



SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

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Report No.: GZEM190601349701
Page: 1 of 29

TEST REPORT

Application No.: GZEM1906013497LM
Applicant: Allecot group limited
Address of Applicant: Room 02, 21/F, Hip Kwan Commercial Building, 38 Pitt Street, Yan Ma Tei, Kowloon, HongKong
Manufacturer: Leadsun Technology Co., Ltd.
Address of Manufacturer: West Area 1st floor, R&D building #1, Pingdong 1st Road, Nanping Science & Technology Industrial Park, Zhuhai, China
Factory: Leadsun Technology Co., Ltd.
Address of Factory: West Area 1st floor, R&D building #1, Pingdong 1st Road, Nanping Science & Technology Industrial Park, Zhuhai, China
Equipment Under Test (EUT):
EUT Name: ALLECOT K5 series LED solar street light
Model No.: KV xxx xx (H), KV xxx (H), VEGA xx, KV26080
(KV, VEGA: represent series number; xxx=0-360: represent power of solar panel; xx=0-80: represent power of light; (H): represent the battery pack with heat insulating material.)
☒ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark: ALLECOT
Standard(s) : EN 55015:2013 +A1:2015
EN 61547:2009
Date of Receipt: 2019-06-11
Date of Test: 2019-06-18 to 2019-06-22
Date of Issue: 2019-07-04

Test Result:	Pass*
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* 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.

Kobe Jian

Kobe Jian
Lab Manager



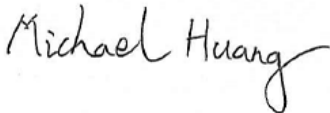
The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant 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.



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-07-04		Original

Authorized for issue by:			
Tested By	 Michael_Huang /Project Engineer	2019-06-18 to 2019-06-22	Date
Checked By	 Terry_Lai /Reviewer	2019-07-04	Date



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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

✕ Declaration of EUT Family Grouping:

Model No.:

KV xxx xx (H), KV xxx (H), VEGA xx, KV26080

(KV, VEGA: represent series number; xxx=0-360: represent power of solar panel; xx=0-80: represent power of light; (H): represent the battery pack with heat insulating material)

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, only different on the product size, battery capacity and appearance power.

Therefore only one model KV26080 with maximum 360W input power was tested in this report.



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4 General Information

4.1 Details of E.U.T.

Power Supply: DC 12.8V 96AH internal rechargeable battery
Cable: N/A

4.2 Description of Support Units

Use the incandescent lamps as charging.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Disturbance Voltage at Mains Terminals	±3.63dB (9kHz to 150kHz)
		±3.22dB (150kHz to 30MHz)
2	Disturbance Power	±3.78dB
3	Radiated Emissions	±5.0dB (30MHz-1GHz)
		±5.0dB (1GHz-6GHz)
4	Radiated Immunity	±2.18dB(80MHz-3GHz)
5	Conducted Immunity	±3.5dB(150kHz-230MHz)
6	Electrostatic Discharge	±6 %
7	EFT (Electrical Fast Transients)	±4 %
8	Surge Immunity	±6%
9	Voltage Dips and Interruptions	±4 %
10	CISPR 20 Immunity	±1.5dB
11	Temperature	±0.4 °C
12	Humidity	±1.3%
13	DC power	±0.5 %

4.4 Test Location

All tests were performed at:

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No tests were sub-contracted.



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4.5 Test Facility

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

● **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

● **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian G-Tick mark as a result of our NVLAP accreditation.

● **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to

ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

● **FCC Recognized 2.948 Listed Test Firm(Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

● **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

● **Industry Canada (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● **VCCI (Registration No.: R-12460, C-12584, G-10449 and T-11179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-10449 and T-11179 respectively.

● **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.



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4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: LED lighting of the EUT.

Audio: N/A

Other: N/A



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5 Equipment List

Radiated Emissions (30MHz-300MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2019-01-20	2020-01-19
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2019-01-20	2020-01-19
Chamber cable	HangTianXing	N/A	EMC0542	2017-06-30	2019-06-29
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9160	EMC2025	2016-09-08	2019-09-07
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2016-06-29	2019-06-28
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	EMC0524	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna 1GHz-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2016-09-09	2019-09-08
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2019-01-11	2020-01-10
Amplifier	HP	8447F	EMC2065	2019-05-29	2020-05-28
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2018-11-19	2019-11-18
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2020-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2019-01-11	2020-01-10
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2019-01-11	2020-01-10
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2018-12-08	2019-12-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2019-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2018-11-19	2019-11-18
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2018-11-19	2019-11-18
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Loop Antenna	Laplace Instruments	RF300	EMC0701	2017-03-20	2020-03-19
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2018-11-19	2019-11-18
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A



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Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
ESD Simulator	TESEQ AG	NSG 435	EMC2071	2019-03-07	2020-03-06
ESD Ground Plane	SGS	3m x 3m	EMC0804	N/A	N/A
Temperature & Humidity	Shanghai Meteorological Instrument Factory Co., Ltd.	ZJ1-2B	EMC0078	2018-07-05	2019-07-04

Radiated Immunity (80MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Compact 3m Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	EMC0525	2016-12-04	2019-12-03
Laser Probe Interface	RF Microwave Instrumentation	FI7000	EMC2089	N/A	N/A
Open Switch And Control Unit	R&S	OSP130	EMC2090	N/A	N/A
Broadband Amplifier(80MHz~1GHz/250W)	R&S	BBA150	EMC2091	2019-01-11	2020-01-10
Broadband Amplifier(800MHz~3GHz/110W)	R&S	BBA150	EMC2092	2019-01-11	2020-01-10
Signal Generator	R&S	SMB100A	EMC2093	2019-01-11	2020-01-10
Laser Probe	RF Microwave Instrumentation	FL7006	EMC2094	2019-02-25	2020-02-24
NRP-Z91 PowerSensor 6GHz	R&S	NPR-Z91	EMC2095	2019-01-11	2020-01-10
NRP-Z91 PowerSensor 6GHz	R&S	NPR-Z91	EMC2096	2019-01-11	2020-01-10
High-Gain Log-periodicAntenna	R&S	HL046E	EMC2097	2019-02-15	2022-02-14
Stacked Logarithmic-Periodic BroadbandAntenna(0.7~9GHz)/300W	SCHWARZBECK MESS - ELEKTRONIK	STLP 9149	SEM003-21	2018-09-18	2021-09-17
Broadband Amplifier (2.5~6GHz/30W)	R&S	BBA150	EMC2105	2018-10-18	2019-10-17
RI Cable	R&S	7m	EMC2098	2019-05-24	2020-05-23
Oscilloscope	Tektronix	TDS3052C	EMC2055	2019-01-07	2020-01-06
Monitor System	Mitsubish Corp.	M-0552AB	EMC0909	N/A	N/A
Test Software EMC32	Rohde & Schwarz	Ver. 9.26.00	GZE100-63	N/A	N/A



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SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch

Report No.: GZEM190601349701

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General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2018-07-20	2019-07-19
DMM	Fluke	73	EMC0007	2018-07-19	2019-07-18



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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: 10m

Limit:

30MHz-230MHz 30dB(μV/m) quasi-peak

230MHz-300MHz 37dB(μV/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

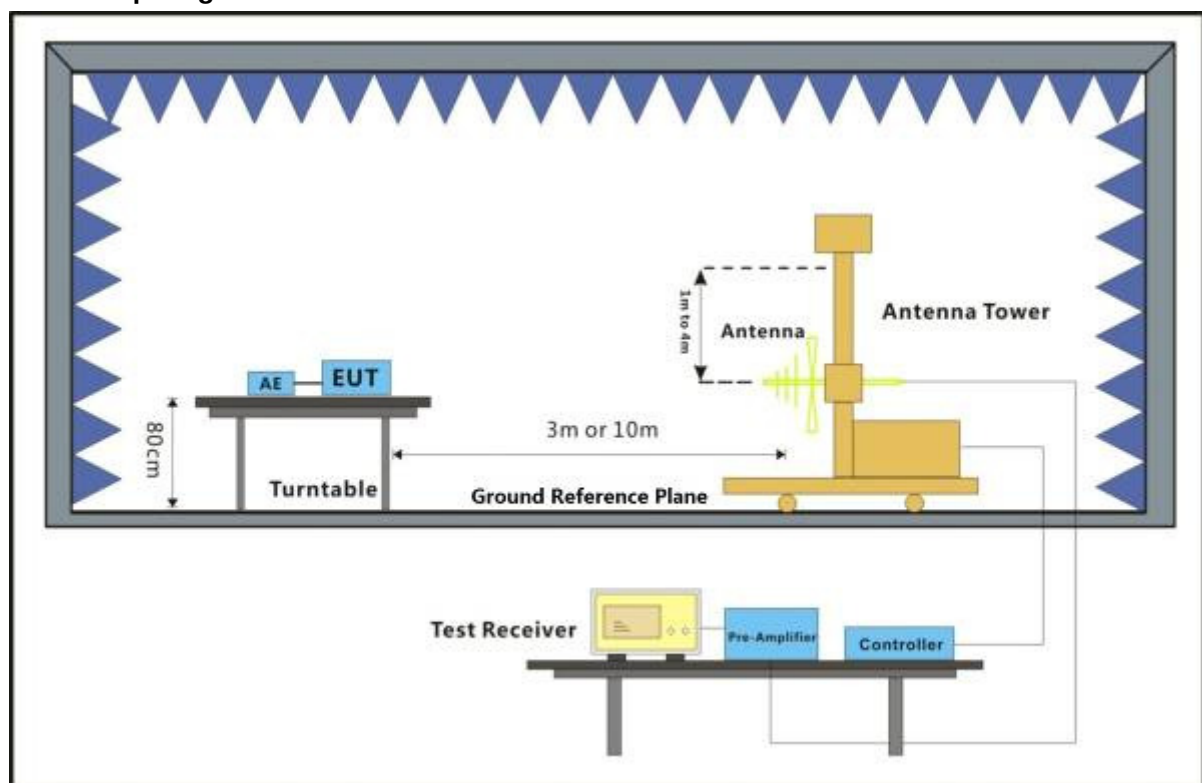
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Test the EUT in LED lighting mode.

6.1.2 Test Setup Diagram

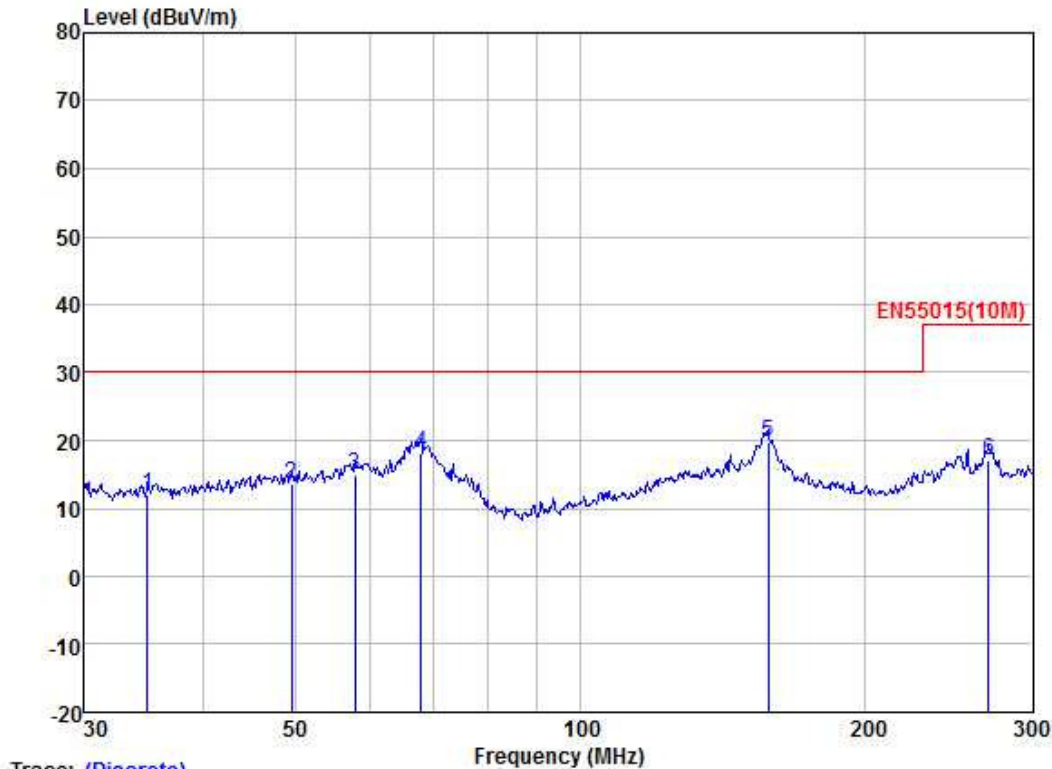


6.1.3 Measurement Data

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.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Mode:a; Polarization:Horizontal



Trace: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	34.924	25.30	12.62	0.60	26.53	11.99	30.00	-18.01	HORIZONTAL	QP
2	49.559	25.35	13.97	0.70	26.50	13.52	30.00	-16.48	HORIZONTAL	QP
3	57.826	27.07	13.66	0.80	26.49	15.04	30.00	-14.96	HORIZONTAL	QP
4	67.939	31.53	12.31	0.87	26.46	18.25	30.00	-11.75	HORIZONTAL	QP
5	157.805	31.39	13.35	1.33	26.44	19.63	30.00	-10.37	HORIZONTAL	QP
6	269.849	29.48	12.55	1.70	26.63	17.10	37.00	-19.90	HORIZONTAL	QP

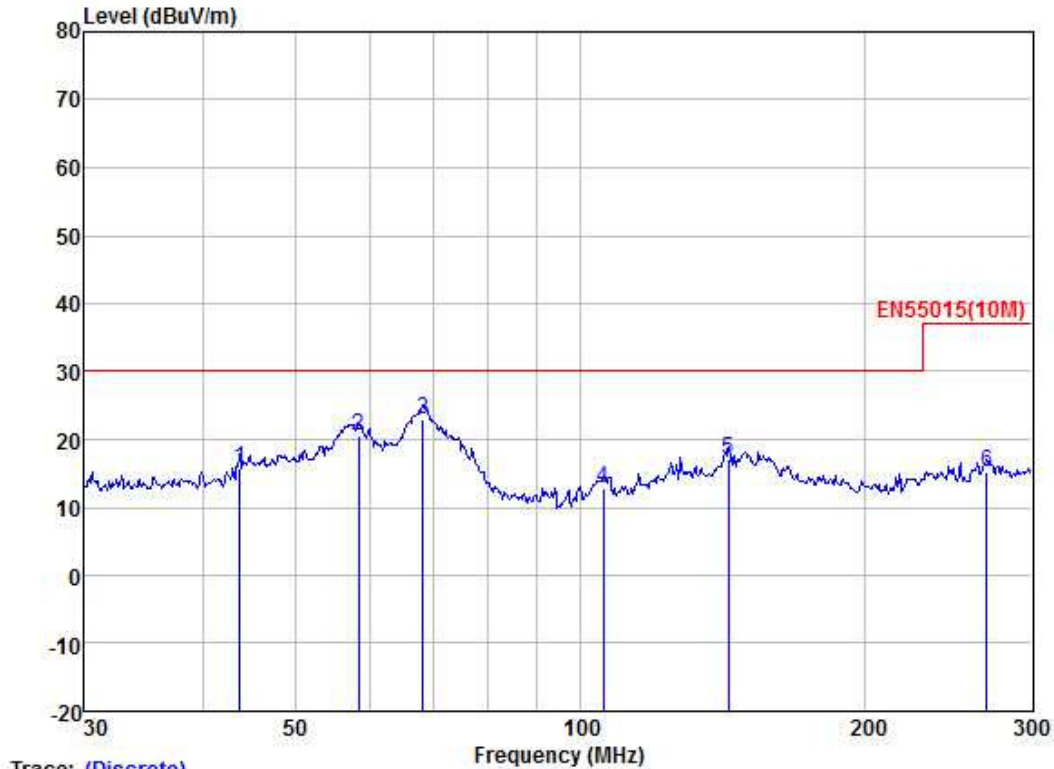


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Mode:a; Polarization:Vertical



Trace: (Discrete)

	ReadAntenna	Cable	Preamp		Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	43.764	28.42	13.20	0.68	26.51	15.79	30.00	-14.21	VERTICAL QP
2	58.361	32.46	13.64	0.80	26.49	20.41	30.00	-9.59	VERTICAL QP
3	68.253	36.20	12.29	0.87	26.46	22.90	30.00	-7.10	VERTICAL QP
4	105.711	28.66	9.28	1.13	26.40	12.67	30.00	-17.33	VERTICAL QP
5	143.259	29.34	12.79	1.28	26.43	16.98	30.00	-13.02	VERTICAL QP
6	268.609	27.53	12.49	1.70	26.63	15.09	37.00	-21.91	VERTICAL QP



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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

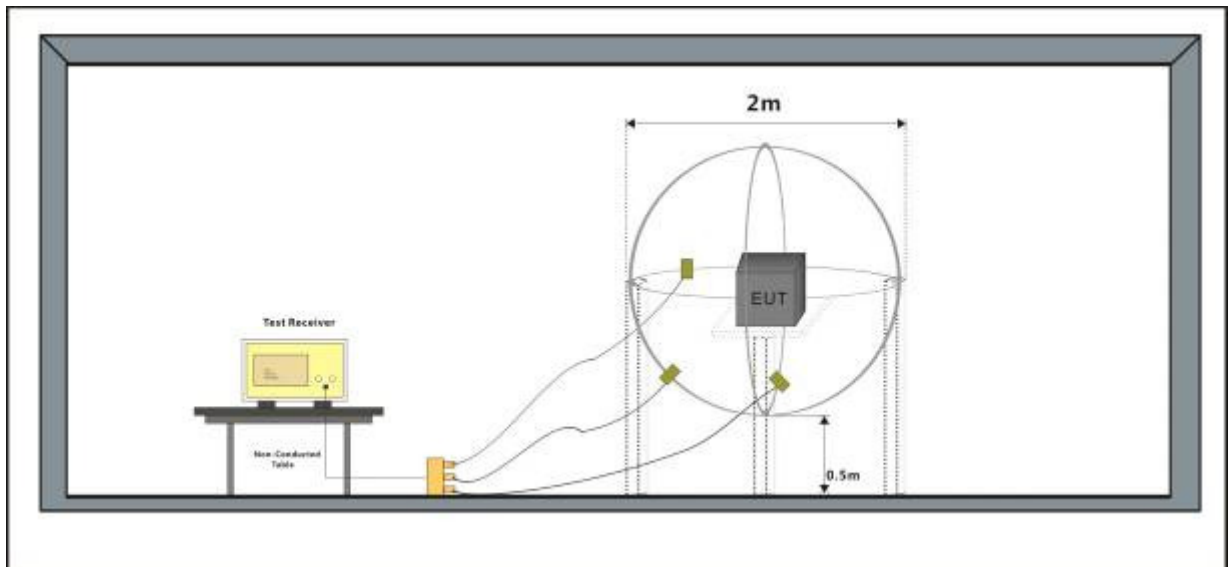
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Test the EUT in LED lighting mode.

6.2.2 Test Setup Diagram



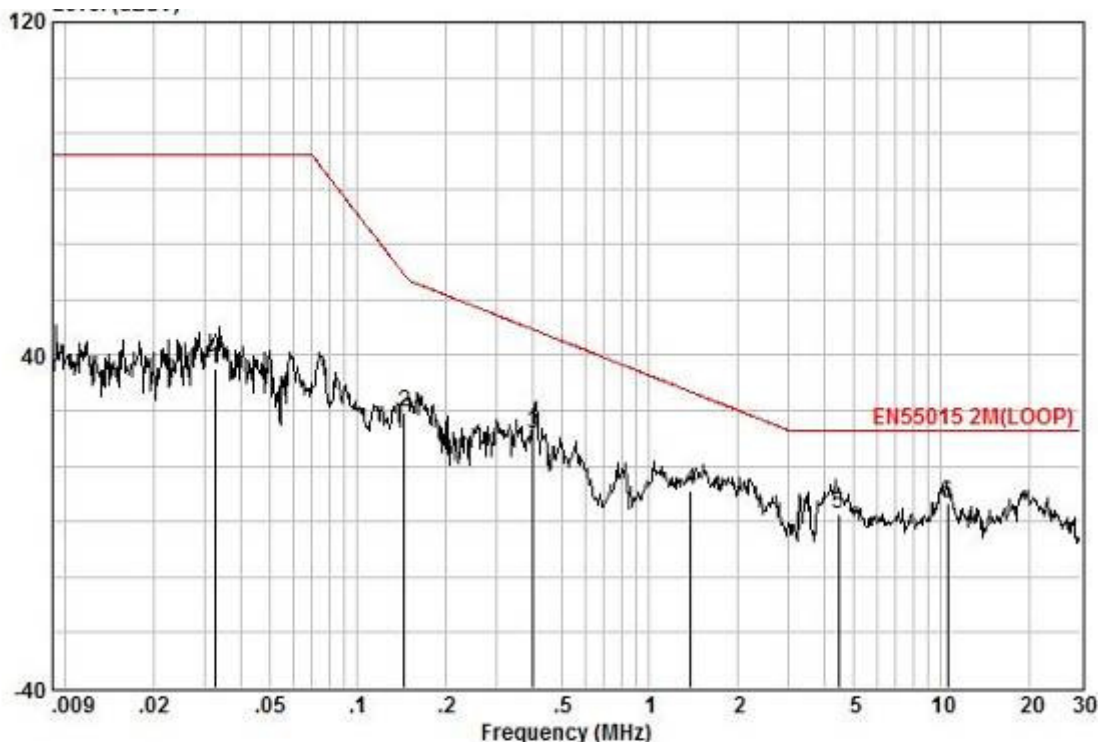
6.2.3 Measurement Data

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.

Measured Level = Read Level + Antenna Factor + Cable Loss

Mode:a; Axial:X

Level (dBuA)



Loop : X
NO :
Model :

Frequency MHz	Read level dBuA	Cable Loss dB	Antenna Factor dB	Measured level dBuA	Limit Line dBuA	Over limit dB	Remark
0.032	38.24	0.34	-1.75	36.83	88.00	-51.17	QP
0.145	40.56	0.33	-14.54	26.35	59.22	-32.87	QP
0.401	42.63	0.32	-21.90	21.05	46.19	-25.14	QP
1.387	33.24	0.34	-25.88	7.70	31.27	-23.58	QP
4.459	28.63	0.54	-27.28	1.88	22.00	-20.12	QP
10.536	29.84	0.61	-26.12	4.33	22.00	-17.67	QP

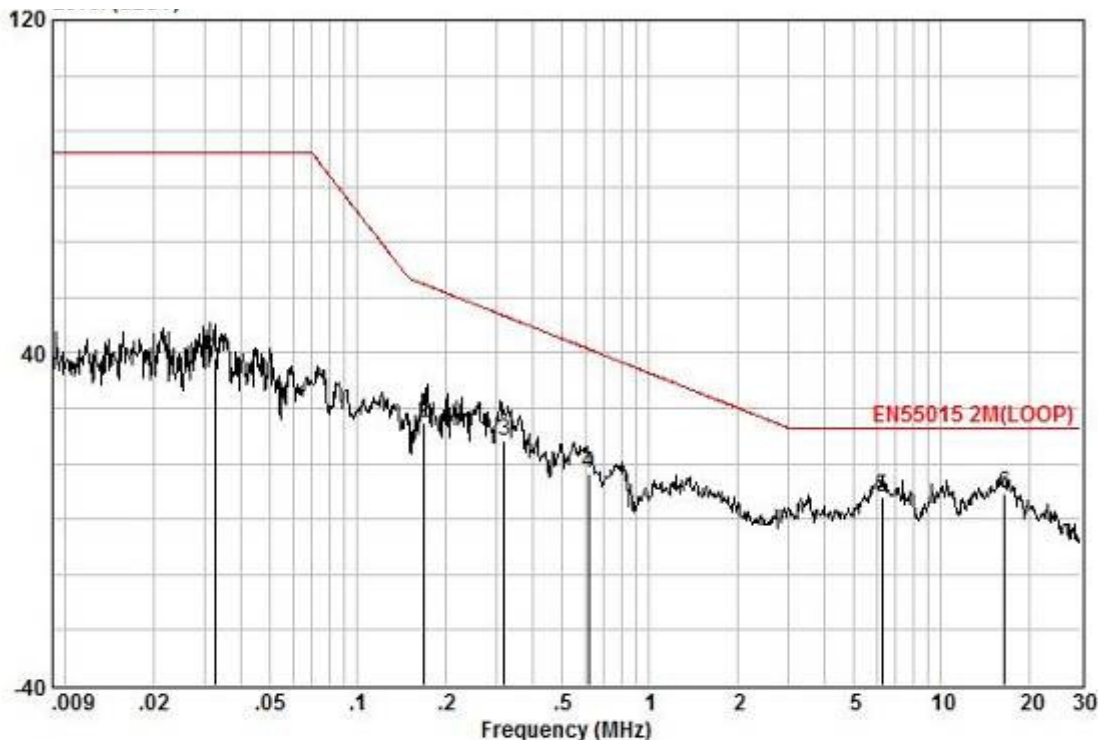


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Mode:a; Axial:Y

Level (dBμA)


Loop : Y
NO :
Model :

Frequency MHz	Read level dBμA	Cable Loss dB	Antenna Factor dB	Measured level dBμA	Limit Line dBμA	Over limit dB	Remark
0.032	38.80	0.34	-0.31	38.83	88.00	-49.17	QP
0.170	37.24	0.29	-14.34	23.19	56.52	-33.33	QP
0.319	37.39	0.33	-18.94	18.78	48.92	-30.14	QP
0.621	33.24	0.32	-22.74	10.82	40.92	-30.10	QP
6.269	30.10	0.58	-25.21	5.47	22.00	-16.53	QP
16.460	23.18	0.67	-17.62	6.23	22.00	-15.77	QP

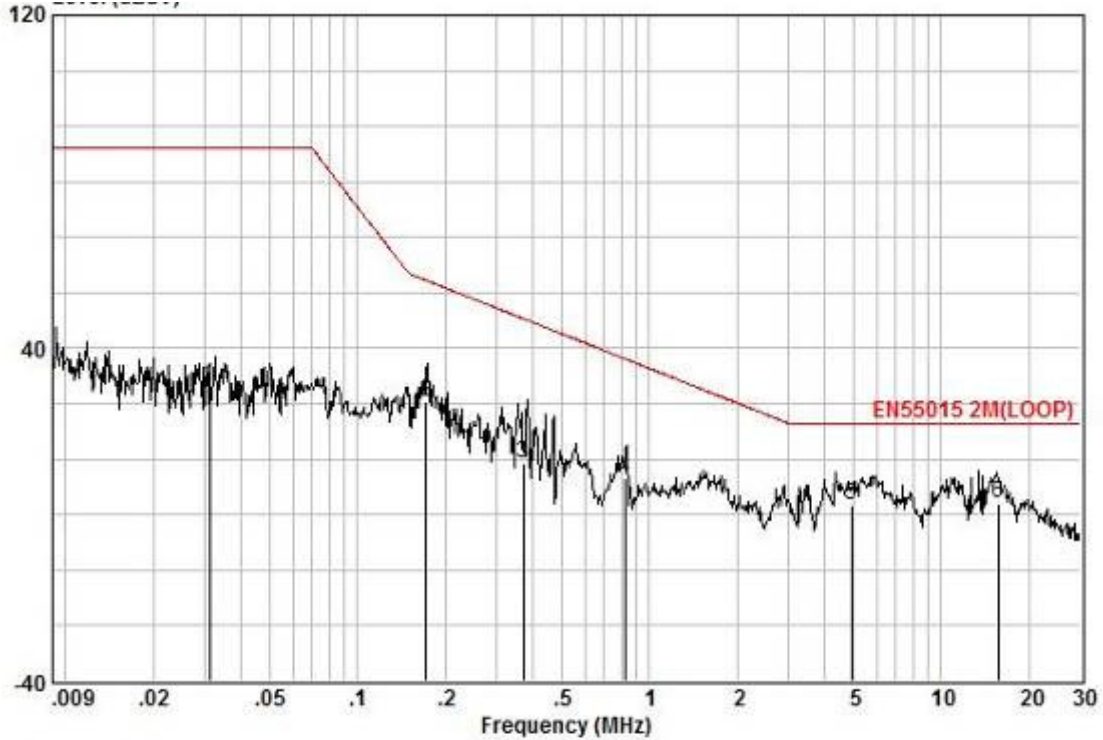


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Mode:a; Axial:Z

Level (dBμA)


Loop : Z
NO :
Model :

Frequency MHz	Read level dBμA	Cable Loss dB	Antenna Factor dB	Measured level dBμA	Limit Line dBμA	Over limit dB	Remark
0.031	32.17	0.34	-1.38	31.13	88.00	-56.87	QP
0.172	42.60	0.28	-15.77	27.11	56.33	-29.22	QP
0.370	33.33	0.32	-21.15	12.50	47.16	-34.66	QP
0.825	33.52	0.30	-24.89	8.94	37.51	-28.57	QP
4.915	28.13	0.55	-26.85	2.33	22.00	-19.67	QP
15.678	28.22	0.67	-25.98	2.90	22.00	-19.10	QP

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.

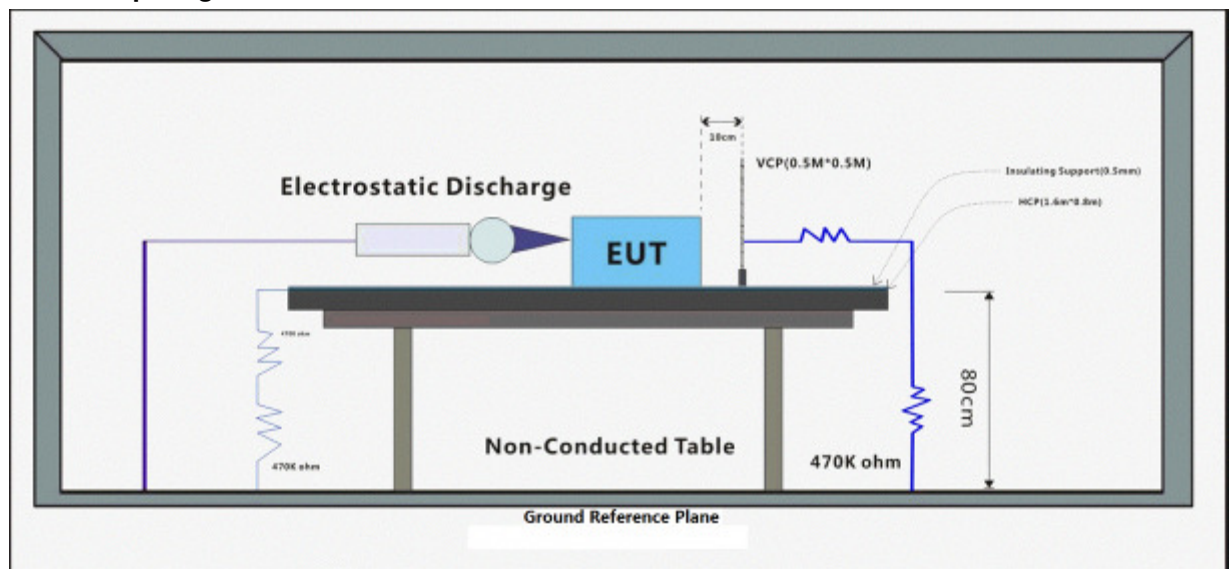
7.2 Electrostatic Discharge

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 E.U.T. Operation

Operating Environment:
 Temperature: 26 °C Humidity: 49.7 % RH Atmospheric Pressure: 1020 mbar
 Test Mode:
 a: Test the EUT in LED lighting mode.
 b: Test the EUT in standby mode.

7.2.2 Test Setup Diagram



7.2.3 Test Results

Test Point:

Observations:

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)

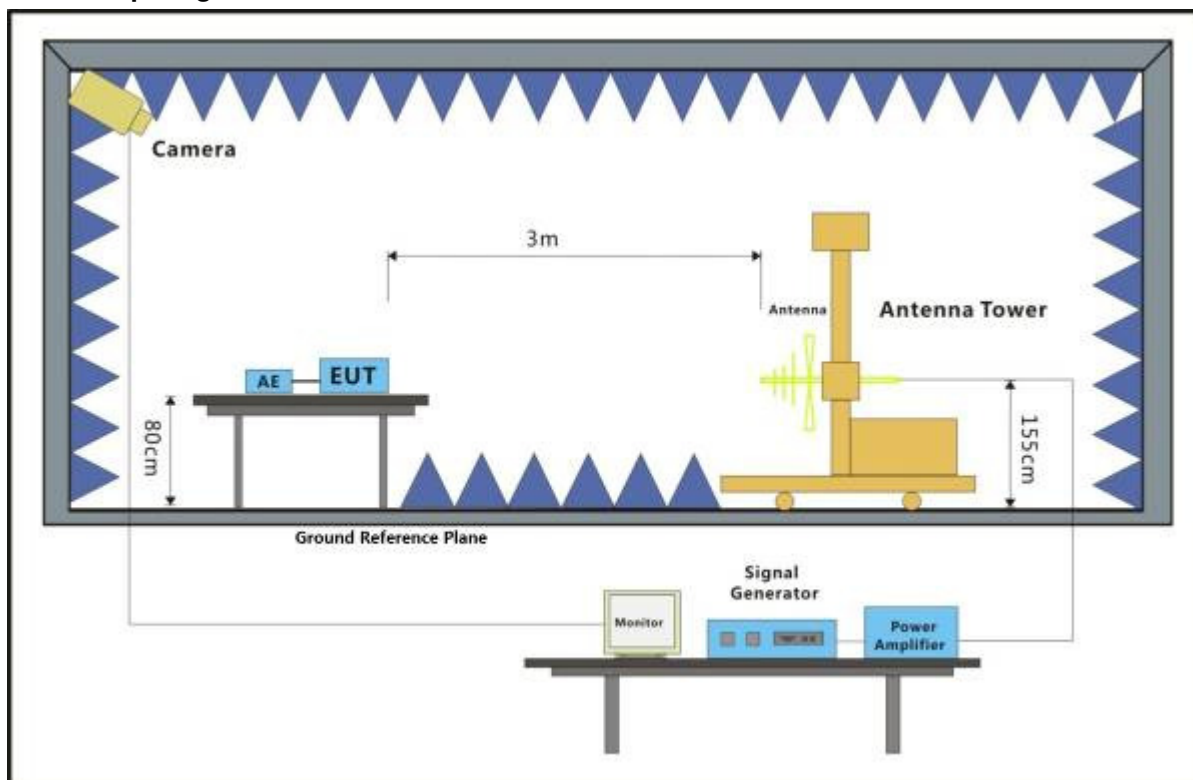
Test Requirement: EN 61547:2009
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
 Performance Criterion: A
 Frequency Range: 80MHz to 1GHz
 Antenna Polarisation: Vertical and Horizontal
 Modulation: 1kHz,80% Amp. Mod,1% increment

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar
 Test Mode:
 a: Test the EUT in LED lighting mode.
 b: Test the EUT in standby mode.

7.3.2 Test Setup Diagram



7.3.3 Test Results

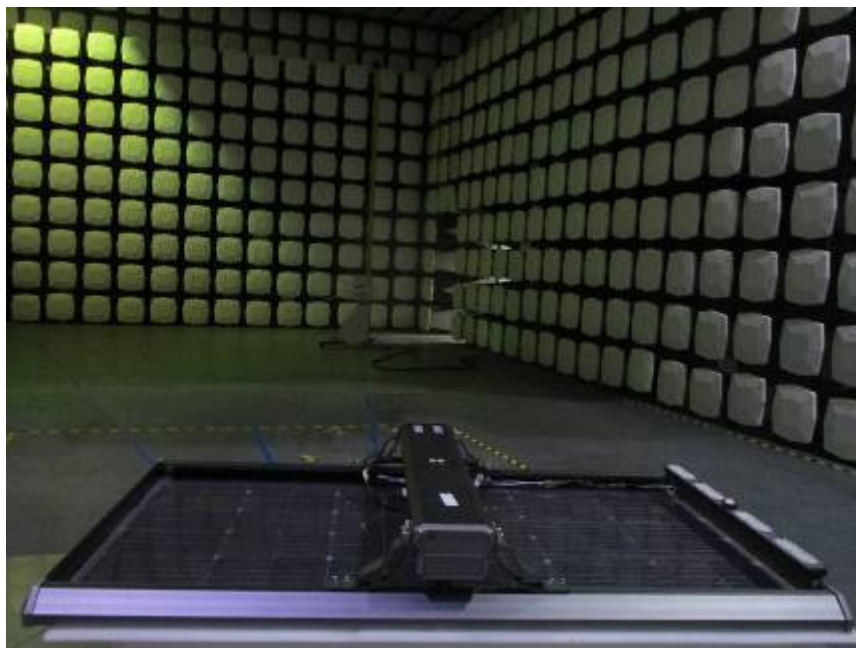
Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A

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

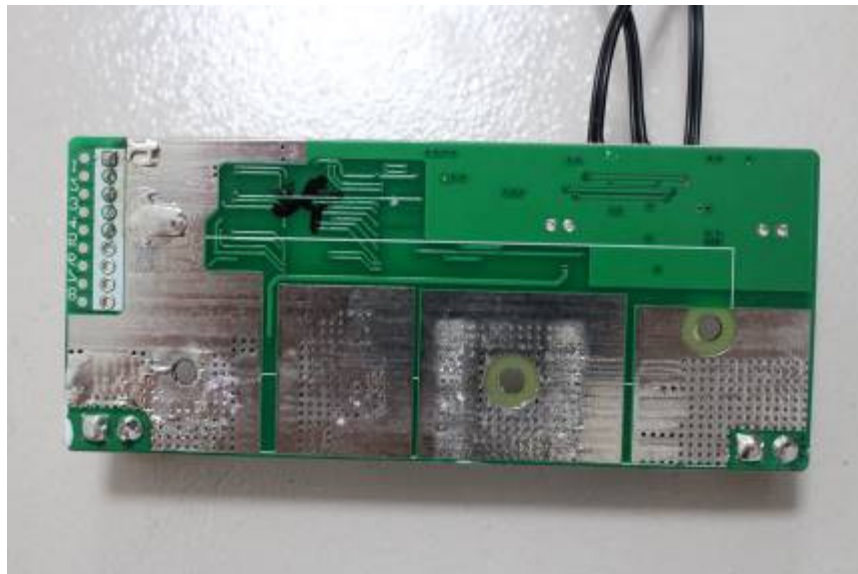
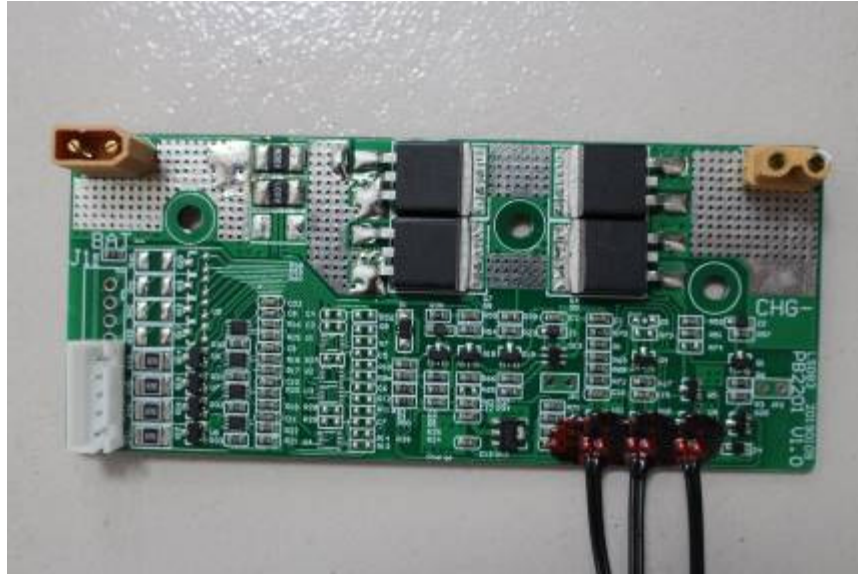


8.5 EUT Constructional Details



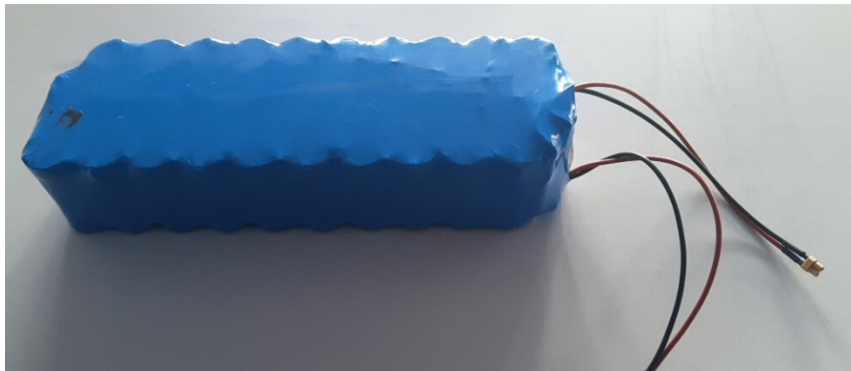








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