TEST REPORT

Application No.:	SHEM2001000484LM
Applicant:	Bestway (Hongkong) International Ltd.
Address of Applicant:	Suite 713, 7/Floor, East Wing, Tsim Sha Tsui Centre, 66 Mody Road, Kowloon, Hongkong
Factory:	Bestway (Nantong) Recreation corp
Address of Factory:	No. 8 Hui Min West Road, Economic Development Zone, Rugao, Jiangsu 226500, P.R. China.
Equipment Under Test (EUT):	
EUT Name:	LED light
Model No.:	58492, 60303¤
¤	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark:	BESTWAY
Standard(s) :	EN 55015:2013 +A1:2015
	EN 61547:2009
Date of Receipt:	2020-01-14
Date of Test:	2020-02-21 to 2020-02-28
Date of Issue:	2020-03-03
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

CE

Parlam Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

NO.588 West Jindu Road,Songjiang District,Shanghai,China 201612 t(86-21)61915666 f(86-21)61915678 www.sgsgroup.com.cn
中国·上海·松江区金都西路588号 邮编: 201612 t(86-21)61915666 f(86-21)61915678 e sgs.china@sgs.com

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2020-03-03	/

Authorized for issue by:				
				
		Lemon Zhang / Project Engineer		
				
		Bruce Tang / Reviewer		

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Radiated Emissions (30MHz-300MHz)	EN 55015:2013 +A1:2015	CISPR 32:2015	N/A	Pass
Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz)	EN 55015:2013 +A1:2015	EN 55015:2013+A1:2015	N/A	Pass

N/A: Not applicable

Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN 61547:2009	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz)	EN 61547:2009	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass

N/A: Not applicable

Note1: Declaration of EUT Family Grouping:

There are 2 models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model 58492 was tested since their differences were the model number.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply: DC 4.5V (3*1.5V "AAA" Battery Size)
Test voltage: DC 4.5V

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission at mains port using AMN	±2.6dB (9kHz to 150kHz)
		±2.3dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	±1.9 dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	±4.1 dB (150kHz to 30MHz)
4	Radiated Power	±3.0dB
5	Radiated emission	±4.4dB (30MHz-1GHz)
		±4.8dB (1GHz-6GHz)
		±5.2dB (6GHz-18GHz)

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L0599)

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• NVLAP (LAB CODE: 201034-0)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

• FCC (Designation Number: CN5033)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory. Test Firm Registration Number: 479755.

• ISED (CAB identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. ISED#: 8617A.

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: Monitor the lamp lighting.

5 Equipment List

Radiated Emissions (30MHz-300MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2019-12-20	2020-12-19
CONTROLLER	INNCO	CO200	SHEM047-1	N/A	N/A
ANTENNA MAST	INNCO	MA400-EP	SHEM047-2	N/A	N/A
TURN DEVICE	INNCO	DE 3600-RH	SHEM047-3	N/A	N/A
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VULB9168	SHEM048-1	2019-10-14	2021-10-13
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
Low Amplifier	CLAVIIO	BDLNA-0001-412010	SHEM164-1	2019-08-13	2020-08-12

Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2019-12-20	2020-12-19
3-dimensional large loop antenna,diam.2m.acc	Rohde & Schwarz	HXYZ9170	SHEM017-1	2019-12-20	2020-12-19
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2019-12-20	2020-12-19
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2017-12-20	2020-12-19
CE test Cable	/	/	CE01	2019-12-26	2020-12-25

Electrostatic Discharge					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-2	2019-08-13	2020-08-12

Radiated Immunity (80MHz-1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2019-08-13	2020-08-12
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2019-12-20	2020-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2019-12-20	2020-12-19
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2019-12-20	2020-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2019-12-20	2020-12-19
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2019-08-13	2020-08-12
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Digital pressure meter	YONGZHI	DYM3-01	SHEM082-1	2018-01-25	2021-01-24
Temperature&humidity recorder	ShangHai weather meter work	ZJ 1-2B	SHEM042-1~6	2019-09-16	2020-09-15
Digital Multimeter	FLUKE	17B	SHEM043-3	2019-09-02	2020-09-01
Autoformer regulator	Guangzhou bao de	TDGC2-5KVA	SHEM150-1	N/A	N/A
Multi-purpose tong tester	FLUKE	316	SHEM001-1	2019-12-20	2020-12-19

6 Emission Test Results

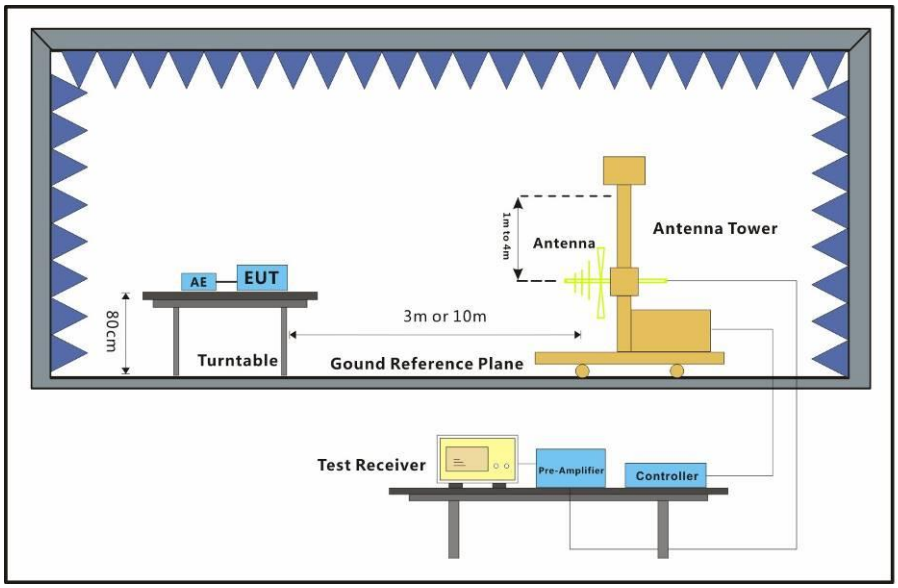
6.1 Radiated Emissions (30MHz-300MHz)

Test Requirement: EN 55015:2013 +A1:2015
Test Method: CISPR 32:2015
Frequency Range: 30MHz to 300MHz
Measurement Distance: 3m
Limit:
30MHz-230MHz 40dB(μV/m) quasi-peak
230MHz-300MHz 47dB(μV/m) quasi-peak
Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 300MHz

6.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar
Test mode a: Lighting Mode: Keep the lamp lighting continuously.

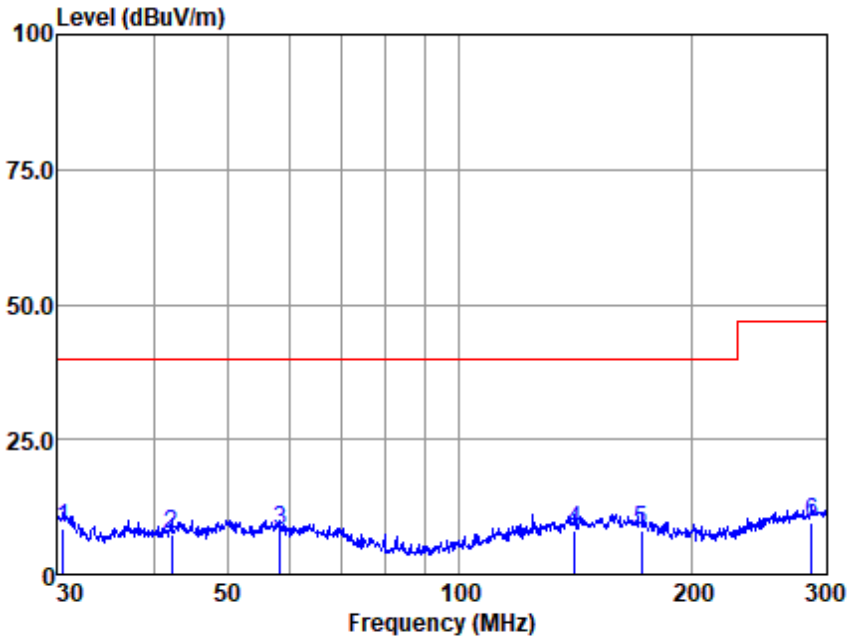
6.1.2 Test Setup Diagram



6.1.3 Measurement Data

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

Mode:a; Polarization:Horizontal

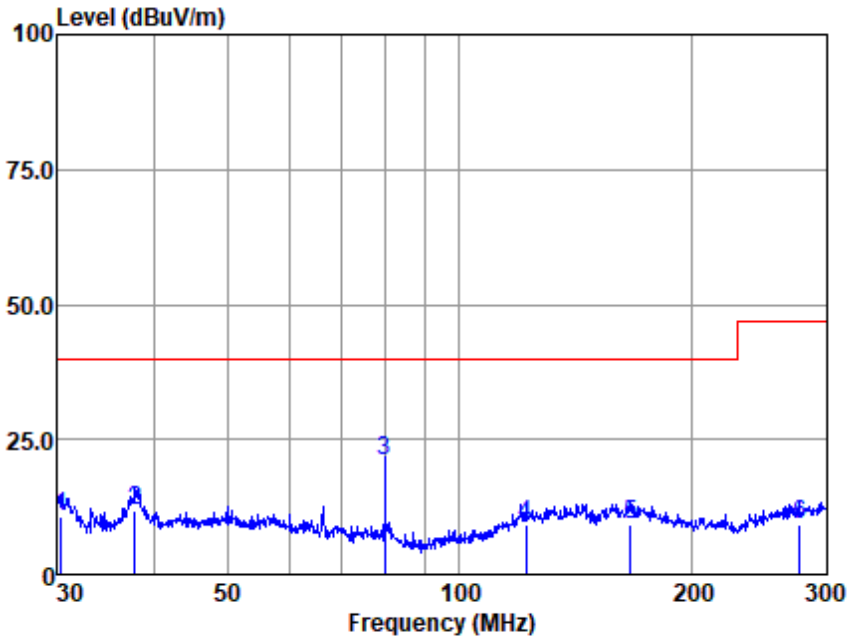


Antenna Polarity :HORIZONTAL
EUT/Project :0484LM
Test mode :a

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.558	37.74	12.22	0.85	42.38	8.43	40.00	-31.57	QP
2	42.279	35.38	13.34	0.98	42.33	7.37	40.00	-32.63	QP
3	58.495	36.13	13.19	1.10	42.33	8.09	40.00	-31.91	QP
4	141.293	36.14	12.56	1.66	42.24	8.12	40.00	-31.88	QP
5	172.632	36.00	12.55	1.85	42.21	8.19	40.00	-31.81	QP
6	287.158	36.21	12.99	2.35	42.12	9.43	47.00	-37.57	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL
EUT/Project :0484LM
Test mode :a

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.347	40.06	12.21	0.85	42.38	10.74	40.00	-29.26	QP
2	37.855	40.51	12.86	0.94	42.34	11.97	40.00	-28.03	QP
3	80.009	52.70	9.20	1.22	42.27	20.85	40.00	-19.15	QP
4	122.214	38.67	11.21	1.51	42.28	9.11	40.00	-30.89	QP
5	166.771	36.67	12.93	1.81	42.21	9.20	40.00	-30.80	QP
6	276.771	36.23	12.75	2.31	42.11	9.18	47.00	-37.82	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

6.2 Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz)

Test Requirement: EN 55015:2013 +A1:2015
Test Method: EN 55015:2013+A1:2015
Frequency Range: 9kHz to 30MHz
Limit:

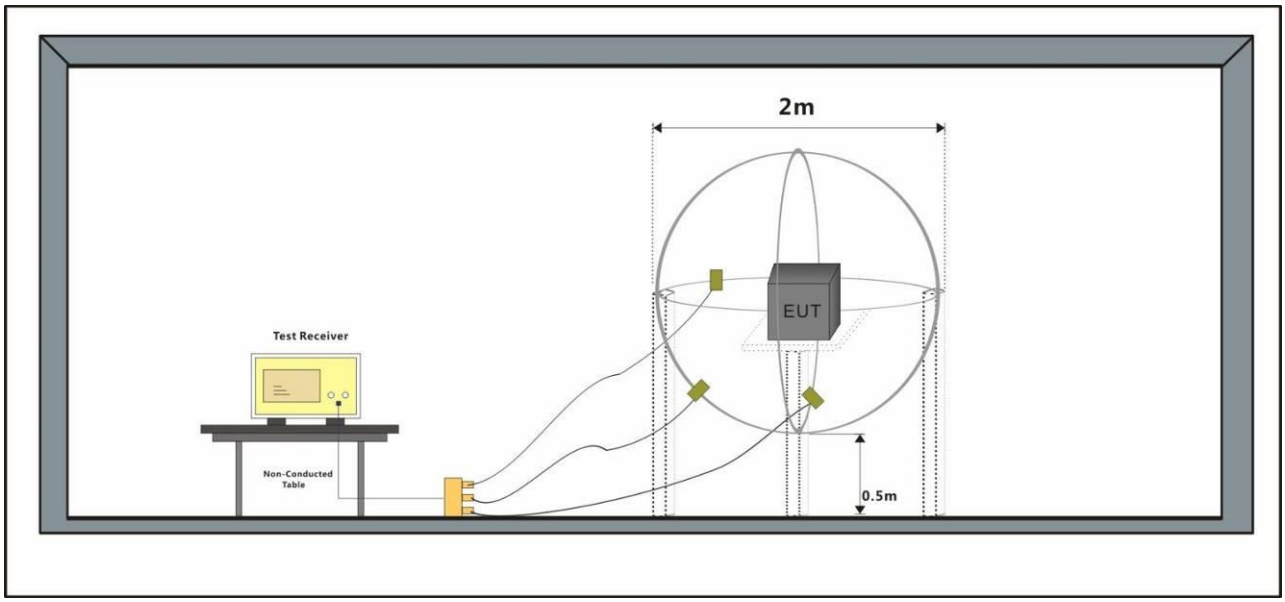
0.009MHz-0.07MHz	88dB(μA) quasi-peak
0.07MHz-0.15MHz	88dB(μA)-58dB(μA) quasi-peak
0.15MHz-3MHz	58dB(μA)-22dB(μA) quasi-peak
3MHz-30MHz	22dB(μA) quasi-peak

Detector: Peak for pre-scan (200Hz resolution bandwidth) 0.009M to 0.15MHz
Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar
Test mode a: Lighting Mode: Keep the lamp lighting continuously.

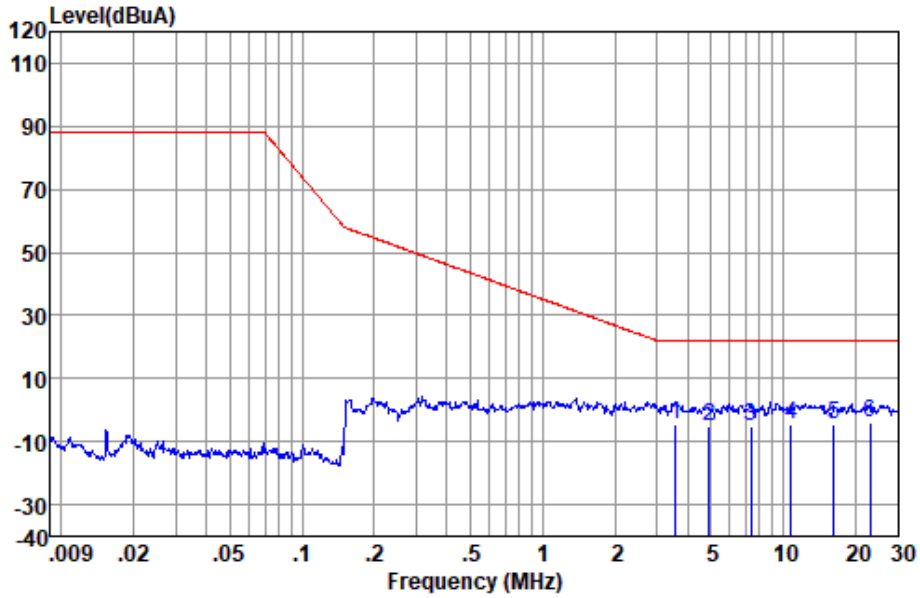
6.2.2 Test Setup Diagram



6.2.3 Measurement Data

An initial pre-scan was performed in the 2m loop antenna using the spectrum analyser in peak detection mode. The EUT was measured for X(A), Y(B), Z(C) polarities.

Mode:a; Axial:X

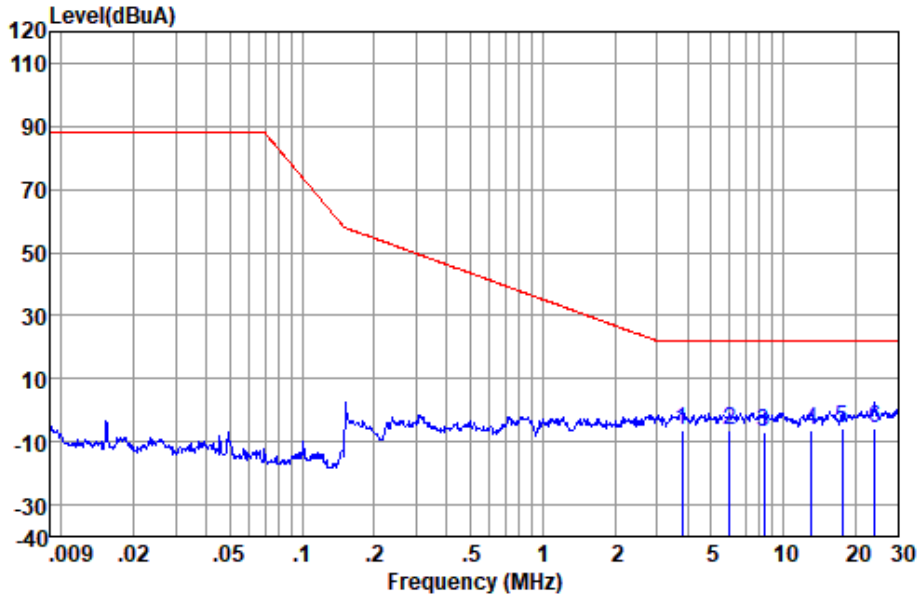


EUT/Project No : 00484LM
Test Mode : a
: X

	Freq (MHz)	Read level (dBuA)	Cable Loss (dB)	Emission Level (dBuA)	Limit (dBuA)	Over Limit (dB)	Remark
1	3.58	-4.81	0.19	-4.62	22.00	-26.62	QP
2	4.91	-5.42	0.19	-5.23	22.00	-27.23	QP
3	7.37	-5.16	0.24	-4.92	22.00	-26.92	QP
4	10.80	-4.88	0.35	-4.53	22.00	-26.53	QP
5	16.33	-4.94	0.44	-4.50	22.00	-26.50	QP
6	23.14	-4.59	0.52	-4.07	22.00	-26.07	QP

Notes: Emission Level = Read Level + Cable loss

Mode:a; Axial:Y

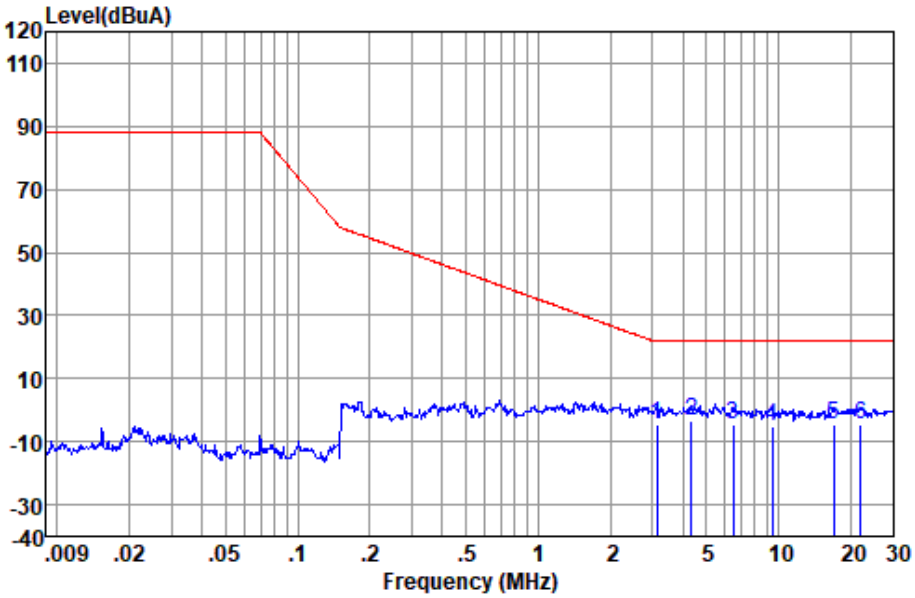


EUT/Project No : 00484LM
Test Mode : a
: Y

	Freq (MHz)	Read level (dBuA)	Cable Loss (dB)	Emission Level (dBuA)	Limit (dBuA)	Over Limit (dB)	Remark
1	3.82	-6.81	0.20	-6.61	22.00	-28.61	QP
2	6.02	-6.50	0.23	-6.27	22.00	-28.27	QP
3	8.33	-7.14	0.25	-6.89	22.00	-28.89	QP
4	13.12	-6.54	0.37	-6.17	22.00	-28.17	QP
5	17.56	-6.18	0.48	-5.70	22.00	-27.70	QP
6	24.10	-6.21	0.57	-5.64	22.00	-27.64	QP

Notes: Emission Level = Read Level + Cable loss

Mode:a; Axial:Z



EUT/Project No : 00484LM
Test Mode : a
: Z

	Freq (MHz)	Read level (dBuA)	Cable Loss (dB)	Emission Level (dBuA)	Limit (dBuA)	Over Limit (dB)	Remark
1	3.12	-4.63	0.18	-4.45	22.00	-26.45	QP
2	4.35	-3.78	0.20	-3.58	22.00	-25.58	QP
3	6.48	-4.72	0.23	-4.49	22.00	-26.49	QP
4	9.48	-5.27	0.31	-4.96	22.00	-26.96	QP
5	17.00	-5.12	0.50	-4.62	22.00	-26.62	QP
6	22.04	-5.03	0.51	-4.52	22.00	-26.52	QP

Notes: Emission Level = Read Level + Cable loss

7 Immunity Test Results

7.1 Performance Criteria Description in EN 61547:2009

Criterion A During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Criterion B During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.

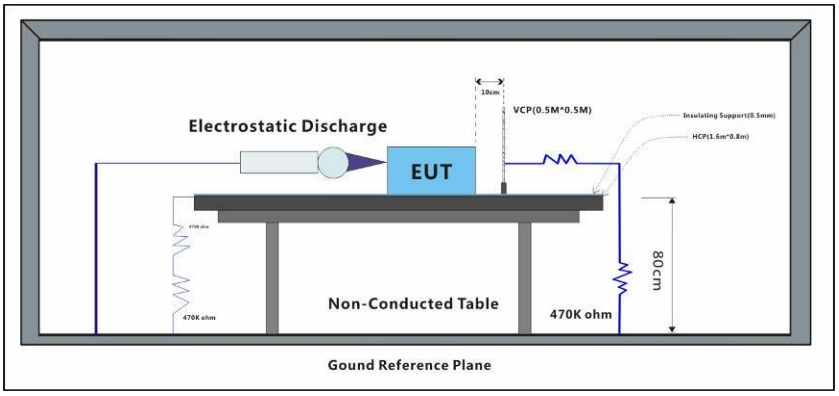
Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Criterion C During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.

7.2 Electrostatic Discharge

Test Requirement: EN 61547:2009
Test Method: EN 61000-4-2:2009
Performance Criterion: B
Discharge Impedance: 330Ω/150pF
Number of Discharge: Minimum 10 times at each test point
Discharge Mode: Single Discharge
Discharge Period: 1 second minimum

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar
Test mode: a: Lighting Mode: Keep the lamp lighting continuously.

7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

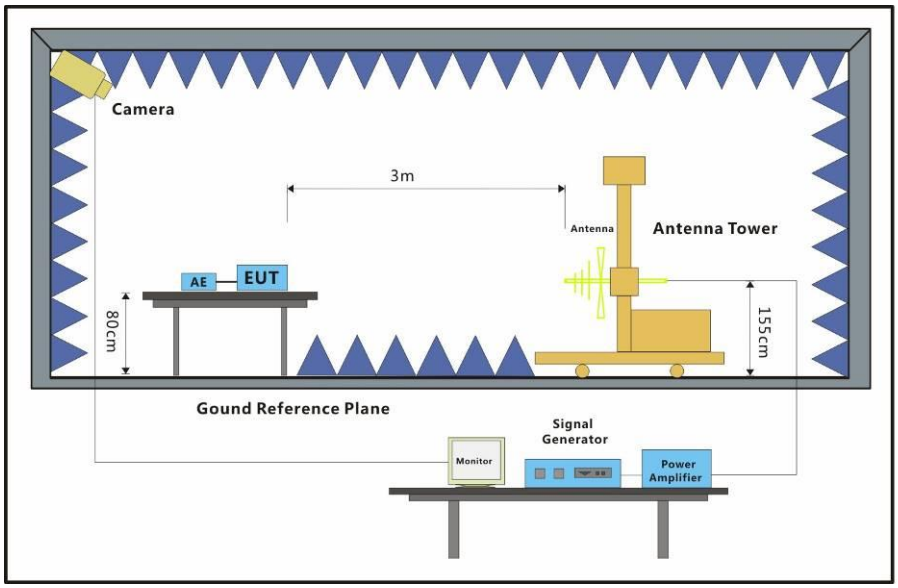
Results:

A: No degradation in the performance of the EUT was observed.

7.3 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 61547:2009
Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
Performance Criterion: A
Frequency Range: 80MHz to 1GHz
Antenna Polarisation: Vertical and Horizontal
Modulation 1kHz,80% Amp. Mod,1% increment

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar
Test mode: a: Lighting Mode: Keep the lamp lighting continuously.

7.3.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	3s	A
80MHz-1GHz	3	Back	3s	A
80MHz-1GHz	3	Left	3s	A
80MHz-1GHz	3	Right	3s	A
80MHz-1GHz	3	Top	3s	A
80MHz-1GHz	3	Underside	3s	A

Results:

A: No degradation in the performance of the EUT was observed.

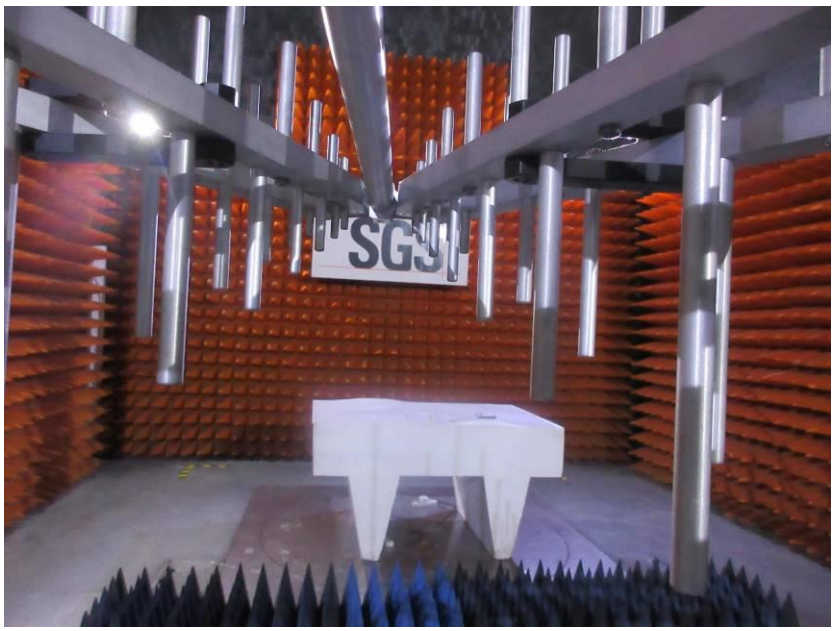
8 Photographs

8.1 Radiated Emissions (30MHz-300MHz) Test Setup

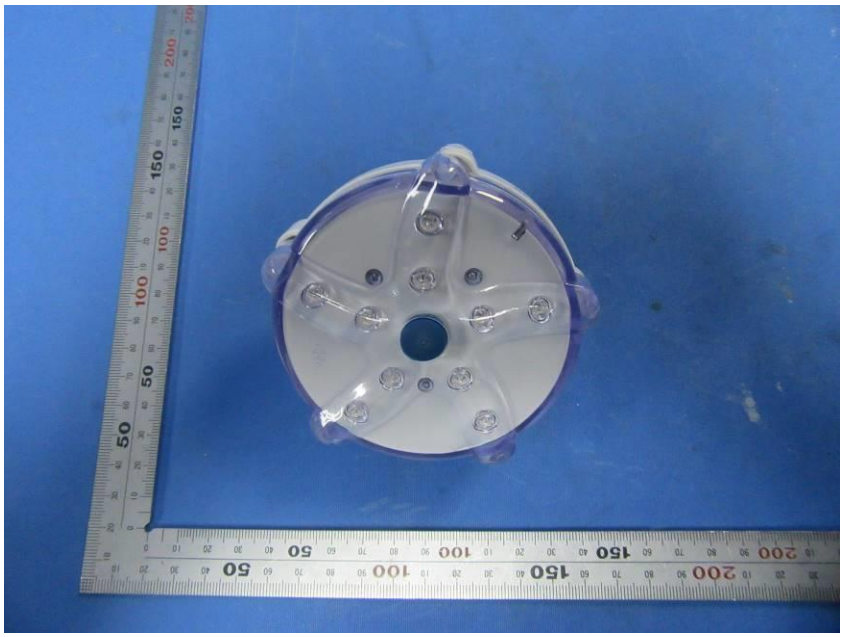
8.2 Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz) Test Setup

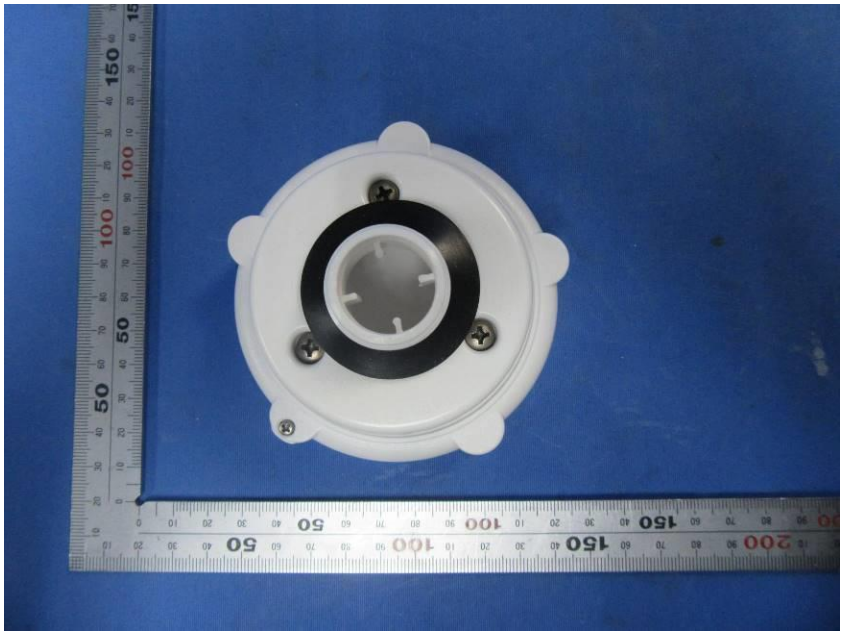
8.3 Electrostatic Discharge Test Setup

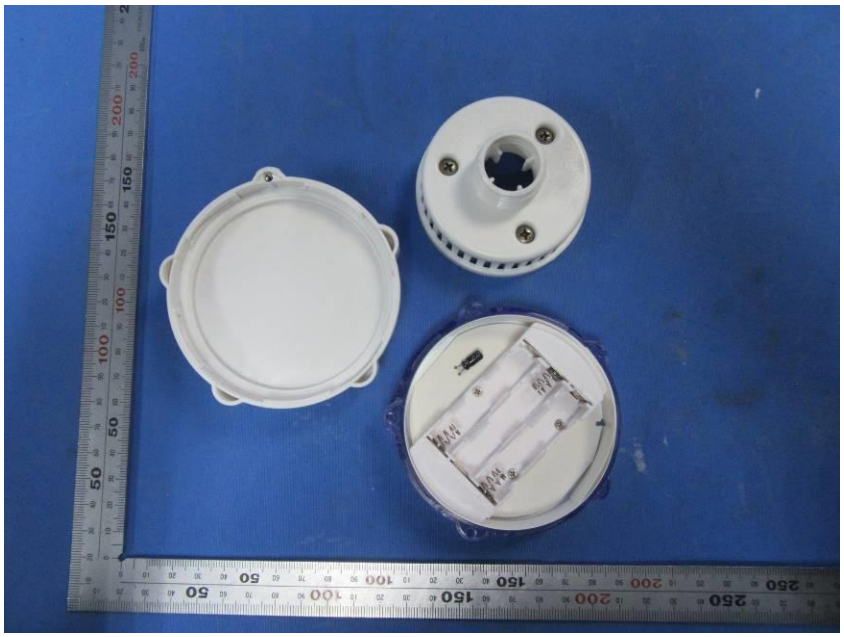
8.4 Radiated Immunity (80MHz-1GHz) Test Setup

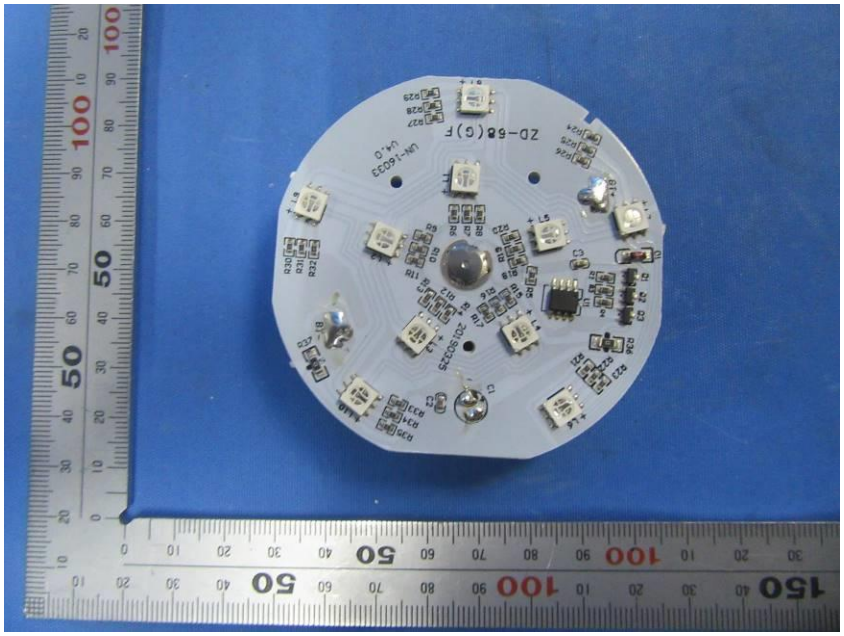


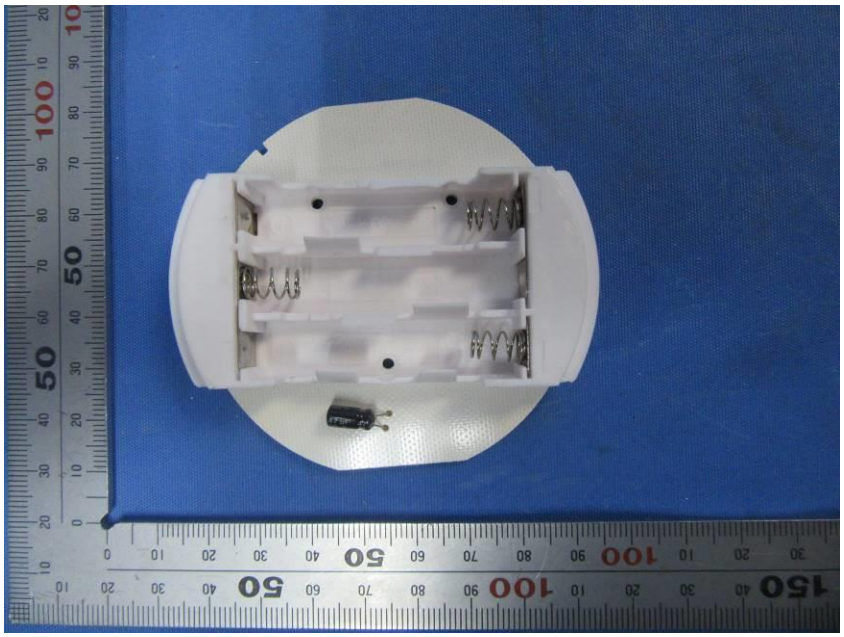
8.5 EUT Constructional Details (EUT Photos)











- End of the Report -