

EN 55014-1:2006 + A1:2009 + A2:2011
EN 55014-2:2015
EN 61000-3-2:2014
EN 61000-3-3:2013


TEST REPORT

For

Shenzhen ESYS Electronics Co.,Ltd

No.1018, Qiuwu Street, Nanlian, Longgang District, Shenzhen City, Guangdong Province, China.

Model: SP1802

Report Type: Original Report	Product Type: K1 baby soother sound machine
Report Number: RSZ180626801-01	
Report Date: 2018-07-05 Seal Deng	
Reviewed By: EMC Engineer	
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Shenzhen).

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
MEASUREMENT UNCERTAINTY.....	5
SYSTEM TEST CONFIGURATION	6
JUSTIFICATION	6
EUT EXERCISE SOFTWARE	6
EQUIPMENT MODIFICATIONS	6
SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLE.....	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST REPORT.....	8
TEST EQUIPMENT LIST	9
EN 55014 §4.1.1-TERMINAL VOLTAGE.....	10
TEST SYSTEM SETUP.....	10
EMI TEST RECEIVER SETUP.....	10
TEST PROCEDURE	10
CORRECTED FACTOR & MARGIN CALCULATION	11
TEST RESULTS SUMMARY	11
TEST DATA	11
EN 55014-1§4.1.2- RADIATED DISTURBANCE.....	14
TEST SYSTEM SETUP.....	14
EMI TEST RECEIVER SETUP.....	14
TEST PROCEDURE	14
CORRECTED AMPLITUDE & MARGIN CALCULATION	15
TEST RESULTS SUMMARY	15
TEST DATA	15
EN 55014-2 §5.1-ELECTROSTATIC DISCHARGE (IEC 61000-4-2).....	17
TEST SYSTEM SETUP.....	17
TEST STANDARD.....	17
TEST PROCEDURE	18
TEST DATA	18
EN 55014-2 §5.2 - FAST TRANSIENTS (IEC 61000-4-4)	22
TEST SYSTEM SETUP.....	22
TEST STANDARD.....	22
TEST PROCEDURE	22
TEST DATA	23
EN 55014-2 §5.3 - INJECTED CURRENTS (IEC 61000-4-6).....	24
TEST SETUP.....	24
TEST STANDARD.....	24
TEST PROCEDURE	24

TEST DATA25

EN 55014-2 §5.5 - RADIO FREQUENCY ELECTROMAGNETIC FIELDS (IEC 61000-4-3)26

TEST SYSTEM SETUP26

TEST STANDARD26

TEST PROCEDURE27

TEST DATA AND SETUP PHOTO27

EN 55014-2 §5.6 SURGES (IEC 61000-4-5)29

TEST SYSTEM SETUP29

TEST STANDARD29

TEST PROCEDURE29

TEST DATA30

EN 55014-2 §5.7-VOLTAGE DIPS AND INTERRUPTIONS (IEC 61000-4-11)31

TEST SETUP31

TEST STANDARD31

TEST PROCEDURE31

TEST DATA32

EN 61000-3-2 – HARMONIC CURRENT EMISSIONS33

EN 61000-3-3 – VOLTAGE FLUCTUATION AND FLICKER34

TEST SYSTEM SETUP34

TEST STANDARD34

TEST DATA AND SETUP PHOTO35

EXHIBIT A - PRODUCT LABELING37

PROPOSED CE LABEL FORMAT37

PROPOSED LABEL LOCATION ON EUT37

EXHIBIT B – EUT PHOTOGRAPHS38

EUT – ALL VIEW38

EUT – FRONT VIEW38

EUT – REAR VIEW39

EUT – TOP VIEW39

EUT – BOTTOM VIEW40

EUT – LEFT VIEW40

EUT – RIGHT VIEW41

EUT – COVER OFF VIEW 141

EUT – COVER OFF VIEW 242

EUT – MAIN BOARD TOP VIEW42

EUT – MAIN BOARD BOTTOM VIEW43

EUT – VOLUME CONTROL BOARD TOP VIEW43

EUT – VOLUME CONTROL BOARD BOTTOM VIEW44

EUT –SPEAKER VIEW44

EUT –USB CABLE VIEW45

EUT –BATTERY TOP VIEW45

EUT –BATTERY BOTTOM VIEW46

EXHIBIT C - TEST SETUP PHOTOGRAPHS47

TERMINAL VOLTAGES - FRONT VIEW47

TERMINAL VOLTAGES - SIDE VIEW47

RADIATED DISTURBANCES - FRONT VIEW48

RADIATED DISTURBANCES - REAR VIEW48

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Shenzhen ESYS Electronics Co.,Ltd*'s product, model number: *SP1802* in this report is a *K1 baby soother sound machin*, which was measured approximately: 7.5 cm (L) *7.5 cm (W) * 8.8 cm (H), rated with input voltage: DC 3.7V from battery. The highest operating frequency is less than 108 MHz.

** All measurement and test data in this report was gathered from production sample serial number: 180626801 (Assigned by BAACL, Shenzhen). The EUT supplied by the applicant was received on 2018-06-26.*

Objective

This report is prepared on behalf of *Shenzhen ESYS Electronics Co.,Ltd* in accordance with EN 55014-1, Electromagnetic Compatibility – Requirements for household appliances, electric tools and similar apparatus Part 1: Emission. EN 55014-2, Electromagnetic Compatibility – Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity- Product family Standard.

EN 61000-3-2, Limits – Limits for harmonic current emissions (equipment input current up to and including 16 A per phase), and also in accordance with EN 61000-3-3, Limits Section 3; Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <16A.

The objective of the manufacturer is to determine compliance with EN 55014-1, EN 55014-2, EN 61000-3-2 and EN 61000-3-3.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with CISPR 16-1-1:2010+A1:2010+A2:2014, specification for radio disturbance and immunity measuring apparatus and methods P1-1: radio disturbance and immunity measuring apparatus measuring apparatus. CISPR 16-1-2:2014, Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances. CISPR 16-1-4:2010+A1:2012, Specification for radio disturbance and immunity measuring apparatus and methods-Part 1-4: Radio disturbance and immunity measuring apparatus -Ancillary equipment -Radiated disturbances; CISPR 16-2-1:2014, Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements. CISPR 16-2-3: 2010+A1:2010+A2:2014, Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements. CISPR 16-4-2: 2011, Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 Meters.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expanded combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will be taken into consideration for the test data recorded in the report

Item		Expanded Measurement uncertainty	
AC Power Line Conducted Disturbances		2.20 dB (k=2, 95% level of confidence)	
Radiated Disturbances	30MHz~200MHz	Horizontal	4.58 dB (k=2, 95% level of confidence)
		Vertical	4.59 dB (k=2, 95% level of confidence)
	200MHz~1 GHz	Horizontal	4.83 dB (k=2, 95% level of confidence)
		Vertical	5.85 dB (k=2, 95% level of confidence)

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

No exercise software was used.

Equipment Modifications

No modification was made to the EUT.

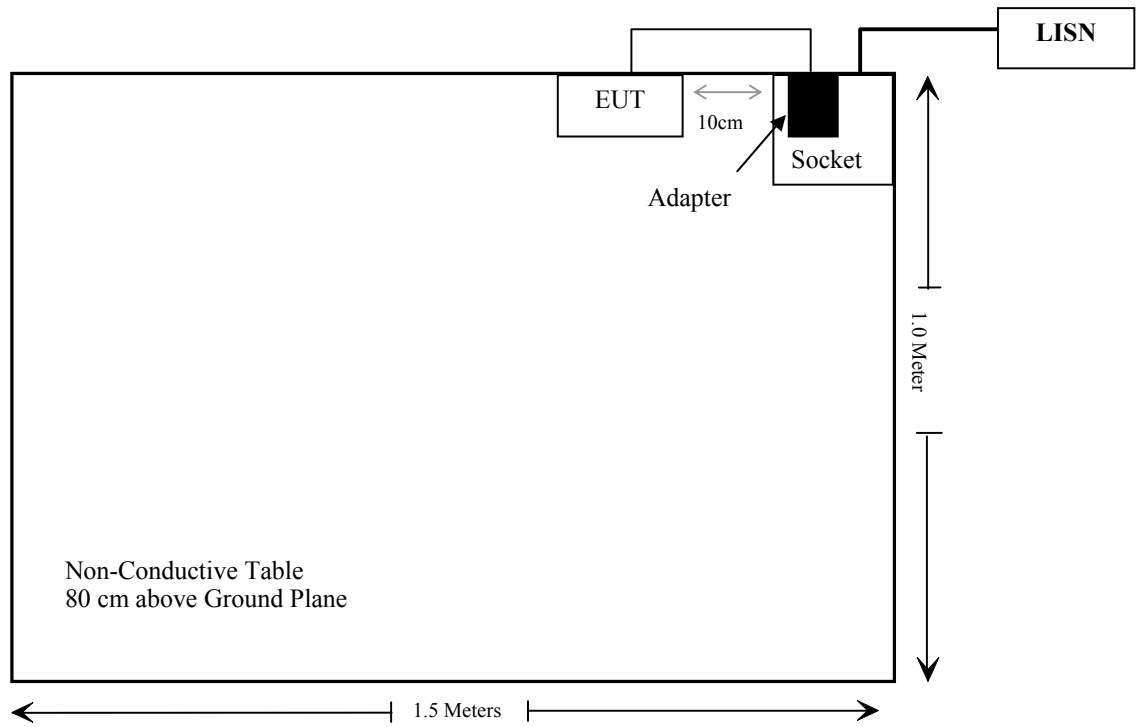
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
BULL	Socket	GN-415K	5503290068073
N/A	Adapter	N/A	N/A

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielded detachable DC cable	1.2	Adapter	EUT
Un-shielded Un-detachable AC cable	1.0	Socket	Mains

Block Diagram of Test Setup



F

SUMMARY OF TEST REPORT

EN 55014-1

Rule	Description	Results
§ 4.1.1	Terminal Voltage	Compliance
§ 4.1.2	Disturbance Power	Not Applicable
§ 4.1.2	Radiated Disturbance	Compliance
§ 4.2	Discontinuous Disturbance	Not Applicable

EN 55014-2

Rule	Description	Results
§ 5.1	Electrostatic Discharge (IEC 61000-4-2)	Compliance
§ 5.2	Fast Transients (IEC 61000-4-4)	Compliance
§ 5.3	Injected Currents (IEC 61000-4-6)	Compliance
§ 5.5	Radio Frequency Electromagnetic Fields (IEC 61000-4-3)	Compliance
§ 5.6	Surges (IEC 61000-4-5)	Compliance
§ 5.7	Voltage Dips and Interruptions (IEC 61000-4-11)	Compliance

EN 61000-3-2

Rule	Description	Results
§7	Harmonic Current Emissions	Compliance

EN 61000-3-3

Rule	Description	Results
§5	Voltage Fluctuation and Flicker	Compliance

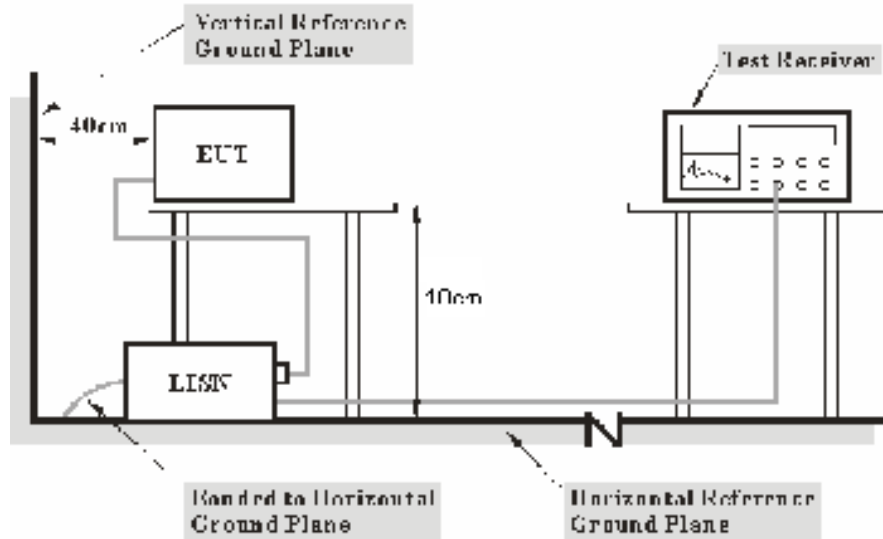
TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMI					
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2017-08-04	2018-08-04
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2017-12-21	2018-12-21
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2018-05-21	2018-11-19
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
HP	Amplifier	HP8447E	1937A01046	2018-05-21	2018-11-19
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2018-01-11	2019-01-11
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
Rohde & Schwarz	Auto test Software	EMC32	V9.10	NCR	NCR
EM Test	Harmonic/Flicker	DPA 500N	V0939105176	2018-01-11	2019-01-11
EM Test	AC Source	ACS500	303276	2018-01-11	2019-01-11
EM Test	Test Software	DPA. Control	V5.0.3.0	NCR	NCR
EMS					
TESEQ	ESD Tester	NSG 438	1476	2017-07-15	2018-07-15
EM Test	EMS Combination Tester	UCS 500 N5	V0939105172	2017-12-06	2018-12-06
EM Test	AC Source	MV2616	V0939105173	2017-12-06	2018-12-06
EM Test	Test Software	IEC. Control	V5.0.9.0	NCR	NCR
A&R	Power Amplifier	500W100B	0348446	NCR	NCR
A&R	Power Amplifier	60S1G6	0348712	NCR	NCR
A&R	Trapezoidal Log Periodic	ATT700M12G	0349411	NCR	NCR
A&R	Antenna	ATL80M1G	348837	NCR	NCR
HP	Signal Generator	8648C	3426A01345	2018-04-19	2019-04-19
/	6dB Attenuator	/	/	NCR	NCR
A&R	RF Power Amplifier	15A250	13444	NCR	NCR
Agilent	Signal Generator	8665B	3744A01692	2018-01-12	2019-01-12
COM-POWER	CDN	CDN M325E	521145	2018-02-27	2019-02-27
BACL	Test Software	VEE PRO	V2.3 VXE	NCR	NCR

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

EN 55014 §4.1.1-TERMINAL VOLTAGE

Test System Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 10cm from EUT and at the least 10cm from other units and other metal planes support units.

The setup of EUT is according with CISPR 16-2-1:2014 measurement procedure. The specification used was the EN 55014-1 limits

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Pulse Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN/ISN VDF} + \text{Cable Loss} + \text{Pulse Limiter Attenuation}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the limit of EN 55014-1

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BA CL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

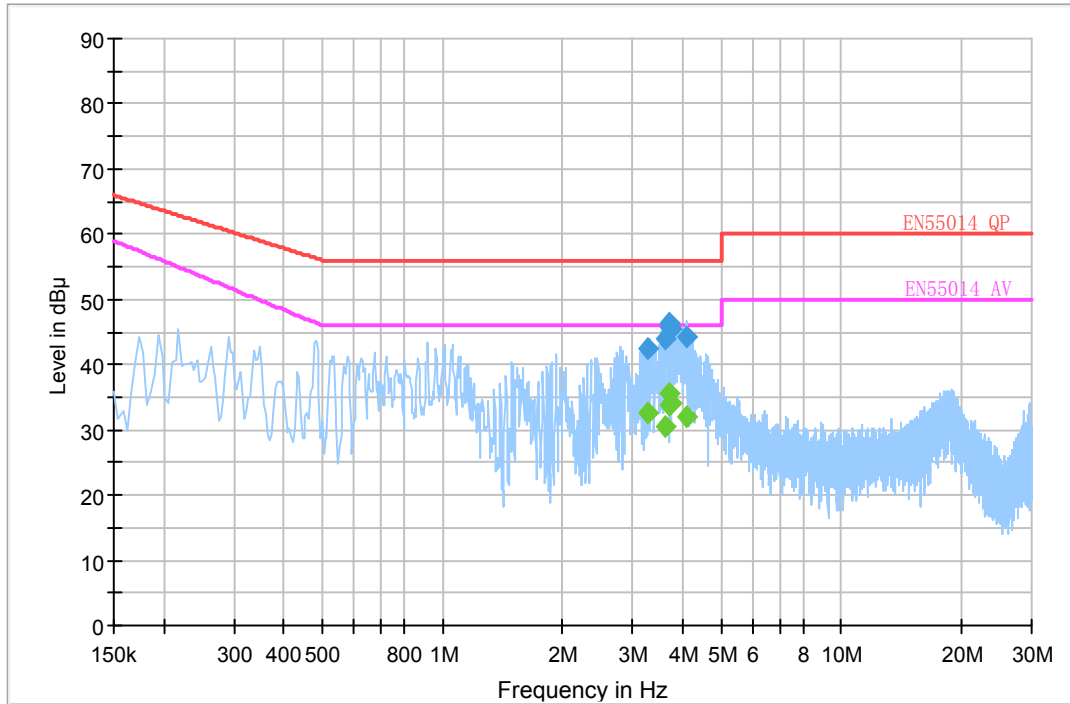
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-07-02.

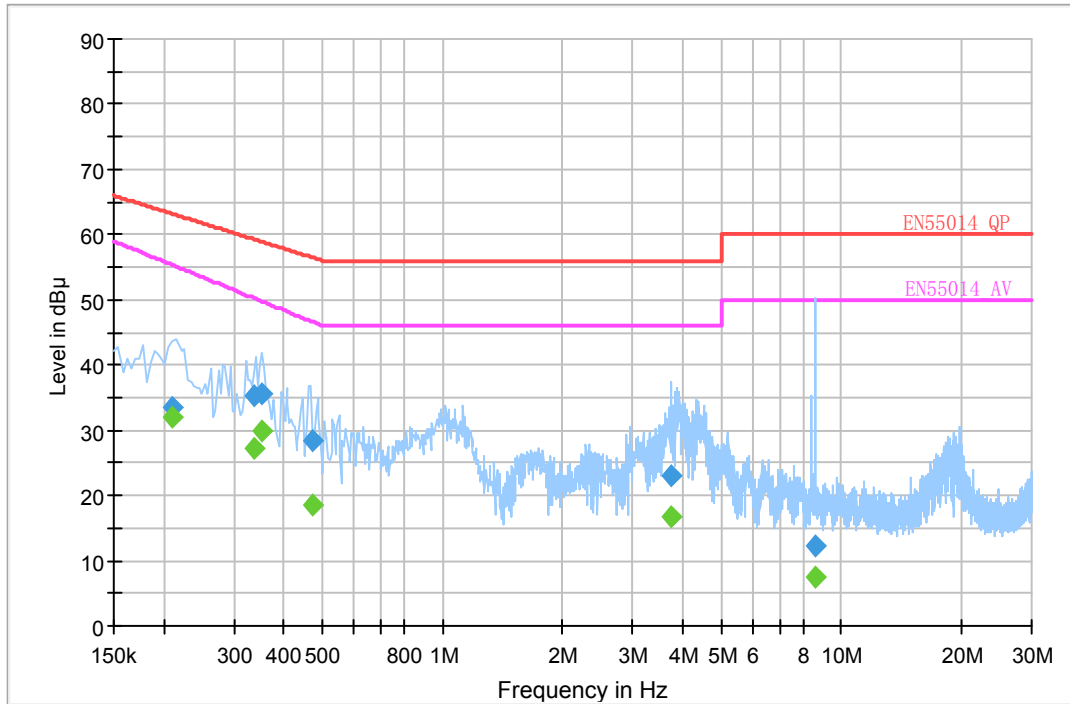
EUT operation mode: Charging & playing music

AC 230V/50 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
3.270330	42.5	20.0	56.0	13.5	QP
3.604630	44.1	20.0	56.0	11.9	QP
3.706410	46.4	20.0	56.0	9.6	QP
3.708810	45.9	20.0	56.0	10.1	QP
3.756910	45.5	20.0	56.0	10.5	QP
4.092590	44.4	20.0	56.0	11.6	QP
3.270330	32.5	20.0	46.0	13.5	Ave.
3.604630	30.5	20.0	46.0	15.5	Ave.
3.706410	35.5	20.0	46.0	10.5	Ave.
3.708810	33.9	20.0	46.0	12.1	Ave.
3.756910	34.1	20.0	46.0	12.0	Ave.
4.092590	32.0	20.0	46.0	14.0	Ave.

AC 230V/50 Hz, Neutral:



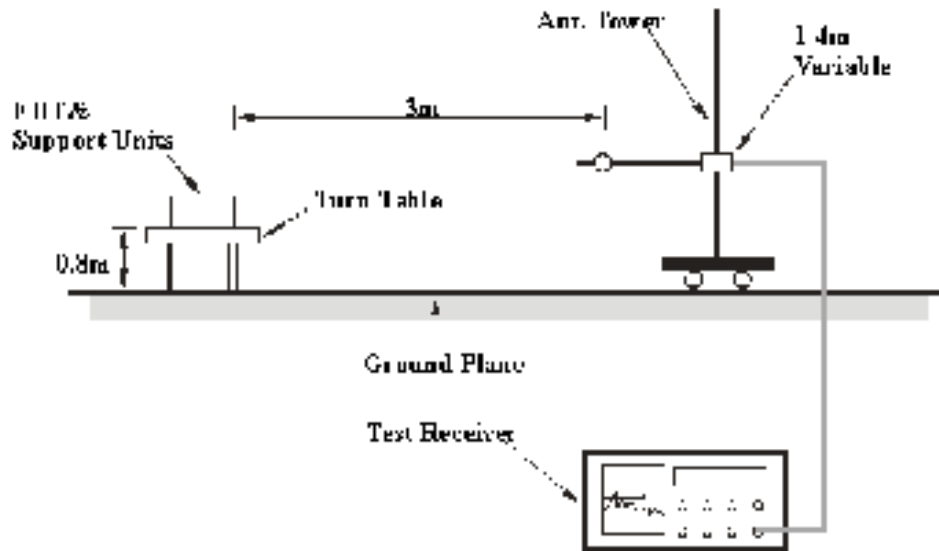
Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.209500	33.4	20.1	63.2	29.9	QP
0.336870	35.4	20.1	59.3	23.9	QP
0.352690	35.5	20.1	58.9	23.4	QP
0.472990	28.5	20.1	56.5	28.0	QP
3.761630	22.9	20.0	56.0	33.1	QP
8.649210	12.1	19.9	60.0	47.9	QP
0.209500	31.9	20.1	55.4	23.5	Ave.
0.336870	27.3	20.1	50.3	23.0	Ave.
0.352690	30.0	20.1	49.8	19.8	Ave.
0.472990	18.6	20.1	46.6	28.0	Ave.
3.761630	16.7	20.0	46.0	29.3	Ave.
8.649210	7.5	19.9	50.0	42.5	Ave.

Note:

- 1) Correction Factor = LISN/ISN VDF (Voltage Division Factor) + Cable Loss + Pulse Limiter Attenuation
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

EN 55014-1§4.1.2- RADIATED DISTURBANCE

Test System Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the CISPR16-1-4: 2010+A1:2012, CISPR 16-2-3: 2010+A1:2010+A2:2014. The related limit was specified in EN55014-1.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in the Quasi-peak detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the limit of EN 55014-1

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

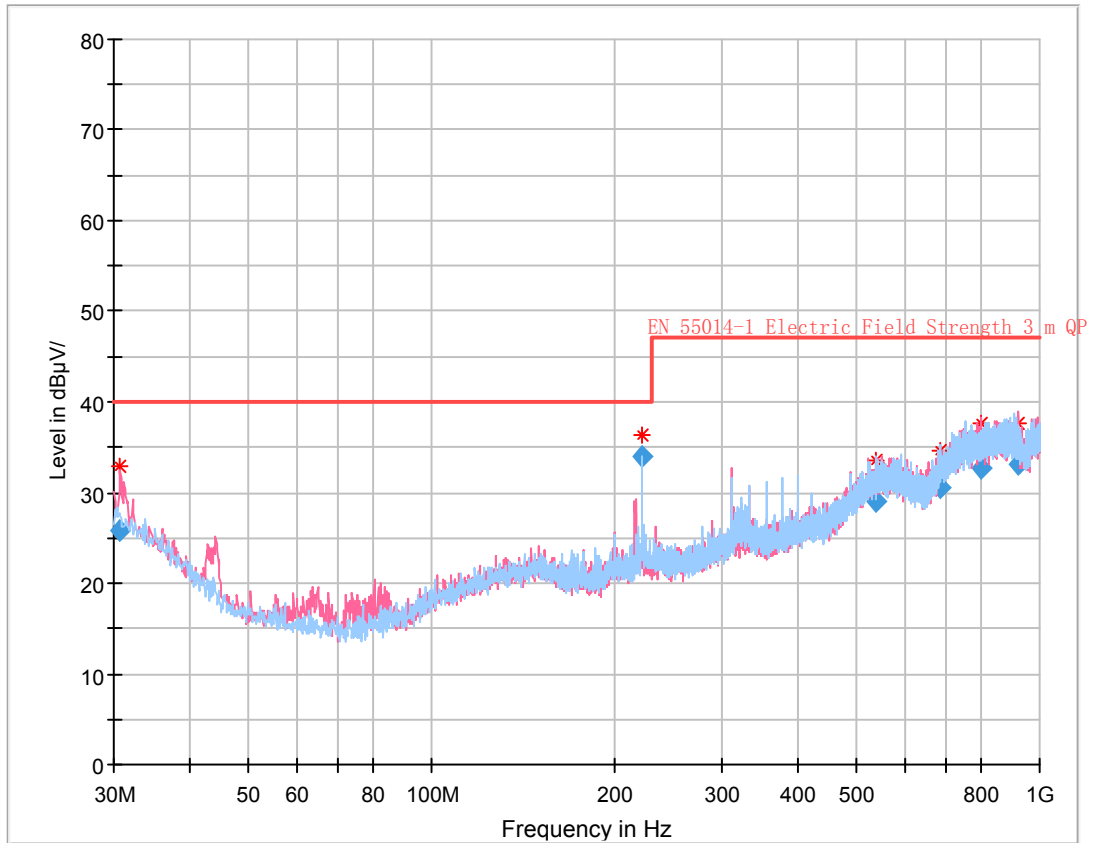
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-06-28.

EUT operation mode: Charging & playing music

30 MHz~1 GHz:



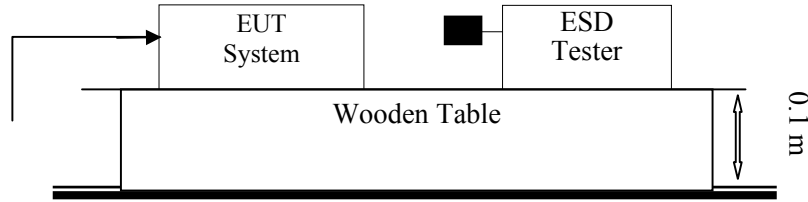
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
30.753250	25.89	100.0	V	226.0	0.2	40.00	14.11
221.993125	34.07	156.0	H	103.0	-4.7	40.00	5.93
537.434375	29.08	190.0	H	146.0	4.8	47.00	17.92
688.299250	30.57	274.0	H	326.0	6.2	47.00	16.43
799.561625	32.76	107.0	V	357.0	9.1	47.00	14.24
920.460125	33.02	400.0	V	276.0	9.4	47.00	13.98

Note:

- 1) Corrected Amplitude = Meter Reading + Correction Factor
- 2) Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain
- 3) Margin = Limit - Corrected Amplitude

EN 55014-2 §5.1-ELECTROSTATIC DISCHARGE (IEC 61000-4-2)

Test System Setup



Remark: ■ is the tip of the electrode

IEC 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Standard

EN 55014-2:2015 / IEC 61000-4-2:2008
 Air Discharge at ±2 kV, ±4 kV, ±8 kV
 Contact Discharge at ±2 kV, ±4 kV

Test Level

Level	Test Voltage Contact Discharge (±kV)	Test Voltage Air Discharge (±kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Performance criterion: B

Test Procedure

Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Contact Discharge:

All the procedure shall be same as Section 8.3.1.of IEC 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane

At least 50 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-07-05.

EUT operation mode: Charging& playing music

Table 1: Electrostatic Discharge Immunity (Air Discharge)

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Front (2 points)	A	A	A	A	A	A	/	/
Rear (5 points)	A	A	A	A	A	A	/	/
Left (2 points)	A	A	A	A	A	A	/	/
Right (2 points)	A	A	A	A	A	A	/	/
Top (1 point)	A	A	A	A	A	A	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
/	/	/	/	/	/	/	/	/

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/



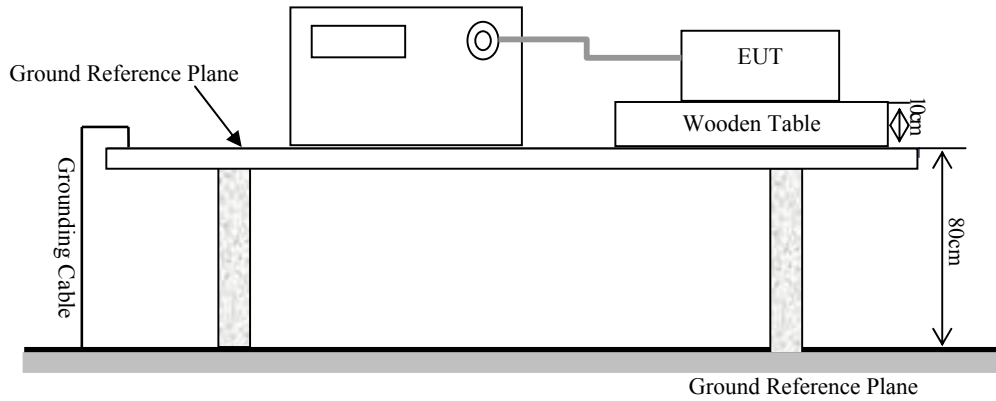
Note:  represents air discharge,  represents direct contact



Test Setup Photos

EN 55014-2 §5.2 - FAST TRANSIENTS (IEC 61000-4-4)

Test System Setup



Test Standard

EN 55014-2:2015 (IEC 61000-4-4:2012)
 AC Mains: Test level 2 at ±1 kV

Test Level

Open Circuit Output Test Voltage ±10%		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

Performance Criterion: B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility’s electrical earth.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-07-04.

EUT operation mode: Charging & playing music

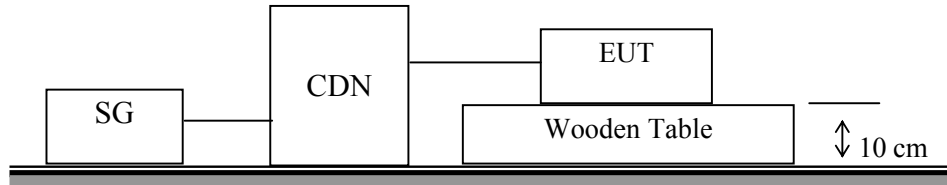
EN 61000-4-4 Test Points		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Mains Power Input Ports	L1	/	/	A	A	/	/	/	/
	N	/	/	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L1/N	/	/	A	A	/	/	/	/
	L1/PE	/	/	/	/	/	/	/	/
	N/PE	/	/	/	/	/	/	/	/
	L1/N/PE	/	/	/	/	/	/	/	/
Signal Port	/	/	/	/	/	/	/	/	



Test Setup photo

EN 55014-2 §5.3 - INJECTED CURRENTS (IEC 61000-4-6)

Test Setup



Test Standard

EN 55014-2:2015 (IEC 61000-4-6:2009)

Test Level 2 at 3 V r.m.s. (unmodulated), 0.15 MHz ~ 80 MHz

Test Level

Level	Voltage Level (r.m.s.) (V)
1	1
2	3
3	10
X	Special

Performance Criterion: A

Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 7) An artificial ear and sound level meter are used to monitor the sound pressure level. RF communication test set is used to monitor the noise level.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-07-04.

EUT operation mode: Charging & playing music

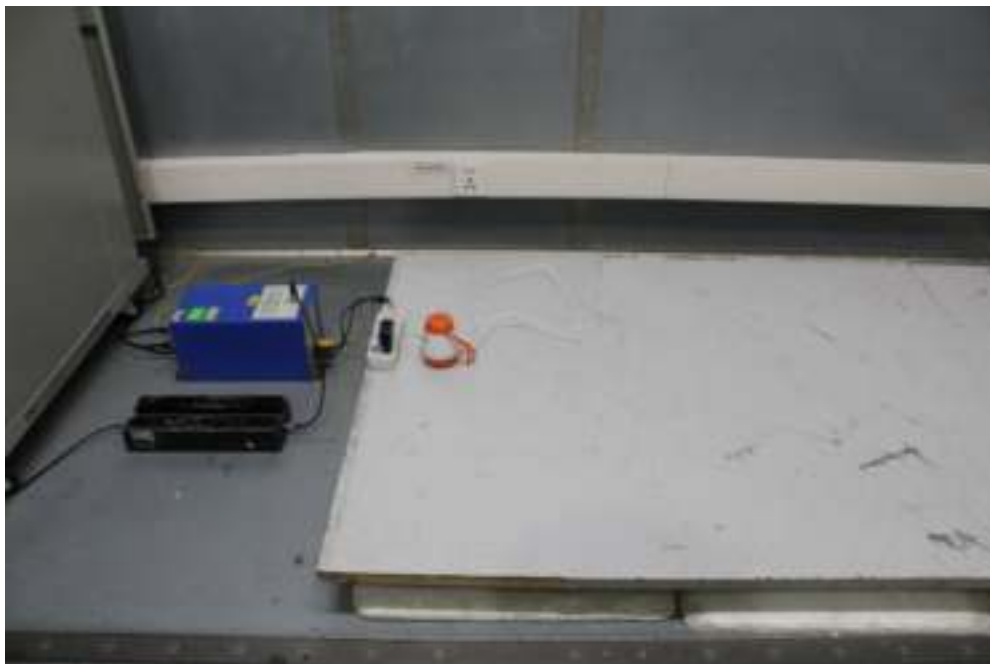
Table 1: AC mains power input port

Frequency range: 150 kHz to 80 MHz

Modulation: Amplitude 80%, 1 kHz sine wave

Test level: 3V r.m.s.

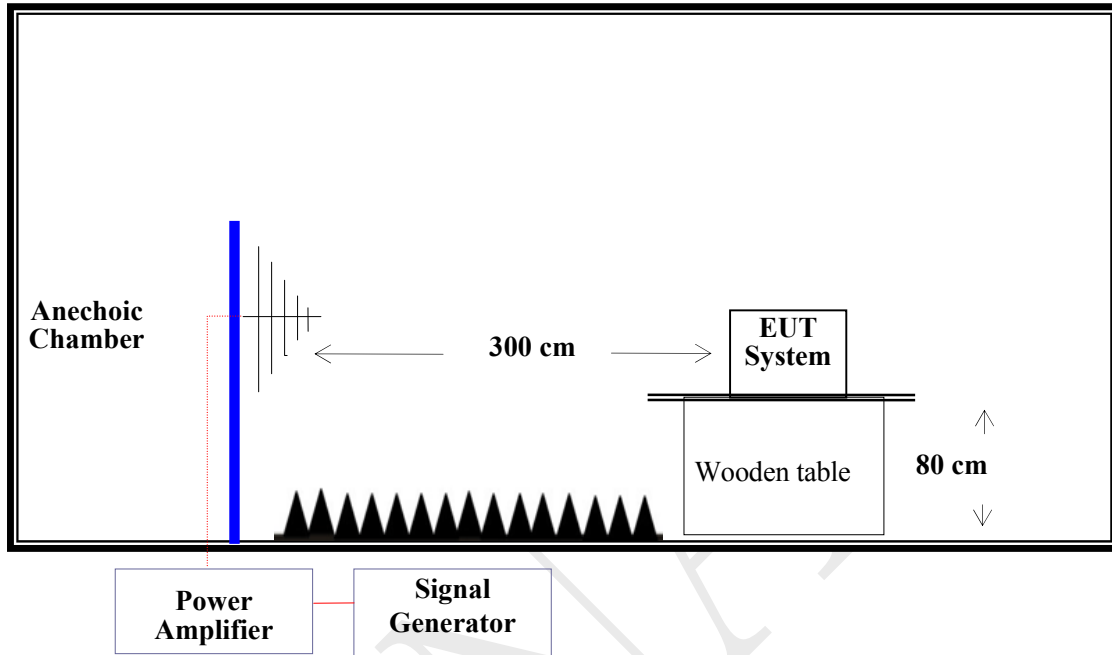
Level	Voltage Level (r.m.s.) U ₀	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/



Test Setup Photo

**EN 55014-2 §5.5 - RADIO FREQUENCY ELECTROMAGNETIC FIELDS
(IEC 61000-4-3)**

Test System Setup



Test Standard

EN 55014-2:2015(IEC 61000-4-3: 2006 + A1:2007 +A2:2010)
Test level 2 at 3V / m un-modulated (r.m.s.) (80-1000 MHz)

Test Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

Performance Criterion: A

Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a sound level meter and Camera are used to monitor the EUT.

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	3 V/m (Test level 2)
2. Radiated Signal	80% AM (1 kHz) Modulation
3. Scanning Frequency	80-1000MHz
4. Sweeping time of radiated	0.0015decade/s
5. Dwell Time	1Sec.

Test Data and Setup Photo

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-07-04.

EUT operation mode: Charging & playing music

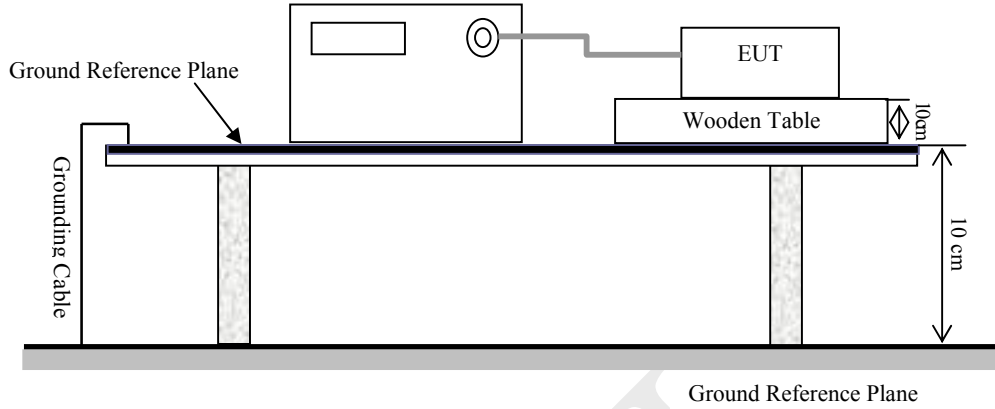
Frequency Range (MHz)	Front Side (3 V/m)		Rear Side (3 V/m)		Left Side (3 V/m)		Right Side (3 V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A



Test Setup Photo

EN 55014-2 §5.6 SURGES (IEC 61000-4-5)

Test System Setup



Test Standard

EN 55014-2: 2015 (IEC 61000-4-5:2005)
 AC mains: Line to Line at ±1kV

Test Level

Level	Open Circuit Output Test Voltage ±10%	Performance Criterion	
		AC Mains	Signal Port
1	0.5 kV	B	C
2	1 kV	B	C
3	2 kV	B	C
4	4 kV	B	C
X	Special	/	/

Test Procedure

- 1) For input power ports, provide a 1.2/50µs voltage surge (at open-circuit condition) and a 8/20 µs current surge into a short circuit.
- 2) For signal ports and telecommunication ports, provide a 10/700µs voltage surge (at open-circuit condition) and a 5/320 µs current surge into a short circuit.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-07-04.

EUT operation mode: Charging & playing music

Table 1: AC mains power input port

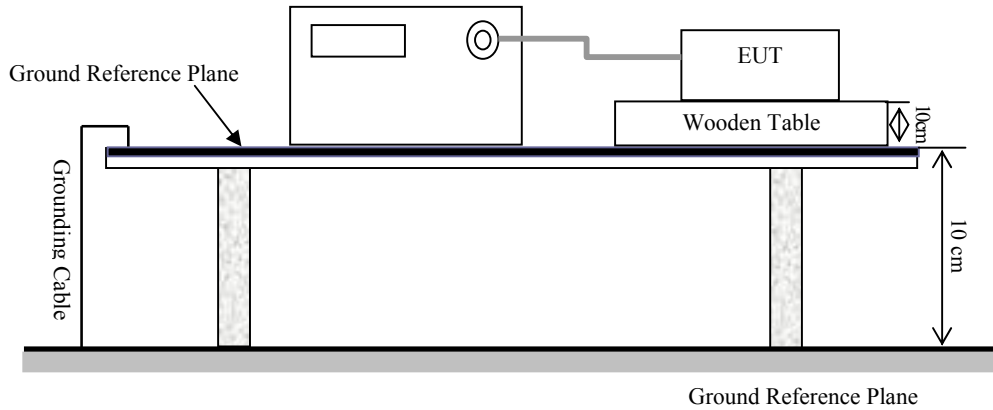
Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L1/N	/	/
2	1kV	±	L1/N	A	/
3	2kV	±	L1/N, L1/PE, N/PE, L1/N/PE	/	/
4	4kV	±	L1/N, L1/PE, N/PE, L1/N/PE	/	/



Test Setup Photo

EN 55014-2 §5.7-VOLTAGE DIPS AND INTERRUPTIONS (IEC 61000-4-11)

Test Setup



Test Standard

EN 55014-2: 2015 (IEC 61000-4-11:2004)

Test level

Test Level	Voltage dip and short interruptions %UT	Duration (Periods)	Performance Criterion
1	100	0.5	C
2	60	10	C
3	30	25	C

Test Procedure

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2018-07-04.

EUT operation mode: Charging & playing music

Level	U2 (% Reduction)	Td(Periods)	Phase Angle	N	Pass	Fail
1	100	0.5	0/180	3	A	/
2	60	10	0/180	3	A	/
3	30	25	0/180	3	A	/



Test Setup Photo

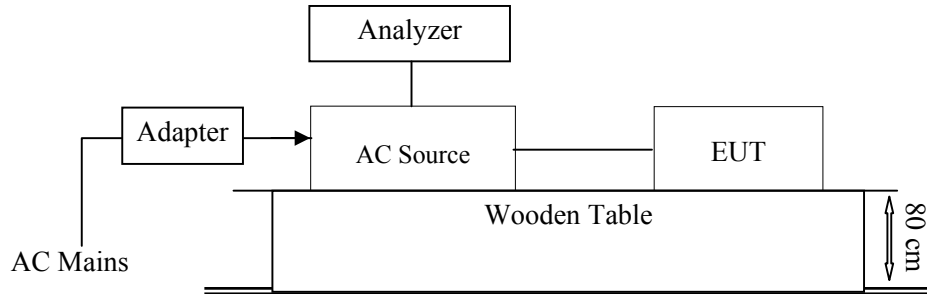
EN 61000-3-2 – HARMONIC CURRENT EMISSIONS

According to EN 61000-3-2:2014 section 7: Equipment with a rated power of 75 W or less, other than lighting equipment, are not included in this standard.

EM

EN 61000-3-3 – VOLTAGE FLUCTUATION AND FLICKER

Test System Setup



Test Standard

According to EN 61000-3-3:2013

Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of Pst shall not be greater than 1,0;
- the value of Plt shall not be greater than 0,65;
- the value of d(t) during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change, dc, shall not exceed 3,3 %;
- the maximum relative voltage change dmax, shall not exceed

a) 4 % without additional conditions;

b) 6 % for equipment which is:

- switched manually, or
- switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0.65.

c) 7 % for equipment which is

- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
- switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and

c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply

depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data and Setup Photo

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

Date of test:	15:13 4.Jul 2018
Tester:	Joson Xiao
Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	120 min (12 Flicker measurements)
Flicker meter:	230V / 50Hz
Customer:	Shenzhen ESYS Electronics Co.,Ltd
E. U. T.:	K1 baby soother sound machine
Model:	SP1802
Test Mode:	Charging& playing music

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.080	1.00	Pass
Plt	0.040	0.65	Pass
dc [%]	0.016	3.30	Pass
dmax [%]	0.279	4.00	Pass
dt [s]	0.000	0.50	Pass



Test Setup Photo

EXHIBIT A - PRODUCT LABELING

Proposed CE Label Format



Specification: The CE marking shall be affixed visibly, legibly and indelibly to the apparatus or to its data plate. Where that is not possible or not warranted on account of the nature of the apparatus, it shall be affixed to the packaging and to the accompanying documents.

Proposed Label Location on EUT

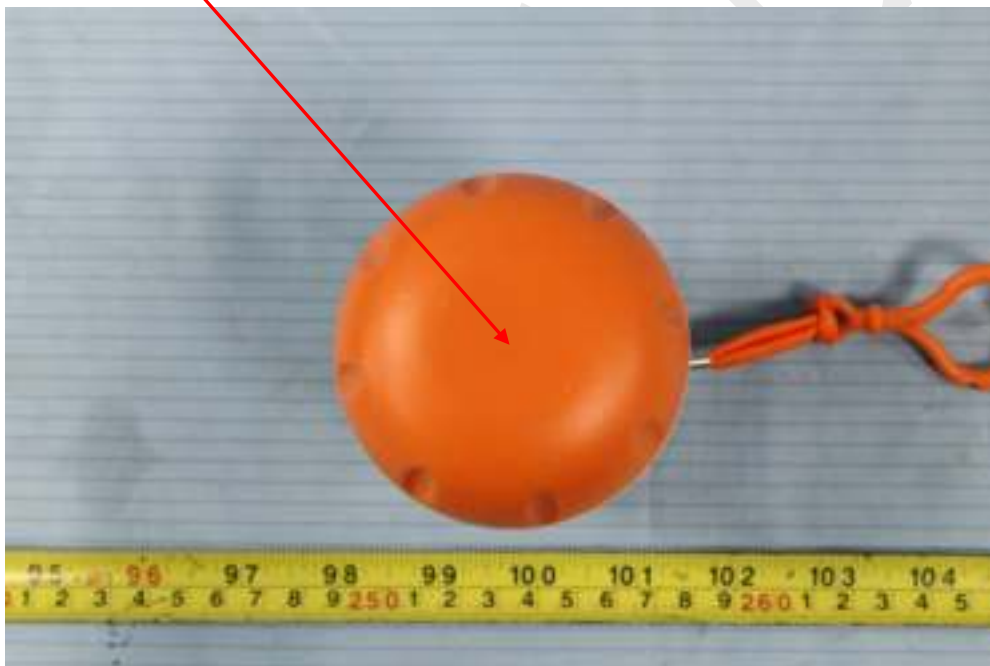


EXHIBIT B – EUT PHOTOGRAPHS

EUT – All View



EUT – Front View



EUT – Rear View



EUT – Top View



EUT – Bottom View



EUT – Left View



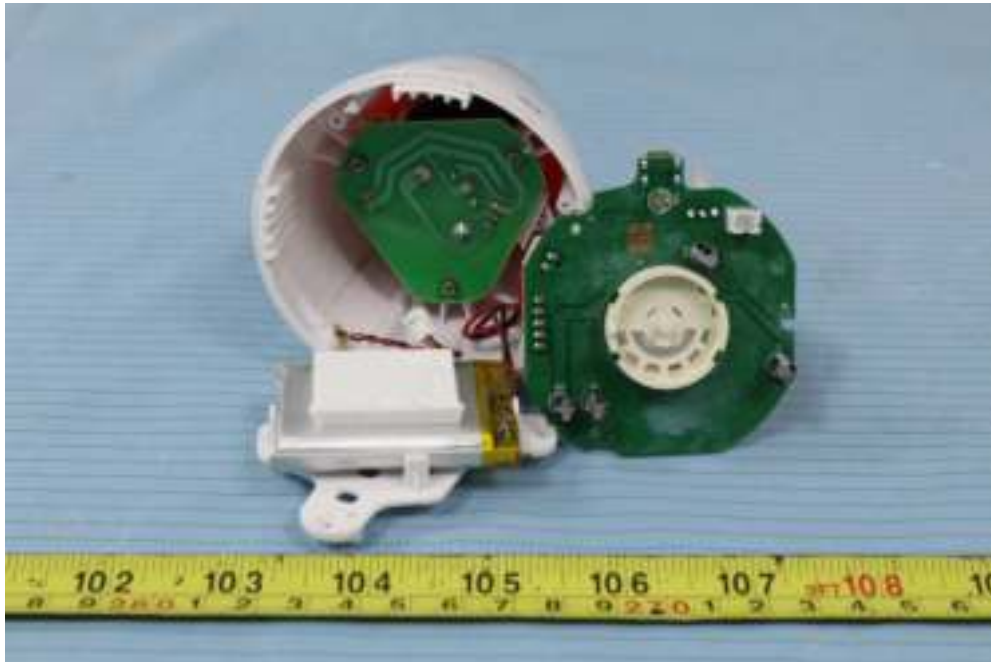
EUT – Right View



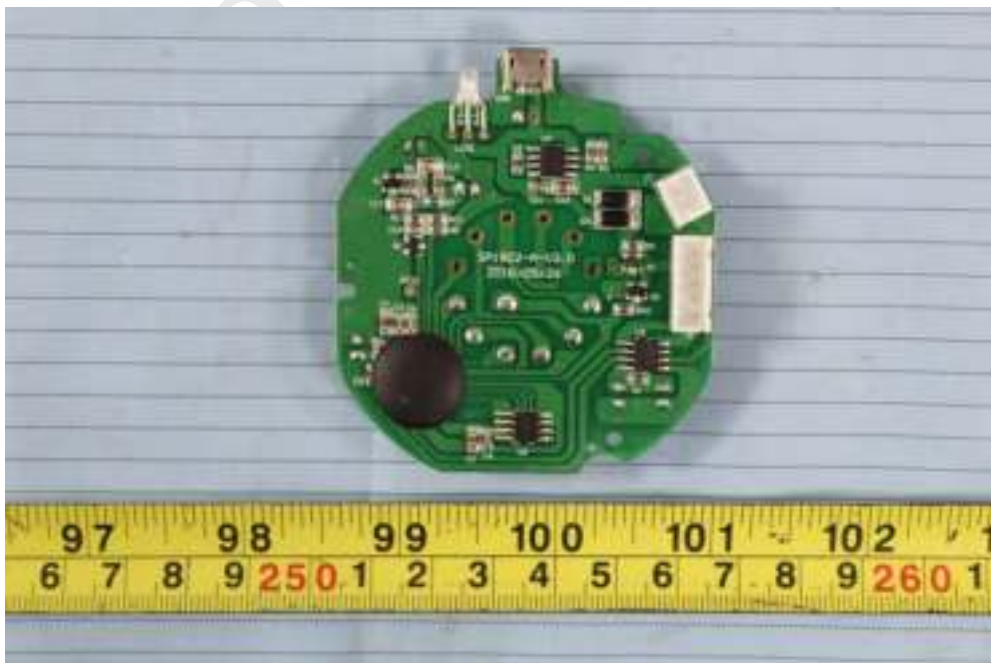
EUT – Cover off View 1



EUT – Cover off View 2



EUT – Main Board Top View



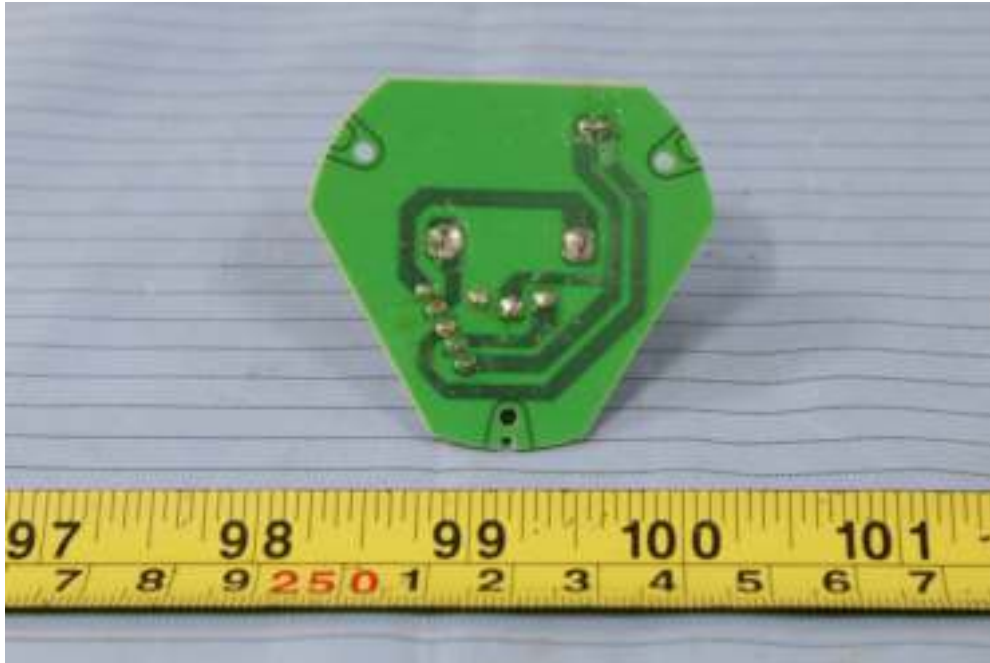
EUT – Main Board Bottom View



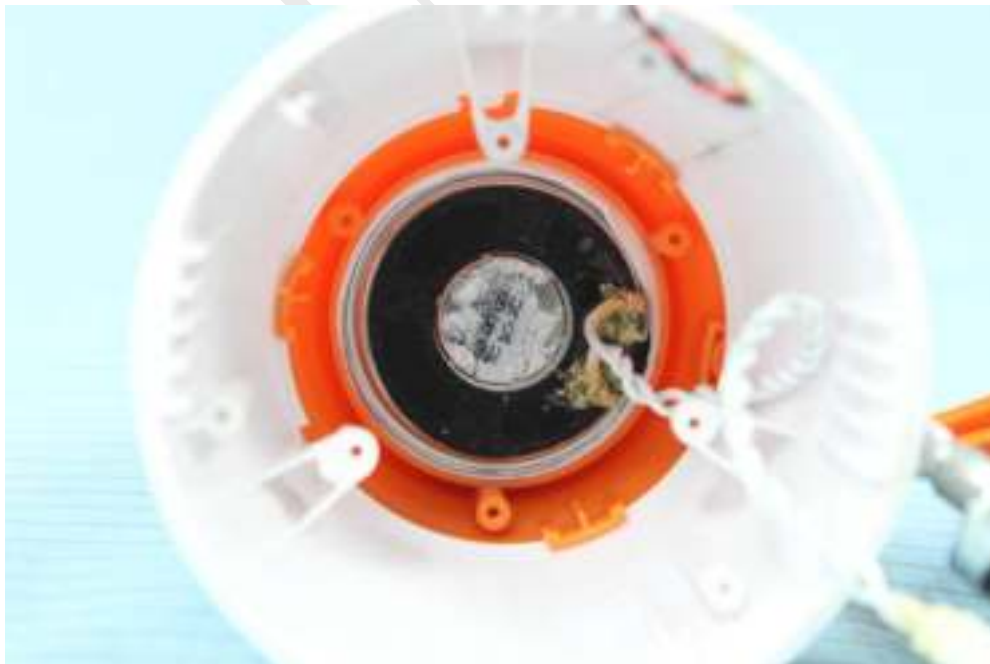
EUT – Volume control Board Top View



EUT – Volume control Board Bottom View



EUT –Speaker View



EUT –USB Cable View



EUT –Battery Top View



EUT –Battery Bottom View



EXHIBIT C - TEST SETUP PHOTOGRAPHS

Terminal Voltages - Front View



Terminal Voltages - Side View



Radiated Disturbances - Front View



Radiated Disturbances - Rear View



******END OF REPORT******