

# TEST REPORT

**Applicant:** Guangdong OPPO Mobile Telecommunications Corp., Ltd.  
**Address:** NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China  
**Equipment Type:** Mobile Phone  
**Model Name:** CPH2339  
**Brand Name:** OPPO  
**FCC ID:** R9C-CPH2339  
**Test Standard:** 47 CFR Part 15 Subpart C  
**Test Date:** Feb. 23, 2022 - Mar. 4, 2022  
**Date of Issue:** Mar. 31, 2022

**ISSUED BY:**

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Sijie Zheng

**Checked by:** Xia Long

**Approved by:** Liao Jianming  
(Technical Director)

*Sijie Zheng*

*Xia Long*

*Jm Liao*

<b>Revision History</b>		
Version	Issue Date	Revisions Content
Rev. 01	Mar. 31, 2022	Initial Issue

## 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
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 .....	6
3	SUMMARY OF TEST RESULTS .....	7
3.1	Test Standards .....	7
3.2	Verdict .....	7
3.3	Test Uncertainty .....	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 Radiated Test (Below 30 MHz) .....	9
4.3.2	For Radiated Test (30 MHz-1 GHz) .....	9
4.3.3	For AC Power Supply Port Test .....	10
5	TEST ITEMS .....	11
5.1	Antenna Requirements .....	11
5.1.1	Relevant Standards .....	11
5.1.2	Antenna Anti-Replacement Construction .....	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 .....	14
5.3	Field Strength of Fundamental Emissions and Radiated Emissions .....	15
5.3.1	Limit.....	15
5.3.2	Test Setup .....	16
5.3.3	Test Procedure .....	16
5.3.4	Test Result .....	16
5.4	Frequency Tolerance .....	17
5.4.1	Limit.....	17
5.4.2	Test Setup .....	17
5.4.3	Test Procedure .....	17
5.4.4	Test Result .....	17
5.5	Conducted Emission .....	18
5.5.1	Limit.....	18
5.5.2	Test Setup .....	18
5.5.3	Test Procedure .....	18
5.5.4	Test Result .....	18
ANNEX A	TEST RESULT .....	19
A.1	Emission Bandwidth .....	19
A.2	Field Strength of Fundamental Emissions .....	20
A.3	Radiated Emissions.....	22
A.4	Frequency Stability.....	26
A.5	Conducted Emissions.....	27
ANNEX C	TEST SETUP PHOTOS .....	29
ANNEX D	EUT EXTERNAL PHOTOS.....	29
ANNEX E	EUT INTERNAL PHOTOS.....	29

# 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
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

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

Applicant	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China

### 2.2 Manufacturer Information

Manufacturer	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China

### 2.3 Factory Information

Factory	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China

### 2.4 General Description for Equipment under Test (EUT)

EUT Name	Mobile Phone
Under Test Model Name	CPH2339
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	11
Software Version	ColorOS V12.1
Dimensions (Approx.)	N/A
Weight (Approx.)	about 190g(with battery)

## 2.5 Technical Information

Network and Wireless connectivity	2G Network GSM/GPRS/EDGE 850/1900 MHz 3G Network WCDMA/HSDPA/HSUPA Band 2/4/5 4G Network LTE FDD Band 2/4/5/7/12/17/26/66 LTE TDD Band 38/41 LTE CA Uplink (UL): CA_7C, CA_38C, CA_41C 5G Network SA: NR n5/n7/n38/n41 NSA(EN-DC): DC_5A_n7A, DC_7A_n5A, DC_66A_n7A Bluetooth (BR+EDR+BLE) 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80) U-NII-1/2A/2C/3, GPS, GLONASS, BDS, Galileo, SBAS, FM Receiver, NFC
-----------------------------------	--

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 Type	Coil Antenna

### 3 SUMMARY OF TEST RESULTS

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Miscellaneous Wireless Communications Services
2	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
1	Antenna Requirement	15.203	RSS-Gen 6.8	--	Pass <sup>Note</sup>
2	Emissions Bandwidth	15.215	RSS-Gen 6.7	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 8.8	ANNEX A.5	Pass

Note: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203 & RSS-Gen 8.3.

#### 3.3 Test Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions (9 kHz-30 MHz)	4.28 dB
Radiated emissions (9 kHz-30 MHz)	3.22 dB
Radiated emissions (30 MHz-1 GHz)-10m	4.80 dB
Radiated emissions (30 MHz-1 GHz)-3m	4.76 dB
Radiated emissions (1 GHz-18 GHz)-3m	4.88 dB

## 4 GENERAL TEST CONFIGURATIONS

### 4.1 Test Environments

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

Relative Humidity	30% to 60%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22°C to +25°C
Working Voltage of the EUT	NV (Normal Voltage)	3.87 V

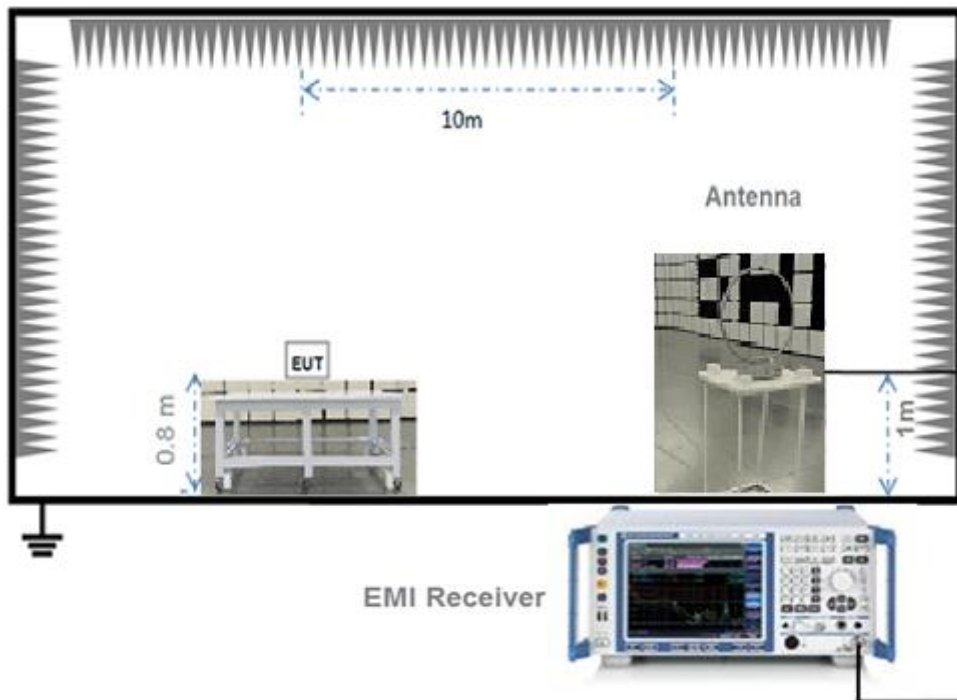
### 4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2021.10.10	2022.10.09
LISN	SCHWARZBECK	NSLK 8127	8127-687	2021.06.08	2022.06.07
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2021.06.04	2022.06.03
Temperature Chamber	AHK	SP20	1412	2021.11.30	2022.11.29
Test Antenna- Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15
Test Antenna- Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2021.08.20	2024.08.19
Anechoic Chamber	EMC TECHNOLOGY LTD	20.1m*11.6 m*7.35m	N/A	2021.08.15	2024.08.14
Anechoic Chamber	CHANGNING	9m*6m*6m	N/A	2020.03.16	2023.03.15
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m* 2.8m	N/A	2022.02.19	2025.02.18
Test Software	BALUN	BL410_E	V19.918	--	--



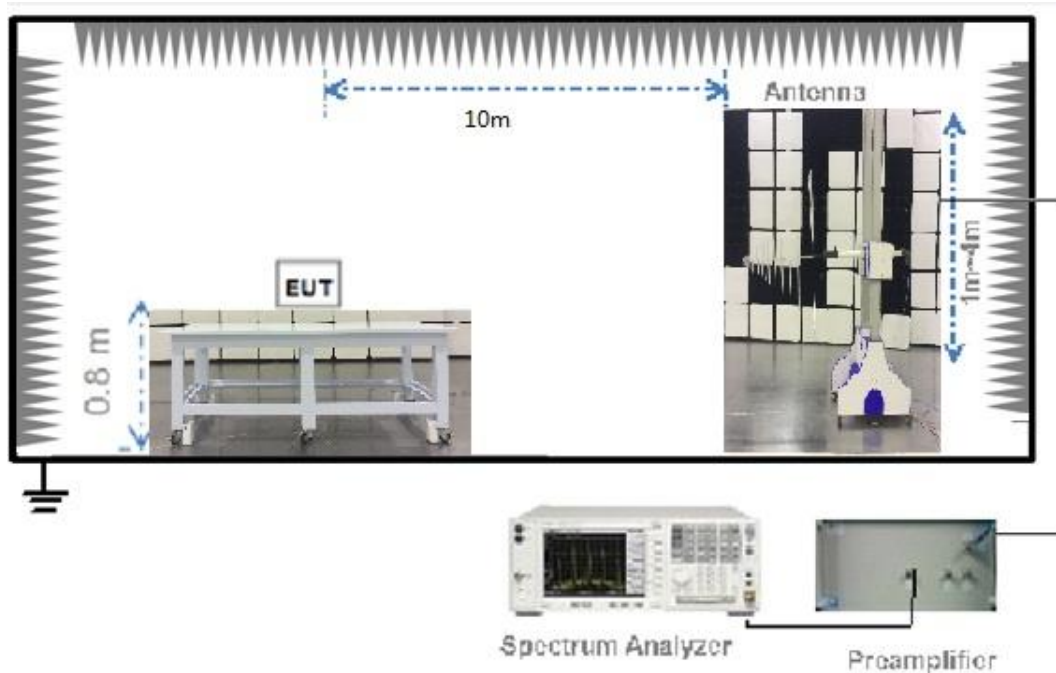
### 4.3 Description of Test Setup

#### 4.3.1 For Radiated Test (Below 30 MHz)



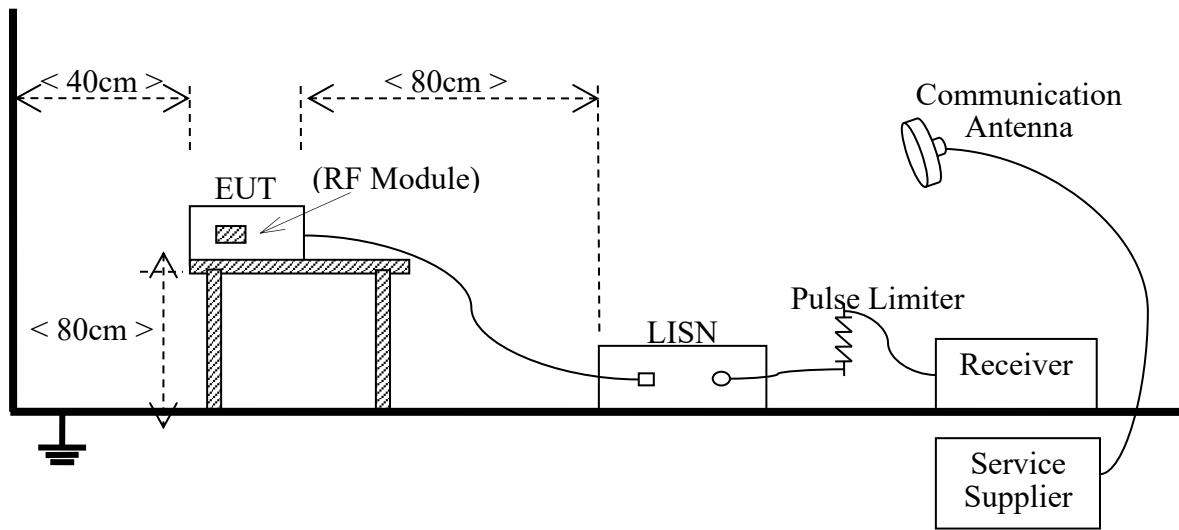
(Diagram 1)

#### 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 Relevant Standards

##### FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

### 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 EUT internal photos.

## 5.2 Emission Bandwidth

### 5.2.1 Definition

15.215(c);

Intentional radiators operating under the alternative provisions to the general emission limits 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.

In some cases, the “x dB bandwidth” is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

### 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 = between 2 to 5 times the OBW

RBW = 1% to 5% the OBW

VBW  $\geq$  3RBW

Sweep = auto

Detector function = peak

Trace = max hold

The 99% emission 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 = between 1.5 to 5 times the OBW

RBW = 1% to 5% OBW

VBW  $\geq$  3RBW

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)

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 spurious 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
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
Below 13.110	30	29.5	48.58	69.5
13.110 ~ 13.410	106	40.5	59.58	80.5
13.410 ~ 13.553	334	50.5	69.58	90.5
13.553 ~13.567	15848	84	103.08	124
13.567 ~ 13.710	334	50.5	69.58	90.5
13.710 ~14.010	106	40.5	59.58	80.5
Above 14.010	30	29.5	48.58	69.5

NOTE:

1. Field Strength ( $\text{dB}\mu\text{V/m}$ ) =  $20*\log[\text{Field Strength } (\mu\text{V/m})]$ .
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 ( $\mu\text{V/m}$ )
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:

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).

### 5.3.2 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

NOTE:

1. Results (dBuV/m) = Reading (dBuV/m) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain (dB)

3. Over limit = Results – Limit.



## 5.4 Frequency Tolerance

### 5.4.1 Limit

FCC §15.225(e)

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

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 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB $\mu$ 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.

NOTE:

1. Results (dBuV) = Reading (dBuV) + Factor (dB)

The reading level is calculated by software which is not shown in the sheet

2. Factor = Insertion loss + Cable loss

3. Over limit = Results – Limit.

# ANNEX A TEST RESULT

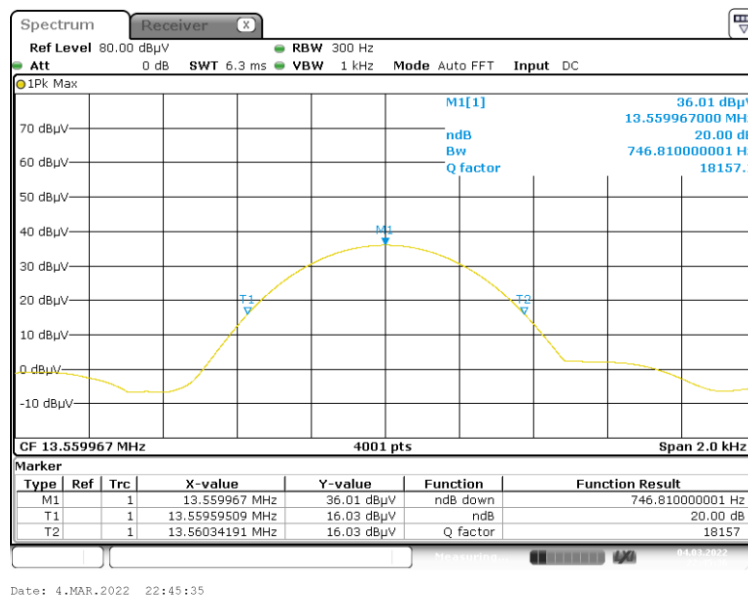
## A.1 Emission Bandwidth

### Test Data

Frequency (MHz)	Emission Bandwidth(20dB down) (kHz)	Occupied Bandwidth(99%) (kHz)
13.560	0.747	0.631

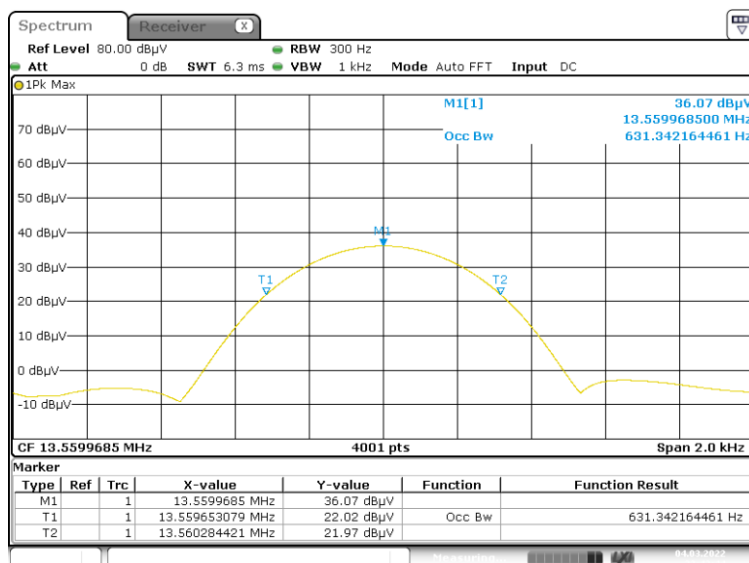
### Test plots

#### Emission Bandwidth



Date: 4.MAR.2022 22:45:35

#### 99% Occupied Bandwidth



Date: 4.MAR.2022 22:43:44

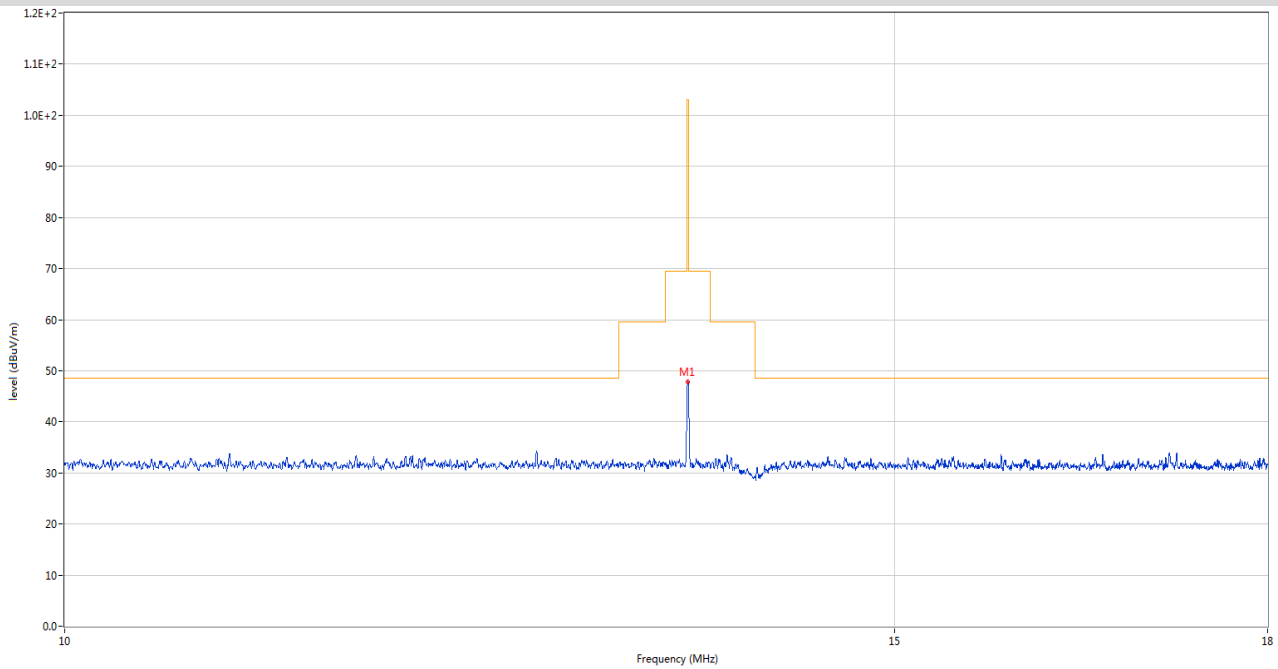
## A.2 Field Strength of Fundamental Emissions

### Test Data

Field Strength of Fundamental Emissions Value					
Frequency (MHz)	Detector	Field Strength (dBuV/m)	Limit @10m (dBuV/m)	EUT	Margin (dB)
13.560	PEAK	48.34	103.0	Vertical	54.66
13.560	PEAK	48.75	103.0	Horizontal	54.25

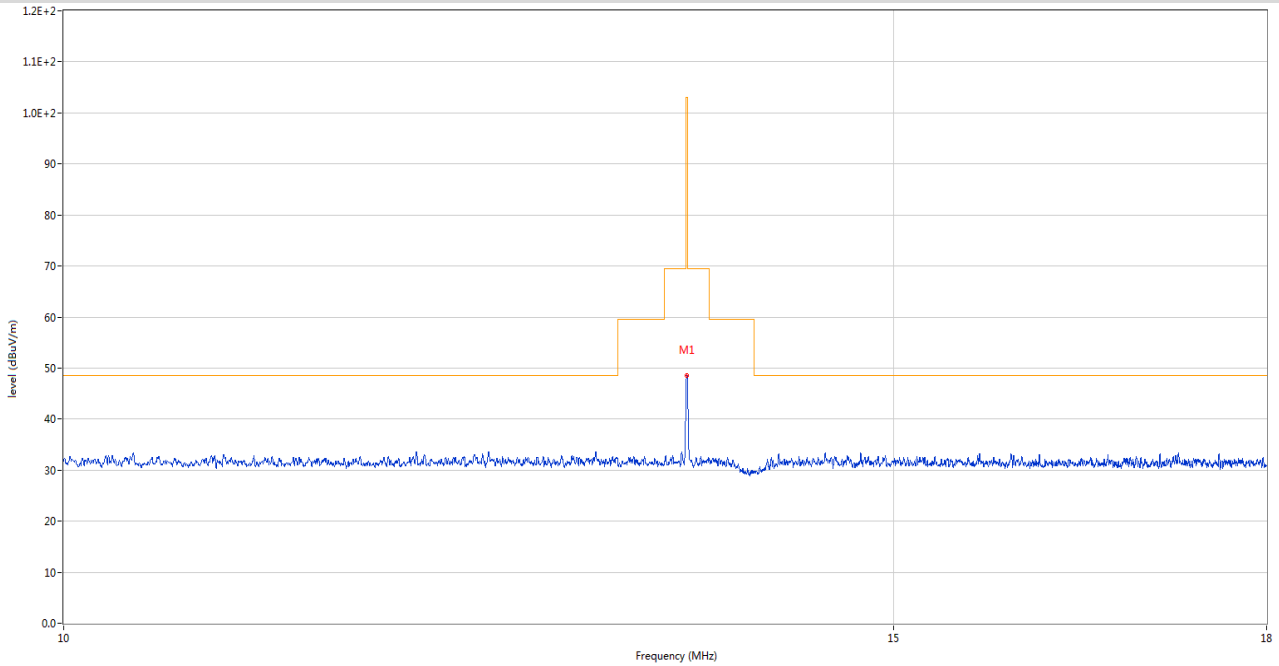
### Test Plot

ANT-LOOP ANT Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	13.560	48.34	20.86	103.0	-54.66	Peak	4.00	100	Vertical	Pass

**ANT-LOOP ANT Horizontal**



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	13.560	48.75	20.86	103.0	-54.25	Peak	185.00	100	Horizontal	Pass

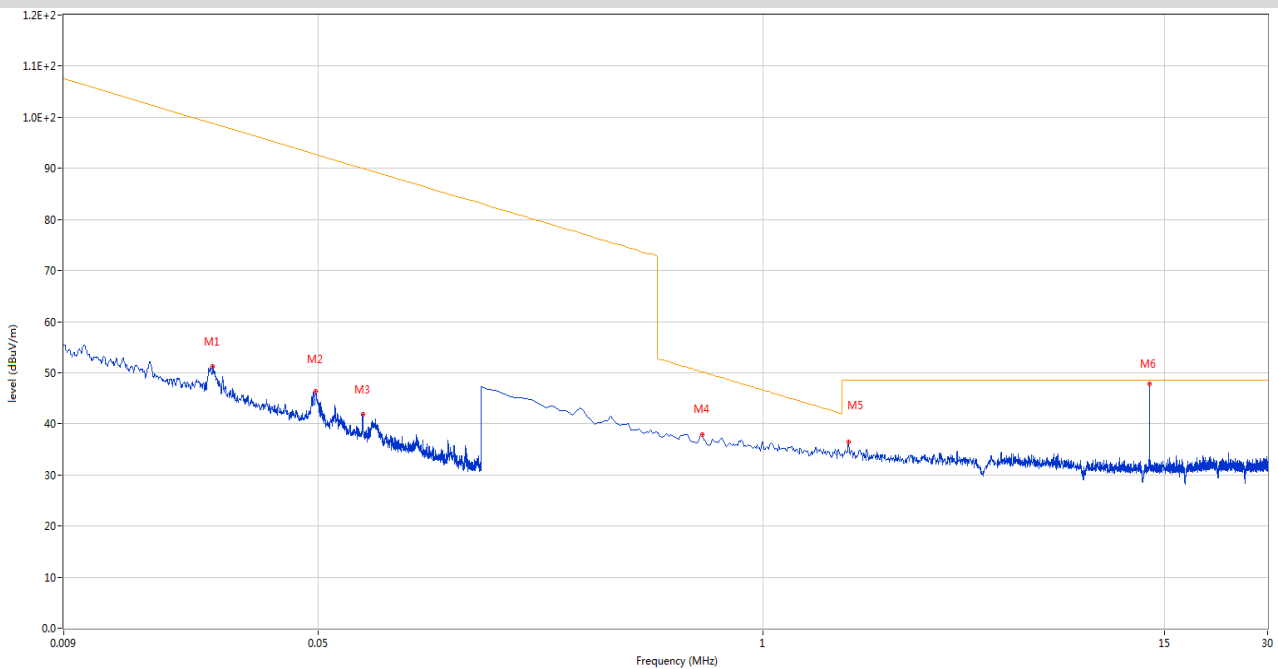
### A.3 Radiated Emissions

Note 1: This frequency which near 13.560 MHz with circle should be ignored because they are NFC carrier frequency.

Note 2: All Radiated Emissions tests were performed in X, Y, Z axis direction of EUT. And only the worst axis test condition was recorded in this test report.

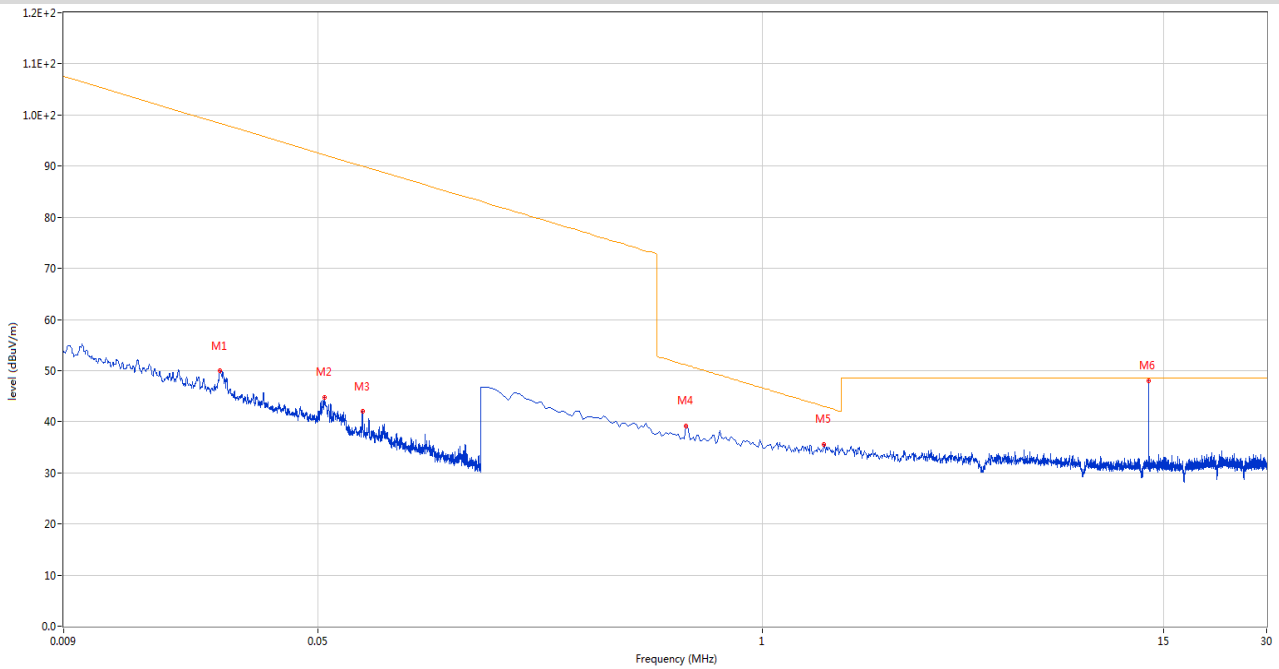
#### The Data and Plots (9 kHz ~ 30 MHz)(at 10m chamber)

Below 30 MHz ANT Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	0.025	51.02	20.24	98.8	-47.78	Peak	17.00	100	Vertical	Pass
2	0.049	45.91	20.24	92.8	-46.89	Peak	0.00	100	Vertical	Pass
3	0.068	41.84	20.18	90.0	-48.16	Peak	247.00	100	Vertical	Pass
4	0.665	37.95	20.37	50.1	-12.15	Peak	334.00	100	Vertical	Pass
5	1.784	36.40	20.49	48.5	-12.10	Peak	356.00	100	Vertical	Pass
6	13.560	47.97	20.86	48.5	-0.53	Peak	184.00	100	Vertical	N/A

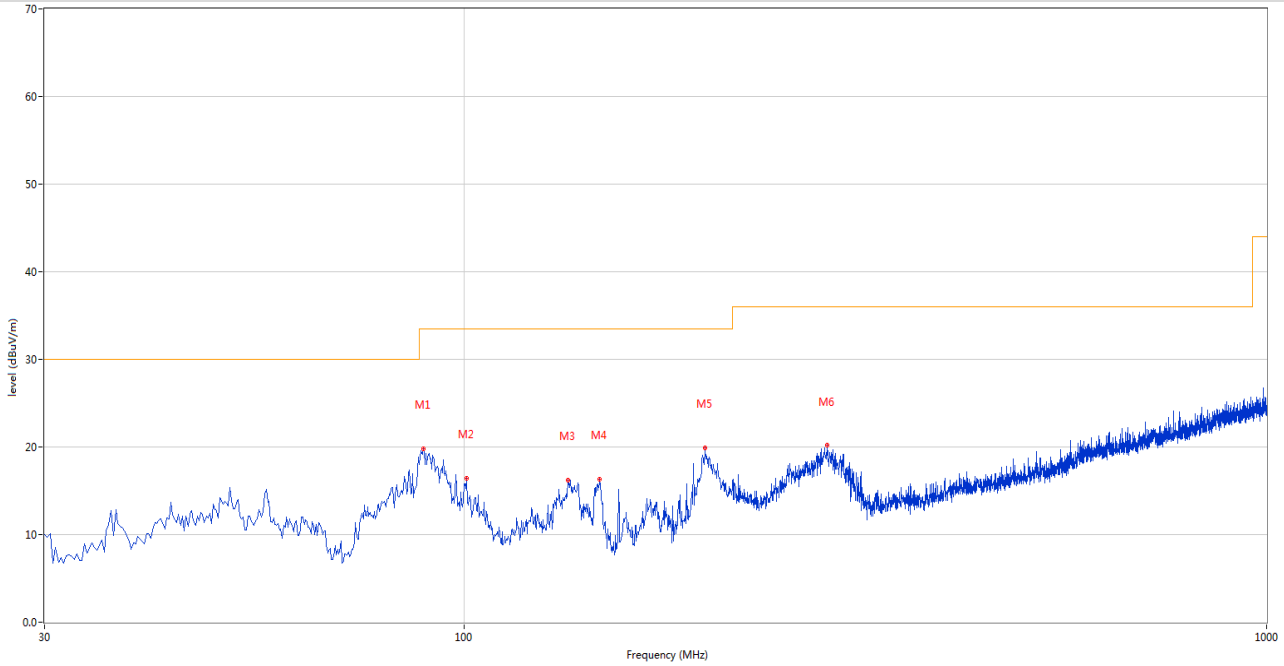
Below 30 MHz ANT Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	0.026	49.87	20.24	98.4	-48.53	Peak	0.00	100	Horizontal	Pass
2	0.052	44.69	20.22	92.2	-47.51	Peak	9.00	100	Horizontal	Pass
3	0.068	42.00	20.18	90.0	-48.00	Peak	1.00	100	Horizontal	Pass
4	0.598	39.21	20.33	51.0	-11.79	Peak	26.00	100	Horizontal	Pass
5	1.516	35.60	20.51	43.0	-7.40	Peak	167.00	100	Horizontal	Pass
6	13.560	48.15	20.86	48.5	-0.35	Peak	194.00	100	Horizontal	N/A

Test Data and Plots (30 MHz ~ 10th Harmonic)

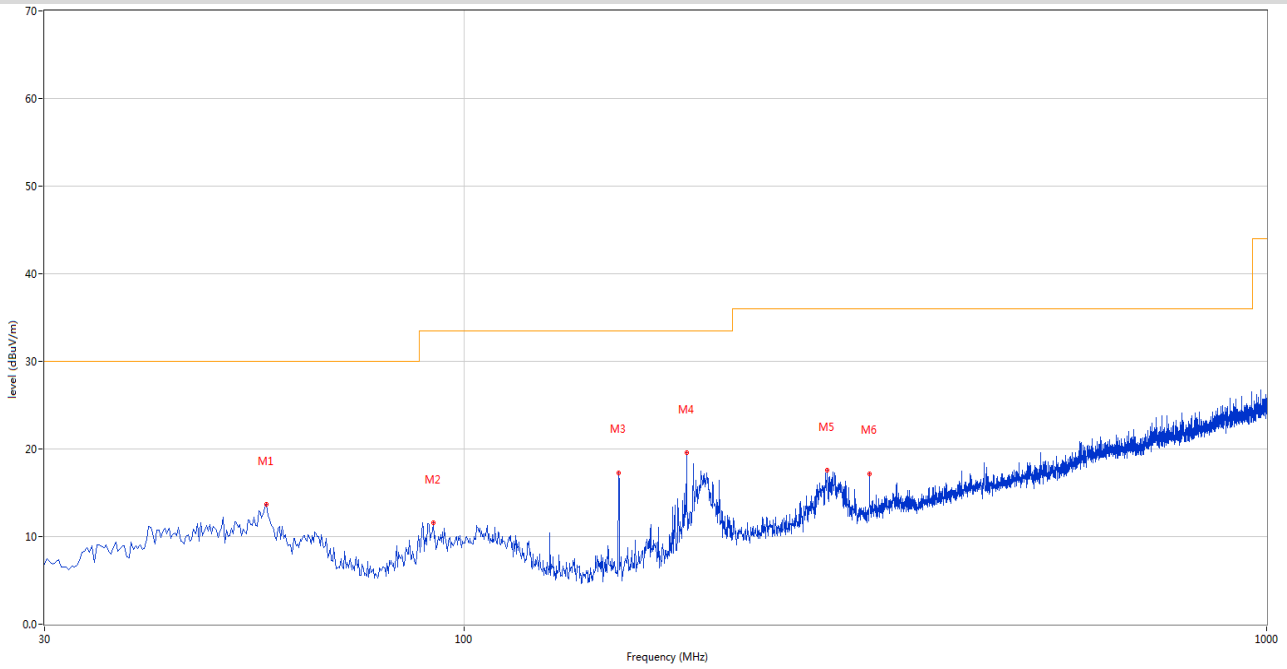
30 MHz to 1 GHz, ANT Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	88.913	19.80	-30.02	33.5	-13.70	Peak	270.00	200	Vertical	Pass
2	100.792	16.45	-27.95	33.5	-17.05	Peak	266.00	100	Vertical	Pass
3	134.734	16.23	-31.38	33.5	-17.27	Peak	260.00	200	Vertical	Pass
4	147.583	16.36	-31.50	33.5	-17.14	Peak	236.00	100	Vertical	Pass
5	199.708	19.92	-27.66	33.5	-13.58	Peak	85.00	100	Vertical	Pass
6	283.107	20.16	-25.48	36.0	-15.84	Peak	181.00	100	Vertical	Pass



30 MHz to 1 GHz, ANT Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	56.668	13.68	-27.10	30.0	-16.32	Peak	297.00	100	Horizontal	Pass
2	91.580	11.58	-29.32	33.5	-21.92	Peak	305.00	200	Horizontal	Pass
3	155.826	17.27	-31.08	33.5	-16.23	Peak	290.00	200	Horizontal	Pass
4	189.283	19.56	-28.74	33.5	-13.94	Peak	73.00	200	Horizontal	Pass
5	283.107	17.55	-25.48	36.0	-18.45	Peak	290.00	200	Horizontal	Pass
6	319.958	17.17	-24.63	36.0	-18.83	Peak	360.00	200	Horizontal	Pass

## A.4 Frequency Stability

Note 1: Because the 85%(3.2895)of the rated supply voltage value exceeds the cut-off voltage lower(3.6V) limit of the manufacturer, the cut-off voltage of EUT is test here.

Note 2: The operating temperature range of the EUT is 0°C to 30°C.

OPERATING FREQUENCY:	13560000 Hz
REFERENCE VOLTAGE:	3.87 V
DEVIATION LIMIT:	±0.01%

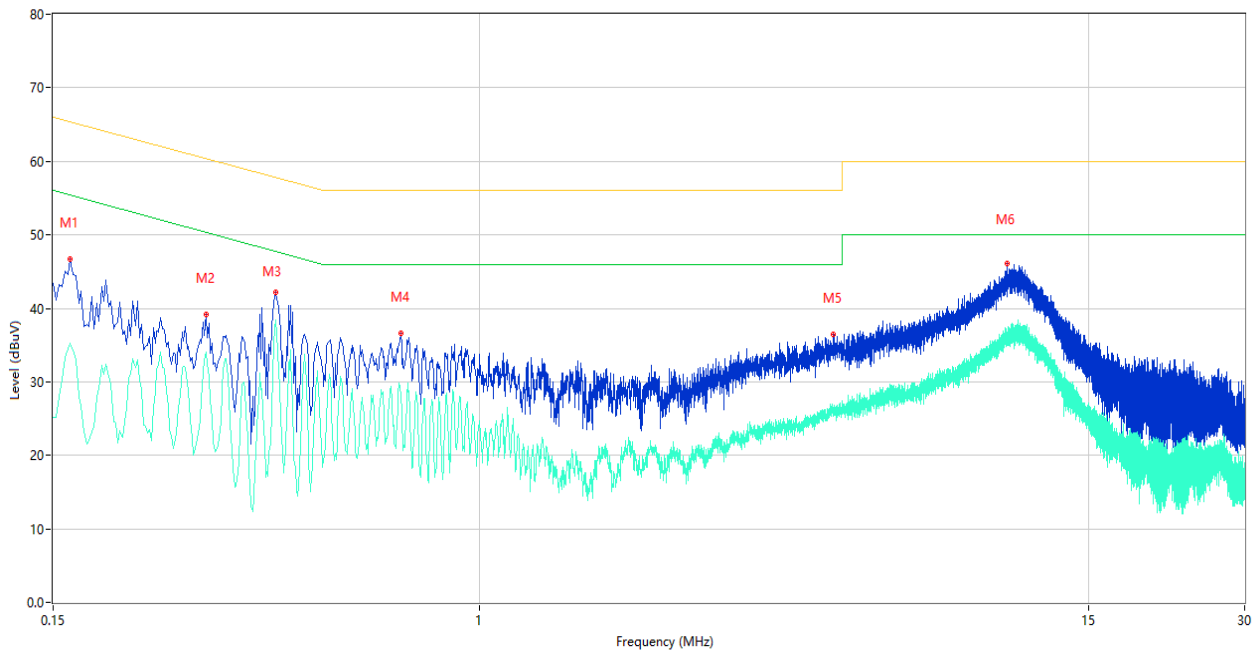
VOLTAGE (%)	Test Conditions		Frequency(MHz)	Deviation(%)	Verdict
	Power (VDC)	Temperature (°C)			
100	3.87	+20°C(Ref)	13.559969	0.000232	Pass
100		-20	13.559862	0.001018	
100		-10	13.559574	0.003145	
100		0	13.560503	0.003712	
100		+10	13.559550	0.003318	
100		+20	13.559500	0.003687	
100		+25	13.560035	0.000261	
100		+30	13.560744	0.005489	
100		+40	13.561212	0.008938	
100		+50	13.559182	0.006036	
MIN(Battery End Point, 85)		3.6	+20	13.560478	
MAX(Battery End Point, 115)	4.5	+20	13.560372	0.002744	

## 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.

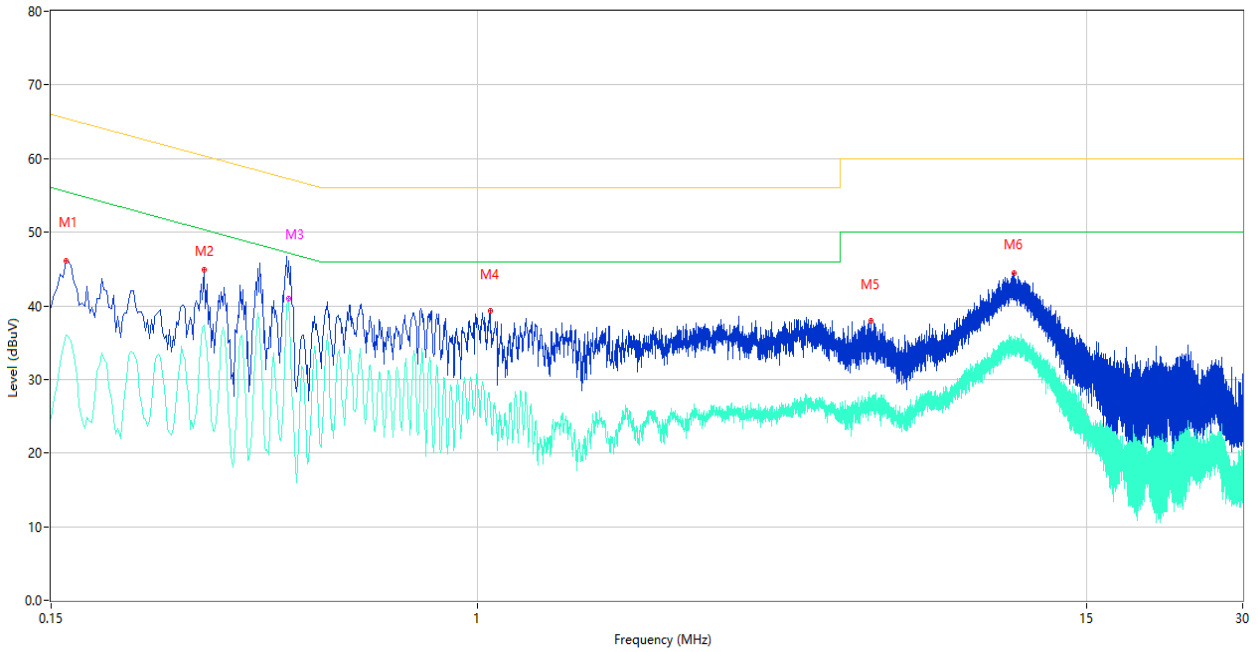
### Test Data and Plots

#### PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.162	46.71	10.17	65.36	-18.65	Peak	L	Pass
1**	0.162	35.28	10.17	55.36	-20.08	AV	L	Pass
2	0.296	39.14	10.07	60.35	-21.21	Peak	L	Pass
2**	0.296	33.98	10.07	50.35	-16.37	AV	L	Pass
3	0.404	42.16	10.09	57.77	-15.61	Peak	L	Pass
3**	0.404	38.42	10.09	47.77	-9.35	AV	L	Pass
4	0.704	36.61	10.08	56.00	-19.39	Peak	L	Pass
4**	0.704	27.88	10.08	46.00	-18.12	AV	L	Pass
5	4.824	36.41	9.96	56.00	-19.59	Peak	L	Pass
5**	4.824	26.49	9.96	46.00	-19.51	AV	L	Pass
6	10.448	46.03	10.09	60.00	-13.97	Peak	L	Pass
6**	10.448	35.97	10.09	50.00	-14.03	AV	L	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.160	46.11	10.17	65.46	-19.35	Peak	N	Pass
1**	0.160	35.95	10.17	55.46	-19.51	AV	N	Pass
2	0.296	44.82	10.07	60.35	-15.53	Peak	N	Pass
2**	0.296	37.31	10.07	50.35	-13.04	AV	N	Pass
3	0.432	46.09	10.10	57.21	-11.12	Peak	N	Pass
3**	0.432	41.03	10.10	47.21	-6.18	AV	N	Pass
4	1.056	39.35	10.02	56.00	-16.65	Peak	N	Pass
4**	1.056	26.79	10.02	46.00	-19.21	AV	N	Pass
5	5.738	37.95	10.04	60.00	-22.05	Peak	N	Pass
5**	5.738	27.20	10.04	50.00	-22.80	AV	N	Pass
6	10.878	44.44	10.07	60.00	-15.56	Peak	N	Pass
6**	10.878	34.34	10.07	50.00	-15.66	AV	N	Pass

## **ANNEX C TEST SETUP PHOTOS**

Please refer the document “BL-SZ2220432-AE-2.PDF”.

## **ANNEX D EUT EXTERNAL PHOTOS**

Please refer the document “BL-SZ2220432--AW.PDF”.

## **ANNEX E EUT INTERNAL PHOTOS**

Please refer the document “BL-SZ2220432--AI.PDF”.

--END OF REPORT--

## Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
3. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the "inspection and testing dedicated stamp" or test report stamp.
4. The test data and results are only valid for the tested samples provided by the customer.
5. This report shall not be partially reproduced without the written permission of the laboratory.
6. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--