak	175.00	150	Horizontal	Pass
5**	8046.213	36.93	18.16	54.0	-17.07	AV	175.00	150	Horizontal	Pass
6	11760.425	49.81	18.84	74.0	-24.19	Peak	104.00	150	Horizontal	Pass
6**	11760.425	38.14	18.84	54.0	-15.86	AV	104.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 12.75 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1800.000	42.39	-10.91	74.0	-31.61	Peak	22.00	150	Vertical	Pass
1**	1800.000	34.01	-10.91	54.0	-19.99	AV	22.00	150	Vertical	Pass
2	2733.700	48.25	-4.43	74.0	-25.75	Peak	341.00	150	Vertical	Pass
2**	2733.700	37.39	-4.43	54.0	-16.61	AV	341.00	150	Vertical	Pass
3	3537.800	43.56	-6.31	74.0	-30.44	Peak	251.00	150	Vertical	Pass
3**	3537.800	35.37	-6.31	54.0	-18.63	AV	251.00	150	Vertical	Pass
4	6074.000	51.26	2.99	74.0	-22.74	Peak	240.00	150	Vertical	Pass
4**	6074.000	43.29	2.99	54.0	-10.71	AV	240.00	150	Vertical	Pass
5	7997.050	48.71	18.40	74.0	-25.29	Peak	108.00	150	Vertical	Pass
5**	7997.050	37.12	18.40	54.0	-16.88	AV	108.00	150	Vertical	Pass
6	11618.400	49.97	20.23	74.0	-24.03	Peak	-1.00	150	Vertical	Pass
6**	11618.400	39.88	20.23	54.0	-14.12	AV	-1.00	150	Vertical	Pass

HIGH CHANNEL 1 GHz to 12.75 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1300.400	40.63	-11.30	74.0	-33.37	Peak	128.00	150	Horizontal	Pass
1**	1300.400	33.01	-11.30	54.0	-20.99	AV	128.00	150	Horizontal	Pass
2	2413.500	47.83	-6.10	74.0	-26.17	Peak	138.00	150	Horizontal	Pass
2**	2413.500	38.14	-6.10	54.0	-15.86	AV	138.00	150	Horizontal	Pass
3	3365.200	43.26	-6.84	74.0	-30.74	Peak	263.00	150	Horizontal	Pass
3**	3365.200	33.75	-6.84	54.0	-20.25	AV	263.00	150	Horizontal	Pass
4	6422.200	52.26	3.83	74.0	-21.74	Peak	361.00	150	Horizontal	Pass
4**	6422.200	42.37	3.83	54.0	-11.63	AV	361.00	150	Horizontal	Pass
5	8060.875	49.44	18.37	74.0	-24.56	Peak	-1.00	150	Horizontal	Pass
5**	8060.875	38.23	18.37	54.0	-15.77	AV	-1.00	150	Horizontal	Pass
6	11772.213	50.52	18.76	74.0	-23.48	Peak	362.00	150	Horizontal	Pass
6**	11772.213	39.42	18.76	54.0	-14.58	AV	362.00	150	Horizontal	Pass

HIGH CHANNEL 1 GHz to 12.75 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1300.300	41.55	-11.29	74.0	-32.45	Peak	346.00	150	Vertical	Pass
1**	1300.300	35.41	-11.29	54.0	-18.59	AV	346.00	150	Vertical	Pass
2	2092.000	44.82	-7.98	74.0	-29.18	Peak	318.00	150	Vertical	Pass
2**	2092.000	32.97	-7.98	54.0	-21.03	AV	318.00	150	Vertical	Pass
3	3588.200	43.93	-5.93	74.0	-30.07	Peak	325.00	150	Vertical	Pass
3**	3588.200	34.71	-5.93	54.0	-19.29	AV	325.00	150	Vertical	Pass
4	6481.200	51.75	2.98	74.0	-22.25	Peak	347.00	150	Vertical	Pass
4**	6481.200	42.20	2.98	54.0	-11.80	AV	347.00	150	Vertical	Pass
5	8045.350	48.66	18.08	74.0	-25.34	Peak	207.00	150	Vertical	Pass
5**	8045.350	37.31	18.08	54.0	-16.69	AV	207.00	150	Vertical	Pass
6	12189.375	50.49	20.34	74.0	-23.51	Peak	51.00	150	Vertical	Pass
6**	12189.375	38.80	20.34	54.0	-15.20	AV	51.00	150	Vertical	Pass

2# circuit

LOW CHANNEL 1 GHz to 12.75 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1380.700	40.13	-11.43	74.0	-33.87	Peak	62.00	150	Horizontal	Pass
1**	1380.700	29.89	-11.43	54.0	-24.11	AV	62.00	150	Horizontal	Pass
2	2870.300	48.31	-3.47	74.0	-25.69	Peak	2.00	150	Horizontal	Pass
2**	2870.300	36.51	-3.47	54.0	-17.49	AV	2.00	150	Horizontal	Pass
3	3668.600	44.20	-5.24	74.0	-29.80	Peak	-1.00	150	Horizontal	Pass
3**	3668.600	35.21	-5.24	54.0	-18.79	AV	-1.00	150	Horizontal	Pass
4	6410.200	52.31	3.87	74.0	-21.69	Peak	179.00	150	Horizontal	Pass
4**	6410.200	42.42	3.87	54.0	-11.58	AV	179.00	150	Horizontal	Pass
5	7973.475	49.35	17.82	74.0	-24.65	Peak	3.00	150	Horizontal	Pass
5**	7973.475	37.23	17.82	54.0	-16.77	AV	3.00	150	Horizontal	Pass
6	11604.888	50.30	20.16	74.0	-23.70	Peak	304.00	150	Horizontal	Pass
6**	11604.888	38.70	20.16	54.0	-15.30	AV	304.00	150	Horizontal	Pass

LOW CHANNEL 1 GHz to 12.75 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1312.400	40.50	-11.13	74.0	-33.50	Peak	224.00	150	Vertical	Pass
1**	1312.400	30.37	-11.13	54.0	-23.63	AV	224.00	150	Vertical	Pass
2	2616.500	48.73	-4.14	74.0	-25.27	Peak	3.00	150	Vertical	Pass
2**	2616.500	35.95	-4.14	54.0	-18.05	AV	3.00	150	Vertical	Pass
3	4109.200	46.42	-4.22	74.0	-27.58	Peak	355.00	150	Vertical	Pass
3**	4109.200	37.36	-4.22	54.0	-16.64	AV	355.00	150	Vertical	Pass
4	6901.400	52.90	4.70	74.0	-21.10	Peak	361.00	150	Vertical	Pass
4**	6901.400	42.27	4.70	54.0	-11.73	AV	361.00	150	Vertical	Pass
5	8062.025	48.96	18.41	74.0	-25.04	Peak	165.00	150	Vertical	Pass
5**	8062.025	38.96	18.41	54.0	-15.04	AV	165.00	150	Vertical	Pass
6	11617.250	50.26	20.22	74.0	-23.74	Peak	362.00	150	Vertical	Pass
6**	11617.250	39.26	20.22	54.0	-14.74	AV	362.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 12.75 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1253.500	39.43	-11.63	74.0	-34.57	Peak	337.00	150	Horizontal	Pass
1**	1253.500	28.32	-11.63	54.0	-25.68	AV	337.00	150	Horizontal	Pass
2	2550.200	46.74	-4.84	74.0	-27.26	Peak	362.00	150	Horizontal	Pass
2**	2550.200	36.32	-4.84	54.0	-17.68	AV	362.00	150	Horizontal	Pass
3	3572.800	43.95	-6.19	74.0	-30.05	Peak	54.00	150	Horizontal	Pass
3**	3572.800	33.74	-6.19	54.0	-20.26	AV	54.00	150	Horizontal	Pass
4	6423.400	51.55	3.70	74.0	-22.45	Peak	330.00	150	Horizontal	Pass
4**	6423.400	42.07	3.70	54.0	-11.93	AV	330.00	150	Horizontal	Pass
5	7550.275	49.36	17.52	74.0	-24.64	Peak	303.00	150	Horizontal	Pass
5**	7550.275	37.96	17.52	54.0	-16.04	AV	303.00	150	Horizontal	Pass
6	11613.225	50.61	20.20	74.0	-23.39	Peak	65.00	150	Horizontal	Pass
6**	11613.225	38.73	20.20	54.0	-15.27	AV	65.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 12.75 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1444.900	41.31	-10.97	74.0	-32.69	Peak	74.00	150	Vertical	Pass
1**	1444.900	29.86	-10.97	54.0	-24.14	AV	74.00	150	Vertical	Pass
2	2636.100	47.82	-5.26	74.0	-26.18	Peak	168.00	150	Vertical	Pass
2**	2636.100	35.47	-5.26	54.0	-18.53	AV	168.00	150	Vertical	Pass
3	3658.200	44.61	-5.27	74.0	-29.39	Peak	347.00	150	Vertical	Pass
3**	3658.200	34.07	-5.27	54.0	-19.93	AV	347.00	150	Vertical	Pass
4	6443.200	51.92	3.00	74.0	-22.08	Peak	145.00	150	Vertical	Pass
4**	6443.200	42.50	3.00	54.0	-11.50	AV	145.00	150	Vertical	Pass
5	8066.913	49.27	18.34	74.0	-24.73	Peak	57.00	150	Vertical	Pass
5**	8066.913	37.51	18.34	54.0	-16.49	AV	57.00	150	Vertical	Pass
6	11619.838	49.66	20.24	74.0	-24.34	Peak	40.00	150	Vertical	Pass
6**	11619.838	39.39	20.24	54.0	-14.61	AV	40.00	150	Vertical	Pass

HIGH CHANNEL 1 GHz to 12.75 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1445.600	40.55	-10.94	74.0	-33.45	Peak	93.00	150	Horizontal	Pass
1**	1445.600	29.71	-10.94	54.0	-24.29	AV	93.00	150	Horizontal	Pass
2	2832.200	48.09	-3.79	74.0	-25.91	Peak	362.00	150	Horizontal	Pass
2**	2832.200	37.60	-3.79	54.0	-16.40	AV	362.00	150	Horizontal	Pass
3	3851.000	44.13	-5.28	74.0	-29.87	Peak	100.00	150	Horizontal	Pass
3**	3851.000	35.21	-5.28	54.0	-18.79	AV	100.00	150	Horizontal	Pass
4	6424.000	52.73	3.64	74.0	-21.27	Peak	88.00	150	Horizontal	Pass
4**	6424.000	42.56	3.64	54.0	-11.44	AV	88.00	150	Horizontal	Pass
5	8022.350	49.05	18.32	74.0	-24.95	Peak	147.00	150	Horizontal	Pass
5**	8022.350	36.68	18.32	54.0	-17.32	AV	147.00	150	Horizontal	Pass
6	10999.125	50.40	19.01	74.0	-23.60	Peak	328.00	150	Horizontal	Pass
6**	10999.125	39.44	19.01	54.0	-14.56	AV	328.00	150	Horizontal	Pass

HIGH CHANNEL 1 GHz to 12.75 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1300.200	41.36	-11.29	74.0	-32.64	Peak	1.00	150	Vertical	Pass
1**	1300.200	34.17	-11.29	54.0	-19.83	AV	1.00	150	Vertical	Pass
2	2711.000	47.68	-4.46	74.0	-26.32	Peak	137.00	150	Vertical	Pass
2**	2711.000	36.37	-4.46	54.0	-17.63	AV	137.00	150	Vertical	Pass
3	3595.000	43.59	-5.94	74.0	-30.41	Peak	91.00	150	Vertical	Pass
3**	3595.000	33.85	-5.94	54.0	-20.15	AV	91.00	150	Vertical	Pass
4	6422.000	52.15	3.85	74.0	-21.85	Peak	105.00	150	Vertical	Pass
4**	6422.000	42.82	3.85	54.0	-11.18	AV	105.00	150	Vertical	Pass
5	8104.862	49.25	17.82	74.0	-24.75	Peak	311.00	150	Vertical	Pass
5**	8104.862	37.75	17.82	54.0	-16.25	AV	311.00	150	Vertical	Pass
6	11614.088	50.35	20.21	74.0	-23.65	Peak	197.00	150	Vertical	Pass
6**	11614.088	38.53	20.21	54.0	-15.47	AV	197.00	150	Vertical	Pass

Test Data and Plots (Band edge)

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

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

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

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

Test Data

1# circuit

Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Factor (dB)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
ZWAVE	Low	614	39.835	3.16	74	34.165	PEAK	Pass
		614	N/A	N/A	54	N/A	AVERAGE	Pass
ZWAVE	HIGH	960	47.028	28.00	74	26.972	PEAK	Pass
		960	N/A	N/A	54	N/A	AVERAGE	Pass

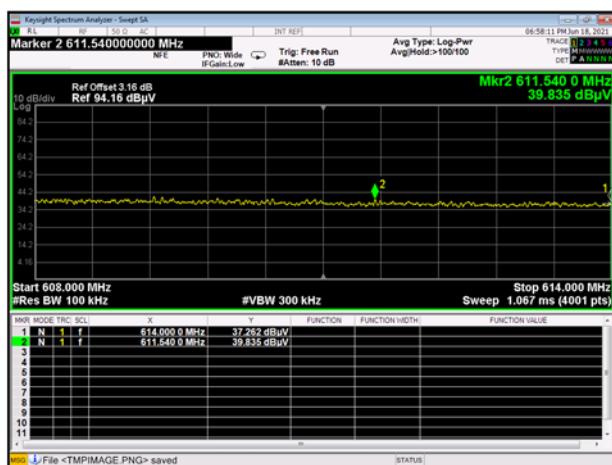
2# circuit

Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Factor (dB)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
ZWAVE	Low	614	40.194	3.16	74	33.806	PEAK	Pass
		614	N/A	N/A	54	N/A	AVERAGE	Pass
ZWAVE	HIGH	960	47.876	3.16	74	26.124	PEAK	Pass
		960	N/A	N/A	54	N/A	AVERAGE	Pass

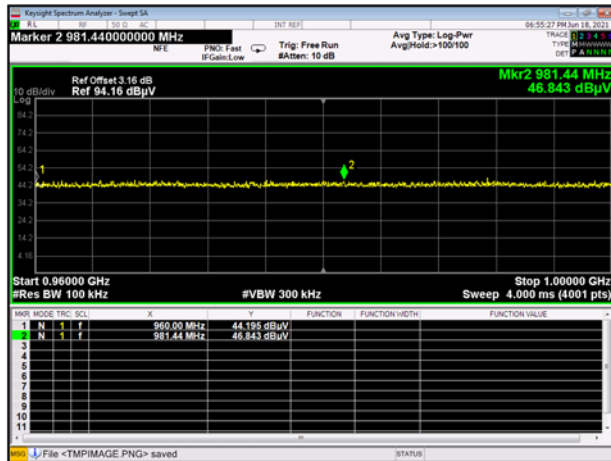
Test plots

1# circuit

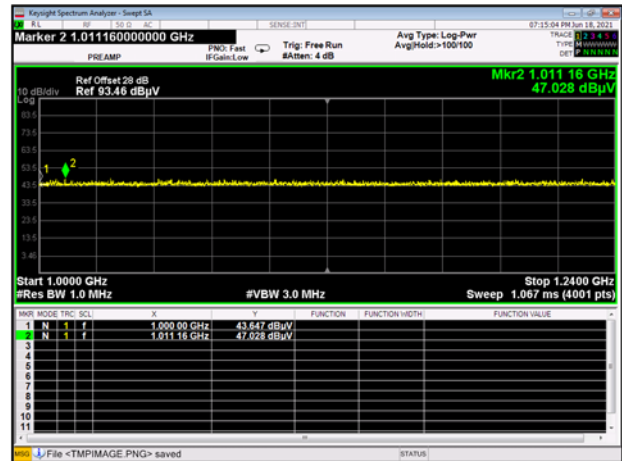
LOW CHANNEL, PEAK



HIGH CHANNEL, PEAK

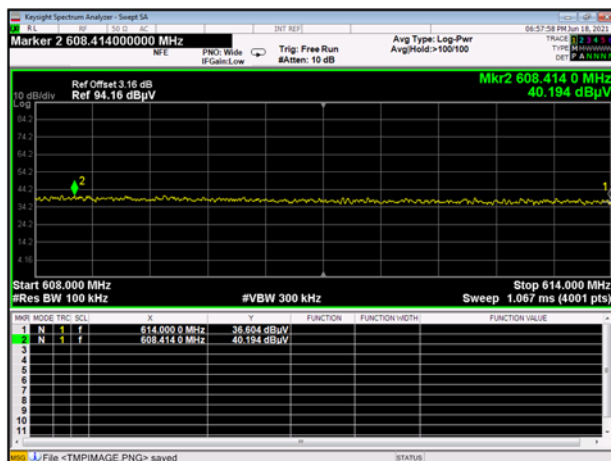


HIGH CHANNEL, PEAK

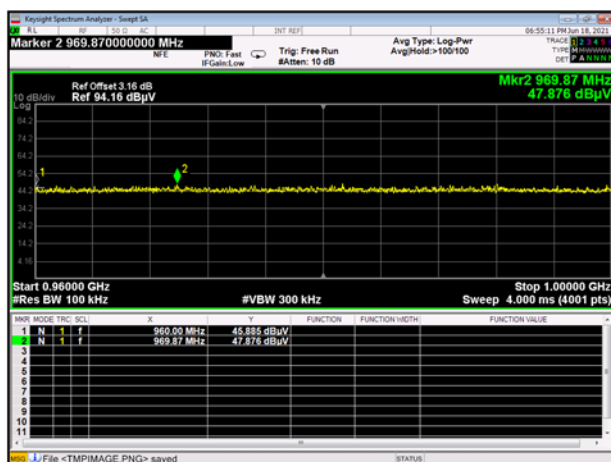


2# circuit

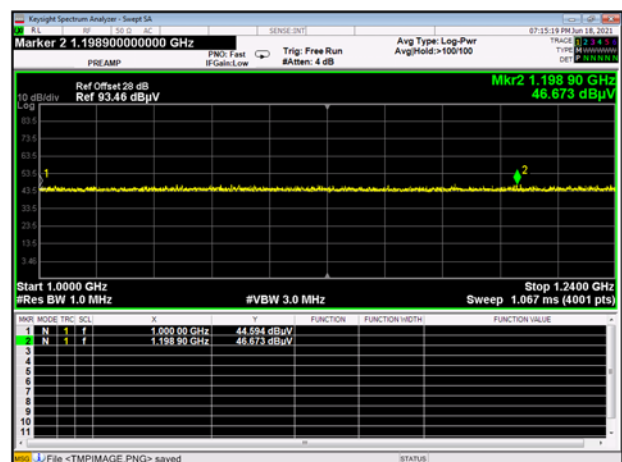
LOW CHANNEL, PEAK



HIGH CHANNEL, PEAK



HIGH CHANNEL, PEAK



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2141004-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2141004-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2141004-AI.PDF”.

--END OF REPORT--