FCC EMC TEST REPORT

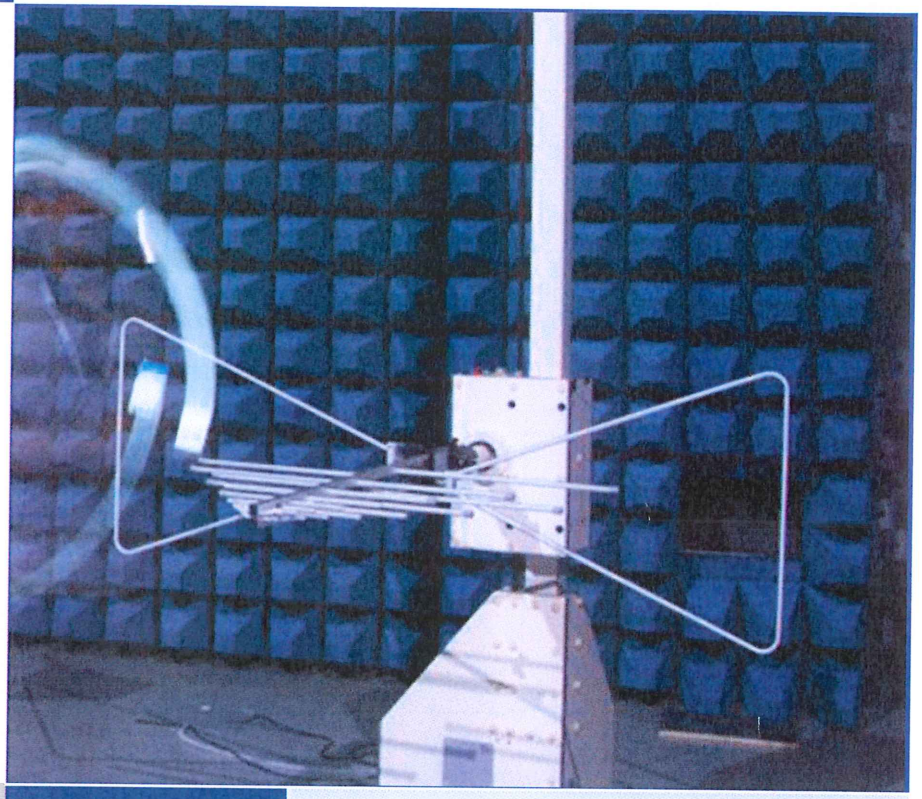
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Fast Wireless Charger

ISSUED TO
DESAY INFOR TECHNOLOGY CO., LTD

DESAY 3rd Industry Zone, chenjiang Town Huizhou, Guangdong, P.R.China



Tested by: Xia Long
Xia Long
(Engineer)
Date Sep. 04, 2018

Approved by:
Wei Yanquan
(Chief Engineer)
Date Sep. 04, 2018

Report No.:	BL-SZ1870029-401
EUT Name:	Fast Wireless Charger
Model Name:	P8C(refer section 2.4)
Brand Name:	DESAY
Test Standard:	47 CFR Part 18
FCC ID:	2AEMN-P8
Test Conclusion:	Pass
Test Date:	Aug. 18, 2018 ~ Aug. 24, 2018
Date of Issue:	Sep. 04, 2018

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Revision History

Version	Issue Date	Revisions
Rev. 01	Aug. 28, 2018	Initial Issue
Rev. 02	Sep. 04, 2018	Added the software version in section 4.2 equipment list; Updated the test modes in section 4.4 test configurations.

TABLE OF CONTENTS

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 organizatin 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℃
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

(1) The test report refer to the BALUN report mode v2.1.
(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	DESAY INFOR TECHNOLOGY CO., LTD
Address	DESAY 3rd Industry Zone, chenjiang Town Huizhou, Guangdong, P.R.China

2.2 Manufacturer Information

Manufacturer	DESAY INFOR TECHNOLOGY CO., LTD
Address	DESAY 3rd Industry Zone, chenjiang Town Huizhou, Guangdong, P.R.China

2.3 Factory Information

Factory	DESAY INFOR TECHNOLOGY CO., LTD
Address	DESAY 3rd Industry Zone, chenjiang Town Huizhou, Guangdong, P.R.China

2.4 General Description for Equipment under Test (EUT)

EUT Name	Fast Wireless Charger
Model Name Under Test	P8C
Series Model Name	P8XX-XX(X=0~9 or A~Z)
Description of model name differentiation	All models are same with electrical parameters and internal circuit structure, but only different on model name and appearance color.
Hardware Version	V2.0
Software Version	V1.0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment	USB Cable	
	Length (Approx.)	1.0 m

2.6 Technical Information

Network and Wireless connectivity	Qi

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

Operating Frequency	110~205 kHz
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type	Coil Antenna
Antenna Gain	0 dBi

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 18	INDUSTRIAL, SCIENTIFIC, AND MEDICAL EQUIPMENT
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	FCC/OST MP-5:1986	Methods of Measurements of Radio Noise Emissions from ISM equipment

3.2 Verdict

No.	Description	FCC Rule	Test Verdict	Result
1	Radiated Emission	18.305	Pass	Annex A.1
3	Conducted Emission	18.307	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 to 25°C	AC 120 V/60 Hz	50% to 55%	100 kPa to 102 kPa

4.2 Test Equipment List

Radiated Emission Test For Frequency Below 30 MHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2018.06.13	2019.06.12	☒
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2017.11.07	2019.11.08	☒
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2019.02.20	☒
EMC Test Software	BALUN	Version: 15.2.0.344				☒

Radiated Emission Test For Frequency 30 MHz - 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	2017.07.22	2019.07.21	☒
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2019.02.20	☒
EMC Test Software	BALUN	Version: 15.2.0.344				☒

Conducted Emission Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2018.06.13	2019.06.12	☒
LISN	SCHWARZBECK	NSLK 8127	8127-687	2018.06.13	2019.06.12	☒
LISN	SCHWARZBECK	NNLK 8129	8129-462	2017.11.08	2018.11.07	☐
AMN	SCHWARZBECK	NNBM8124	8124-509	2018.06.13	2019.06.12	☐
AMN	SCHWARZBECK	NNBM8124	8124-510	2018.06.13	2019.06.12	☐
ISN	TESEQ	ISN T800	34449	2017.12.05	2018.12.04	☐
Shielded Enclosure	ChangNing	CN-130701	130703	N/A	N/A	☒
EMC Test Software	BALUN	Version: 15.2.0.344				☒

4.3 Test Enclosure list

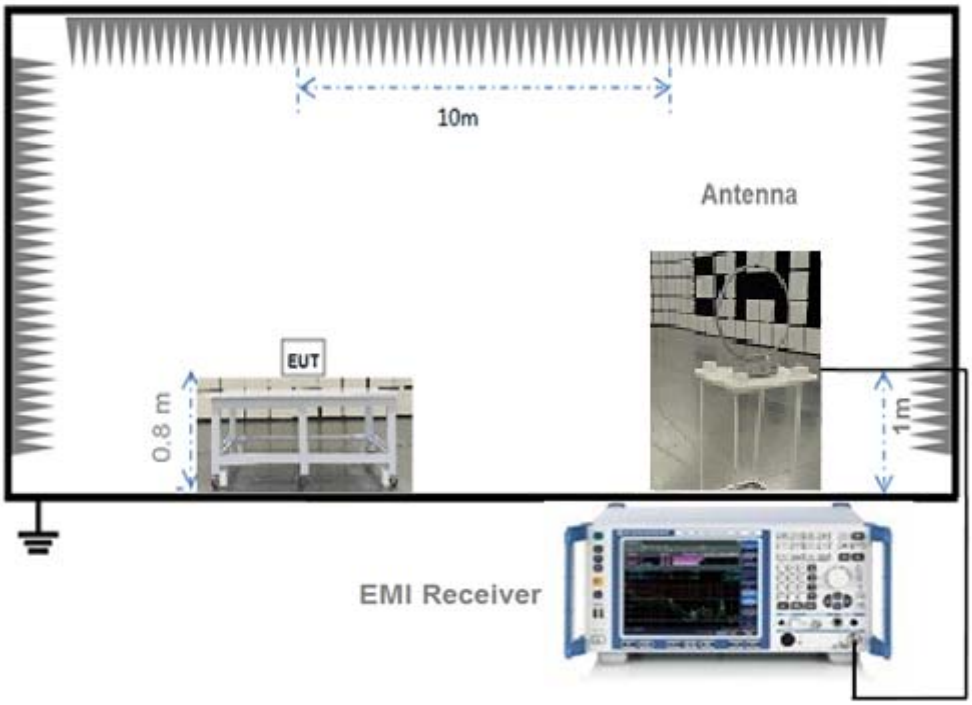
Description	Manufacturer	Model	Serial No.	Length	Description	Use
PC	N/A	N/A	N/A	N/A	Special Handled	☐
Laptop	Apple	A1465	N/A	N/A	N/A	☐
Printer	HP	DESKJET 1000	N/A	N/A	N/A	☐
Keyboard	Logitech	Y-BP62a	N/A	N/A	N/A	☐
Mouse	Logitech	M100	N/A	N/A	N/A	☐
USB disk	Kingston	N/A	N/A	N/A	N/A	☐
TF Card	Kingston	N/A	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	☐
iPhone	Apple	A1863	FD6W61M MJCLM	N/A	N/A	☒
Phone	MI	M4	N/A	N/A	N/A	☐
Laptop	LENOVO	K29	N/A	N/A	N/A	☐
Bluetooth Earphone	SAMSUNG	Gear Circle	N/A	N/A	N/A	☐
Wireless Communications 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	ROHDE&SCHWARZ	HMP2020	18141664	N/A	N/A	☐
Adapter 1	N/A	EP-TA10CBC	N/A	N/A	5V/2A	☒
Adapter 2	N/A	A824A-120150U-EU1	N/A	N/A	9V/1.67A	☒

4.4 Test Configurations

Test Configurations (TC) No.	Description
TC01	The Working Test Mode (with Adapter 1) EUT + USB Cable + Adapter 1 + iPhone(Battery status: <1%)
TC02	The Working Test Mode (with Adapter 2) EUT + USB Cable + Adapter 2 + iPhone(Battery status: <1%)
TC03	The Working Test Mode (with Adapter 1) EUT + USB Cable + Adapter 1 + iPhone(Battery status: 50%)
TC04	The Working Test Mode (with Adapter 2) EUT + USB Cable + Adapter 2 + iPhone(Battery status: 50%)
TC05	The Working Test Mode (with Adapter 1) EUT + USB Cable + Adapter 1 + iPhone(Battery status: >90%)
TC06	The Working Test Mode (with Adapter 2) EUT + USB Cable + Adapter 2 + iPhone(Battery status: >90%)

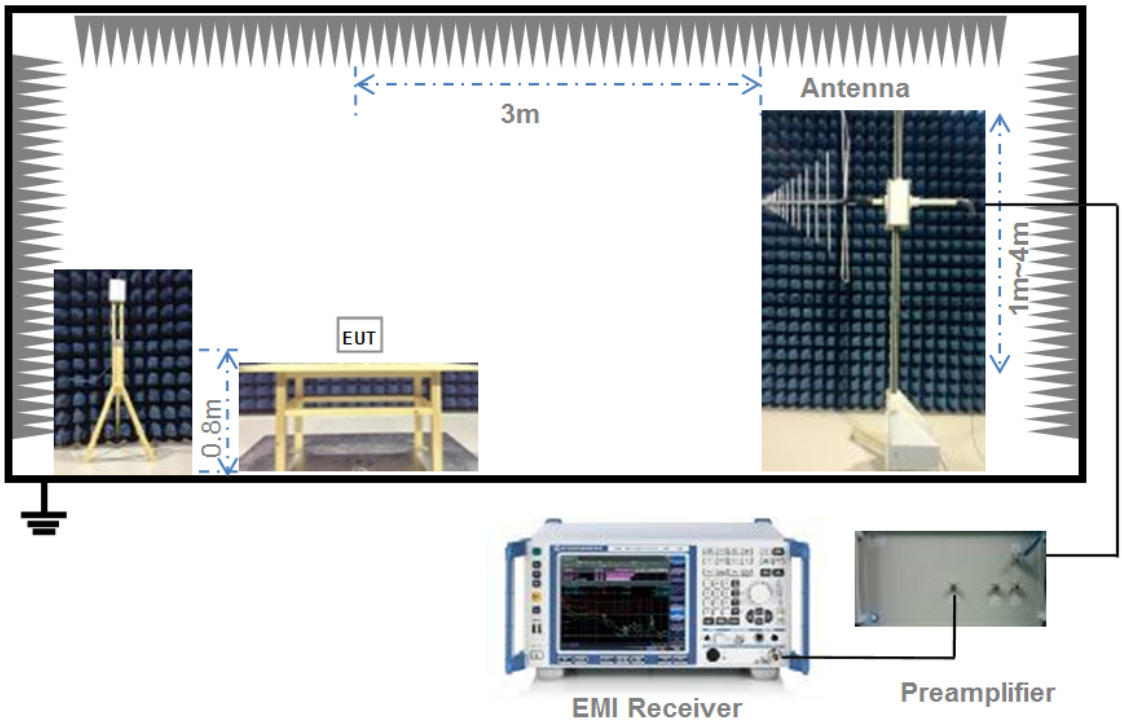
4.5 Test Setups

Test Setup 1



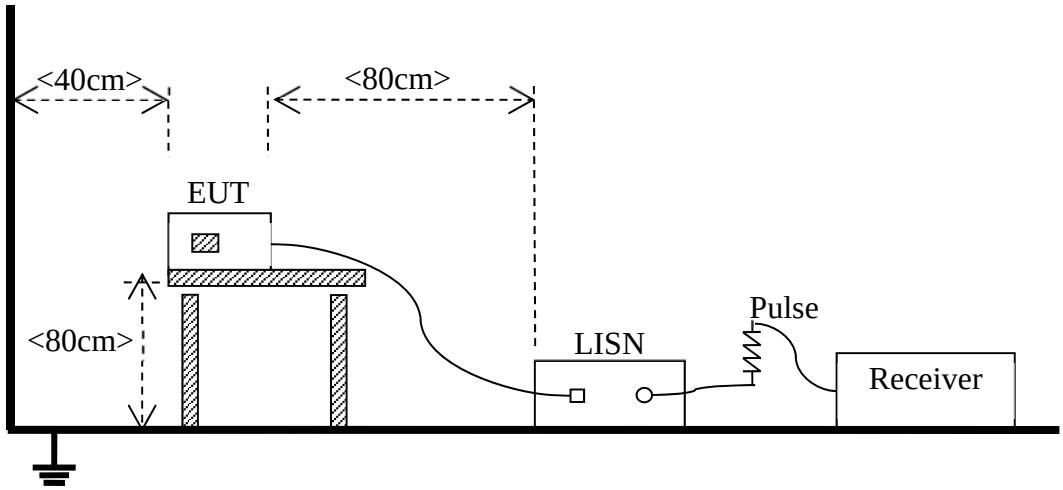
(For Radiated Emission Test (Below 30 MHz))

Test Setup 2



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

Test Setup 3



(For Conducted Emission)

4.6 Test Conditions

Test Case	Test Conditions	
Radiated Emission	Test Env.	NTNV
	Test Setup	Test Setup 1&2
	Test Configuration	TC01~TC06[Note]
Conducted Emission	Test Env.	NTNV
	Test Setup	Test Setup 3
	Test Configuration	TC01~TC06[Note]
Note: Based on client request, all normal using modes of the normal function were tested, but only the worst test data of test mode is reported in this report. And the Working Test Mode (TC01 with Adapter 1) is the worst mode in this report.		

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Field strength limits

5.1.1.1 The field strength levels of emissions which lie outside the bands specified in § 18.301, unless otherwise indicated, shall not exceed the following:

ISM Frequency of § 18.301

ISM frequency	Tolerance
6.78 MHz	±15.0 kHz
13.56 MHz	±7.0 kHz
27.12 MHz	±163.0 kHz
40.68 MHz	±20.0 kHz
915 MHz	±13.0 MHz
2,450 MHz	±50.0 MHz
5,800 MHz	±75.0 MHz
24,125 MHz	±125.0 MHz
61.25 GHz	±250.0 MHz
122.50 GHz	±500.0 MHz
245.00 GHz	±1.0 GHz

Equipment	Operating frequency	RF Power generated By equipment (watts)	Field strength limit (uV/m)(distance)
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	Below 500	25 (300m)
		500 or more	25 × SQRT(power/500) (300m)[1]
	Any non-ISM frequency	Below 500	15 (300m)
		500 or more	15 × SQRT(power/500) (300m)[1]
Industrial heaters and RF stabilized arc welders	On or below 5,725 MHz	any	10 (1600m)
	Above 5,725 MHz	any	(2)
Medical diathermy	Any ISM frequency	any	25 (300m)
	Any non-ISM frequency	any	15 (300m)
Ultrasonic	Below 490 kHz	Below 500	2,400/F(kHz) (300m)
		500 or more	2,400/F(kHz) × SQRT(power/500) (300m)[3]
Induction cooking ranges	490 to 1,600 kHz	any	24,000/F(kHz) (30m)
	Above 1,600 kHz	any	15 (30m)
	Below 90 kHz	any	1500 (30m)[4]
	On or above 90 kHz	any	300 (30m)[4]

1 Field strength may not exceed 10 μV/m at 1600 meters. Consumer equipment operating below 1000 MHz is not

permitted the increase in field strength otherwise permitted here for power over 500 watts.
2 Reduced to the greatest extent possible.
3 Field strength may not exceed 10 μV/m at 1600 meters. Consumer equipment is not permitted the increase in field strength otherwise permitted here for over 500 watts.
4 Induction cooking ranges manufactured prior to February 1, 1980, shall be subject to the field strength limits for miscellaneous ISM equipment.
For example, Any non-ISM frequency Emission level(10m) dBuV/m for 0.009~30MHz = 20log (15) + 40log (300/10) dBuV/m = 82.5 dBuV/m; Any ISM frequency Emission level(10m) dBuV/m for 0.009~30MHz = 20log (25) + 40log (300/10) dBuV/m = 87 dBuV/m

The field strength limits for RF lighting devices shall be the following:

Consumer equipment

Frequency (MHz)	Field Strength (μV/m @30m)	Field Strength (dBμV/m @30m)	Field Strength (dBμV/m @10m)	Field Strength (dBμV/m @3m)
30-88	10	20	29.5	40
88-216	15	23.5	33.0	43.5
216-1000	20	26	35.5	46

Non-consumer equipment

Frequency (MHz)	Field Strength (μV/m @30m)	Field Strength (dBμV/m @30m)	Field Strength (dBμV/m @10m)	Field Strength (dBμV/m @3m)
30-88	30	29.5	39	49.5
88-216	50	34	43.5	54
216-1000	70	37	46.5	57

Note: The more stringent limit applies at transition frequencies.

5.1.1.2 Test Setup

Refer to 4.5 section (test setup 1) 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.

5.1.3 Conducted Emission

5.1.3.1 Test Limit

All Induction cooking ranges and ultrasonic equipment

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.009-0.05	110	--
0.05-0.15	90-80*	--
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

NOTE*: Decreases with the logarithm of the frequency.

All other part 18 consumer devices

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

NOTE*: Decreases with the logarithm of the frequency.

RF lighting devices

Frequency (MHz)	Maximum RF line voltage measured with a 50 uH/50 ohm LISN (uV)	Maximum RF line voltage measured with a 50 uH/50 ohm LISN (dBμV)
Non-consumer equipment		
0.45-1.6	1000	60
1.6-30	3000	70
Consumer equipment		
0.45-2.51	250	48
2.51-3	3000	70
3-30	250	48

NOTE*: Decreases with the logarithm of the frequency.

5.1.3.2 Test Setup

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

5.1.3.3 Test Procedure

The EUT is connected to the power mains through a LISN which provides 50 Ω/50 μH 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.

5.1.3.4 Test Result

Please refer to ANNEX A.2.

ANNEX A TEST RESULTS

A.1 Radiated Emission

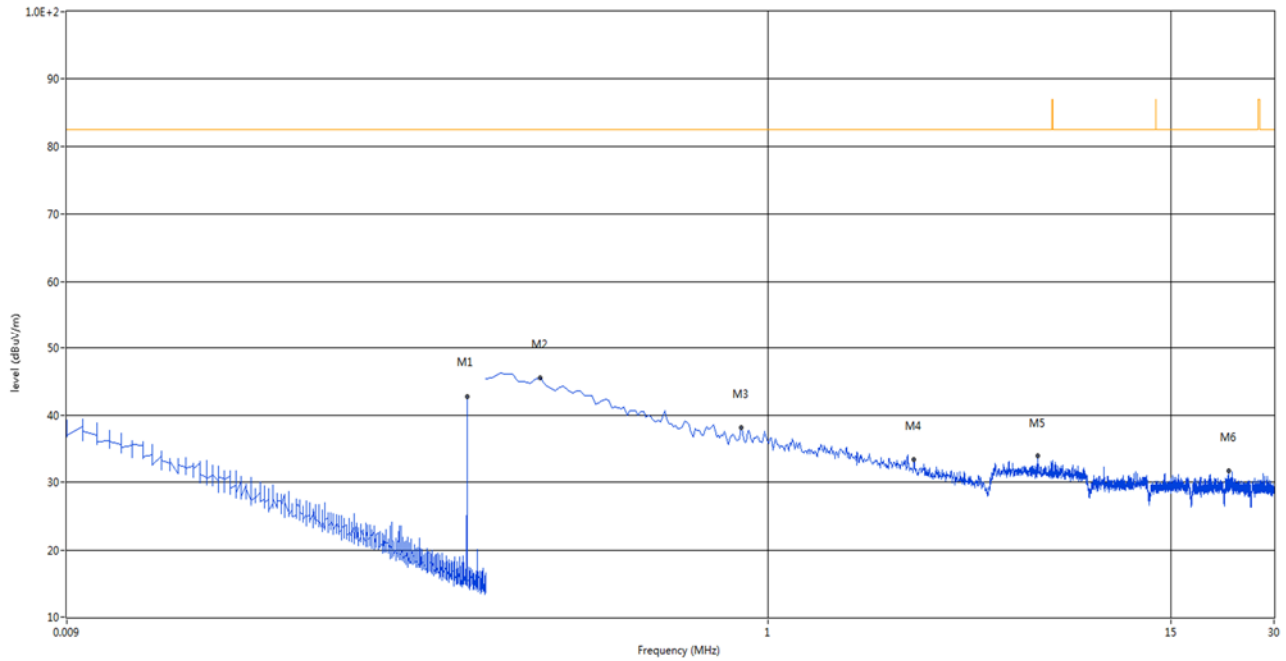
Note [1]: The symbol of "--" in the table which means not application.

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

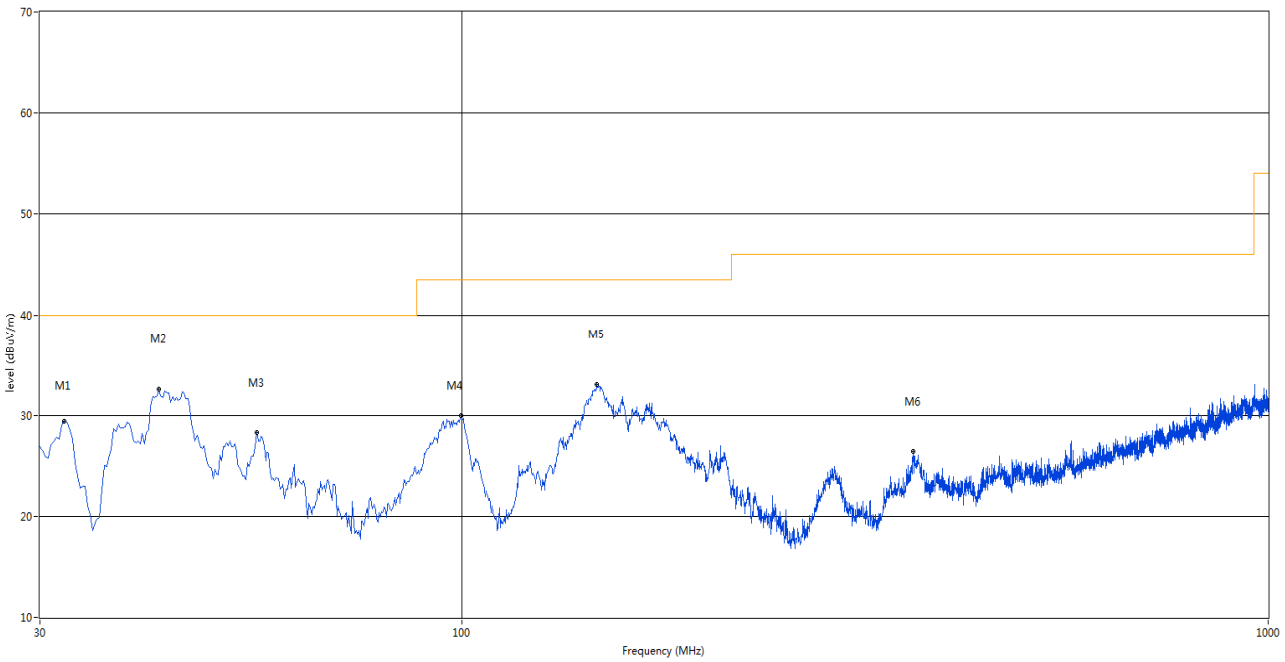
The Working Test Mode (with Adapter 1)

A.1.1 Test Antenna Horizontal, 9 kHz –30 MHz



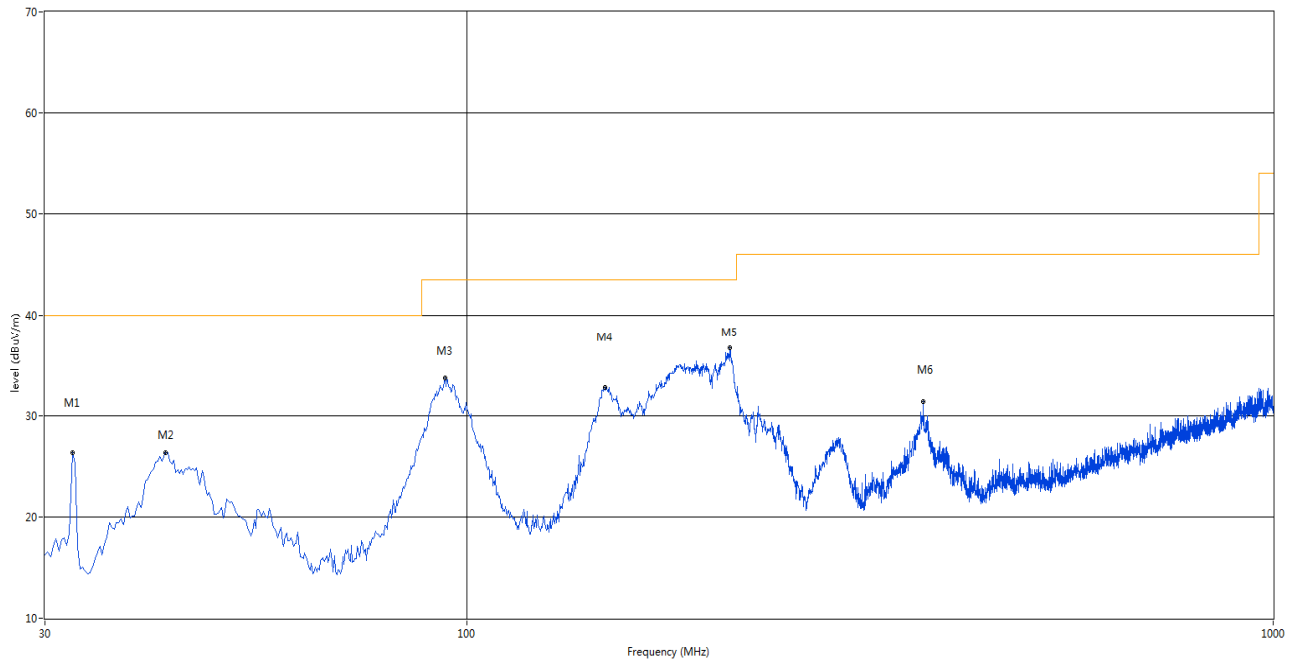
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	0.133	43.60	20.15	82.5	-38.9	Peak	219.00	100	Vertical	N/A
2	0.217	45.60	20.18	82.5	-36.90	Peak	359.00	100	Vertical	Pass
3	0.836	38.13	20.47	82.5	-44.37	Peak	17.00	100	Vertical	Pass
4	2.672	33.42	20.49	82.5	-49.08	Peak	337.00	100	Vertical	Pass
5	6.148	33.88	20.82	82.5	-48.62	Peak	4.00	100	Vertical	Pass
6	22.077	31.67	21.13	82.5	-50.83	Peak	352.00	100	Vertical	Pass

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



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	32.182	29.39	-18.93	40.0	-10.61	Peak	115.00	100	Vertical	Pass
2	42.125	32.62	-17.81	40.0	-7.38	Peak	214.00	100	Vertical	Pass
3	55.705	28.28	-18.45	40.0	-11.72	Peak	10.00	100	Vertical	Pass
4	99.840	29.98	-20.70	43.5	-13.52	Peak	298.00	200	Vertical	Pass
5	147.128	33.05	-16.14	43.5	-10.45	Peak	25.00	100	Vertical	Pass
6	363.195	26.39	-14.28	46.0	-19.61	Peak	0.00	300	Vertical	Pass

A.1.3 Test Antenna Horizontal, 30 MHz – 1 GHz



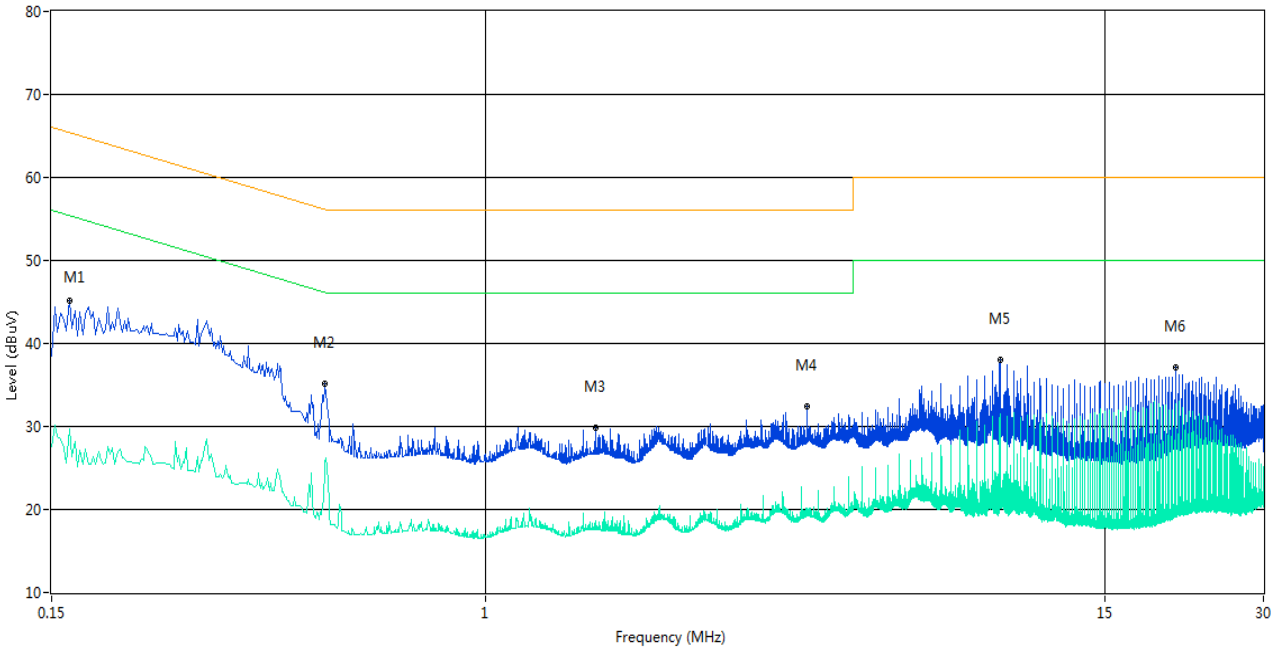
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	32.425	26.29	-18.88	40.0	-13.71	Peak	230.00	300	Horizontal	Pass
2	42.367	26.35	-17.85	40.0	-13.65	Peak	342.00	200	Horizontal	Pass
3	94.020	33.68	-21.18	43.5	-9.82	Peak	355.00	200	Horizontal	Pass
4	148.340	32.80	-16.03	43.5	-10.70	Peak	138.00	200	Horizontal	Pass
5	212.117	36.67	-19.30	43.5	-6.83	Peak	0.00	200	Horizontal	Pass
6	368.045	31.33	-14.11	46.0	-14.67	Peak	313.00	100	Horizontal	Pass

A.2 Conducted Emission

Test Data and Plots

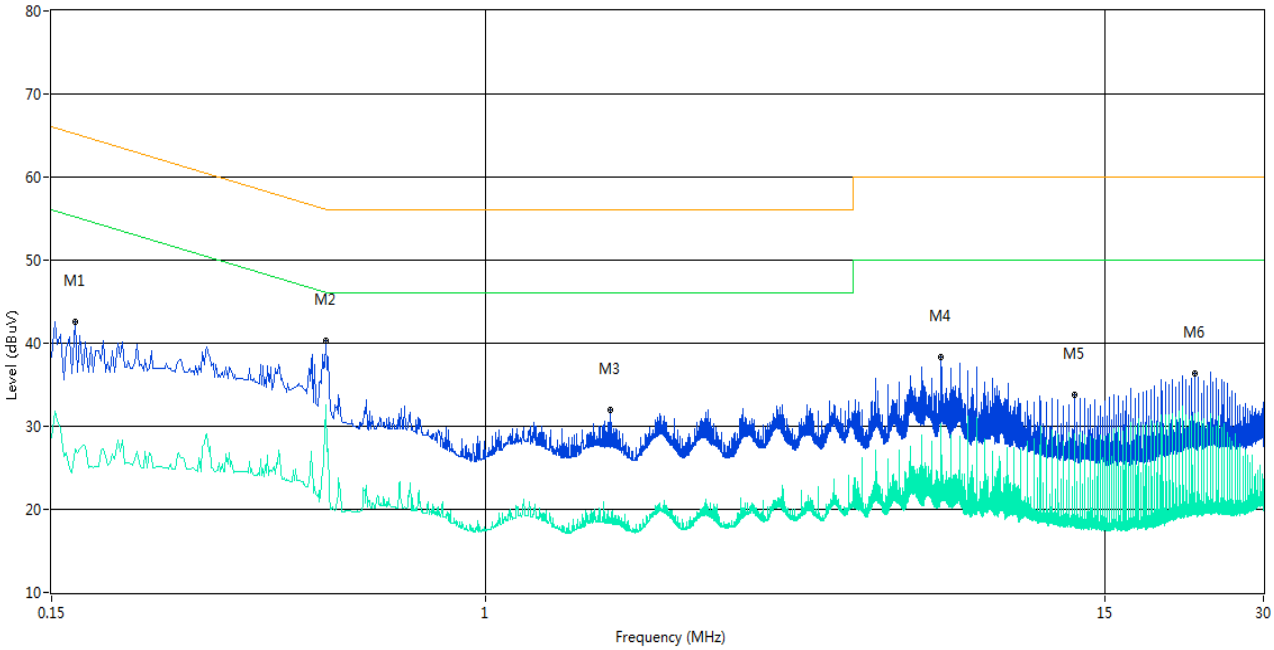
The Working Test Mode (with Adapter 1)

A.2.1 L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.158	42.9	10.04	65.6	-22.70	Peak	L Line	Pass
1**	0.158	27.5	10.04	55.6	-28.10	AV	L Line	Pass
2	0.496	35.2	10.05	56.1	-20.90	Peak	L Line	Pass
2**	0.496	25.8	10.05	46.1	-20.30	AV	L Line	Pass
3	1.616	29.8	10.08	56.0	-26.20	Peak	L Line	Pass
3**	1.616	17.9	10.08	46.0	-28.10	AV	L Line	Pass
4	4.080	32.5	10.15	56.0	-23.50	Peak	L Line	Pass
4**	4.080	19.2	10.15	46.0	-26.80	AV	L Line	Pass
5	9.476	38.1	10.30	60.0	-21.90	Peak	L Line	Pass
5**	9.476	31.5	10.30	50.0	-18.50	AV	L Line	Pass
6	20.480	37.1	10.61	60.0	-22.90	Peak	L Line	Pass
6**	20.480	32.7	10.61	50.0	-17.30	AV	L Line	Pass

A.2.2 N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.166	42.6	10.04	65.2	-22.60	Peak	N Line	Pass
1**	0.166	27.2	10.04	55.2	-28.00	AV	N Line	Pass
2	0.498	40.3	10.05	56.0	-15.70	Peak	N Line	Pass
2**	0.498	32.6	10.05	46.0	-13.40	AV	N Line	Pass
3	1.726	32.0	10.08	56.0	-24.00	Peak	N Line	Pass
3**	1.726	19.0	10.08	46.0	-27.00	AV	N Line	Pass
4	7.332	38.3	10.24	60.0	-21.70	Peak	N Line	Pass
4**	7.332	30.4	10.24	50.0	-19.60	AV	N Line	Pass
5	13.144	33.8	10.40	60.0	-26.20	Peak	N Line	Pass
5**	13.144	29.1	10.40	50.0	-20.90	AV	N Line	Pass
6	22.254	36.4	10.66	60.0	-23.60	Peak	N Line	Pass
6**	22.254	31.5	10.66	50.0	-18.50	AV	N Line	Pass

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1870029-AE.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ1870029-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ1870029-AI.PDF”.

--END OF REPORT--