



Report No.: AOC250410010ER

TEST REPORT IEC 62612:2018 Self-ballasted LüED-lamps for general lighting services with supply voltages >50 V - Performance requirements	
Report Reference No.:	AOC250410010ER
Tested by (name + signature) :	Bill Hu <i>Bill Hu</i>
Approved by (name + signature) :	Robin Liu <i>Robin Liu</i>
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Testing Laboratory	Shenzhen AOCE Electronic Technology Service Co., Ltd
Address:	Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China
Applicant's name	Zhongshan Lianheliuming Lighting Technology Co., Ltd.
Address:	8F-1 and 2F-1 Distric D, Building VIPlant, No.1Henglong Road, Tonyi Industrial Park, Guzhen Town, Zhongshan City, 528421 Guangdong, P.R.China
Test specification:	
Test standard:	IEC 62612:2018 Self-ballasted LED-lamps for general lighting services with supply voltages >50 V - Performance requirements
Non-standard test method:	N/A
Test Report Form No.: TRF.IEC_62612_A	
TRF Originator	AOCE
Master TRF:	Dated 2023-03
Test item description :	
LED Tube (T8 LED Tube)	
Trade Mark	Navigate
Manufacturer:	Same as applicant
Model/Type reference:	T8RC24W
Ratings:	220-240V~, 50/60Hz, 0.20A, 24W

**Test item description.....:**

Trade Mark: Navigate
Model/Type reference: T8RC24W
Ratings electrical paremeters.....: 220-240V~, 50/60Hz,0.20A, 24W
Rated displacement factor: 0.9
Lamp shape.....: T8
Lamp base.....: G13
Dimmable or not.....: Not
Rated luminous flux.....: 2280 lm
Rated Efficacy.....: 95 lm/W
Declared CCT.....: 6500K
Declared color rendering index: 80
Declared chromaticity co-ordinate....: 7 SDCM
Declared life time.....: 20000 hours
Claimed lumen maintenance.....: N/A

Possible test case verdicts.....:

- test case does not apply to the test object..... : N/A
- test object does meet the requirement : P (Pass)
- test object does not meet the requirement : F (Fail)

Testing.....:

Date of receipt of test item: Jun.5.2024
Date (s) of performance of tests.....: Jun.5.2024 to Apr.16.2025
Sample Code of report.....:

Model	Numbers	Sample Code of lab.	Sample Code of report
T8RC24W	55	230428112041-01 230428112041-55	R_S1 to R_S55

General remarks

This report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the item(s) tested.

"(see enclosure #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (.) is used as the decimal separator.

When determining of test conclusion. measurement uncertainty of test has been considered.

**General product information:**

The submitted samples was self-ballasted LED lamps for general use.

Lamp dimension:

Lamp diameter: 28 mm Lamp MOL: 1200 mm

Manufacture : Zhongshan Lianheliuming Lighting Technology Co., Ltd.

Manufacture address: 8F-1 and 2F-1 Distric D,Building VIPlant, No.1Henglong Road,Tonyi Industrial Park, Guzhen Town,Zhongshan City,528421Guangdong,P.R.China

Summary of testing:

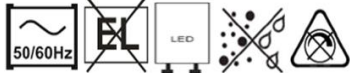
More details of sample size please see the following table:

Test	Representative Model
Dimensions	Same 5 units for all tests
Luminous intensity distribution	
Lamp power	
Displacement factor	
Luminous flux	Same 20 unit s for all tests
Efficacy	
Chromaticity tolerance	
Correlated colour temperature	
Colour rendering index	
Lumen maintenance	
Temp erature cycling. energised	10
Supply voltage switching	10
Accelerated operational life test	10

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Representation:

LED Tube (T8 LED Tube)	Navigate
Model:T8RC24W	
Rating: 220-240V~, 50/60Hz,0.20A, 24W	
	
This lamp is not suitable to be used in emergency luminaires designed for double-capped fluorescent lamp(s).	
Rated luminous flux (lm):2280lm	
Rated life: 20000h	
CCT: 6500K	
Rated efficacy: 95lm/W	
Dimensions: 28 mm × 1200mm	
Displacement factor: 0.9	
Manufacturer:Zhongshan Lianheliuming Lighting Technology Co., Ltd.	
Made In China	ta: -20 to 40°C

According to Appendix 1. 60Hz was selected for all the tests.

All the parameters mentioned in the standard IEC 62612:2018 and complied with the requirements in this standard except for items that are not tested..



Critical components information:					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ^{1) 2)}
G13 lamp cap	JIANENG LIGHT FITTINGS CO., LTD.	G13 lamp cap	--	--	Tested with appliance
- Pins of lamp cap	Honghuicheng Hardware (Shenzhen) Co., Ltd	--	Ø2.4 mm; copper: > 60%	--	Tested with appliance
- Plastic of lamp cap	BAYER MATERIALSCIENCE AG	6165 X + (z)(f1)	PC; V-0; 125°C	--	Tested with appliance & UL E41613
- Fuse in lamp cap	Dongguan Rexmax Electronics Co., Ltd	TBP	250V. T2A	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40032053
Fixed glue between lamp cap and glass tube	SHIN-ETSU CHEMICAL CO LTD	KE-45	HB. 105°C	--	Tested with appliance and UL E192980
LED	MLS CO.,LTD	E2835UX55	SMD 2835; I _F =60mA. V _F =2.9-3.0V. View angle: 120°. CCT: 3000-6500K	--	Tested with appliance
PCB of LED module	LIANMENG ELECTRONICS HUIYANG CO LTD	LM-6	Metal base; 130°C; V-0	--	Tested with appliance & UL E469262
Internal wires	ZHONGSHAN HUALAN ELECTRONIC CO LTD	3135	600V; 20AWG; 200°C	--	Tested with appliance & UL E303124
Heat-shrinkable tube	SHENZHEN WOER HEAT SHRINKABLE MATERIAL CO LTD	RSFR	600V. 125°C		Tested with appliance & UL E203950
LED starter	Foshan Fengchi Lighting Appliance Co., Ltd.	S10	250Vac; 2A	--	Tested with appliance
- Plastic body	Covestro Deutschland AG [PC Resins]	6485 + (z)(f1)	PC; V-0; 125°C	--	Tested with appliance & UL E41613



- Base	Covestro Deutschland AG [PC Resins]	6485 + (z)(f1)	PC; V-0; 125°C	--	Tested with appliance & UL E41613
- Fuse	Dongguan Dawei Metal Electron Co., Ltd.	3T	250VAC; T2A	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40032335
- Pins	FUAN SAIQI SANBAO ELECTRIC APPLIANCE FACTORY	--	Copper: > 60%	--	Tested with appliance

LED driver of B-30W:

Fuse resistor	Xuyi Sanwei Electric Co. Ltd.	RXF	0.5W; 2.2Ω	IEC/EN 62368-1	VDE 40037299
Transformer	Guangdong Hualing Electronic Technology Co., Ltd.	EE14	2.0mH	--	Tested with appliance
- Bobbin	CHANG CHUN PLASTICS Co., Ltd.	T375J	PMC; V-0; 150°C	--	Tested with appliance & E59481
- Magnet wire	DONG GUAN YIDA INDUSTRIAL CO LTD	2UEW/155	155°C	--	Tested with appliance & E344055
- Insulation tape	SYMBIO INC	35660(a). 35660Y(e)	130°C	--	Tested with appliance & UL E50292
PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-5150	CEM-1; V-0; 130°C	--	Tested with appliance & UL E123995
Electrolytic capacitor	Nantong Huayuyu Electronics Co., Ltd.	10uF	10uF. 400V. 105 °C	--	Tested in appliance

Supplementary information:

- ¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.
²⁾ License available upon request.



IEC 62612:2018			
Clause	Requirement – Test	Result - Remark	Verdict
	PERFORMANCE REQUIREMENTS		
4	General requirements on tests		P
	Comply with this standard will start and operate satisfactorily at voltages between 92 % and 106 % of rated supply voltage and at an ambient air temperature between –20 °C and 40 °C and in a luminaire complying with IEC 60598-1.	Complied	P
5	Marking		P
	a) Rated luminous flux (lm). rated colour and for directional lamps only. beam angle	2280lm	P
	b) Lamp photometric code including initial and maintained colour variation category	-	N/A
	c) Rated life (h) and the related lumen maintenance (x)	20000h	P
	d) Failure fraction (Fy). corresponding to the rated life	-	N/A
	e) For dirctional lamps only. peak intensity(cd)	-	N/A
	f) Rated colour including initial and aintained colour variation category	6500K	P
	g) Ageing time (h). if different to 0 h	-	N/A
	h) Rated efficacy (lm/W)	95lm/W	P
	i) Dimensions. including dimensional tolerances	28mm x 1200mm	P
	j) Displacement factor	0.9	P
6	Dimensions		P
	Comply with the requirements as indicated by the manufacture and responsoble vendors	Complied with requirements as indicated by the manufacturer.	P
8	Lamp input		P
8.1	Lamp power		P
	The initial power consumed by each individual LED lamp in the measured sample shall not exceed the rated power by more than 10 %.	-	P
	The average of initial power consumed by the LED lamps in the measured sample shall not exceed the rated power by more than 7.5 %.	Rated: 24 W; Measured: 24.30 W; Deviation: +1.25%	P
8.2	Displacement factor		P
	The measured displacement factor for each individual lamp of the sample shall not be less than the marked value by more than 0.05	See appendix 3 Rated: 0.9	P

9	Light output		P
9.1	Luminous flux		P
	For non-directional LED Lamps. the rated luminous flux should be preferably be one of the following values: 100lm. 150lm. 250lm. 350lm. 500lm. 800lm. 1000lm. 1500lm. 2000lm. 3000lm.		



IEC 62612:2018			
Clause	Requirement – Test	Result - Remark	Verdict
	The initial luminous flux of each individual LED lamp in the measured sample shall not be less than the rated luminous flux by more than 10 %	See appendix 3	P
	The average initial luminous flux of the LED lamps in the measured sample shall not be less than the rated luminous flux by more than 7.5 %.	Rated: 2280 lm; Luminous flux: 2301.6 lm; Deviation: +0.95%	P
9.2	Luminous intensity distribution. peak intensity and beam angle		N/A
9.2.1	The requirements of 9.2.4 and 9.2.5 are to be applied to LED lamps having a directional (spot) distribution.	Not applicable	N/A
9.2.3	Luminous intensity distribution		P
	The initial distribution of luminous intensity shall be in accordance with that declared by the manufacturer.	See appendix 2	P
9.2.4	Peak intensity value		N/A
	the initial peak intensity of each individual LED lamp in the measured sample shall not be less than 75 % of the rated intensity.	Not applicable	N/A
9.2.5	Beam angle value		N/A
	the initial beam angle value of each individual LED lamp in the measured sample shall not deviate by more than 25 % of the rated value.	Not applicable	N/A
9.3	Efficacy		P
	the LED lamp efficacy shall not be less than 80 % of the rated LED lamp efficacy as declared by the manufacturer or responsible vendor.	Rated: 95 lm/W; Light efficacy: 94.72 lm/W; Deviation: -0.3%	P
10	Colour nomenclature. variation and rendering		P
10.1	Colour variation categories		P
	the measured chromaticity co-ordinate values of an LED lamp (initial value) shall not move beyond the chromaticity coordinate tolerance category as indicated by the manufacturer or responsible vendor	See appendix 3 7 SDCM	P
	the measured chromaticity co-ordinate values of an LED lamp (maintained value) shall not move beyond the chromaticity coordinate tolerance category as indicated by the manufacturer or responsible vendor		P
10.2	Colour rendering index (CRI)		P
	The measured CRI values shall not be lower than 3 point from the rated CRI.	See appendix 3 Rated: 80.0	P
11	Lamp Life		P
11.2	Lumen maintenance		P
	a) The measured luminous flux value at 25 % of rated life (with a maximum duration of 6 000 h) shall never be less than the luminous flux pertaining to the maximum lumen maintenance value related to the rated life as defined and provided by the manufacturer or responsible vendor		P



IEC 62612:2018			
Clause	Requirement – Test	Result - Remark	Verdict
	b) The calculated lumen maintenance shall correspond with the lumen maintenance code as defined and provided by the manufacturer or vendor.		P
11.3	Endurance tests		P
11.3.2	Temperature cycling test		P
	The LED lamp is placed in a test chamber in which the temperature is varied from – 10 °C to +40 °C over a 4 h period and for a test duration of 250 periods (1 000 h). The LED lamp is switched on at test voltage for 34 min and off for 34 min.		P
	At the end of the test all the LED lamps shall operate and have a luminous flux which stays within the claimed lumen maintenance code for a period of at least 15 min and show no physical effects of temperature cycling such as cracks or delaminating of the label.		P
11.3.3	Supply switching test		P
	The LED lamp shall be operated continuously without switching at a test voltage and at a temperature corresponding to 10 K above the maximum specified operating temperature		P
	At the end of the test all the LED lamps shall operate and have a luminous flux which stays within the claimed lumen maintenance code for a period of at least 15 min.	See appendix 5	P
11.3.4	Operational high temperature stree test		P
	The LED lamp shall be operated continuously without switching at a test voltage and at a temperature corresponding to 10 K above the maximum specified operating temperature		P
	At the end of this test. and after cooling down to room temperature and being stabilised. all the lamps shall at least a luminous flux of 70% compared to the initial value for at least 15 min	See appendix 6	P

**Appendix 1 The Compare Between Rated Frequency**

Sample No.	Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Luminaire Efficacy(Lm/W)
R_S1	230.00	50	0.210	24.15	0.500	2310.52	95.7
R_S2	230.00	50	0.211	24.31	0.501	2325.31	95.6
R_S1	230.00	60	0.206	24.45	0.516	2300.27	94.1
R_S2	230.00	60	0.205	24.38	0.517	2282.43	93.6

**According to the above test data. 60Hz data is more worse. 60Hz was selected for all the tests.*

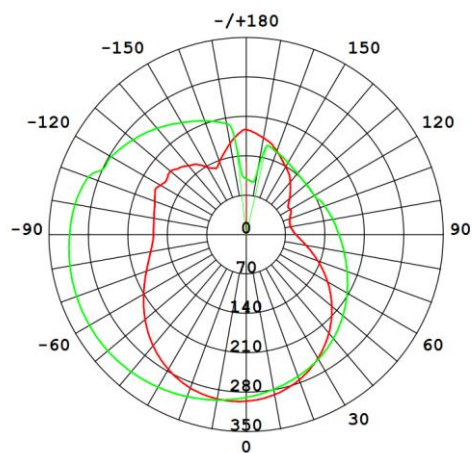
**Appendix 2 Luminous Intensity Distribution**

Sample code: R_S1

Voltage (V)	Current (A)	Power (W)	Power factor	Luminous flux(lm)	Peak intensity(cd)	Beam angle(°)	Efficacy (lm/W)	Output flux ratio in π solid angle
230.00	0.205	24.28	0.515	2301.0	276.007	N/A	94.77	31.1%

Light Distribution Curve. Zonal lumen summary

γ	Φ zone	Φ total	%lum, lamp
0- 10	23.76	23.76	1.03, 1.03
10- 20	69.91	93.69	4.07, 4.07
20- 30	111.9	205.6	8.93, 8.93
30- 40	147.1	352.6	15.3, 15.3
40- 50	173.4	526.0	22.9, 22.9
50- 60	190.4	716.5	31.1, 31.1
60- 70	198.7	915.4	39.8, 39.8
70- 80	199.9	1115	48.5, 48.5
80- 90	195.8	1311	57, 57
90-100	189.0	1500	65.2, 65.2
100-110	178.5	1678	72.9, 72.9
110-120	158.9	2141	79.8, 79.8
120-130	136.2	1973	85.8, 85.8
130-140	117.1	2091	90.9, 90.9
140-150	93.09	2183	94.9, 94.9
150-160	65.84	2250	97.8, 97.8
160-170	38.85	2288	99.5, 99.5
170-180	12.59	2301	100, 100



Zonal lumen summary

Light Distribution Curve

**Appendix 3 Initial Test Data**

Sample No.	Voltage (V)	Current (A)	Power (W)	Displacement factor	Luminous flux(lm)	Color tolerance (SDCM)*	CCT	CRI
R_S1	230.00	0.205	24.33	0.905	2302.4	1.8	6576	81.9
R_S2	230.00	0.204	24.24	0.909	2301.6	1.7	6597	82.5
R_S3	230.00	0.205	24.42	0.906	2337.9	1.7	6551	82.4
R_S4	230.00	0.203	24.01	0.907	2279.5	1.8	6484	81.7
R_S5	230.00	0.207	24.57	0.906	2312.4	1.8	6557	81.9
R_S6	230.00	0.205	24.28	0.909	2306.5	1.7	6558	81.7
R_S7	230.00	0.204	24.25	0.905	2274.1	1.7	6564	82.5
R_S8	230.00	0.202	23.97	0.907	2256.9	1.7	6570	81.8
R_S9	230.00	0.207	24.56	0.906	2323.5	1.6	6551	82.7
R_S10	230.00	0.205	24.32	0.909	2301.6	1.7	6565	82.6
R_S11	230.00	0.205	24.34	0.905	2323.1	1.8	6577	81.3
R_S12	230.00	0.205	24.31	0.909	2308.3	1.6	6610	81.8
R_S13	230.00	0.206	24.42	0.905	2321.4	1.7	6560	81.2
R_S14	230.00	0.207	24.63	0.911	2277.8	1.7	6553	82.3
R_S15	230.00	0.206	24.54	0.906	2309.7	1.7	6570	81.2
R_S16	230.00	0.206	24.39	0.909	2313.9	1.6	6549	82.1
R_S17	230.00	0.206	24.45	0.905	2321.4	1.7	6550	80.7
R_S18	230.00	0.204	24.27	0.909	2263.5	1.8	6631	82.1
R_S19	230.00	0.200	23.75	0.905	2294.1	1.7	6477	80.9
R_S20	230.00	0.203	24.01	0.905	2302.9	1.7	6597	81.1
Average	230.00	0.205	24.30	0.907	2301.6	1.7	6562	81.8

**Note: Color tolerance is based on IEC 6500K.*

**Appendix 4 Temperature Cycling Test Data**

Sample No.	Initial Luminous Flux(lm)	After Temperature Cycling Test Luminous Flux(lm)	Lumen Maintenance
R_S21	2322.85	2221.48	95.64%
R_S22	2307.93	2208.73	95.70%
R_S23	2335.02	2234.79	95.71%
R_S24	2310.40	2213.89	95.82%
R_S25	2312.01	2227.59	96.35%
R_S26	2277.23	2203.44	96.76%
R_S27	2309.26	2208.60	95.64%
R_S28	2295.46	2204.49	96.04%
R_S29	2307.05	2202.82	95.48%
R_S30	2334.67	2220.39	95.11%
Average	2311.19	2214.62	95.83%

**Appendix 5 Supply Switching Test Data**

Sample No.	Initial Luminous Flux(lm)	After Temperature Cycling Test Luminous Flux(lm)	Lumen Maintenance
R_S31	2309.05	2225.87	96.40%
R_S32	2320.30	2202.20	94.91%
R_S33	2322.29	2232.94	96.15%
R_S34	2296.03	2223.76	96.85%
R_S35	2305.57	2207.73	95.76%
R_S36	2304.82	2235.17	96.98%
R_S37	2335.39	2218.23	94.98%
R_S38	2278.95	2216.17	97.25%
R_S39	2326.22	2207.31	94.89%
R_S40	2331.96	2221.91	95.28%
Average	2313.06	2219.13	95.95%

**Appendix 6 Accelerated Operational Life Test Data**

Sample No.	Initial Luminous Flux(lm)	After Temperature Cycling Test Luminous Flux(lm)	Lumen Maintenance
R_S41	2309.33	2220.28	96.14%
R_S42	2299.63	2205.83	95.92%
R_S43	2303.62	2226..76	96.66%
R_S44	2325.62	2236.70	96.18%
R_S45	2331.86	2218.20	95.13%
R_S46	2321.76	2202.83	94.88%
R_S47	2320.87	2232.57	96.20%
R_S48	2277.89	2218.06	97.37%
R_S49	2331.11	2212.30	94.90%
R_S50	2315.57	2203.07	95.14%
Average	2313.73	2217.65	95.85%

**Appendix 7 After 6000 hours life Test Data**

Sample No.	Voltage (V)	Current (A)	Power (W)	Displacement factor	Luminous flux(lm)	Color tolerance (SDCM)*	CCT	CRI
R_S1	230.00	0.202	23.93	0.906	2129.3	1.9	6558	80.8
R_S2	230.00	0.202	24.01	0.908	2134.6	2.1	6613	82.0
R_S3	230.00	0.203	24.12	0.906	2131.1	1.8	6513	82.2
R_S4	230.00	0.203	24.01	0.907	2125.3	1.9	6485	81.3
R_S5	230.00	0.203	24.11	0.909	2139.2	1.8	6557	81.4
R_S6	230.00	0.202	24.02	0.908	2132.5	1.8	6529	80.9
R_S7	230.00	0.203	24.13	0.906	2127.0	1.9	6556	81.1
R_S8	230.00	0.199	23.62	0.907	2106.0	1.7	6490	81.3
R_S9	230.00	0.203	24.17	0.906	2130.3	2.1	6537	81.1
R_S10	230.00	0.204	24.18	0.907	2139.5	2.5	6525	81.3
R_S11	230.00	0.203	24.13	0.905	2126.0	1.8	6539	80.5
R_S12	230.00	0.202	24.01	0.909	2138.3	1.7	6610	81.2
R_S13	230.00	0.203	24.09	0.909	2132.7	1.7	6560	81.3
R_S14	230.00	0.204	24.21	0.911	2123.6	2.3	6553	82.0
R_S15	230.00	0.203	24.16	0.908	2124.6	1.7	6586	81.1
R_S16	230.00	0.203	24.13	0.909	2136.3	2.2	6531	81.5
R_S17	230.00	0.204	24.18	0.906	2123.6	1.7	6527	80.2
R_S18	230.00	0.202	24.01	0.909	2124.7	1.8	6607	82.0
R_S19	230.00	0.197	23.43	0.904	2133.8	1.9	6436	80.3
R_S20	230.00	0.201	23.81	0.906	2138.2	1.8	6587	81.0
Average	230.00	0.202	24.02	0.907	2129.8	1.905	6545	81.2

*Note: Color tolerance is based on IEC 6500K.

**Appendix 8 After 6000 hours Lumen Maintenance Data**

Sample No.	Initial Luminous Flux(lm)	After 6000 hours Life Test Luminous Flux(lm)	Lumen Maintenance
R_S1	2302.4	2129.3	92.48%
R_S2	2301.6	2134.6	92.74%
R_S3	2337.9	2131.1	91.15%
R_S4	2279.5	2125.3	93.24%
R_S5	2312.4	2139.2	92.51%
R_S6	2306.5	2132.5	92.46%
R_S7	2274.1	2127.0	93.53%
R_S8	2256.9	2106.0	93.31%
R_S9	2323.5	2130.3	91.68%
R_S10	2301.6	2139.5	92.96%
R_S11	2323.1	2126.0	91.52%
R_S12	2308.3	2138.3	92.64%
R_S13	2321.4	2132.7	91.87%
R_S14	2277.8	2123.6	93.23%
R_S15	2309.7	2124.6	91.99%
R_S16	2313.9	2136.3	92.32%
R_S17	2321.4	2123.6	91.48%
R_S18	2263.5	2124.7	93.87%
R_S19	2294.1	2133.8	93.01%
R_S20	2302.9	2138.2	92.85%
Average	2301.6	2129.8	92.54%

**Note: Color tolerance is based on IEC 6500K.*



Appendix 9 Photo of test sample

Details of: Overview for model T8RC24W

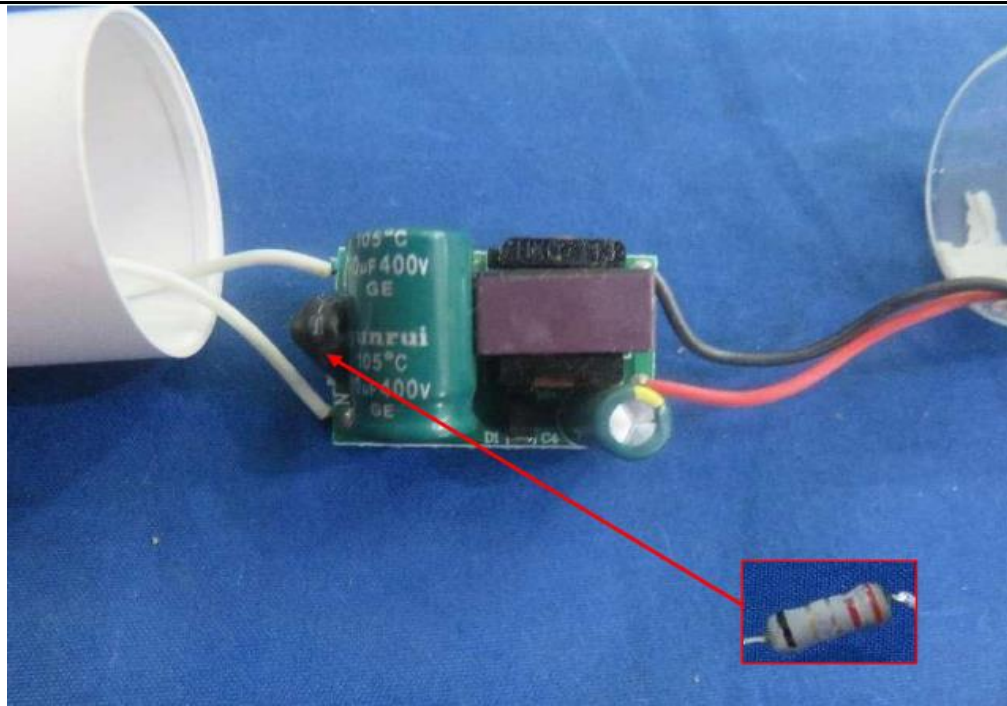


Details of: Overview for model T8RC24W

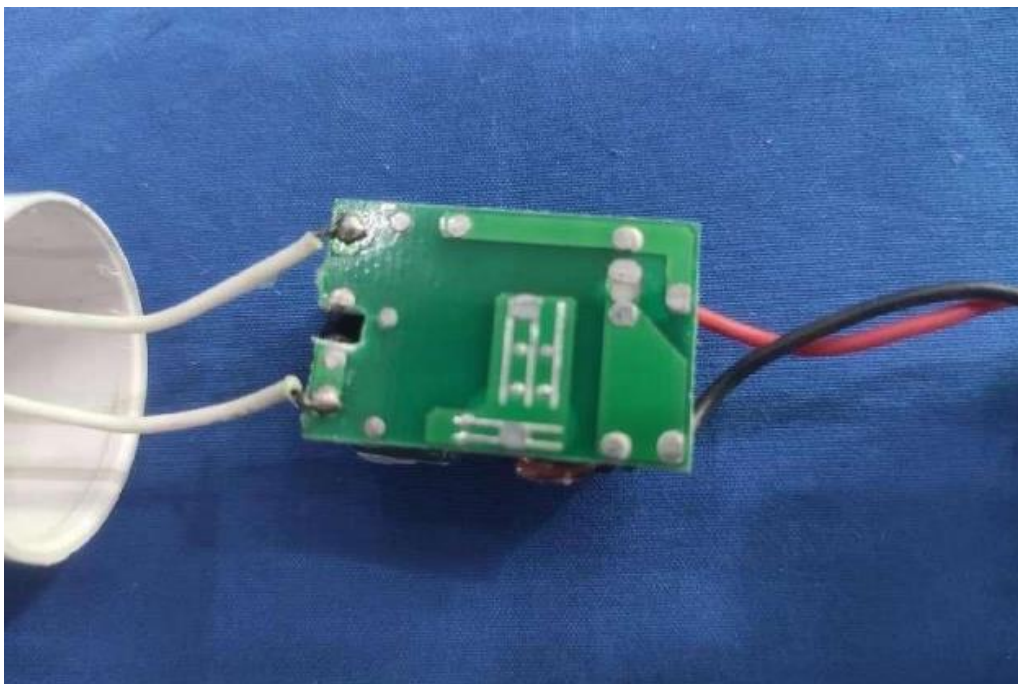




Details of: Overview for model T8RC24W

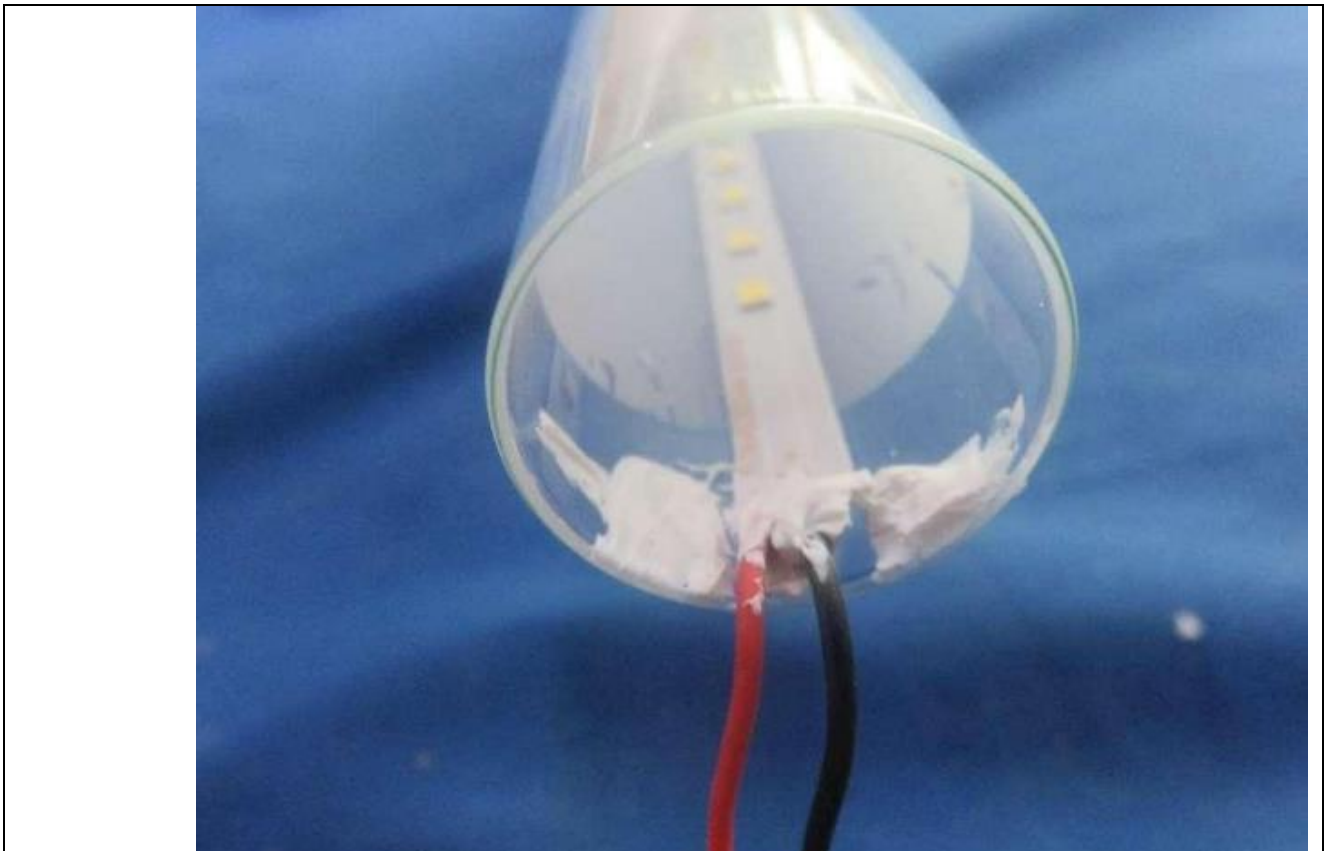


Details of: Overview for model T8RC24W





Details of: Overview for model T8RC24W



---End of test report---