SHENZHEN IMPROVE NEW ENERGY TECH CO.,LTD

CE-EMC TEST REPORT

Prepared For:	SHENZHEN IMPROVE NEW ENERGY TECH CO.,LTD 4F, Building 17, Yuanyiyuan Industrial Park, Xixiang Street, Bao'an District, ShenZhen
Product Name:	NightLight
Trade Mark:	N/A
Model:	DS37A, DS37B, DS37C, DS37D, DS37E, DS37F, DS37G, DS37H, DS37I, DS37J
Prepared By:	Shenzhen United Testing Technology Co., Ltd. 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China
Receipt Date	Jul., 07, 2017
Test Date:	Jul., 07, 2017 – Jul., 17, 2017
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Report No.:	UNI2017071101ER-01

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TEST REPORT DECLARATION

Applicant	:	SHENZHEN IMPROVE NEW ENERGY TECH CO.,LTD
Address	:	4F, Building 17, Yuanyiyuan Industrial Park, Xixiang Street, Bao'an District, ShenZhen
EUT Description	:	NightLight
Model Number	:	DS37A, DS37B, DS37C, DS37D, DS37E, DS37F, DS37G, DS37H, DS37I, DS37J

Test Standards:

EN55015:2013+A1:2015
EN61547:2009
EN61000-4-2:2009
EN61000-4-3:2006+A2:2010

The EUT described above is tested by Shenzhen United Testing Technology Co., Ltd. EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. Shenzhen United Testing Technology Co., Ltd. EMC Laboratory is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the 2014/30/EU directive and its amendment requirements. The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Prepared by: _____
Kahn yang/Editor

Reviewer: _____
Sherwin Qian/Supervisor

Approved & Authorized Signer: _____
Liuze/Manager

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Magnetic Test	PASS
Radiated Emission	PASS
Electrostatic Discharge Test	PASS
RF Field Strength Susceptibility Test	PASS

2. GENERAL INFORMATION

2.1. Report information

2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that UNI approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that UNI in any way guarantees the later performance of the product/equipment.

2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, UNI therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through UNI, unless the applicant has authorized UNI in writing to do so.

2.2. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

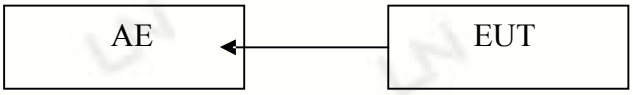
Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.42 dB ±3.42 dB	±4.0 dB ±3.6 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB	±5.2 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB	N/A
Mains Harmonic	Voltage	±3.11%	N/A
Voltage Fluctuations & Flicker	Voltage	±3.25%	N/A

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description	:	NightLight
Applicant	:	SHENZHEN IMPROVE NEW ENERGY TECH CO.,LTD 4F, Building 17, Yuanyiyuan Industrial Park, Xixiang Street, Bao'an District, ShenZhen
Manufacturer	:	SHENZHEN IMPROVE NEW ENERGY TECH CO.,LTD 4F, Building 17, Yuanyiyuan Industrial Park, Xixiang Street, Bao'an District, ShenZhen
Model Number	:	DS37A

3.2. Block Diagram of EUT Configuration



3.3. Operating Condition of EUT

Test mode 1: ON

3.4. Test Conditions

Temperature: 23-26℃
Relative Humidity: 55-68 %

3.5. Modifications

No modification was made.

3.6. Abbreviations

AC	Alternating Current
AMN	Artificial Mains Network
DC	Direct Current
EM	ElectroMagnetic
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
IF	Intermediate Frequency
RF	Radio Frequency
rms	root mean square
EMI	Electromagnetic Interference
EMS	Electromagnetic Susceptibility

3.7. Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

4. TEST EQUIPMENT USED

4.1. RADIATED TEST SITE

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1.	Horn Antenna	Sunol	DRH-118	A101415	2017.9.9
2.	BicoNILog Antenna	Sunol	JB1 Antenna	A090215	2017.9.9
3.	PREAMP	HP	8449B	3008A00160	2017.9.12
4.	PREAMP	HP	8447D	2944A07999	2017.9.12
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESR3	101891	2017.9.12
6.	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2017.9.11
7.	VECTOR Signal Generator	ROHDE&SCHWARZ	SMU200A	101521	2017.9.11
8.	ANT Tower&Turn table Controller	Champro	EM 1000	60764	2017.9.11
9	Anechoic Chamber	Taihe Maorui	9m*6m*6m	966A0001	2017.12.13
10	Shielding Room	Taihe Maorui	6.4m*4m*3m	643A0001	2017.9.14
11	EM CAMLP	SCHWARZBECK	MDS21	03350	2017.9.13

4.2. MAGNETIC TEST (In Shielding Room)

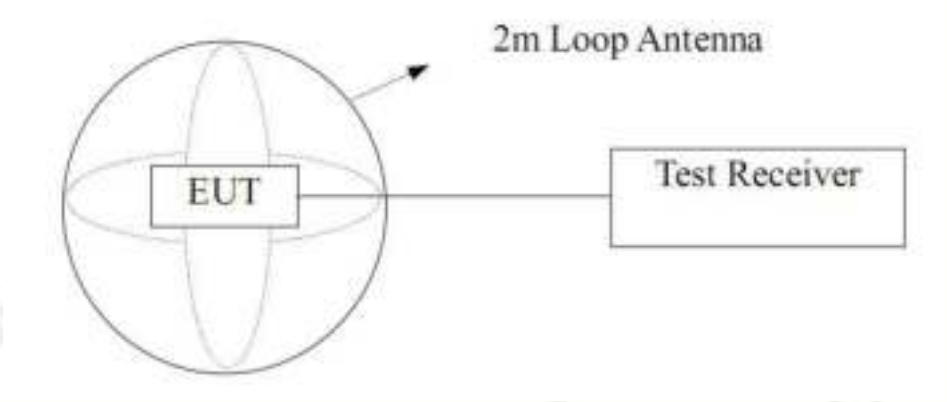
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Magnetic Test System	Beijing ZHINAN	ZN30401	13015	2017.9.12
2	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	101210	2017.9.12

4.3. EMS

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	ESD Simulator	Thermo ELECTRON	MZ-15/EC	1010264	2017.9.12
2	ESD Simulator	EM TEST	ESD30C/P30	1202-17	2017.9.20
3	Surge Generator	Shanghai Lioncel	LSG-506S	LSG506S0160601	2017.9.12
4	Coupler	Shanghai Lioncel	CDN-532S	CDN532S0160601	2017.9.12
5	EFT/B Generator	Shanghai Lioncel	EFT-404S	EFT404S0160601	2017.9.12
6	DIPS Generator	Shanghai Lioncel	VDS-1101	VDS11010160601	2017.9.12
7	Magnetic Field Test System	Shanghai Lioncel	PMF801C-T	PMF801C-T	2017.9.12

5. MAGNETIC TEST

5.1. Block Diagram of Test Setup



5.2. Test Standard

EN55015:2013+A1:2015

5.3. Magnetic Field Emission Limits

Frequency	Limits for loop diameter (dBμA)
	2m
9KHz ~ 70KHz	88
70KHz ~ 150KHz	88 ~ 58*
150KHz ~ 2.2MHz	58 ~ 26*
2.2MHz ~ 3.0MHz	58
3.0MHz ~ 30MHz	22

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

5.4. EUT Configuration on Test

The configuration of the EUT is same as Section 3.2..

5.5. Operating Condition of EUT

5.5.1.Setup the EUT as shown in Section 6.1.

5.5.2.Turn on the power of all equipments.

5.5.3.Let the EUT work in test mode (ON) and test it.

5.6. Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coax switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter (R&S test receiver ESHS20) is set at 200Hz. For frequency band 150KHz to 30MHz , the bandwidth is set at 10KHz.

As the peak value is too low against the limit, so the test data has been recorded.

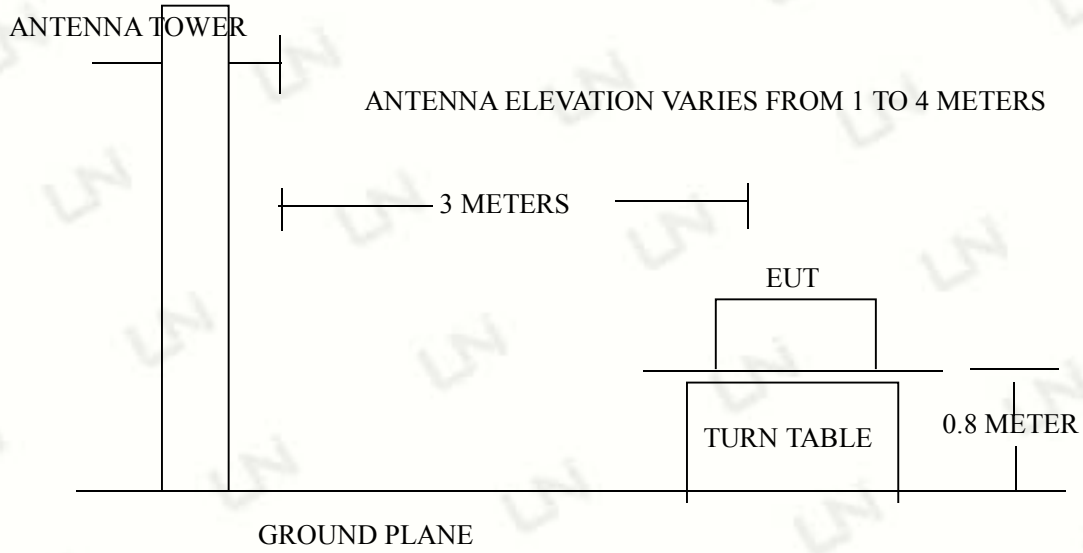
5.7. Test Results

PASS.

The frequency range from 9KHz to 30MHz is investigated.

6. RADIATED EMISSION TEST

6.1. Open Site Setup Diagram



6.2. Test Standard

EN55015:2013+A1:2015

6.3. Radiated Emission Limit

All emanations from a computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dBμV/m)
30 ~ 230	3	40
230 ~ 300	3	47

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instruments antenna and the closed point of any part of the EUT.

6.4. EUT Configuration on Test

The EN55015 regulations test method must be used to find the maximum emission during radiated emission test.

6.5. Operating Condition of EUT

6.5.1. Setup the EUT as shown on Section 5.1.

6.5.2. Turn on the power of all equipments.

6.5.3. Let the EUT work in test mode and measure it.

6.6. Test Procedure

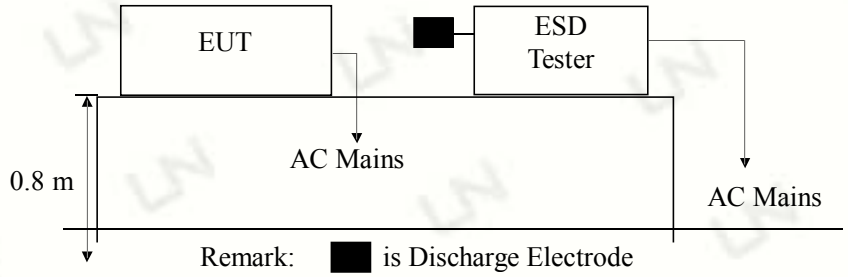
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antennas (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.
The bandwidth setting on the test receiver (R&S TEST RECEIVER ESCS20) is 120 KHz.
The EUT is tested in Semi-Anechoic Chamber. and all the scanning waveform is put in **Appendix I.**

6.7. Test Results

PASS.

7.ELECTROSTATIC DISCHARGE TEST

7.1. Block Diagram of ESD Test Setup



7.2. Test Standard

EN61547:2009 (EN61000-4-2:2009)
Severity Level 3 for Air Discharge at 8KV
Severity Level 2 for Contact Discharge at 4KV

7.3. Severity Levels and Performance Criterion

7.3.1. Severity 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

7.3.2. Performance criterion: B

7.4. EUT Configuration on Test

The configurations of EUT are listed in Section 3.2.

7.5. Operating Condition of EUT

7.5.1. Setup the EUT as shown in Section 9.1.

7.5.2. Turn on the power of all equipments.

7.5.3. Let the EUT work in test mode (full load) and test it.

7.6. Test Procedure

7.6.1. 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.

7.6.2. Contact Discharge:

All the procedure shall be same as Section 9.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

7.6.3. Indirect discharge for horizontal coupling plane

At least 20 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.

7.6.4. Indirect discharge for vertical coupling plane

At least 20 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.

7.7. Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

Temperature:	*22℃*	*Humidity:*	*50%RH*
Test Mode:	*Full load*	*Air pressure:*	*1006hPa*
Test Engineer:	*John Lee*		

Air Discharge: 8KV For each point positive 10 times and negative 10 times

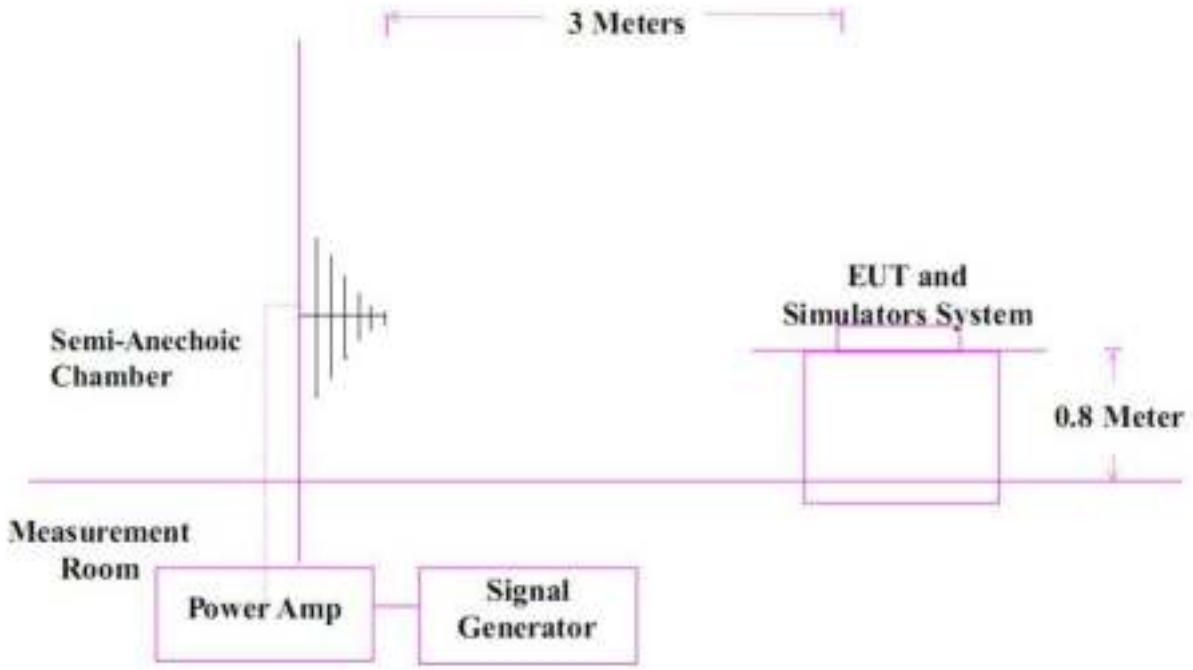
discharge. Contact Discharge: 4KV

Location	*Kind* *A-Air Discharge* *C-Contact Discharge*	*Result*
Slots	*A*	*PASS*
Metal Part	*C*	*PASS*
HCP	*C*	*PASS*
VCP of Front	*C*	*PASS*
VCP of Rear	*C*	*PASS*
VCP of Left	*C*	*PASS*
VCP of Right	*C*	*PASS*

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

8. RF FIELD STRENGTH SUSCEPTIBILITY TEST

8.1. R/S Test Setup



8.2. Test Standard

EN61547:2009 (EN61000-4-3:2006+A2:2010)
Severity Level 2 at 3V / m

8.3. Severity Levels and Performance Criterion

8.3.1. Severity level

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

8.3.2. Performance criterion : A

8.4. EUT Configuration on Test

The configurations of EUT are listed in Section 3.2.

8.5. Operating Condition of EUT

Setup the EUT as shown in Section 10.1. The operating conditions of EUT are listed in section 3.3.

8.6. 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 CCD camera is used to monitor the EUT.
All the scanning conditions are as follows:

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1 Sec.

8.7. Test Results

PASS.

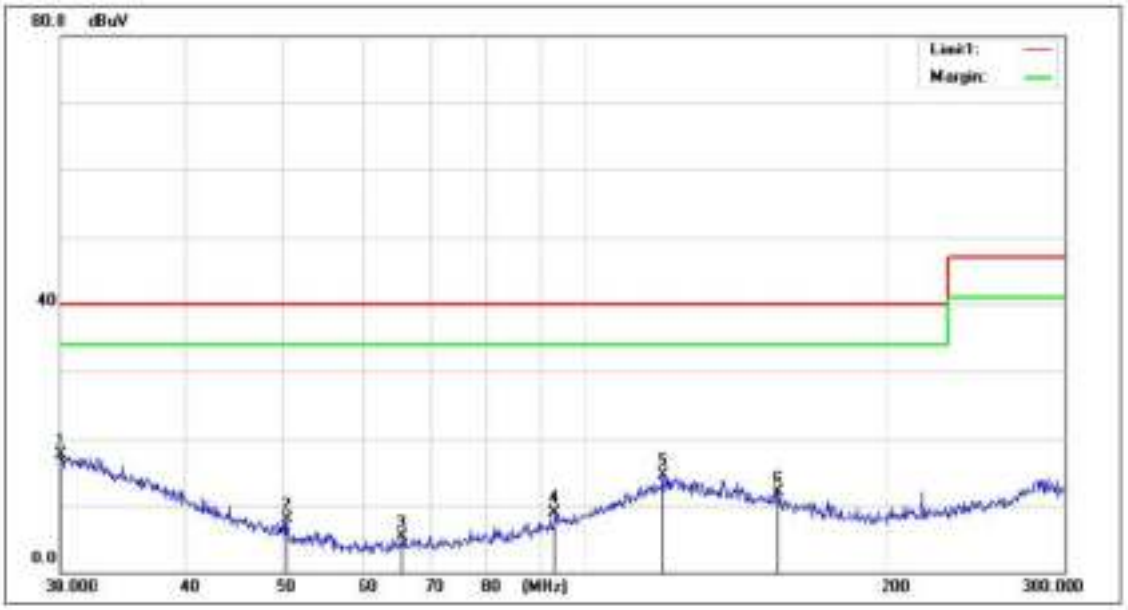
Please refer to the following page.

RF Field Strength Susceptibility Test Results

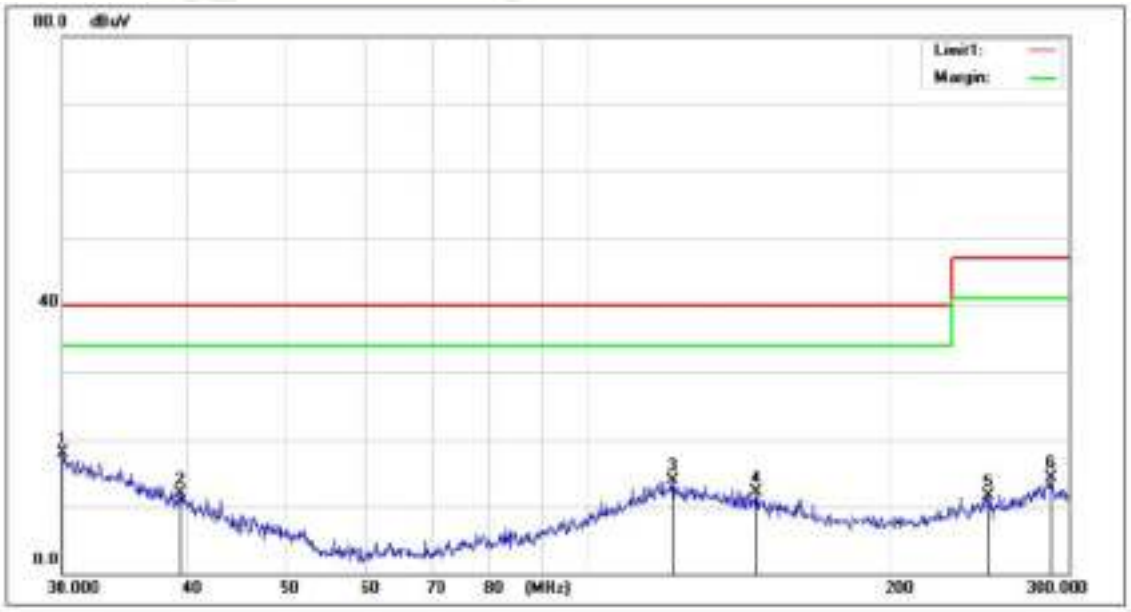
Temperature:	*22℃*	*Humidity:*	*50%RH*
Test Mode:	*Full load*	*Air pressure:*	*1006hPa*
Test Engineer:	*John Lee*		
Modulation:	*AM ☐ Pulse ☐ none 1 KHz 80%*		
Criterion : A			

	Frequency Range :80-1000MHz	
Steps	*1%*	*1%*
	Horizontal	*Vertical*
Front	*Pass*	*Pass*
Right	*Pass*	*Pass*
Rear	*Pass*	*Pass*
Left	*Pass*	*Pass*

APPENDIX I

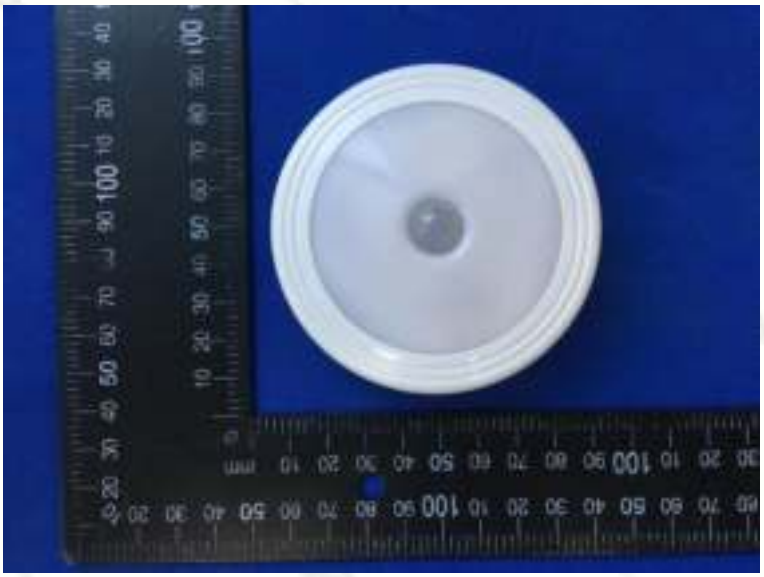


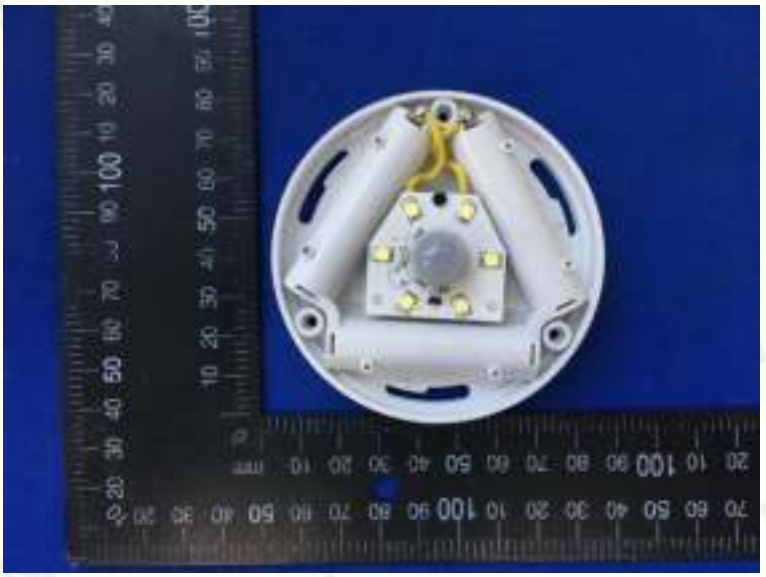
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1*	30.0692	26.67	-9.19	17.48	40.00	-22.52			peak
2	50.4802	29.98	-22.14	7.84	40.00	-32.16			peak
3	65.7841	28.66	-23.27	5.39	40.00	-34.61			peak
4	93.3515	28.60	-19.75	8.85	40.00	-31.15			peak
5	119.4322	28.40	-13.97	14.43	40.00	-25.57			peak
6	155.6400	27.81	-15.87	11.94	40.00	-28.06			peak

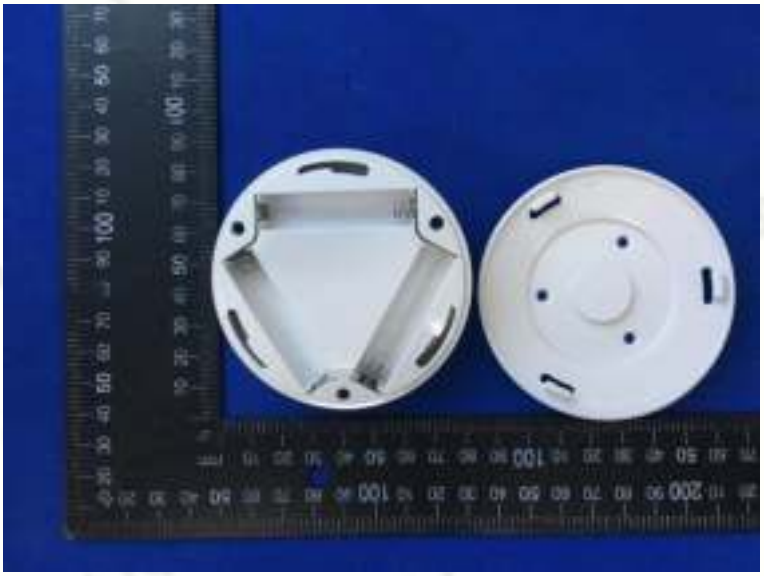


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1*	30.0692	27.14	-9.19	17.95	40.00	-22.05			peak
2	39.3660	27.38	-15.39	11.99	40.00	-28.01			peak
3	121.3728	27.84	-13.93	13.91	40.00	-26.09			peak
4	146.9336	27.45	-15.38	12.07	40.00	-27.93			peak
5	249.5291	27.67	-16.08	11.59	47.00	-35.41			peak
6	288.4837	27.70	-13.42	14.28	47.00	-32.72			peak

APPENDIX II







End of Report