

FCC/ISED

RF

TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

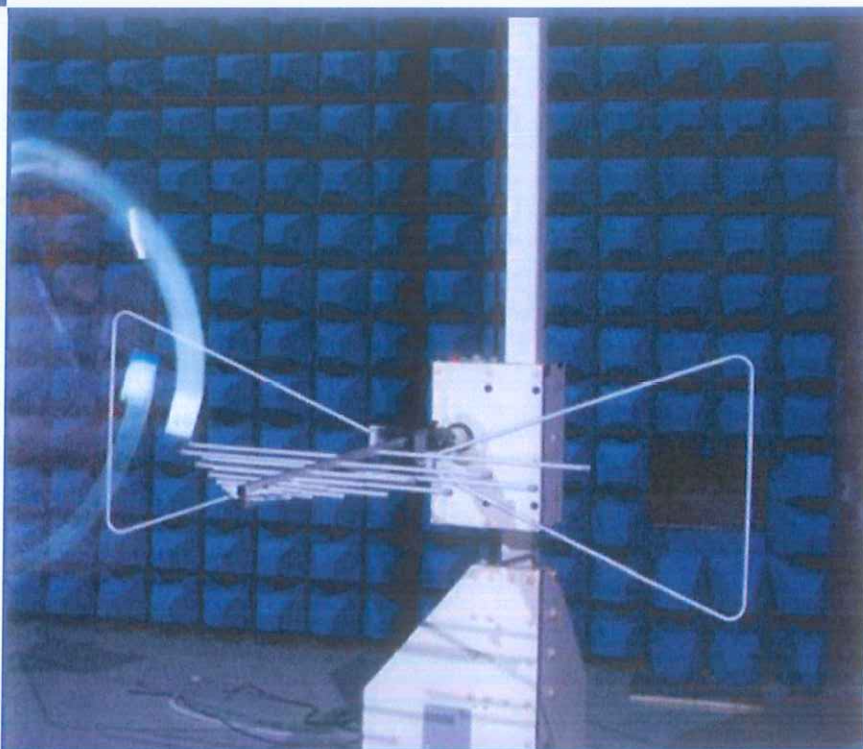


FOR

Fully Rugged Windows Tablet

ISSUED TO
Shenzhen UniStrong Science & Technology Co., Ltd

B, 4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China



Tested by: Xia Long
Xia Long

(Engineer)
Date: Apr. 20, 2018

Approved by: Liao Jianming
Liao Jianming
(Technical Director)

Date: Apr. 20, 2018

Report No.: BL-EC1830163-402

EUT Name: Fully Rugged Windows Tablet

Model Name: UT50

Brand Name: UniStrong

Test Standard: 47 CFR Part 15 Subpart C
RSS-Gen (Issue 4, November 2014)
RSS-210 (Issue 9, August 2017)

FCC ID: 2AOPD-UT50

ISED Number: 11546A-UT50

Test conclusion: Pass

Test Date: Apr. 03, 2018 ~ Apr. 10, 2018

Date of Issue: Apr. 20, 2018

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. BALUN Laboratory. Any objections should be raised within thirty days from the date of issue. To validate the report, please contact us.

Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Apr. 20, 2018</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	Ancillary Equipment	6
2.6	Technical Information	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	10
4.3.1	For Radiated Test (Below 30 MHz)	10
4.3.2	For Radiated Test (30 MHz-1 GHz)	10
4.3.3	For AC Power Supply Port Test	11
5	TEST ITEMS.....	12
5.1	Antenna Requirements	12
5.1.1	Standard Applicable	12
5.1.2	Antenna Anti-Replacement Construction	12

5.1.3	Antenna Gain	12
5.2	Emission Bandwidth	13
5.2.1	Definition	13
5.2.2	Test Setup	13
5.2.3	Test Procedure	13
5.2.4	Test Result	13
5.3	Field Strength of Fundamental Emissions and Radiated Emissions	14
5.3.1	Limit	14
5.3.2	Test Setup	15
5.3.3	Test Procedure	15
5.3.4	Test Result	15
5.4	Frequency Tolerance	16
5.4.1	Limit	16
5.4.2	Test Setup	16
5.4.3	Test Procedure	16
5.4.4	Test Result	16
5.5	Conducted Emission	17
5.5.1	Limit	17
5.5.2	Test Setup	17
5.5.3	Test Procedure	17
5.5.4	Test Result	17
ANNEX A	TEST RESULT	18
A.1	Emission Bandwidth	18
A.2	Field Strength of Fundamental Emissions	19
A.3	Radiated Emissions	21
A.4	Frequency Stability	25
A.5	Conducted Emissions	26
ANNEX C	TEST SETUP PHOTOS	28
ANNEX D	EUT EXTERNAL PHOTOS	28
ANNEX E	EUT INTERNAL PHOTOS	28

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	<p>The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1.</p> <p>The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.</p> <p>The laboratory is a testing organization accredited by American Association for Laboratory Accreditation(A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01.</p> <p>The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.</p>
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 to 25°C
Ambient Relative Humidity	45% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

- (1) The test report reference to the report template version v5.1.
- (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.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Shenzhen UniStrong Science & Technology Co., Ltd.
Address	B, 4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China

2.2 Manufacturer Information

Manufacturer	Shenzhen UniStrong Science & Technology Co., Ltd.
Address	B, 4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Fully Rugged Windows Tablet
Under Test Model Name	UT50
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V4.0
Software Version	BIOS: R.AA.00.03.00/EC: R.AA.00.03.00/OS: R.AA.00.30.00
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	SJYEnergy
	Model No.	BA900
	Serial No.	N/A
	Capacity	2900 mAh
	Rated Voltage	11.4 V
	Limit Charge Voltage	13.05 V
Ancillary Equipment 2	Adapter	
	Brand Name	AK
	Model No.	AK65WG-1900342W1
	Serial No.	N/A
	Rated Input	100-240 V~, 1.5 A, 50/60 Hz
	Rated Output	19 V= 3.42 A
Ancillary Equipment 3	Power Line	
	Length (Approx.)	1.5 m

2.6 Technical Information

Network and Wireless connectivity	3G Network WCDMA/HSDPA/HSUPA Band 1/2/3/4/5/8 4G Network FDD LTE Band 1/2/3/4/5/7/8/12/13/20/25/26/30 TDD LTE Band 41 Bluetooth, WIFI, NFC, GPS, GLONASS, BDS
-----------------------------------	--

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

Modulation Type	ASK
Product Type	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Frequency Range	13.56 MHz
Receiver Categorization	3
Number of channel	1
Tested Channel	1
Antenna Gain	0dBi
Antenna Type	PIFA Antenna

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C (10-1-15 Edition)	Miscellaneous Wireless Communications Services
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
3	RSS-Gen (Issue 4, Nov. 2014)	General Requirements for Compliance of Radio Apparatus
4	RSS-210 (Issue 9, August 2017)	Licence-Exempt Radio Apparatus: Category I Equipment

3.2 Verdict

No.	Description	FCC Part No.	ISED Part No.	Test Result	Verdict
1	Antenna Requirement	15.203	RSS-Gen 7.1.4	--	Pass ^{Note}
2	Emissions Bandwidth	2.1049	RSS-Gen	ANNEX A.1	Pass
3	Field Strength of Fundamental Emissions	15.225(a)	RSS-210 B.6	ANNEX A.2	Pass
4	Radiated Emissions	15.225(d) 15.209	RSS-210 B.6	ANNEX A.3	Pass
5	Frequency Stability	15.225(e)	RSS-210 B.6	ANNEX A.4	Pass
6	Conducted Emission	15.207	RSS-Gen	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	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)	11.4 V

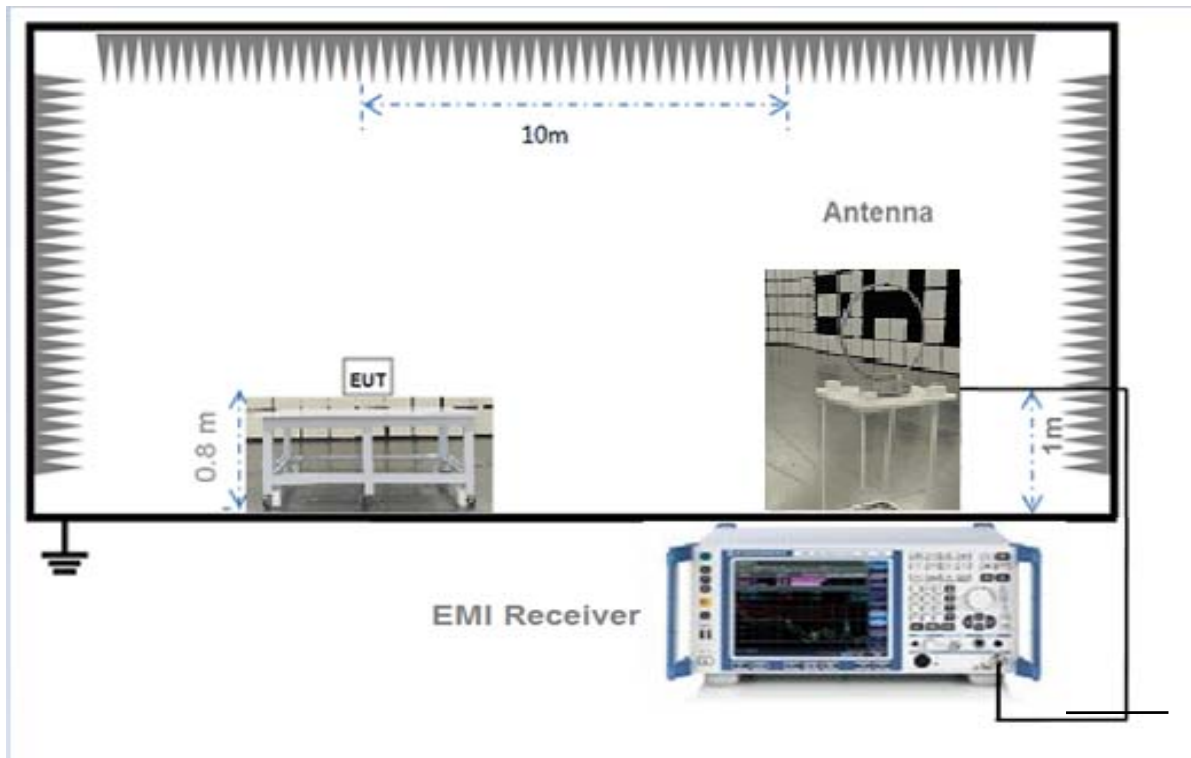
4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2017.06.12	2018.06.11	<input type="checkbox"/>
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	260592	2017.06.12	2018.06.11	<input type="checkbox"/>
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2017.06.12	2018.06.11	<input type="checkbox"/>
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2017.06.12	2018.06.11	<input type="checkbox"/>
Spectrum Analyzer	AGILENT	E4440A	MY4530443 4	2017.11.07	2018.11.06	<input type="checkbox"/>
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2017.06.22	2018.06.21	<input checked="" type="checkbox"/>
LISN	SCHWARZBECK	NSLK 8127	8127-687	2017.06.22	2018.06.21	<input checked="" type="checkbox"/>
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2017.06.12	2018.06.11	<input type="checkbox"/>
Power Splitter	KMW	DCPD-LDC	1305003215	--	--	<input type="checkbox"/>
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2017.06.12	2018.06.11	<input type="checkbox"/>
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--	<input type="checkbox"/>
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--	<input type="checkbox"/>
DC Power Supply	ROHDE&SCHWARZ	HMP2020	18141664	2017.06.22	2018.06.21	<input type="checkbox"/>
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2017.06.27	2018.06.26	<input type="checkbox"/>
Test Antenna- Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2017.11.07	2019.11.08	<input checked="" type="checkbox"/>
Test Antenna- Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2017.07.22	2019.07.21	<input checked="" type="checkbox"/>
Test Antenna- Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2016.07.12	2018.07.11	<input type="checkbox"/>
Test Antenna- Horn(18-40 GHz)	A-INFO	LB- 180400KF	J211060273	2017.01.06	2018.01.05	<input type="checkbox"/>
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2019.02.20	<input checked="" type="checkbox"/>

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
Anechoic Chamber	EMC TECHNOLOGY LTD	21.1m*11.6m*7.35m	N/A	2016.08.09	2018.08.08	<input checked="" type="checkbox"/>
Shielded Enclosure	ChangNing	CN-130701	130703	--	--	<input checked="" type="checkbox"/>

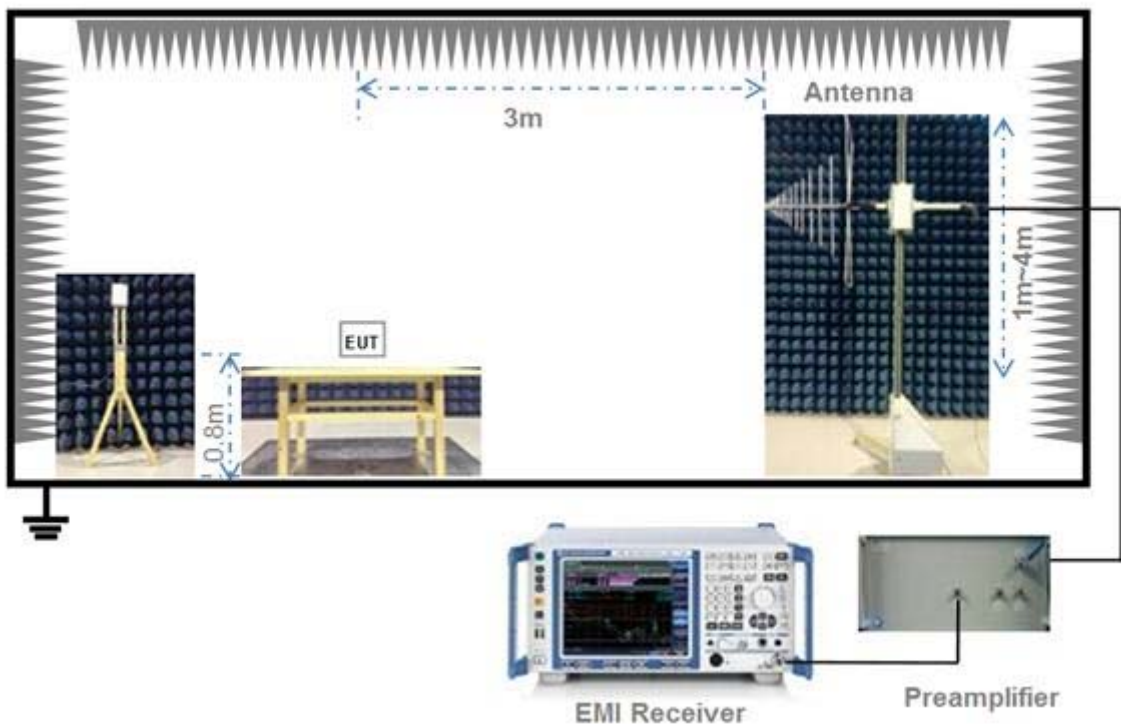
4.3 Description of Test Setup

4.3.1 For Radiated Test (Below 30 MHz)



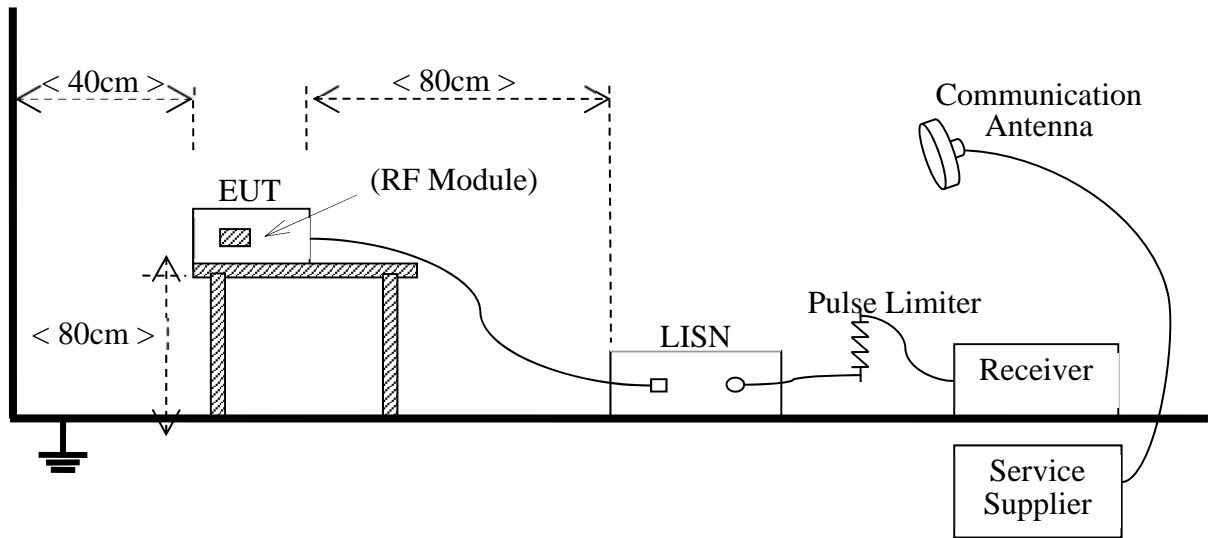
(Diagram 1)

4.3.2 For Radiated Test (30 MHz-1 GHz)



(Diagram 2)

4.3.3 For AC Power Supply Port Test



(Diagram 3)

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Standard Applicable

FCC §15.203 & 15.247(b); RSS-Gen 7.1.4

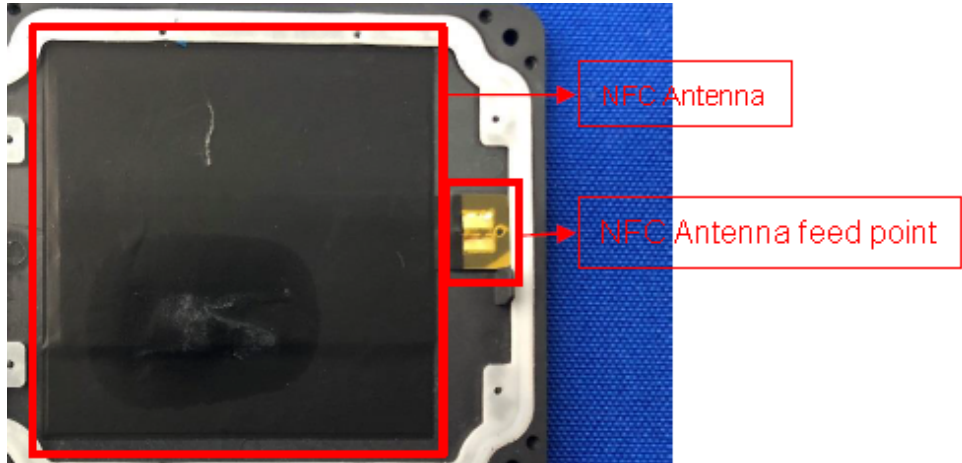
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply 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 An embedded-in	An embedded-in antenna design is used.

Reference Documents	Item
Photo	

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 Emission Bandwidth

5.2.1 Definition

FCC §2.1049&15.215(c); RSS-Gen

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency.

5.2.2 Test Setup

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

The 20dB bandwidth is measured with a spectrum analyzer connected via a receiver antenna placed near the EUT while the EUT is operating in transmission mode.

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth

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 Field Strength of Fundamental Emissions and Radiated Emissions

5.3.1 Limit

FCC §15.225(a), (b), (c); RSS-Gen B.6

According to FCC section 15.225, for <30 MHz, Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set 10 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 KHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)

There was no detected Restricted bands and Radiated suprious emission below 30MHz. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows; 3 m Limit(dBuV/m) = $20\log(X)+40\log(30/3)= 20\log(15848)+40\log(30/3) = 124\text{dBuV}$

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 range (MHz)	Field Strength@30m		Field Strength@10m	Field Strength@3m
	μV/m	dBμV/m	dBμV/m	dBμV/m
Below 13.110	30	29.5	49.5	69.5
13.110 ~ 13.410	106	40.5	60.5	80.5
13.410 ~ 13.553	334	50.5	70.5	90.5
13.553 ~13.567	15.848	84	104	124
13.567 ~ 13.710	334	50.5	70.5	90.5
13.710 ~14.010	106	40.5	60.5	80.5
Above 14.010	30	29.5	49.5	69.5

NOTE:

1. Field Strength (dBμV/m) = $20*\log[\text{Field Strength } (\mu\text{V/m})]$.
2. In the emission tables above, the tighter limit applies at the band edges.

FCC §15.225(d)

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)
0.009 - 0.490	$2400/F(\text{kHz})$
0.490 - 1.705	$24000/F(\text{kHz})$
1.705 - 30.0	30
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

Note:

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

5.3.2 Test Setup

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 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

5.3.4 Test Result

Please refer to ANNEX A.2

5.4 Frequency Tolerance

5.4.1 Limit

FCC §15.225(e); RSS-Gen B.6

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.4.2 Test Setup

See section 4.1.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

1. The test is performed in a Temperature Chamber.
2. The EUT is configured as MS + DC Power Supply.

5.4.4 Test Result

Please refer to ANNEX A.4.

5.5 Conducted Emission

5.5.1 Limit

FCC §15.207; RSS-Gen

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

5.5.2 Test Setup

See section 4.1.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The 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.

5.5.4 Test Result

Please refer to ANNEX A.5.

ANNEX A TEST RESULT

A.1 Emission Bandwidth

Test Data

Frequency (MHz)	Emission Bandwidth(20dB down) (kHz)	Occupied Bandwidth(99%) (kHz)
13.56	26.818	23.132

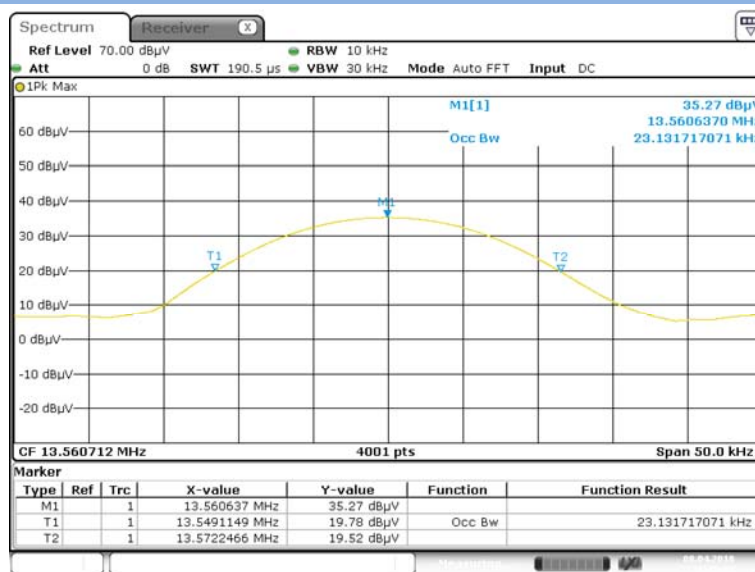
Test plots

Emission Bandwidth



Date: 8.APR.2018 16:19:22

99% Occupied Bandwidth



Date: 8.APR.2018 16:18:23

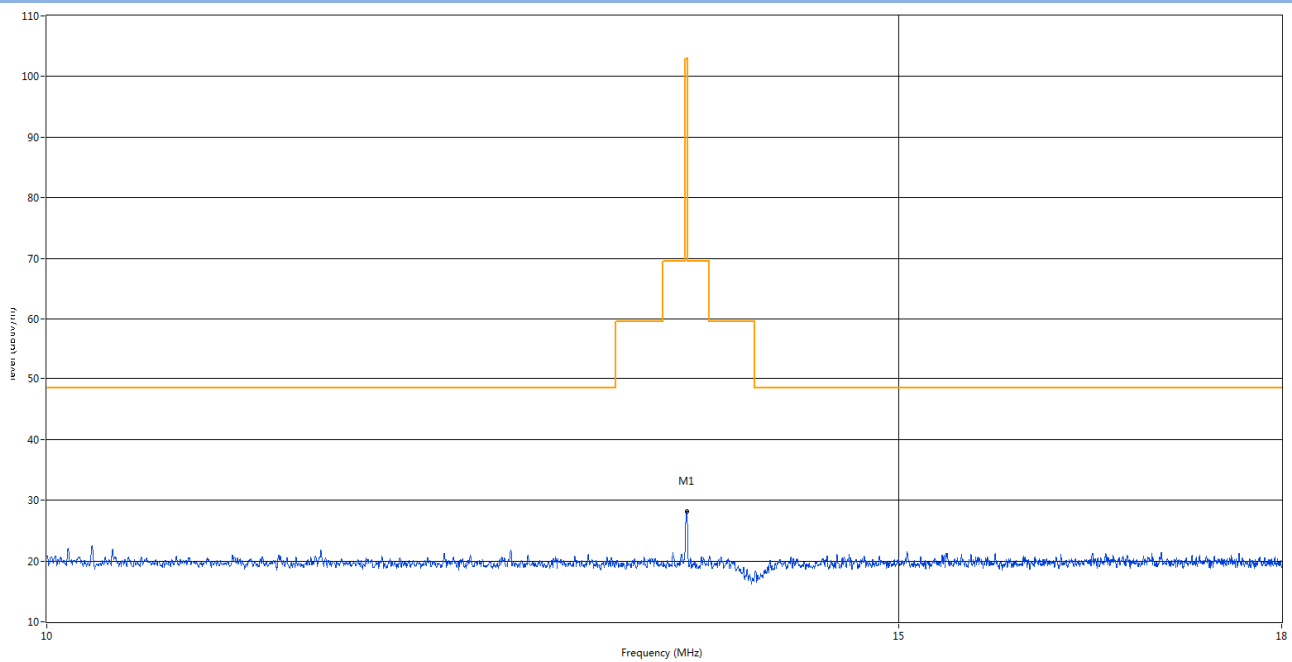
A.2 Field Strength of Fundamental Emissions(at 10m chamber)

Test Data

Field Strength of Fundamental Emissions Value					
Frequency (MHz)	Detector	Field Strength (dBuV/m)	Limit @10m (dBuV/m)	Antenna	Margin (dB)
13.56	PEAK	28.18	103.0	Vertical	66.82
13.56	PEAK	28.09	103.0	Horizontal	69.75

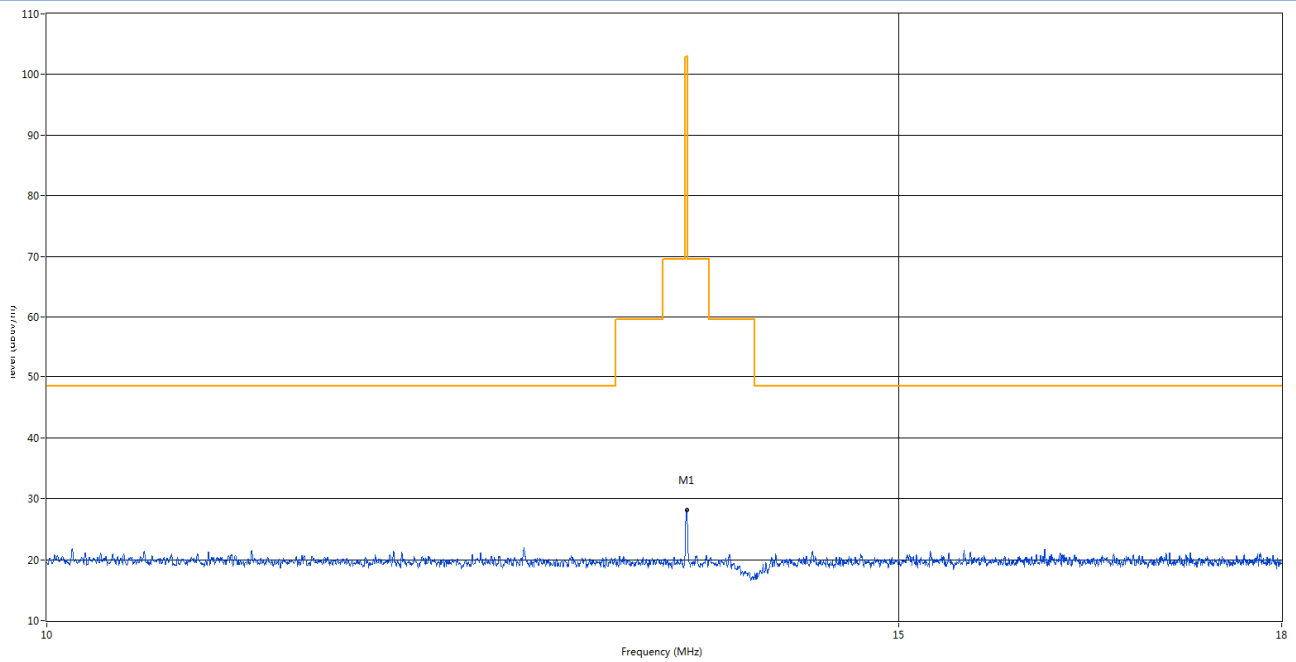
Test Plot

ANT-LOOP ANT Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	13.560	28.18	9.44	103.0	74.82	Peak	280.00	100	Vertical	Pass

ANT-LOOP ANT Horizontal

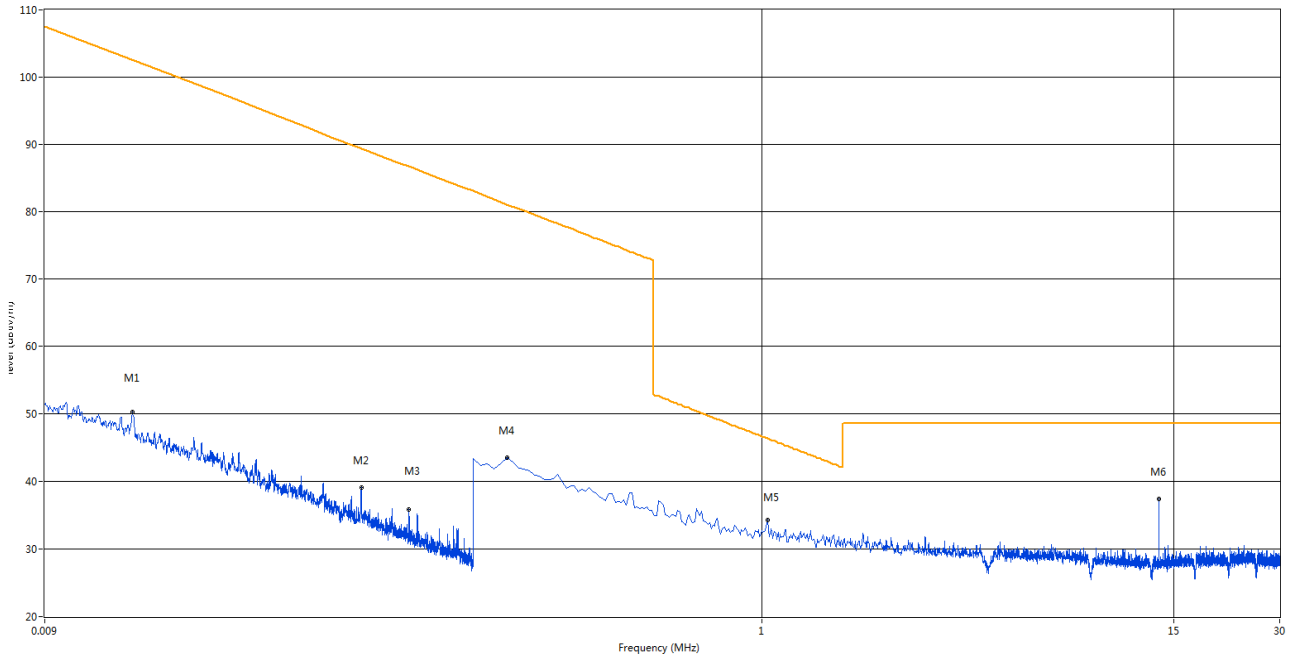


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	13.560	28.09	9.44	103.0	74.91	Peak	350.00	100	Horizontal	Pass

A.3 Radiated Emissions

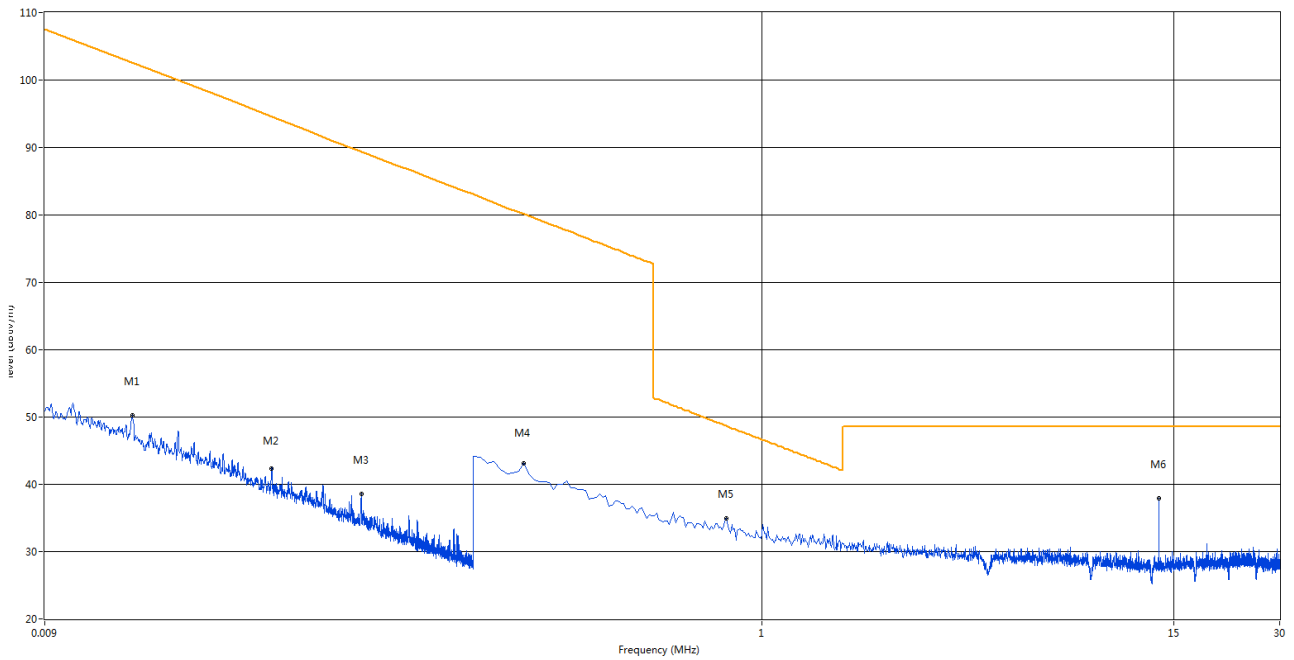
The Data and Plots (9 kHz ~ 30 MHz)(at 10m chamber)

Below 30 MHz ANT Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	0.016	50.21	19.77	102.5	52.29	Peak	141.00	100	Vertical	Pass
2	0.072	39.06	19.82	89.5	50.44	Peak	0.00	100	Vertical	Pass
3	0.098	35.81	19.80	86.7	50.89	Peak	70.00	100	Vertical	Pass
4	0.187	43.46	19.77	81.1	37.64	Peak	113.00	100	Vertical	Pass
5	1.038	34.29	20.09	46.3	12.01	Peak	325.00	100	Vertical	Pass
6	13.560	37.34	20.13	48.5	11.16	Peak	360.00	100	Vertical	N/A

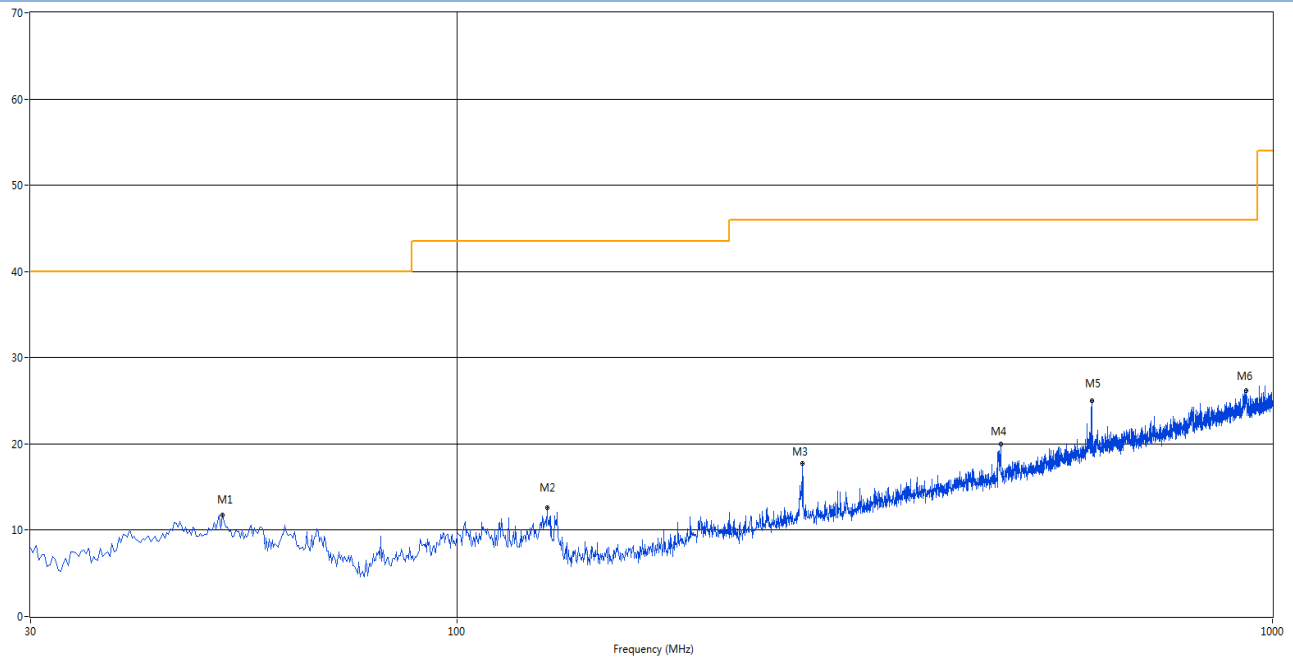
Below 30 MHz ANT Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	0.016	50.18	19.77	102.5	52.32	Peak	291.00	100	Horizontal	Pass
2	0.040	42.36	19.87	94.6	52.24	Peak	360.00	100	Horizontal	Pass
3	0.072	38.54	19.82	89.5	50.96	Peak	360.00	100	Horizontal	Pass
4	0.210	43.06	19.77	80.2	37.14	Peak	219.00	100	Horizontal	Pass
5	0.792	34.91	20.05	48.7	13.79	Peak	87.00	100	Horizontal	Pass
6	13.560	37.86	20.13	48.5	10.64	Peak	237.00	100	Horizontal	N/A

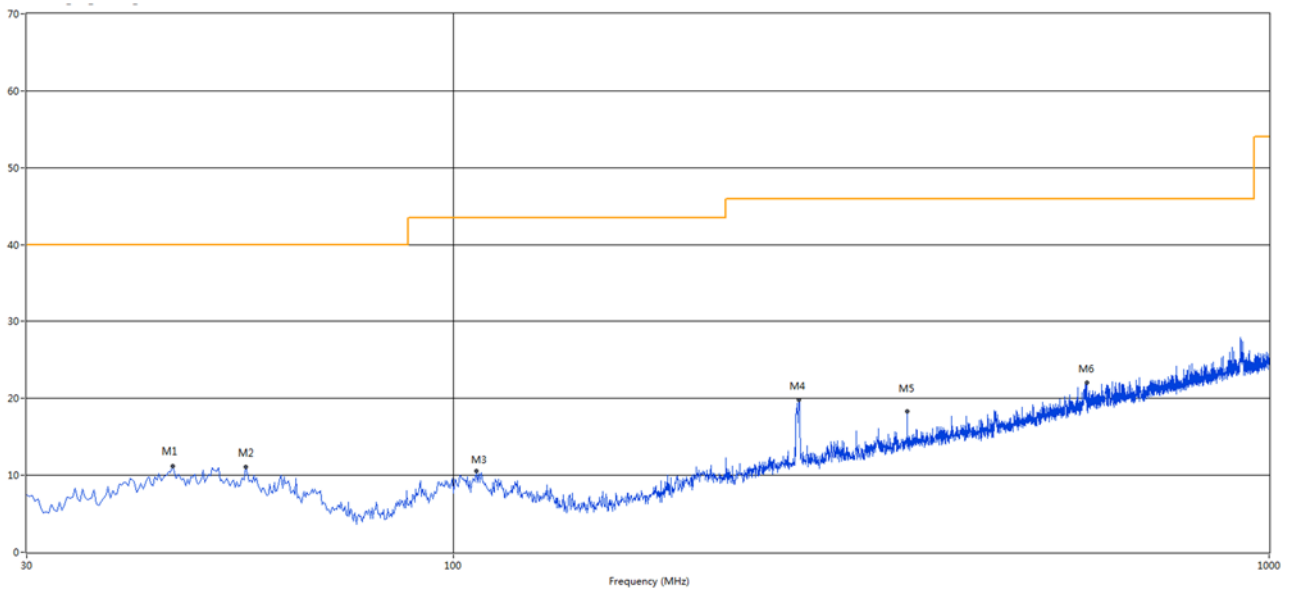
Test Data and Plots (30 MHz ~ 10th Harmonic))(at 3m chamber)

30 MHz to 1 GHz, ANT Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	51.583	11.79	-24.22	40.0	28.21	Peak	311.50	100	Vertical	Pass
2	128.940	12.59	-28.61	43.5	30.91	Peak	211.90	100	Vertical	Pass
3	265.468	17.75	-23.73	46.0	28.25	Peak	271.70	200	Vertical	Pass
4	464.560	19.94	-18.74	46.0	26.06	Peak	79.80	100	Vertical	Pass
5	600.118	24.92	-15.52	46.0	21.08	Peak	30.30	100	Vertical	Pass
6	928.220	26.15	-10.84	46.0	19.85	Peak	0.00	200	Vertical	Pass

30 MHz to 1 GHz, ANT Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	45.278	11.20	-24.41	40.0	28.80	Peak	285.20	200	Horizontal	Pass
2	55.705	11.05	-24.80	40.0	28.95	Peak	358.00	100	Horizontal	Pass
3	106.630	10.60	-25.66	43.5	32.90	Peak	164.90	200	Horizontal	Pass
4	265.468	19.70	-23.73	46.0	26.30	Peak	3.80	100	Horizontal	Pass
5	360.042	18.24	-21.00	46.0	27.76	Peak	216.40	100	Horizontal	Pass
6	597.692	21.99	-15.66	46.0	24.01	Peak	0.00	200	Horizontal	Pass

A.4 Frequency Stability

OPERATING FREQUENCY:	13560000 Hz
REFERENCE VOLTAGE:	11.4 V
DEVIATION LIMIT:	$\pm 0.01\%$

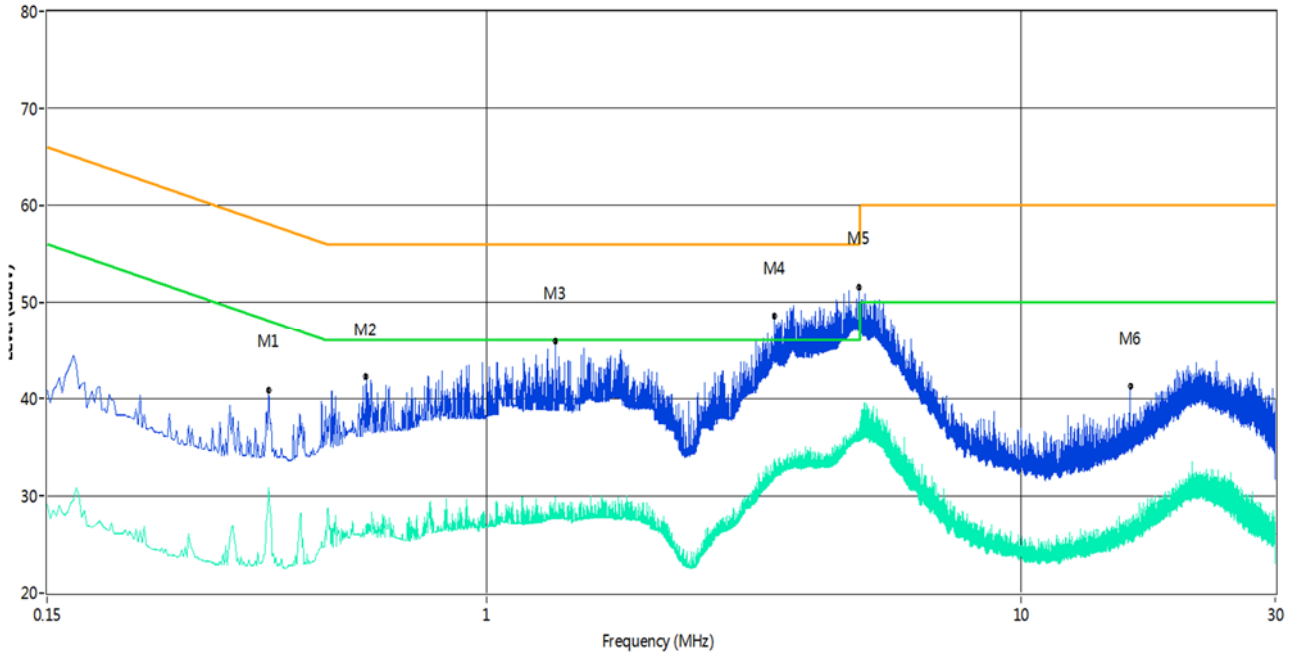
VOLTAGE (%)	Test Conditions		Frequency(Hz)	Deviation(ppm)	Verdict
	Power (VDC)	Temperature (°C)			
100	11.4	+20°C(Ref)	13560637	-0.00004697	Pass
100		-20	13560644	-0.00004749	
100		-10	13560648	-0.00004779	
100		0	13560716	-0.00005280	
100		+10	13560725	-0.00005346	
100		+20	13560820	-0.00006047	
100		+25	13560888	-0.00006548	
100		+30	13560903	-0.00006659	
100		+40	13560905	-0.00006674	
100		+50	13560920	-0.00006784	
Battery End Point	11.1	+20	13560927	-0.00006836	
115	13.05	+20	13561024	-0.00007551	

A.5 Conducted Emissions

Note 1: 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.

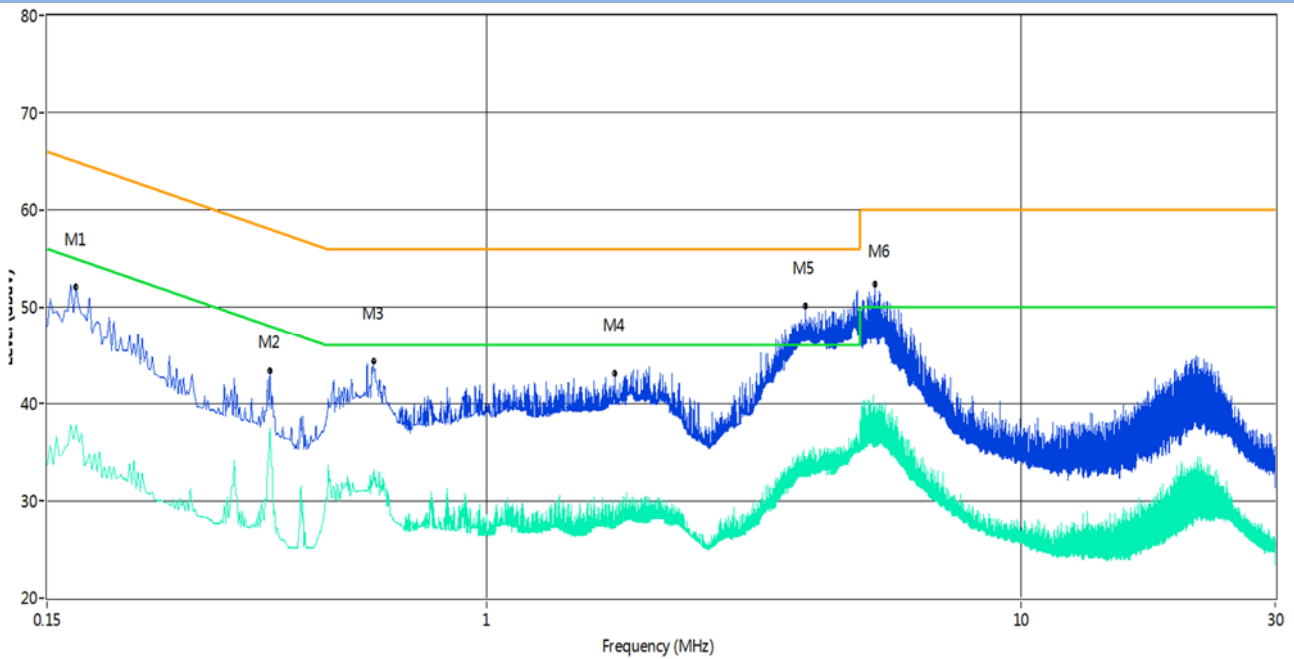
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.39	40.9	13.00	59.1	18.20	Peak	L Line	Pass
1**	0.39	30.8	13.00	49.1	18.30	AV	L Line	Pass
2	0.59	42.2	13.00	56.0	13.80	Peak	L Line	Pass
2**	0.59	27.1	13.00	46.0	18.90	AV	L Line	Pass
3	1.34	45.9	13.00	56.0	10.10	Peak	L Line	Pass
3**	1.34	29.8	13.00	46.0	16.20	AV	L Line	Pass
4	3.46	48.6	13.00	56.0	7.40	Peak	L Line	Pass
4**	3.46	33.1	13.00	46.0	12.90	AV	L Line	Pass
5	4.97	51.6	13.00	56.0	4.40	Peak	L Line	Pass
5**	4.97	36.3	13.00	46.0	9.70	AV	L Line	Pass
6	16.03	41.2	13.00	60.0	18.80	Peak	L Line	Pass
6**	16.03	25.4	13.00	50.0	24.60	AV	L Line	Pass

PHASE N



No.	Frequency (MHz)	Results (dBμV)	Factor (dB)	Limit (dBμV)	Margin (dB)	Detector	Line	Verdict
1	0.17	52.1	13.00	65.4	13.30	Peak	N Line	Pass
1**	0.17	37.8	13.00	55.4	17.60	AV	N Line	Pass
2	0.39	43.4	13.00	59.1	15.70	Peak	N Line	Pass
2**	0.39	37.5	13.00	49.1	11.60	AV	N Line	Pass
3	0.61	44.4	13.00	56.0	11.60	Peak	N Line	Pass
3**	0.61	32.2	13.00	46.0	13.80	AV	N Line	Pass
4	1.73	43.1	13.00	56.0	12.90	Peak	N Line	Pass
4**	1.73	28.8	13.00	46.0	17.20	AV	N Line	Pass
5	3.95	50.2	13.00	56.0	5.80	Peak	N Line	Pass
5**	3.95	33.5	13.00	46.0	12.50	AV	N Line	Pass
6	5.33	52.4	13.00	60.0	7.60	Peak	N Line	Pass
6**	5.33	35.5	13.00	50.0	14.50	AV	N Line	Pass

ANNEX C TEST SETUP PHOTOS

Please refer the document “BL-EC1830163-AE2.PDF”.

ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-EC1830163--AW.PDF”.

ANNEX E EUT INTERNAL PHOTOS

Please refer the document “BL-EC1830163--AI.PDF”.

--END OF REPORT--