



Test Report

Report No.: HB-123E-0551/21

Product : T8 LED Tube
Model/Type : T8-10, T8-18, T8-22
Brand Name : --
Applicant : Foshan Caishuo Opto-Electronic Tech. Co., Ltd.
Application No. : 20210727006
Date of Issue : 2021-09-02
Standards : Commission Regulation (EU) 2019/2020
Commission Regulation (EU) 2021/341

Zhongshan Bontek Compliance Testing Laboratory Co., Ltd.

Tongyi Industrial Zone Dongxing East Road, Guzhen Town
Zhongshan City, Guangdong Province, China

TEST REPORT

laying down ecodesign requirements for light sources and separate control gears pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012

Report No.	HB-123E-0551/21
Application No.	20210731007
Testing Laboratory	Zhongshan Bontek Compliance Testing Laboratory Co., Ltd.
Address	Tongyi Industrial Zone Dongxing East Road, Gu Zhen Town, Zhongshan City, Guang Dong Province, China
Applicant's name	Foshan Caishuo Opto-Electronic Tech. Co., Ltd.
Address	Room 502, Building 7, No. 194, Junyi Road, Changxing Industrial Zone, Junan Town, Shunde District, Foshan City, Guangdong Province, China
Test specification	
Standard(s)	Commission Regulation (EU) 2019/2020 Commission Regulation (EU) 2021/341
Test procedure	☐ Partial test ☒ Type test ☐ Verification test
Non-standard test method	N/A
Test Report Form No.	HB-5S-123E-1
TRF Originator	LTS
Master TRF	2021-05
Test item description	T8 LED Tube
Trade Mark	--
Manufacture	Same as applicant
Address	Same as applicant
Model/Type reference	T8-10, T8-18, T8-22
Ratings	220-240V~, 50/60Hz

Summary of testing:

This report is a type test report according to specific requirements:

- Commission Regulation (EU) 2019/2020
- Commission Regulation (EU) 2021/341
- Commission Regulation (EU) 2019/2015
- Commission Regulation (EU) 2021/340

Information on product and website is not considered in this report.

Until now, Lumen maintenance factor and Survival factor are under test. The products are found to comply with all other tests.

For Energy Efficiency classes, see page 7 for details.

As required by applicant, additional test of IES TM-21-11 was applied for projection of lumen maintenance.

Tested by (signature): Zhaoyi Deng

Reviewed by (signature).....: Lechun Guan

Approved by (signature): Zhaofu Peng

Date of issue.....: 2021-09-03

General remarks:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

“(see Appendix #)” 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.

Page 1 to 13 for test report

Page 14 to 17 for test data.

Page 18 for IES TM-21 test report

Page 19 for photo documentation

Possible test case verdicts:

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

Testing:

Date of receipt of test item: 2021-07-27

Date (s) of performance of tests.....: 2021-07-28 to 2021-08-31

Test item particulars:

EUT type.....: ☒ Light source ☐ Separate control gears
☐ Containing product is a light source
☐ Containing product with separable light source and/or separable control gear.

Light source type: ☐ CFL ☒ LED ☐ Halogen ☐ HID
☐ Metal halide ☐ Others: _____

Classification.....: ☐ Directional ☒ Non-directional
☒ Mains light source ☐ Non-mains light source
☐ Connected light source ☐ Colour-tuneable light source
☐ High-luminance light source

Rated voltage and frequency.....: 220-240V, 50/60Hz

Rated / nominal wattage (0,1W).....: See model list

Rated / nominal useful lumen (lm).....: See model list

Declared color temperature (K): 4000

Rated / nominal beam angle (°).....: N/A

Rated life (h): 20000

Rated colour rendering index: 80

Optimum use in standard condition
ta=25°C.....: ☒ Yes ☐ No

Dimmable ☐ Yes ☒ No

Application for outdoor / industrial: ☐ Yes ☒ No

Mercury content x,x mg: ☐ Yes _____mg ☒ No

Copy of marking plate:

(not provided by applicant)

General product information:

- The product is classified to non-directional mains light source.
- Rating: 220-240V, 50/60Hz, see model list below for details.

Model list:

Model	Rated input	Rated power	DF	Rated luminous flux	Rated CCT	CRI	R9
T8-10	220-240V~, 50/60Hz	10.0W	0.90	1000lm	4000K	≥80	≥1
T8-18		18.0W	0.90	2000lm	4000K	≥80	≥1
T8-22		22.0W	0.90	2400lm	4000K	≥80	≥1

(EU) 2019/2020			
Clause	Requirement - Test	Result - Remark	Verdict
ANNEX II	Ecodesign requirements		P
1	Energy efficiency requirements		P
(a)	For light source		P
	The declared power consumption P_{on} shall not exceed the maximum allowed power P_{onmax} : $P_{onmax} = C \times (L + \Phi_{use} / (F \times \eta)) \times R$		P
	C (correction factor)	1.08	—
	L (end loss factor)	1.5	—
	F (efficacy factor)	1.00	—
	η (threshold efficacy).....	120	—
	R (CRI factor)	1	—
	Calculated P_{onmax}	(see appended table)	P
	Standby power P_{sb} shall not exceed 0.5W		N/A
	Networked standby power P_{sb} shall not exceed 0.5W		N/A
(b)	For separate control gear		N/A
	Minimum energy efficiency at full-load shall in table shall apply		N/A
	No-load power P_{no} shall not exceed 0.5W		N/A
	Standby power P_{sb} shall not exceed 0.5W		N/A
	Networked standby power P_{sb} shall not exceed 0.5W		N/A
2	Functional requirements		P
	Below requirements shall be applied to light sources		P
	Colour rendering index ≥ 80	(see appended table)	P
	- exception for CRI<80		N/A
	Displacement factor at P_{on} for LED and OLED MLS	(see appended table)	P
	Lumen maintenance factor for LED and OLED	(under test)	N/A
	Survival factor for LED and OLED	(under test)	N/A
	Colour consistency for LED and OLED ≤ 6	(see appended table)	P
	Flicker for LED and OLED MLS, $P_{stLM} \leq 1$	(see appended table)	P
	Stroboscopic effect for LED and OLED MLS, SVM ≤ 0.9 (from 2024-09-01, ≤ 0.4)	(see appended table)	P
	- exception for light sources intended for use in outdoor applications, industrial application or other applications where allow a CRI<80		N/A
3.	Information requirements		N/A
(a)	Information to be displayed on the light source itself		N/A
	Useful luminous flux (except CTLS, LFL, CFLni, other FL, HID)		N/A
	Correlated colour temperature		N/A
	Beam angle		N/A

(EU) 2019/2020			
Clause	Requirement - Test	Result - Remark	Verdict
(b)	Information to be visibly displayed on the packaging		N/A
	(1) Light source placed on the market, not in a containing product		N/A
	(a) useful luminous flux, clearly indicating the angle		N/A
	(b) correlated colour temperature		N/A
	(c) beam angle		N/A
	(d) electrical interface details		N/A
	(e) the L ₇₀ B ₅₀ lifetime for LED and OLED light sources		N/A
	(f) the on-mode power		N/A
	(g) the standby power		N/A
	(h) the networked standby power		N/A
	(i) the colour rendering index		N/A
	(j) if CRI < 80, indication for intended use situation		N/A
	(k) if the light source is designed for optimum use in non-standard conditions		N/A
	(l) warning for dimming methods		N/A
	(m) warning if contain mercury		N/A
	(n) a warning that it shall not be disposed of as unsorted municipal waste.		N/A
	(2) Separate controlgear:		N/A
	(a) the maximum output power of the control gear for HL, LED and OLED, or the power of the light sources for FL and HID		N/A
	(b) the type of light sources		N/A
	(c) the efficiency in full-load		N/A
	(d) the no-load power		N/A
	(e) the standby power		N/A
	(f) the networked standby power		N/A
	(g) warning for dimming methods		N/A
	(h) a QR-code redirecting to a free-access website		N/A
(c)	Information to be visibly displayed on a free-access website of the manufacturer, importer or authorised representative		N/A
	(1) Separate control gears:		N/A
	(a) the information specified in point 3 (b)(2), except 3 (b)(2)(h);		N/A
	(b) the outer dimensions in mm		N/A
	(c) the mass in grams of the control gear,		N/A
	(d) instructions on how to remove lighting control parts and non-lighting parts or how to switch them off or minimise their power consumption during control-gear testing for market surveillance purposes		N/A

(EU) 2019/2020			
Clause	Requirement - Test	Result - Remark	Verdict
	(e) if the control gear can be used with dimmable light sources, a list of minimum characteristics that the light sources should have to be fully compatible with the control gear during dimming, and possibly a list of compatible dimmable light sources		N/A
	(f) recommendations on how to dispose of it at the end of its life in line with Directive 2012/19/EU		N/A
(d)	Technical documentation		N/A
	(1) separate control gears:		N/A
	The information specified in point 3 (c)(2) of this Annex shall also be contained in the technical documentation file drawn up for the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC.		N/A
(e)	Information for products specified in point 3 of Annex III		N/A
	The intended purpose shall be stated in the technical documentation and on all forms of packaging, product information and advertisement, together with an explicit indication that the light source or separate control gear is not intended for use in other applications.		N/A
	The technical documentation file drawn up for the purposes of conformity assessment, in accordance with Article 5 of this Regulation shall list the technical parameters that make the product design specific to qualify for the exemption.		N/A
	In particular for light sources indicated in point 3(p) of Annex III it shall be stated: 'This light source is only for use by photo sensitive patients. Use of this light source will lead to increased energy cost compared to an equivalent more energy efficient product.'		N/A

	Commission Delegated Regulation (EU) 2019/2015	P
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	Table: Energy efficiency classes for lamps		P
	Type of lamp..... :	☒ Non-directional ☐ Directional ☒ Mains light source ☐ Non-mains light source	—
	Applicable factor F _{TM} :	1.000	—
	Rated η _{TM} :	T8-10: 100.0 lm/W; T8-18: 111.1 lm/W; T8-22: 109.1 lm/W	—
	Measured η _{TM} :	T8-10: 105.8 lm/W; T8-18: 114.6 lm/W; T8-22: 112.2 lm/W	—
	Classification ¹⁾ :	T8-10: Class F; T8-18: Class E; T8-22: Class F	—
Energy efficiency class		Total mains efficacy η _{TM} (lm/W) η _{TM} = (Φ _{use} / P _{on}) × F _{TM}	
A (most efficient)		210 ≤ η _{TM}	
B		185 ≤ η _{TM} < 210	
C		160 ≤ η _{TM} < 185	
D		135 ≤ η _{TM} < 160	
E		110 ≤ η _{TM} < 135	
F		85 ≤ η _{TM} < 110	
G (least efficient)		η _{TM} < 85	
Remark: 1. Classification is according to rated value.			

Table		Product information sheet	
Supplier's name or trade mark:		Foshan Caishuo Opto-Electronic Tech. Co., Ltd.	
Supplier's address:		Room 502, Building 7, No. 194, Junyi Road, Changxing Industrial Zone, Junan Town, Shunde District, Foshan City, Guangdong Province, China	
Model identifier:		T8-10	
Type of light source:		Lamp	
Light source cap-type (or other electric interface)		G13	
Lighting technology used:		LED	Non-directional or directional: NDLS
Mains or non-mains:		MLS	Connected light source (CLS): No
Colour-tuneable light source:		No	Envelope: No
High luminance light source:		No	
Anti-glare shield:		No	Dimmable: No
Product parameters			
Parameter	Value	Parameter	Value
General product parameters:			
Energy consumption in on-mode (kWh/1 000 h)		10	Energy efficiency class F
Useful luminous flux (Φ_{use}), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)		1000 in sphere	Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set 4000
On-mode power (P_{on}), expressed in W		10.0	Standby power (P_{sb}), expressed in W and rounded to the second decimal --
Networked standby power (P_{net}) for CLS, expressed in W and rounded to the second decimal		--	Colour rendering index, rounded to the nearest integer, or the range of CRI values that can be set 80
Outer dimensions without separate control gear, lighting control parts and nonlighting control parts, if any (millimetre)	Height	28	Spectral power distribution in the range 250 nm to 800 nm, at full-load See attachment 1
	Width	600	
	Depth	28	

Claim of equivalent power	--	If yes, equivalent power (W)	--
		Chromaticity coordinates (x and y)	0.380 0.380
Parameters for directional light sources:			
Peak luminous intensity (cd)	--	Beam angle in degrees, or the range of beam angles that can be set	--
Parameters for LED and OLED light sources:			
R9 colour rendering index value	1	Survival factor	0.90
the lumen maintenance factor	0.95		
Parameters for LED and OLED mains light sources:			
displacement factor (cos ϕ 1)	0.90	Colour consistency in McAdam ellipses	6
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.	--	If yes then replacement claim (W)	--
Flicker metric (P_{st} LM)	0.1	Stroboscopic effect metric (SVM)	0.1

Table		Product information sheet	
Supplier's name or trade mark:		Foshan Caishuo Opto-Electronic Tech. Co., Ltd.	
Supplier's address:		Room 502, Building 7, No. 194, Junyi Road, Changxing Industrial Zone, Junan Town, Shunde District, Foshan City, Guangdong Province, China	
Model identifier:		T8-18	
Type of light source:		Lamp	
Light source cap-type (or other electric interface)		G13	
Lighting technology used:		LED	Non-directional or directional: NDLS
Mains or non-mains:		MLS	Connected light source (CLS): No
Colour-tuneable light source:		No	Envelope: No
High luminance light source:		No	
Anti-glare shield:		No	Dimmable: No
Product parameters			
Parameter	Value	Parameter	Value
General product parameters:			
Energy consumption in on-mode (kWh/1 000 h)		18	Energy efficiency class E
Useful luminous flux (Φ_{use}), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)		2000 in sphere	Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set 4000
On-mode power (P_{on}), expressed in W		18.0	Standby power (P_{sb}), expressed in W and rounded to the second decimal --
Networked standby power (P_{net}) for CLS, expressed in W and rounded to the second decimal		--	Colour rendering index, rounded to the nearest integer, or the range of CRI values that can be set 80
Outer dimensions without separate control gear, lighting control parts and nonlighting control parts, if any (millimetre)	Height	28	Spectral power distribution in the range 250 nm to 800 nm, at full-load See attachment 1
	Width	1200	
	Depth	28	

Claim of equivalent power	--	If yes, equivalent power (W)	--
		Chromaticity coordinates (x and y)	0.380 0.380
Parameters for directional light sources:			
Peak luminous intensity (cd)	--	Beam angle in degrees, or the range of beam angles that can be set	--
Parameters for LED and OLED light sources:			
R9 colour rendering index value	1	Survival factor	0.90
the lumen maintenance factor	0.95		
Parameters for LED and OLED mains light sources:			
displacement factor (cos ϕ 1)	0.90	Colour consistency in McAdam ellipses	6
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.	--	If yes then replacement claim (W)	--
Flicker metric (P _{st} LM)	0.1	Stroboscopic effect metric (SVM)	0.1

Table		Product information sheet	
Supplier's name or trade mark:		Foshan Caishuo Opto-Electronic Tech. Co., Ltd.	
Supplier's address:		Room 502, Building 7, No. 194, Junyi Road, Changxing Industrial Zone, Junan Town, Shunde District, Foshan City, Guangdong Province, China	
Model identifier:		T8-22	
Type of light source:		Lamp	
Light source cap-type (or other electric interface)		G13	
Lighting technology used:		LED	Non-directional or directional: NDLS
Mains or non-mains:		MLS	Connected light source (CLS): No
Colour-tuneable light source:		No	Envelope: No
High luminance light source:		No	
Anti-glare shield:		No	Dimmable: No
Product parameters			
Parameter	Value	Parameter	Value
General product parameters:			
Energy consumption in on-mode (kWh/1 000 h)		22	Energy efficiency class F
Useful luminous flux (Φ_{use}), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)		2400 in sphere	Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set 4000
On-mode power (P_{on}), expressed in W		22.0	Standby power (P_{sb}), expressed in W and rounded to the second decimal --
Networked standby power (P_{net}) for CLS, expressed in W and rounded to the second decimal		--	Colour rendering index, rounded to the nearest integer, or the range of CRI values that can be set 80
Outer dimensions without separate control gear, lighting control parts and nonlighting control parts, if any (millimetre)	Height	28	Spectral power distribution in the range 250 nm to 800 nm, at full-load See attachment 1
	Width	1200	
	Depth	28	

Claim of equivalent power	--	If yes, equivalent power (W)	--
		Chromaticity coordinates (x and y)	0.380 0.380
Parameters for directional light sources:			
Peak luminous intensity (cd)	--	Beam angle in degrees, or the range of beam angles that can be set	--
Parameters for LED and OLED light sources:			
R9 colour rendering index value	1	Survival factor	0.90
the lumen maintenance factor	0.95		
Parameters for LED and OLED mains light sources:			
displacement factor ($\cos \phi$)	0.90	Colour consistency in McAdam ellipses	6
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.	--	If yes then replacement claim (W)	--
Flicker metric (P_{st} LM)	0.1	Stroboscopic effect metric (SVM)	0.1

Attachment 1

Test Result

Table 1: Initial test result for light source												P
Sample No.	Input voltage (V)	P _{on} (W)	P _{sb} (W)	P _{net} (W)	DF	Useful lumen (lm)	η _{TM}	CCT (K)	CRI	SCDM	P _{stLM}	SVM
Model: T8-10												
1	230	9.89	N/A	N/A	0.9412	1052	106.4	3999	82.1	1.8	0.008	0.022
2	230	9.82	N/A	N/A	0.9380	1042	106.1	3999	82.1	2.3	0.008	0.022
3	230	9.87	N/A	N/A	0.9444	1040	105.4	4014	82.2	2.6	0.008	0.020
4	230	9.67	N/A	N/A	0.9418	1018	105.3	4047	82.3	1.8	0.008	0.023
5	230	9.85	N/A	N/A	0.9354	1040	105.6	3962	82.2	3.8	0.009	0.020
6	230	9.82	N/A	N/A	0.9365	1040	105.9	3996	82.0	2.4	0.009	0.021
7	230	9.73	N/A	N/A	0.9417	1034	106.3	3997	82.2	2.0	0.008	0.023
8	230	9.80	N/A	N/A	0.9406	1034	105.5	3999	82.0	2.5	0.009	0.018
9	230	9.84	N/A	N/A	0.9436	1045	106.2	4036	82.1	2.7	0.009	0.023
10	230	9.78	N/A	N/A	0.9446	1032	105.5	4061	82.0	1.2	0.009	0.019
Average value		9.81	N/A	N/A	0.9408	1038	105.8	4011	82.1	2.3	0.009	0.021
Rated value		10.0	N/A	N/A	0.90	1000	100.0	4000	80	6	0.1	0.1
Remark:												
1. Test condition: 230V, 50Hz.												
2. P _{onmax} = 10.62W												
3. Useful lumen = ☒ total lumen ☐ lumen in 120° cone ☐ lumen in 90° cone												
Model: T8-18												
1	230	17.69	N/A	N/A	0.9362	2039	115.3	4007	82.1	2.4	0.017	0.005
2	230	17.80	N/A	N/A	0.9402	2020	113.5	3989	82.2	2.6	0.015	0.005
3	230	17.71	N/A	N/A	0.9387	2028	114.5	4002	82.0	2.2	0.018	0.005
4	230	17.83	N/A	N/A	0.9401	2055	115.3	4039	82.2	1.6	0.018	0.006
5	230	17.67	N/A	N/A	0.9346	2008	113.6	4008	82.3	2.4	0.020	0.004
6	230	17.64	N/A	N/A	0.9345	2010	113.9	4070	82.3	1.0	0.017	0.004
7	230	17.77	N/A	N/A	0.9394	2033	114.4	4026	82.3	2.5	0.014	0.005
8	230	17.81	N/A	N/A	0.9380	2062	115.8	4018	82.2	2.7	0.014	0.006
9	230	17.84	N/A	N/A	0.9427	2024	113.5	3971	82.0	3.3	0.014	0.004
10	230	17.68	N/A	N/A	0.9370	2048	115.8	4056	82.2	1.7	0.014	0.006
Average value		17.74	N/A	N/A	0.9381	2033	114.6	4019	82.2	2.2	0.016	0.005
Rated value		18.0	N/A	N/A	0.90	2000	111.1	4000	80	6	0.1	0.1
Remark:												
1. Test condition: 230V, 50Hz.												
2. P _{onmax} = 19.62W												
3. Useful lumen = ☒ total lumen ☐ lumen in 120° cone ☐ lumen in 90° cone												

Attachment 1

Test Result

Table 1: Initial test result for light source												P
Sample No.	Input voltage (V)	P _{on} (W)	P _{sb} (W)	P _{net} (W)	DF	Useful lumen (lm)	η_{TM}	CCT (K)	CRI	SCDM	P _{stLM}	SVM
Model: T8-22												
1	230	21.78	N/A	N/A	0.9427	2444	112.2	4005	82.2	2.1	0.031	0.023
2	230	21.63	N/A	N/A	0.9418	2431	112.4	3997	82.1	2.1	0.016	0.009
3	230	21.82	N/A	N/A	0.9350	2452	112.4	3996	82.2	2.5	0.027	0.016
4	230	21.81	N/A	N/A	0.9346	2439	111.8	3976	82.2	2.1	0.032	0.022
5	230	21.67	N/A	N/A	0.9353	2433	112.3	3972	82.0	2.7	0.016	0.023
6	230	21.81	N/A	N/A	0.9402	2452	112.4	3961	82.3	2.6	0.017	0.024
7	230	21.77	N/A	N/A	0.9448	2442	112.2	3956	82.0	3.1	0.025	0.024
8	230	21.75	N/A	N/A	0.9414	2439	112.1	3948	82.3	3.7	0.018	0.013
9	230	21.76	N/A	N/A	0.9383	2439	112.1	3961	82.0	2.9	0.019	0.015
10	230	21.74	N/A	N/A	0.9444	2441	112.3	3967	82.3	2.2	0.030	0.008
Average value		21.75	N/A	N/A	0.9399	2441	112.2	3974	82.2	2.6	0.023	0.018
Rated value		22.0	N/A	N/A	0.90	2400	109.1	4000	80	6	0.1	0.1
Remark: 1. Test condition: 230V, 50Hz. 2. P _{onmax} = 23.22W 3. Useful lumen = ☒ total lumen ☐ lumen in 120° cone ☐ lumen in 90° cone												

Table 2: Initial test result for separate control gear										N/A
Sample No.	Input voltage (V)	Input current (A)	Input power (W)	Output voltage (V)	Output current (A)	Output power (W)	Energy efficiency	P _{no} (W)	P _{sb} (W)	P _{net} (W)
1										
2										
3										
Average value										
Remark: N/A										

Attachment 1

Test Result

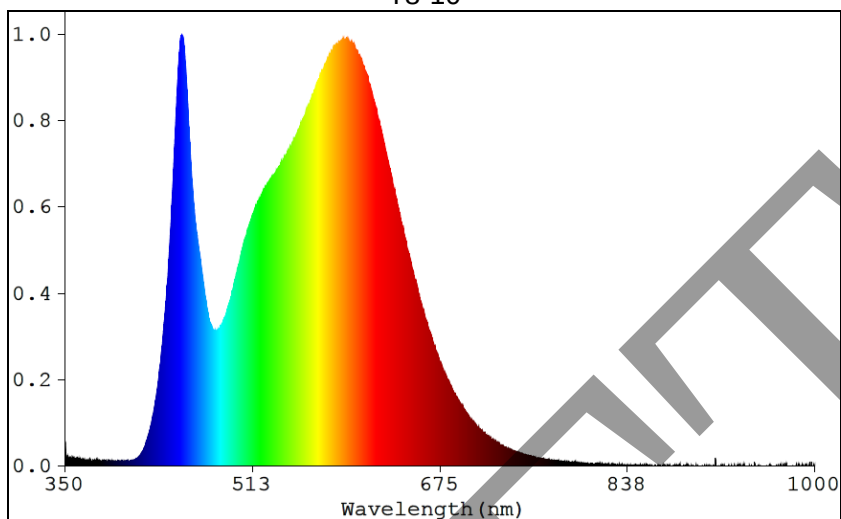
Table 3: Test result of lumen maintenance and lamp survival factor					N/A
Sample No.	Test voltage (V)	Φ_{total} (lm)		Lumen maintenance factor	Survival factor
		Initial	3000h		
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
Average value					
Remark: N/A					

Attachment 1

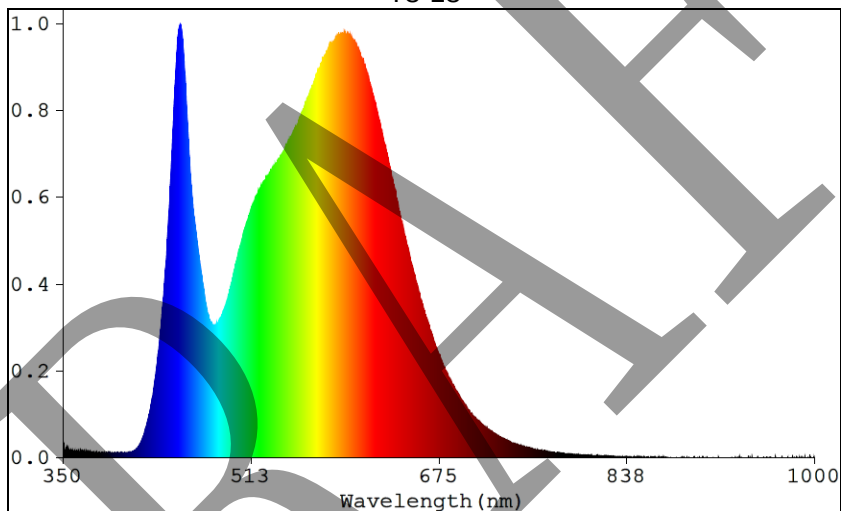
Test Result

Spectrum of sample 1#:

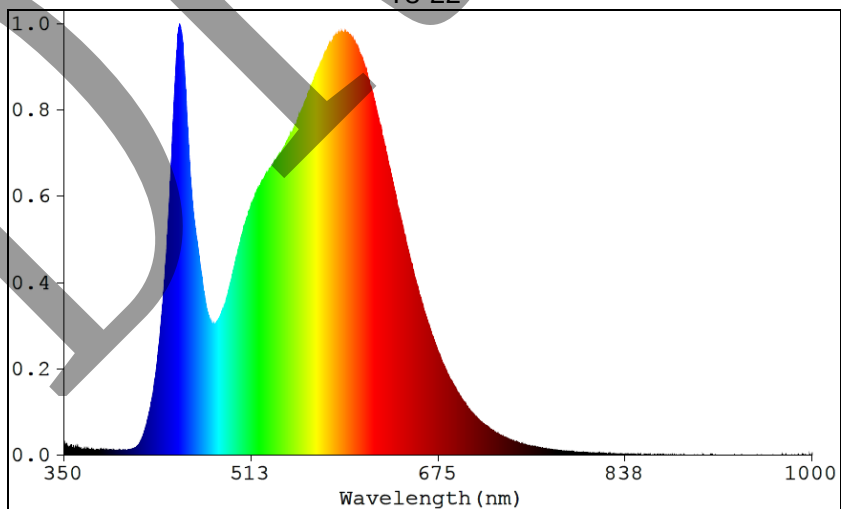
T8-10



T8-18



T8-22



Attachment 2

IES TM-21-11

Conditions

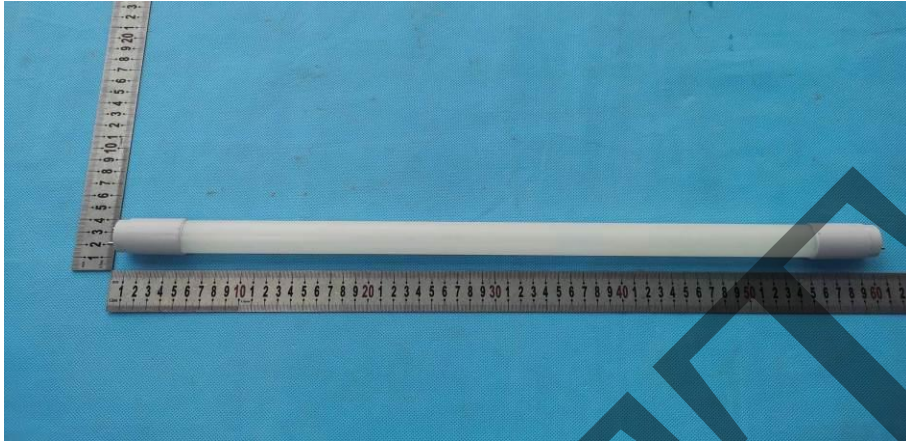
Description of Test Sample	
Rating	See model list
Exterior dimensions	See main report
Colour temperature	See model list
Information of LED chip	
Manufacturer	EVERLIGHT ELECTRONICS CO., LTD
Model	67-21S series
Rating	I _F : 60mA, V _F : 3V
LM-80 Test Details	
Total number of units tested	25 per case
Number of failures	0 per case
Test duration (h)	10000
Test drive current (mA)	60
Tested case temperature 1 (°C)	55
Tested case temperature 2 (°C)	85
Tested case temperature 3 (°C)	105
Remark: LM-80 test report (T-14-04-VLP-0038-TP) was issued by Reliability Lab, Everlight Electronics at 2016-06-28.	
In-Situ Inputs	
Drive current (mA)	Max. 50mA
In-situ case temperature (°C)	Max. 85°C
Percentage of initial lumens to project	70%

Result

Result at LM-80 test condition				
Interpolation Result (projection base on in-situ temperature)				
Time at which to estimate lumen maintenance (hours)	3000	10000	20000	30000
Lumen maintenance at time (%)	98.99	94.06	87.45	81.30
Reported L70(10K) at 85°C (h)	51000			

Attachment 3

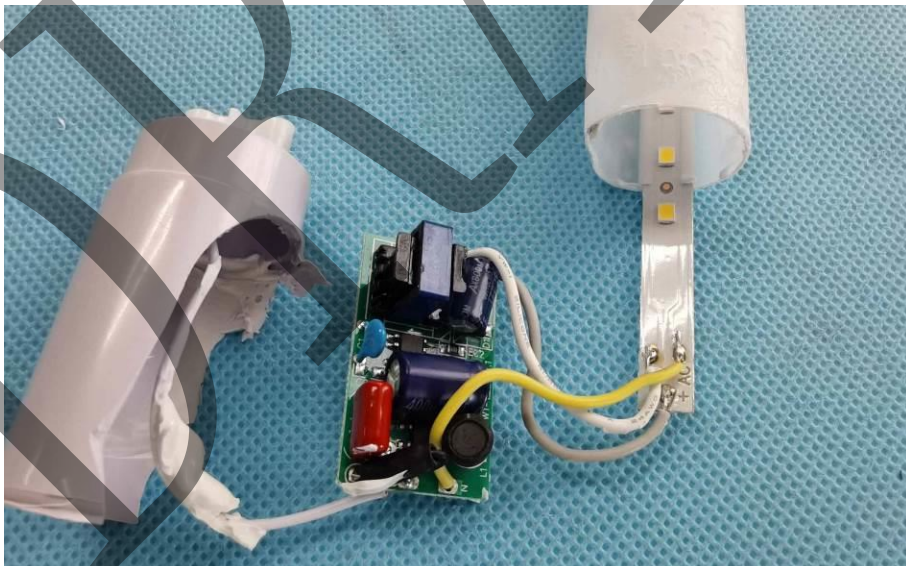
Photo Documentation



Picture 1: whole view of T8-10



Picture 2: whole view of T8-18 and T8-22



Picture 3: internal view

---- End of Test Report ----