

FCC

EMC

TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

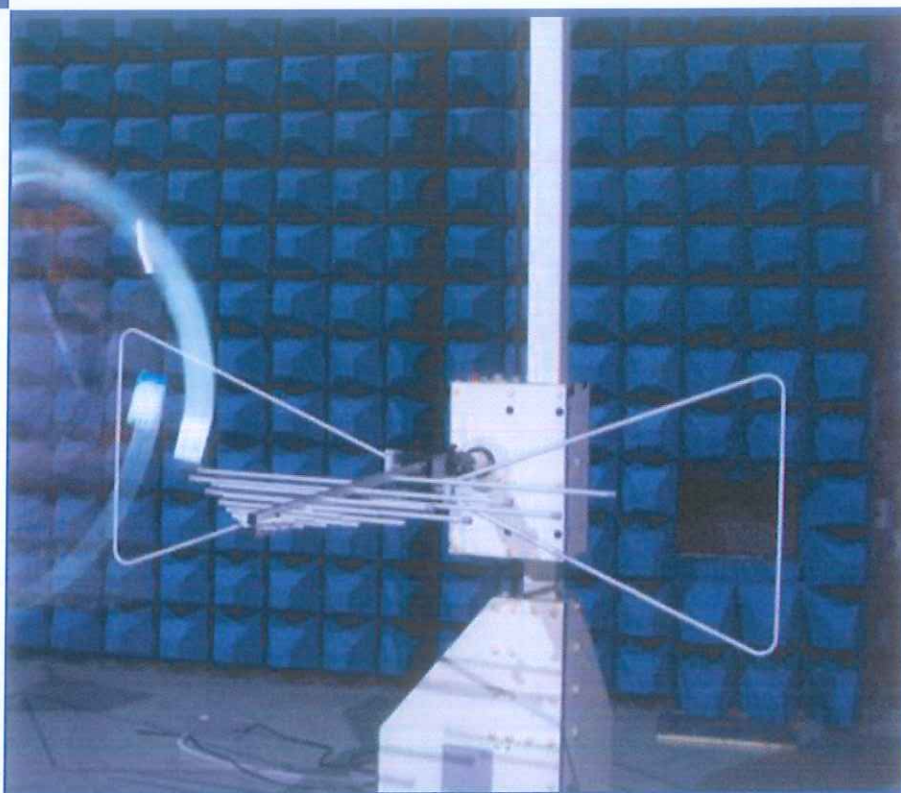


FOR

8Bitdo SF30 v2 Bluetooth GamePad

ISSUED TO
SHENZHEN 8BITDO TECH CO., LTD.

Room 210, Building 1, Nanhai Ecool, No.6 Xinghua Road, Shekou,
Nanshan District, Shenzhen



Tested by: Xia Long
Xia Long
(Engineer)

Date: Feb. 01, 2018

Approved by: Wei Yanquan
Wei Yanquan
(Chief Engineer)

Date: Feb. 01, 2018

Report No.: BL-SZ1810146-401

EUT Name: 8Bitdo SF30 v2 Bluetooth GamePad

Model Name: 80BI

Brand Name: 8BITDO

Test Standard: 47 CFR Part 15 Subpart B

FCC ID: 2AOWF-SNF30V2

Test Conclusion: Pass

Test Date: Jan. 10, 2018 ~ Jan. 15, 2018

Date of Issue: Feb. 01, 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

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Feb. 01, 2018</u>	<u>Initial Issue</u>

TABLE OF CONTENTS

1	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
3.3	Test Uncertainty.....	7
4	GENERAL TEST CONFIGURATIONS.....	8
4.1	Test Environments.....	8
4.2	Test Equipment List.....	8
4.3	Test Enclosure list.....	9
4.4	Test Configurations.....	10
4.5	Test Setups.....	11
4.6	Test Conditions.....	13
5	TEST ITEMS.....	14
5.1	Emission Tests.....	14
ANNEX A	TEST RESULTS.....	16

A.1	Radiated Emission.....	16
A.2	Conducted Emission.....	20
ANNEX B	TEST SETUP PHOTOS.....	22
ANNEX C	EUT EXTERNAL PHOTOS.....	22
ANNEX D	EUT INTERNAL PHOTOS.....	22

1 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
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co.,Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. 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. 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.
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 refer to the BALUN report mode v6.5.
- (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.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	SHENZHEN 8BITDO TECH CO., LTD.
Address	Room 210, Building 1, Nanhai Ecool, No.6 Xinghua Road, Shekou, Nanshan District, Shenzhen

2.2 Manufacturer Information

Manufacturer	Shenzhen Zhongxingda Electronic Co., Ltd.
Address	3-4/F, Bldg 10, Tongfuyu Industrial Zone, Lezhujiao Village, Xixiang, Baoan District, Shenzhen

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	8Bitdo SF30 v2 Bluetooth GamePad
Model Name Under Test	80BI
Series Model Name	80BI, SF30
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only different on appearance.
Hardware Version	2.0
Software Version	4.02
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A
Network and Wireless connectivity	Bluetooth

2.5 Ancillary Equipment

Ancillary Equipment	Battery	
	Brand Name	RYX
	Model No.	451860P
	Serial No.	N/A
	Capacity	480 mAh
	Rated Voltage	3.7 V
	Limit Charge Voltage	3.7 - 4.2 V

2.6 Technical Information

Note: Not applicable.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	FCC 47 CFR Part 15 Subpart B (10-1-16 Edition)	Unintentional Radiators
2	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3.2 Verdict

No.	Description	FCC Rule	Test Verdict	Result
1	Radiated Emission	15.109	Pass	Annex A .1
2	Conducted Emission, AC Ports	15.107	Pass	Annex A .2

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)	3.23 dB
Radiated emissions (30 MHz-1 GHz)	4.30 dB
Radiated emissions (1 GHz-18 GHz)	4.81 dB
Radiated emissions (18 GHz-40 GHz)	5.71 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

Environment Parameter	Selected Values During Tests			
	Temperature	Voltage	Relative Humidity	Ambient Pressure
Normal Temperature, Normal Voltage (NTNV)	23°C~26°C	DC 3.7 V from Battery or DC 5 V from Laptop	50%-55%	100 to 102 kPa

4.2 Test Equipment List

Radiated Emission Test For Frequency Below 1 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWA RZ	ESRP	101036	2017.06.22	2018.06.21	☒
Test Antenna- Bi-Log	SCHWARZBECK	VULB 9163	9163-977	2016.07.19	2018.07.18	☒
Test Antenna- Horn	SCHWARZBECK	BBHA 9120D	9120D-1600	2016.07.12	2018.07.11	☐
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2019.02.20	☒

Radiated Emission Test For Frequency Above 1 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2017.11.08	2018.11.07	☒
Test Antenna- Bi-Log	SCHWARZBECK	VULB 9163	9163-624	2016.07.21	2018.07.20	☐
Test Antenna- Horn	SCHWARZBECK	BBHA 9120D	9120D-1148	2016.07.21	2018.07.20	☒
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2019.02.20	☒

Conducted Emission Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWA RZ	ESRP	101036	2017.06.22	2018.06.21	☒
LISN	SCHWARZBECK	NSLK 8127	8127-687	2017.06.22	2018.06.21	☒
LISN	SCHWARZBECK	NNLK 8129	8129-462	2017.11.08	2018.11.07	☐
AMN	SCHWARZBECK	NNBM8124	8124-509	2017.06.22	2018.06.21	☐
AMN	SCHWARZBECK	NNBM8124	8124-510	2017.06.22	2018.06.21	☐
ISN	TESEQ	ISN T800	34449	2017.06.22	2018.06.21	☐
Shielded Enclosure	ChangNing	CN-130701	130703	N/A	N/A	☒

4.3 Test Enclosure list

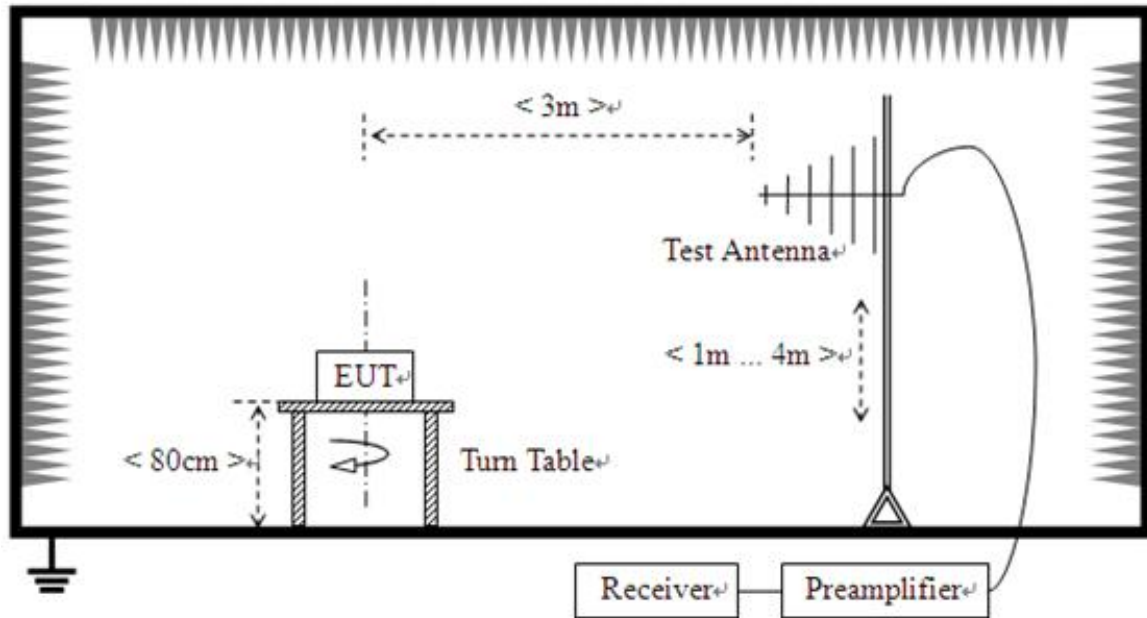
Description	Manufacturer	Model	Serial No.	Length	Description	Use
PC	Dell	015K3N	N/A	N/A	Special Handled	☐
Laptop	Lenovo	E31-80	R3026PU9	N/A	N/A	☒
Laptop	Apple	A1465	N/A	N/A	N/A	☒
Printer	HP	DESKJET 1000	N/A	N/A	N/A	☐
Keyboard	Logitech	Y-BP62a	N/A	N/A	N/A	☐
Mouse	Logitech	M100	N/A	N/A	N/A	☐
USB disk	Kingston	N/A	N/A	N/A	N/A	☐
TF Card	Kingston	N/A	N/A	N/A	N/A	☐
VGA Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
HDMI Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
DVI Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
Coaxial video cable	N/A	N/A	N/A	2.0 m	Shielded with core	☐
iPhone	Apple	A1586	N/A	N/A	N/A	☐
Phone	MI	M4	N/A	N/A	N/A	☒
Bluetooth Earphone	SAMSUNG	Gear Circle	N/A	N/A	N/A	☐
Wireless Communication s Test Set	R&S	CMW500	142028	N/A	Cal. Due 2018.06.11	☐
WIFI Router	TP-LINK	TL-WDR7500	N/A	N/A	N/A	☐
Earphone	N/A	OPPO	N/A	1.1 m	N/A	☐
Car Battery	Camel	55530	N/A	N/A	12 V/55 Ah	☐
Artificial load	N/A	N/A	N/A	N/A	2.5 Ω /100 W	☐
Artificial load	N/A	N/A	N/A	N/A	5 Ω /100 W	☐
Electronic Load	ITECH	IT8511	N/A	N/A	N/A	☐
USB Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☒
DC Power Supply	ITECH	IT6863A	60001401068 7210006	N/A	N/A	☐
LCD Monitor	SAMSUNG	UA32C4000P	N/A	N/A	N/A	☐
LCD Monitor	Dell	U241HB	N/A	N/A	N/A	☐
RJ45 Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
MacBook	N/A	N/A	N/A	N/A	N/A	☒
Switch	N/A	N/A	N/A	N/A	N/A	☒

4.4 Test Configurations

Test Configurations (TC) No.	Description
TC01	<u>The Charging Test Mode</u> EUT + Battery + USB Cable + Laptop
TC02	<u>The BT Control Test Mode</u> EUT + Battery + Phone +BT Link
TC03	<u>The USB Control With Windows Equipment Test Mode</u> EUT + Battery + USB Cable+ Laptop
TC04	<u>The USB Control With macOS Equipment Test Mode</u> EUT + Battery + USB Cable + MacBook
TC05	<u>The USB Control With Switch Equipment Test Mode</u> EUT + Battery + USB Cable + Switch

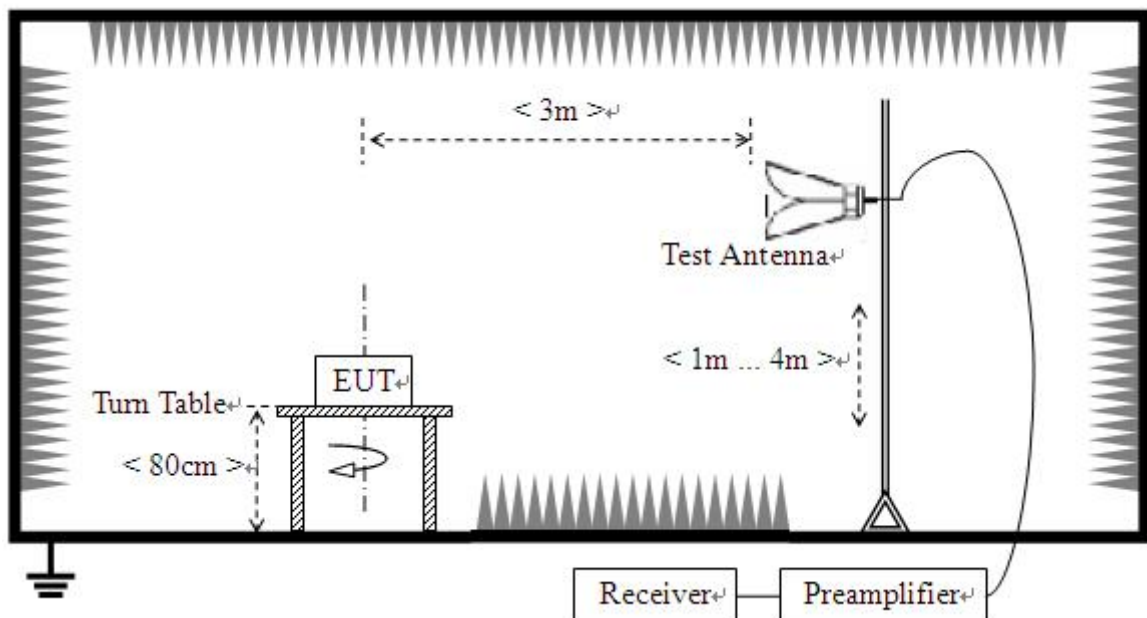
4.5 Test Setups

Test Setup 1

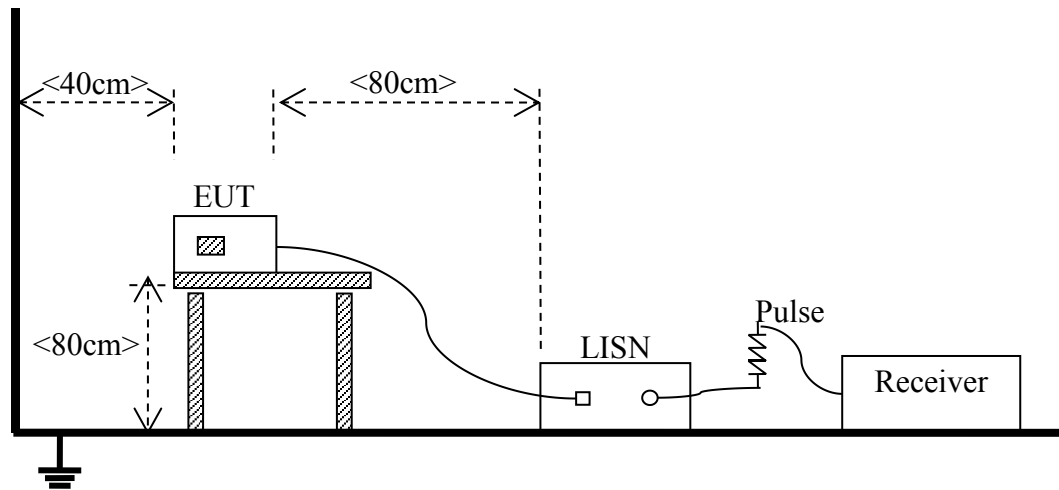


(For Radiated Emission Test (30 MHz-1 GHz))

Test Setup 2



(For Radiated Emission Test (above 1 GHz))

Test Setup 3

(For Conducted Emission, AC Ports Test)

4.6 Test Conditions

Test Case	Test Conditions	
Radiated Emission	Test Env.	NTNV
	Test Setup	Test Setup 1&2
	Test Configuration	TC01~TC05 ^{Note}
Conducted Emission, AC Ports	Test Env.	NTNV
	Test Setup	Test Setup 3
	Test Configuration	TC01~TC05 ^{Note}

Note: Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report. The Charging Test Mode is the worst mode in this report.

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Radiated Emission

5.1.1.1 Limit

Frequency range (MHz)	Class B (at 3 m)		Class B (at 10 m)	Class A (at 10 m)	
	Field Strength ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Field Strength ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)
30 - 88	100	40	30	90	39
88 - 216	150	43.5	33.5	150	43.5
216 - 960	200	46	36	210	46.4
Above 960	500	54	44	300	49.5

NOTE:

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

5.1.1.2 Test Setup

Refer to 4.5 section (test setup 1 to test setup 2) for radiated emission test, the photo of test setup please refer to ANNEX B.

5.1.1.3 Test Procedure

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.

An initial pre-scan was performed in the chamber using the EMI Receiver in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bi-Log antenna with 2 orthogonal polarities.

5.1.1.4 Test Result

Please refer to ANNEX A.1.

5.1.2 Conducted Emission

5.1.2.1 Test Limit

Frequency range (MHz)	Class A	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15 - 0.50	79	66
0.50 - 30	73	60

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

NOTE:

- 1) The lower limit shall apply at the band edges.
- 2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50 MHz.

5.1.2.2 Test Setup

Refer to 4.5 section test (test setup 3) for conducted emission, the photo of test setup please refer to ANNEX B.

5.1.2.3 Test Procedure

The EUT is connected to the power mains through a LISN which provides 50 Ω /50 μ H of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are 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.

5.1.2.4 Test Result

Please refer to ANNEX A.2.

ANNEX A TEST RESULTS

A.1 Radiated Emission

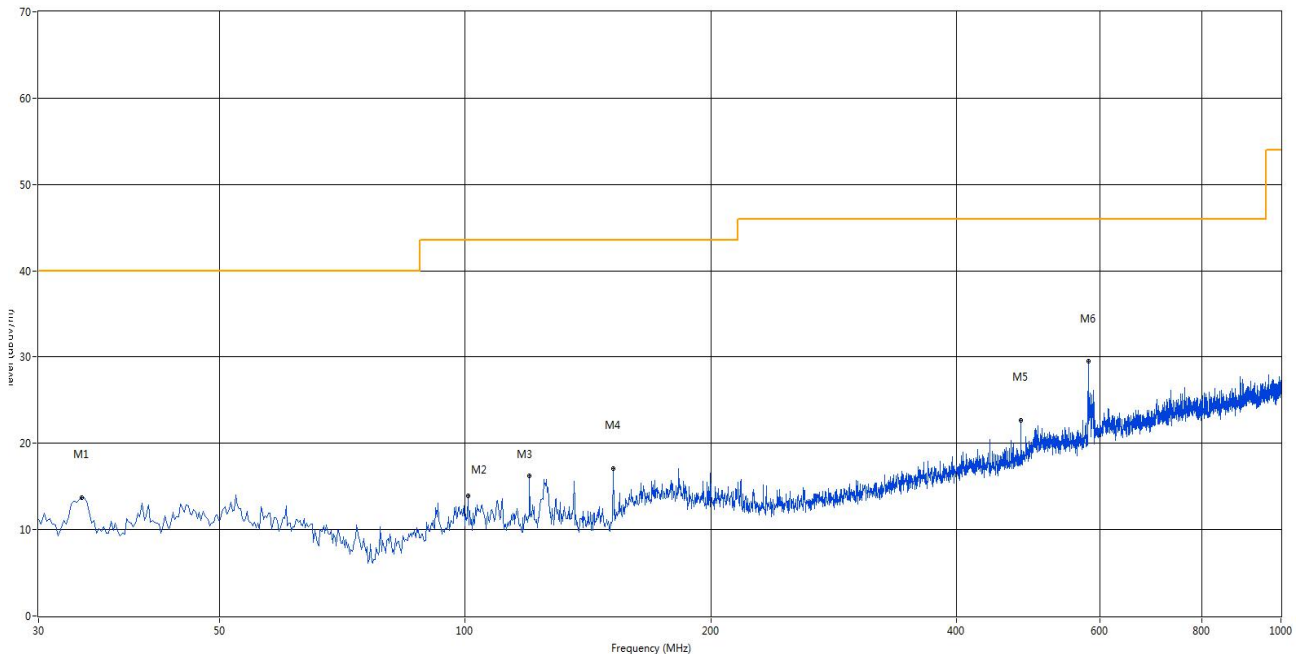
Note 1: The symbol of “--” in the table which means not application.

Note 2: For the test data above 1 GHz, according the ANSI C63.4-2014, 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.

Test Data and Plots

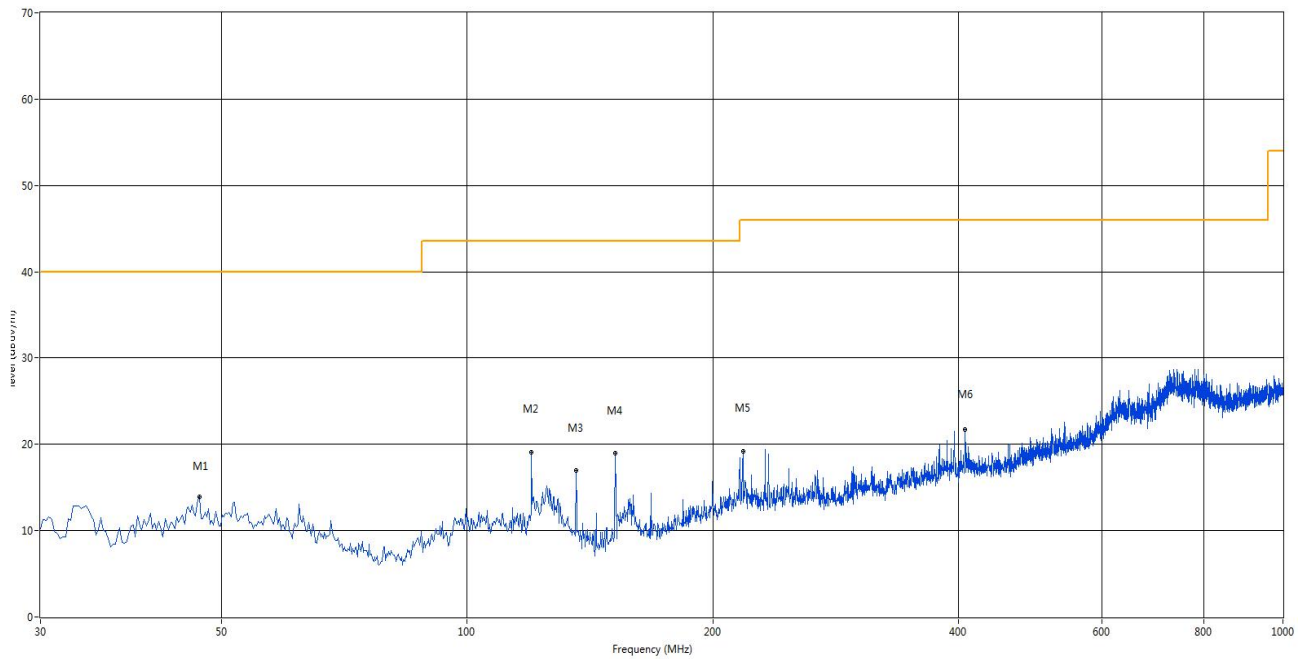
The Charging Test Mode

A.1.1 Test Antenna Vertical, 30 MHz – 1 GHz

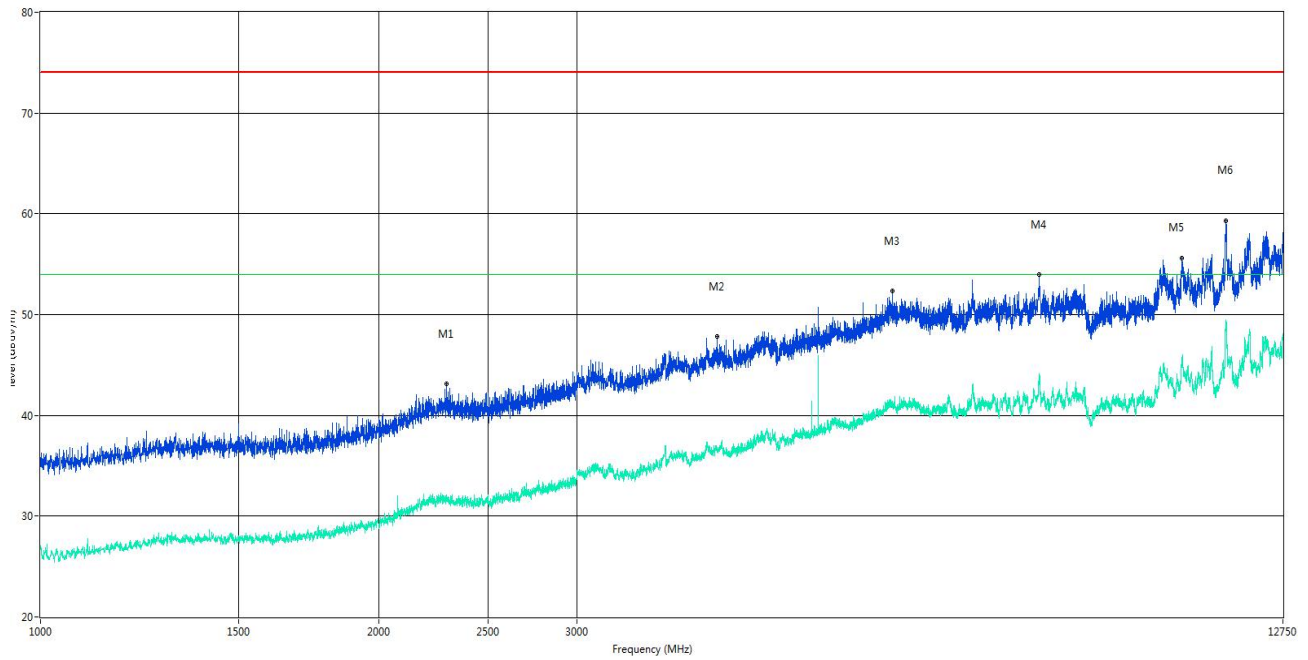


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	33.880	13.75	-25.57	40.0	26.25	Peak	97.50	200	Vertical	Pass
2	100.810	13.95	-23.80	43.5	29.55	Peak	139.60	200	Vertical	Pass
3	119.967	16.23	-25.54	43.5	27.27	Peak	97.50	100	Vertical	Pass
4	151.977	17.10	-26.88	43.5	26.40	Peak	343.40	100	Vertical	Pass
5	480.080	22.71	-16.77	46.0	23.29	Peak	359.40	100	Vertical	Pass
6	581.202	29.47	-14.22	46.0	16.53	Peak	213.00	100	Vertical	Pass

A.1.2 Test Antenna Horizontal, 30 MHz – 1 GHz

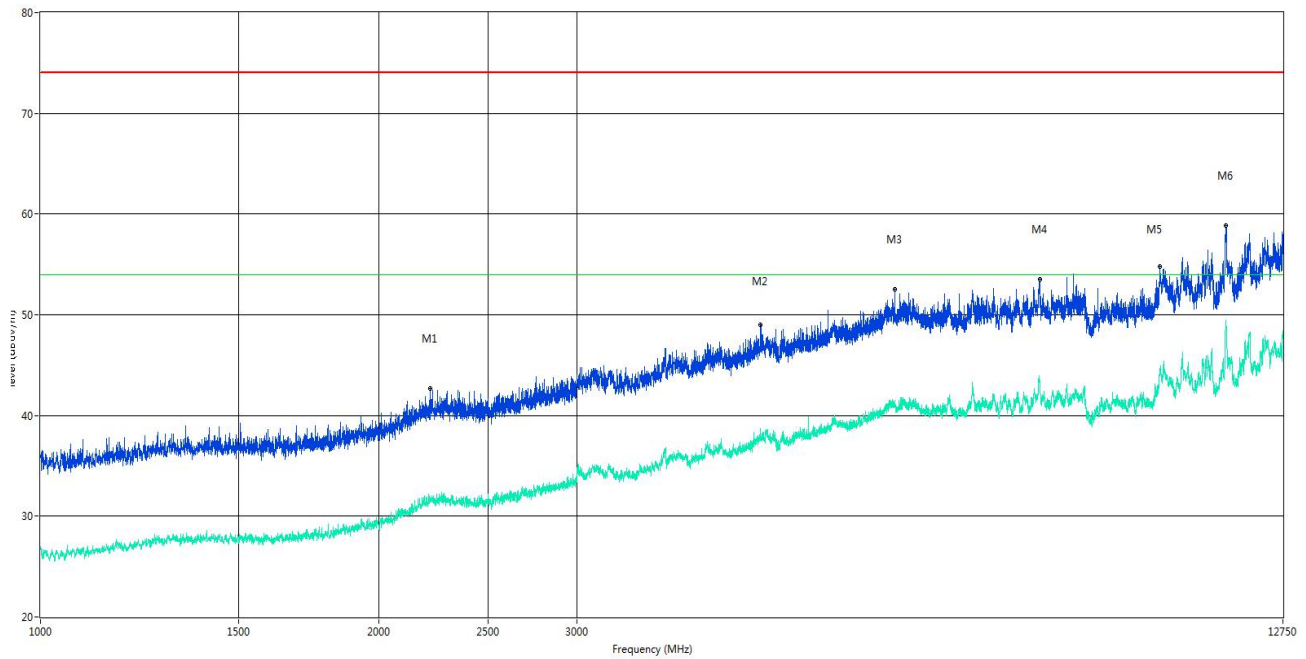


A.1.3 Test Antenna Vertical, 1 GHz – 12.75 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1**	2297.500	31.5	-10.02	54.0	22.50	AV	292.60	100	Vertical	Pass
1	2297.500	43.12	-10.02	74.0	30.88	Peak	292.60	100	Vertical	Pass
2**	4000.000	36.8	-4.28	54.0	17.20	AV	215.00	100	Vertical	Pass
2	4000.000	47.79	-4.28	74.0	26.21	Peak	215.00	100	Vertical	Pass
3**	5728.000	41.0	0.65	54.0	13.00	AV	179.80	100	Vertical	Pass
3	5728.000	52.32	0.65	74.0	21.68	Peak	179.80	100	Vertical	Pass
4**	7736.000	43.6	4.63	54.0	10.40	AV	319.10	100	Vertical	Pass
4	7736.000	53.94	4.63	74.0	20.06	Peak	319.10	100	Vertical	Pass
5**	10370.938	45.6	6.02	54.0	8.40	AV	0.80	100	Vertical	Pass
5	10370.938	55.58	6.02	74.0	18.42	Peak	0.80	100	Vertical	Pass
6**	11342.687	49.0	9.91	54.0	5.00	AV	33.70	100	Vertical	Pass
6	11342.687	59.33	9.91	74.0	14.67	Peak	33.70	100	Vertical	Pass

A.1.4 Test Antenna Horizontal, 1 GHz – 12.75 GHz



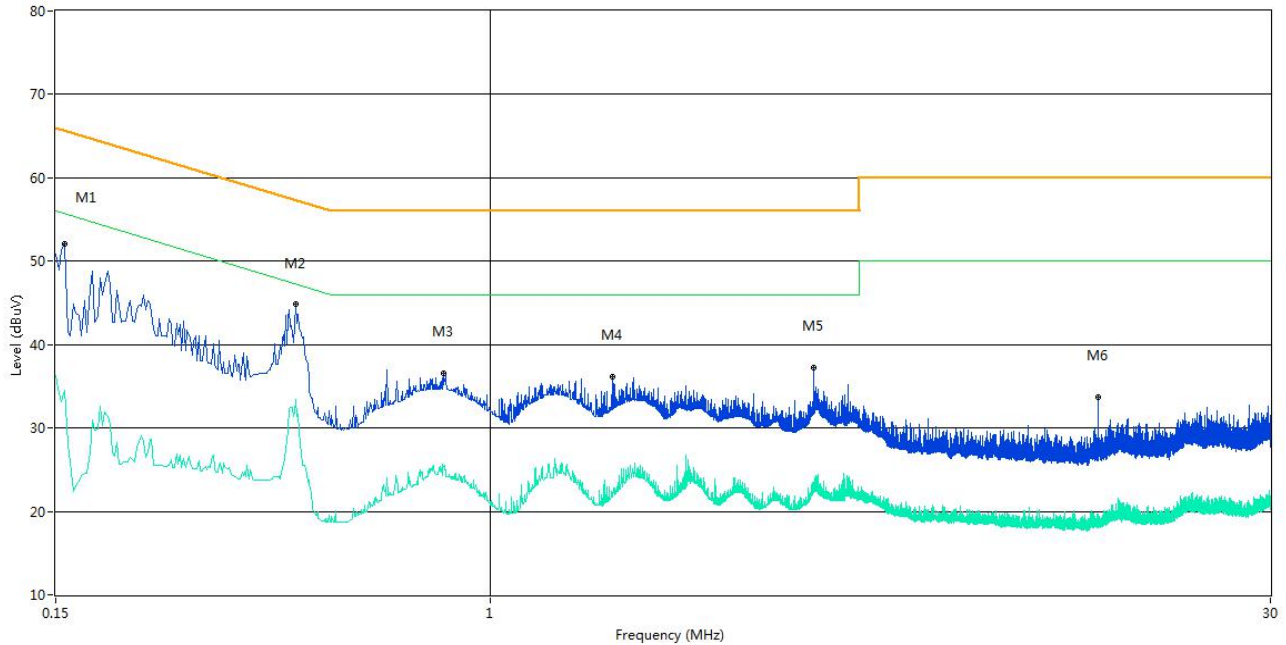
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1**	2222.500	31.8	-10.67	54.0	22.20	AV	76.50	100	Horizontal	Pass
1	2222.500	42.68	-10.67	74.0	31.32	Peak	76.50	100	Horizontal	Pass
2**	4370.000	37.9	-2.72	54.0	16.10	AV	187.90	100	Horizontal	Pass
2	4370.000	49.00	-2.72	74.0	25.00	Peak	187.90	100	Horizontal	Pass
3**	5758.000	41.0	1.14	54.0	13.00	AV	174.40	100	Horizontal	Pass
3	5758.000	52.53	1.14	74.0	21.47	Peak	174.40	100	Horizontal	Pass
4**	7751.813	42.6	3.55	54.0	11.40	AV	248.40	100	Horizontal	Pass
4	7751.813	53.51	3.55	74.0	20.49	Peak	248.40	100	Horizontal	Pass
5**	9912.375	44.4	5.32	54.0	9.60	AV	45.50	100	Horizontal	Pass
5	9912.375	54.75	5.32	74.0	19.25	Peak	45.50	100	Horizontal	Pass
6**	11349.875	48.8	10.27	54.0	5.20	AV	185.70	100	Horizontal	Pass
6	11349.875	58.86	10.27	74.0	15.14	Peak	185.70	100	Horizontal	Pass

A.2 Conducted Emission

Test Data and Plots

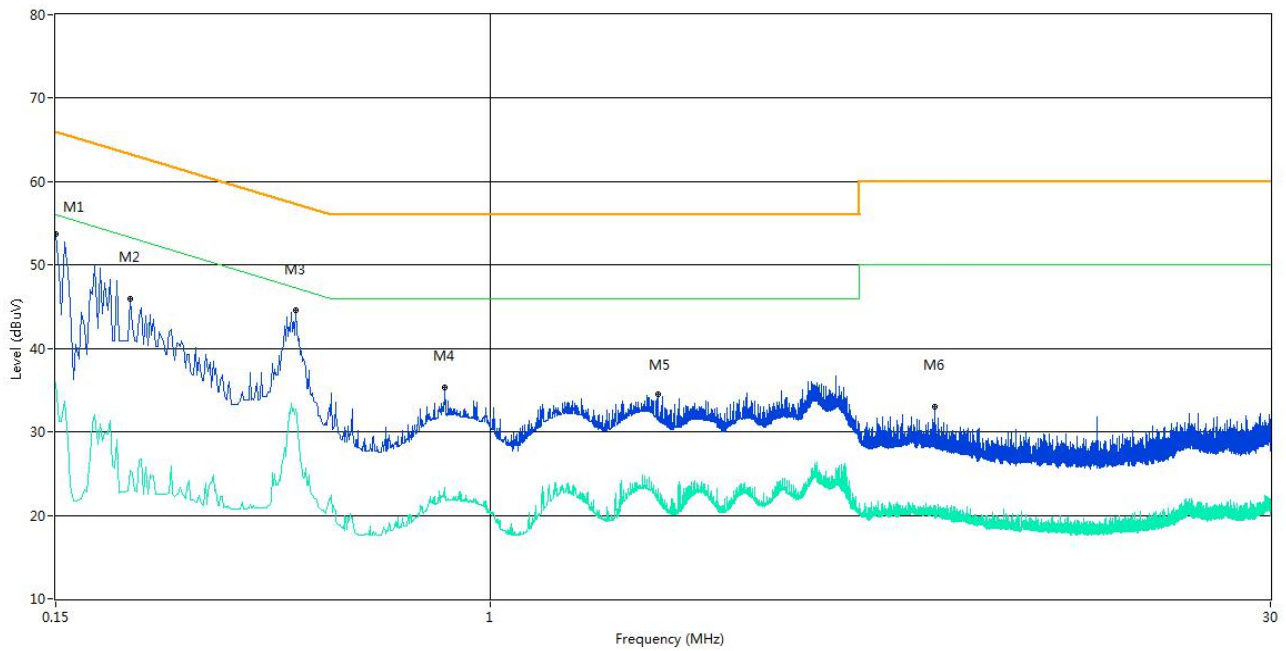
The Charging Test Mode

A.2.1 L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.156	52.1	10.04	65.7	13.60	Peak	L Line	Pass
1**	0.156	34.6	10.04	55.7	21.10	AV	L Line	Pass
2	0.428	44.8	10.04	57.3	12.50	Peak	L Line	Pass
2**	0.428	33.5	10.04	47.3	13.80	AV	L Line	Pass
3	0.814	36.5	10.05	56.0	19.50	Peak	L Line	Pass
3**	0.814	25.4	10.05	46.0	20.60	AV	L Line	Pass
4	1.702	36.1	10.08	56.0	19.90	Peak	L Line	Pass
4**	1.702	21.2	10.08	46.0	24.80	AV	L Line	Pass
5	4.100	37.3	10.15	56.0	18.70	Peak	L Line	Pass
5**	4.100	22.7	10.15	46.0	23.30	AV	L Line	Pass
6	14.124	33.7	10.43	60.0	26.30	Peak	L Line	Pass
6**	14.124	19.0	10.43	50.0	31.00	AV	L Line	Pass

A.2.2 N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.150	53.7	10.04	66.0	12.30	Peak	N Line	Pass
1**	0.150	35.8	10.04	56.0	20.20	AV	N Line	Pass
2	0.208	46.0	10.04	63.3	17.30	Peak	N Line	Pass
2**	0.208	25.4	10.04	53.3	27.90	AV	N Line	Pass
3	0.428	44.6	10.04	57.3	12.70	Peak	N Line	Pass
3**	0.428	32.7	10.04	47.3	14.60	AV	N Line	Pass
4	0.820	35.3	10.05	56.0	20.70	Peak	N Line	Pass
4**	0.820	22.2	10.05	46.0	23.80	AV	N Line	Pass
5	2.072	34.6	10.09	56.0	21.40	Peak	N Line	Pass
5**	2.072	23.3	10.09	46.0	22.70	AV	N Line	Pass
6	6.950	33.0	10.23	60.0	27.00	Peak	N Line	Pass
6**	6.950	19.7	10.23	50.0	30.30	AV	N Line	Pass

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1810146-AE.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ1810146-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ1810146-AI.PDF”.

--END OF REPORT--