



中国认可
国际互认
检测
TESTING
CNAS L5228



Test Report

Report No.: HB-123E-0395/24

Product : LED luminaire
Model/Type : See model list
Brand Name : N/A
Applicant : Zhuotai Sanitary Ware Co.,Ltd.
Application No. : 20240311006
Date of Issue : 2024-04-01
Standards : Commission Regulation (EU) 2019/2020
Commission Regulation (EU) 2021/341

Zhongshan Bontek Compliance Testing Laboratory Co., Ltd.
1-4/F., Annex Building 1, Huayi Tongyi Industrial Park Factory Area,
Caosandongxing Road, Guzhen, Zhongshan, Guangdong, China



TEST REPORT ErP verification of Ecodesign and Energy labelling requirement for Light Source Implementation measure (EU) 2019/2020 and (EU) 2019/2015	
Report No. :	HB-123E-0395/24
Application No. :	20240311006
Testing Laboratory :	Zhongshan Bontek Compliance Testing Laboratory Co., Ltd.
Address :	1-4/F., Annex Building 1, Huayi Tongyi Industrial Park Factory Area, Caosandongxing Road, Guzhen, Zhongshan, Guangdong, China
Applicant's name :	Zhuotai Sanitary Ware Co.,Ltd.
Address :	No.188, Lianxing Road, Baijiao Town, Doumen, Zhuhai
Test specification:	
Standards :	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-2
TRF Originator :	LTS
Master TRF :	2024-01
Test item description :	LED luminaire
Trade Mark(s) :	N/A
Manufacturer and address ... :	Same as applicant
Factory and address :	Same as applicant
Model/Type reference :	See model list
Ratings :	See model list

Summary of testing:

This report is a type test report according to the requirements of:

- 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, all tests were completed and the products are found to comply with all requirements.

For energy efficiency class, see details on page 12.

Tested by (signature).....: Zhaoyi Deng

Reviewed by (signature): Lechun Guan

Approved by (signature).....: Zhaofu Peng

Date of issue: 2024-04-01



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 point is used as the decimal separator.

Main report: Page 1 to 14 for test report;

Attachment 1: 15 to 17 for test data;

Attachment 2: Page 18 for photo documentation.

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.....: ☒ LED ☐ OLED ☐ CFL ☐ CFLni ☐ HL
☐ FL ☐ LFL ☐ Magnetic induction ☐ HID
☐ Other:

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

Dimmable.....: ☒ Dimmable ☐ Non- dimmable

Use of light source.....: ☒ Indoor ☐ Outdoor ☐ Industry

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

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

Rated voltage and frequency (V/Hz).....: See model list

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

Rated useful luminous flux (lm).....: See model list

Declared color temperature (K).....: See model list

Rated beam angle (°).....: N/A (non-directional)

Rated life time (h).....: 30000

Rated color rendering index.....: 80

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: 2023-10-10

Date (s) of performance of tests: 2023-10-10 to 2024-04-01

Copy of marking plate:

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(not considered)

General product information and other remarks:

1. The products are classified as "containing product with separable light source".
2. The light source can be adjusted to a color temperature of 3000-6500K through an external dimmer. The reference control settings are 3000K
3. According to requirement of applicant, the model RXD21298A1 2835-168D-500*8MM-12V-56R was chosen for full test at reference control settings and initial test was performed at 6500K.
4. The light source is non-directional non-mains light source.
5. For other details, see model list below.

Model list for separable light source

Model	Rated input	Rated power	Rated luminous flux	Range of CCT	CRI	R9
RXD21298A1 2835-168D-500*8MM-12V-56R	12VDC	4.5W	430lm	3000-6500K	80	1

Model list for containing product

Model	Rated input	Rated total power (W)	Rated power (W) for LED module	Light source
ZT22001	220-240VAC, 50/60Hz	108	55	RXD21298A1 2835-168D-500*8MM-12V-56R
ZT22001A		55	55	
ZT22001-1		100	55	
ZT22001-1A		55	55	
ZT22001-2		108	55	
ZT22001-2A		55	55	
ZT22002		105	52	
ZT22002A		52	52	
ZT22002-1		105	52	
ZT22002A-1		52	52	
ZT22002-2		97	52	
ZT22002A-2		52	52	
ZT22003		103	50	
ZT22003A		50	50	
ZT22003-1		103	50	
ZT22003A-1		50	50	
ZT22003-2		95	50	
ZT22003A-2		50	50	
ZT22004		89	47	
ZT22004A		47	47	

ZT22004-1	100	47
ZT22004A-1	47	47
ZT22004-2	92	47
ZT22004A-2	47	47
ZT22005	97	44
ZT22005A	44	44
ZT22005-1	89	44
ZT22005A-1	44	44
ZT22005-2	81	44
ZT22005A-2	44	44
ZT22006	87	42
ZT22006A	42	42
ZT22006-1	79	42
ZT22006A-1	42	42
ZT22006-2	79	42
ZT22006A-2	42	42
ZT22007	84	39
ZT22007A	39	39
ZT22007-1	76	39
ZT22007A-1	39	39
ZT22007-2	84	39
ZT22007A-2	39	39
ZT22008	62	35
ZT22008A	36	36
ZT22008-1	73	36
ZT22008A-1	36	36
ZT22008-2	64	36
ZT22008A-2	36	36
ZT22009	86	33
ZT22009A	33	33
ZT22009-1	86	33
ZT22009A-1	33	33
ZT22009-2	78	33
ZT22009A-2	33	33



ZT22010		83	30	
ZT22010A		30	30	
ZT22010-1		75	30	
ZT22010A-1		30	30	
ZT22010-2		67	30	
ZT22010A-2		30	30	
ZT22011		72	27	
ZT22011A		27	27	
ZT22011-1		69	27	
ZT22011A-1		27	27	
ZT22011-2		64	27	
ZT22011A-2		27	27	
ZT22011-3		55	27	
ZT22011-4		54	26	
ZT22012		67	25	
ZT22012A		25	25	
ZT22012-1		62	25	
ZT22012A-1		25	25	
ZT22012-2		61	24	
ZT22012A-2		24	24	
ZT22012-3		52	24	
ZT22015		60	23	
ZT22015A		23	23	
ZT22015-1		60	23	
ZT22015A-1		23	23	
ZT22015-2		60	23	
ZT22015A-2		23	23	
ZT22015-3		52	24	
ZT22015A-3		24	24	
ZT22016		58	21	
ZT22016A		21	21	
ZT22016-1		49	21	
ZT22016A-1		21	21	
ZT22016-2		50	22	

ZT22016-3		49	21	
ZT22016-4		49	21	
ZT22016-5		58	21	
ZT22016-6		45	21	
ZT22016-7		40	12	
ZT22016A-7		12	12	
ZT22017		32	19	
ZT22017-1		32	19	
ZT22017-2		32	19	
ZT22017-3		32	19	
ZT22017A		19	19	
ZT22018		49	21	
ZT22018-1		49	21	
ZT22018-2		49	21	
ZT22018A		21	21	
ZT22019		48	20	
ZT22019X		20	20	
ZT22019-1		48	20	
ZT22019-2		48	20	
ZT22019-3		48	20	
ZT22019-4		48	20	
ZT22019-5		48	20	
ZT22020		40	19	
ZT2202A		19	19	
ZT22020-1		40	19	
ZT22020-2		40	19	
ZT22020-3		40	19	
ZT22020-4		40	18	
ZT22020-5		40	18	
ZT22021		30	17	
ZT22021A		17	17	
ZT22021-1		30	17	
ZT22021-2		30	17	
ZT22021-3		30	17	



ZT22021-4		31	18	
ZT22021-5		29	16	
ZT22021-6		29	16	
ZT22021-7		28	15	
ZT22022		45	19	
ZT22022A		19	19	
ZT22022-1		45	19	
ZT22022-2		44	18	
ZT22023		29	16	
ZT22023A		16	16	
ZT22023-1		30	17	
ZT22023-2		28	15	
ZT22024		26	13	
ZT22024A		13	13	
ZT22025-1aa		30	17	
ZT22025A-1aa		17	17	
ZT22026-1aa		48	20	
ZT22026A-1aa		20	20	
ZT22027-1aa		58	21	
ZT22027A-1aa		21	21	
ZT22028-1aa		30	14	
ZT22028A-1aa		14	14	
ZT22029-1aa		38	17	
ZT22029A-1aa		17	17	
ZT22030-1aa		47	19	
ZT22030A-1aa		19	19	
Remark: the place holder "aa" can be 00-99, stand for different decorative pattern on the mirror				

(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).....:	1.00	—
	L (end loss factor).....:	1.5	—
	F (efficacy factor).....:	1.00	—
	η (threshold efficacy).....:	120	—
	R (CRI factor).....:	1.00	—
	Calculated P_{onmax}:	(see appended table)	P
	Standby power P_{sb} shall not exceed 0.5W	(see appended table)	N/A
	Networked standby power P_{net} shall not exceed 0.5W	(see appended table)	N/A
(b)	For separate control gear		N/A
	Minimum energy efficiency at full-load shall in table shall apply	(see appended table)	N/A
	No-load power P_{no} shall not exceed 0.5W	(see appended table)	N/A
	Standby power P_{sb} shall not exceed 0.5W	(see appended table)	N/A
	Networked standby power P_{net} shall not exceed 0.5W	(see appended table)	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		N/A
	Lumen maintenance factor for LED and OLED	(see appended table)	P
	Survival factor for LED and OLED	(see appended table)	P
	Colour consistency for LED and OLED ≤ 6	(see appended table)	P
	Flicker for LED and OLED MLS, $P_{stLM} \leq 1$		N/A
	Stroboscopic effect for LED and OLED MLS, $SVM \leq 0.9$ (from 2024-09-01, ≤ 0.4)		N/A
	- 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

(EU) 2019/2020			
Clause	Requirement - Test	Result - Remark	Verdict
	Useful luminous flux (except CTLS, LFL, CFLni, other FL, HID)		N/A
	Correlated colour temperature		N/A
	Beam angle		N/A
(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

(EU) 2019/2020			
Clause	Requirement - Test	Result - Remark	Verdict
	(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
	(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
	Table: Energy efficiency classes for lamps		P
	Model: RXD21298A1 2835-168D-500*8MM-12V-56R		—
	Type of lamp.....:	☐ Directional light source ☒ Non-directional light source ☐ Mains light source ☒ Non-mains light source	—
	Applicable factor F _{TM}:	0.926	—
	Rated η _{TM} (lm/W).....:	88.5	—
	Measure η _{TM} (lm/W).....:	93.9 at 3000K 98.3 at 6500K	—
	Classification ¹⁾:	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 of energy efficiency is according to rated value.			

Table		Product information sheet	
Supplier's name or trade mark:		Zhuotai Sanitary Ware Co.,Ltd.	
Supplier's address:		No.188, Lianxing Road, Baijiao Town, Doumen, Zhuhai	
Model identifier:		RXD21298A1 2835-168D-500*8MM-12V-56R	
Type of light source:		LED	
Light source cap-type (or other electric interface)		Connecting leads	
Lighting technology used:		LED	Non-directional or directional: NDLS
Mains or non-mains:		NMLS	Connected light source (CLS): No
Colour-tuneable light source:		No	Envelope: No
High luminance light source:		No	
Anti-glare shield:		No	Dimmable: Yes
Product parameters			
Parameter		Value	Parameter
General product parameters:			
Energy consumption in on-mode (kWh/1 000 h), rounded up to the nearest integer		5	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°)		430 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 3000-6500K
On-mode power (P_{on}), expressed in W		4.5	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	500	Spectral power distribution in the range 250 nm to 800 nm, at full-load See "Photometric test record"
	Width	8	
	Depth	1	
Claim of equivalent power		-	If yes, equivalent power (W) -

		Chromaticity coordinates (x and y)	0.435 0.403
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	0.96		
Parameters for LED and OLED mains light sources:			
displacement factor (cos ϕ_1)	-	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 (Pst LM)	-	Stroboscopic effect metric (SVM)	-

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	SDCM	P _{st} LM	SVM
Model: RXD21298A1 2835-168D-500*8MM-12V-56R (tested on 3000K)												
1	12	4.34	N/A	N/A	N/A	439.5	93.9	2993	81.6	1.3	N/A	N/A
2	12	4.33	N/A	N/A	N/A	439.5	93.9	2992	81.7	1.2	N/A	N/A
3	12	4.34	N/A	N/A	N/A	442.1	94.4	2992	81.4	1.3	N/A	N/A
4	12	4.34	N/A	N/A	N/A	440.2	93.9	2999	81.8	1.3	N/A	N/A
5	12	4.34	N/A	N/A	N/A	444.4	94.8	2990	81.6	1.2	N/A	N/A
6	12	4.32	N/A	N/A	N/A	439.7	94.2	2996	81.4	1.4	N/A	N/A
7	12	4.35	N/A	N/A	N/A	440.8	93.9	2999	81.4	1.5	N/A	N/A
8	12	4.36	N/A	N/A	N/A	442.1	93.8	2996	81.5	1.3	N/A	N/A
9	12	4.36	N/A	N/A	N/A	435.3	92.4	2995	81.5	1.5	N/A	N/A
10	12	4.37	N/A	N/A	N/A	444.7	94.3	2992	81.7	1.3	N/A	N/A
Average value		4.35	N/A	N/A	N/A	440.8	93.9	2994	81.6	1.3	N/A	N/A
Rated value		4.5	N/A	N/A	N/A	430	88.5	3000	80	6	0.1	0.1
Remark: 1. Test condition: 12VDC. 2. P _{onmax} = 5.08 W 3. Useful lumen = ☒ total lumen ☐ lumen in 120° cone ☐ lumen in 90° cone												
Model: RXD21298A1 2835-168D-500*8MM-12V-56R (tested on 6500K)												
1	12	4.19	N/A	N/A	N/A	446.5	98.7	6392	82.3	0.7	N/A	N/A
2	12	4.18	N/A	N/A	N/A	444.3	98.4	6395	82.5	0.7	N/A	N/A
3	12	4.18	N/A	N/A	N/A	446.4	98.9	6399	82.5	0.8	N/A	N/A
4	12	4.20	N/A	N/A	N/A	442.8	97.6	6398	82.5	0.6	N/A	N/A
5	12	4.19	N/A	N/A	N/A	446.8	98.6	6392	82.5	0.7	N/A	N/A
6	12	4.19	N/A	N/A	N/A	443.1	97.8	6390	82.5	0.8	N/A	N/A
7	12	4.18	N/A	N/A	N/A	442.3	98.1	6393	82.5	0.9	N/A	N/A
8	12	4.22	N/A	N/A	N/A	444.8	97.6	6393	82.5	0.8	N/A	N/A
9	12	4.20	N/A	N/A	N/A	442.8	97.7	6396	82.2	0.7	N/A	N/A
10	12	4.20	N/A	N/A	N/A	449.9	99.2	6391	82.5	0.8	N/A	N/A
Average value		4.19	N/A	N/A	N/A	445.0	98.3	6394	82.4	0.7	N/A	N/A
Rated value		4.5	N/A	N/A	N/A	430	88.5	6500	80	6	N/A	N/A
Remark: 1. Test condition: 12VDC. 2. P _{onmax} = 5.08 W 3. Useful lumen = ☒ total lumen ☐ lumen in 120° cone ☐ lumen in 90° cone												

Attachment 1: Test Result

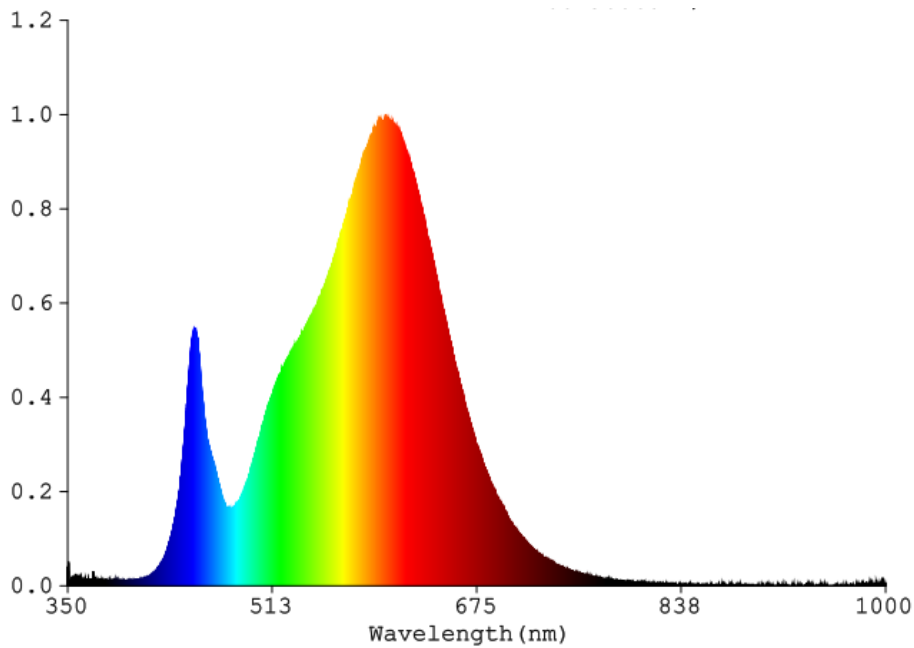
Table 2: Initial test result for separate control gear										N/A
Sample No.	Input voltage (V)	Input current (A)	Input power (W)	Output voltage (V)	Output current (A)	Output power (W)	Energy efficiency	P _{no} (W)	P _{sb} (W)	P _{net} (W)
1	--	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--	--	--
Average value		--	--	--	--	--	--	--	--	--
Remark:										
1. Output is setting to full load (--).										
2. Required minimum energy efficiency=--										

Table 3: Test result of lumen maintenance and lamp survival factor					P
Sample No.	Test voltage (V)	Φ_{total} (lm)		Lumen maintenance factor	Survival factor ²⁾
		Initial	3600h ¹⁾		
Model: RXD21298A1 2835-168D-500*8MM-12V-56R					
1	12	439.5	436.7	99.37%	S
2	12	439.5	435.8	99.16%	S
3	12	442.1	438.2	99.12%	S
4	12	440.2	437.1	99.30%	S
5	12	444.4	440.0	99.02%	S
6	12	439.7	435.5	99.05%	S
7	12	440.8	436.0	98.93%	S
8	12	442.1	437.3	98.92%	S
9	12	435.3	431.7	99.17%	S
10	12	444.7	440.0	98.94%	S
Average value		440.8	436.8	99.10%	100%
Remark:					
1. For the aging test, the product is power on 150min and power off 30min, total 1200 cycle. 3600h is total test time and actual operation time is 3000h.					
2. “S” means the lamp is survived when the cycles reached. “F” means the lamp failure when the cycles reached.					
3. $X_{LMF,MIN}\%$ = 96%					

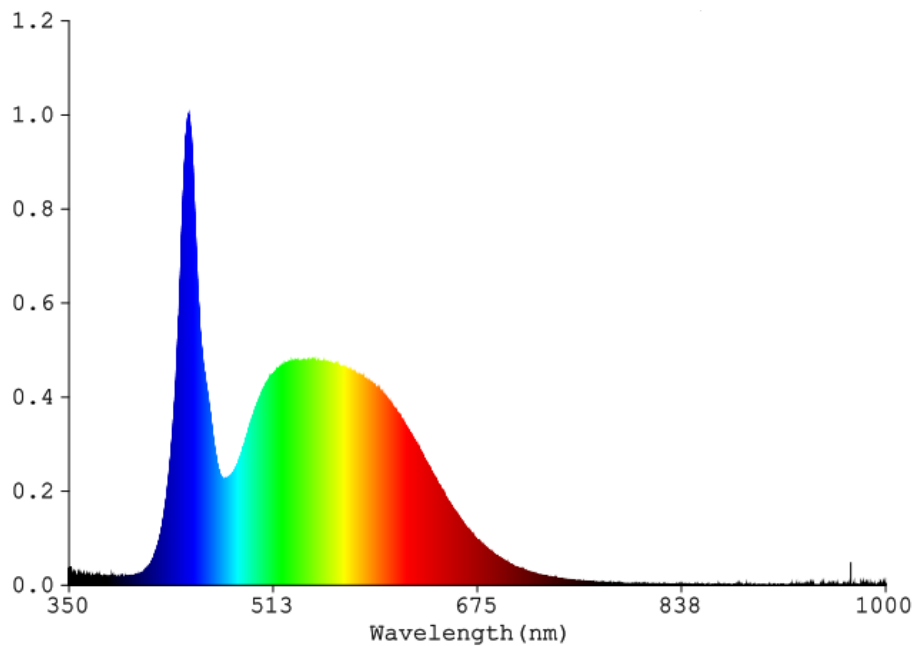
Attachment 1: Test Result

Photometric test record

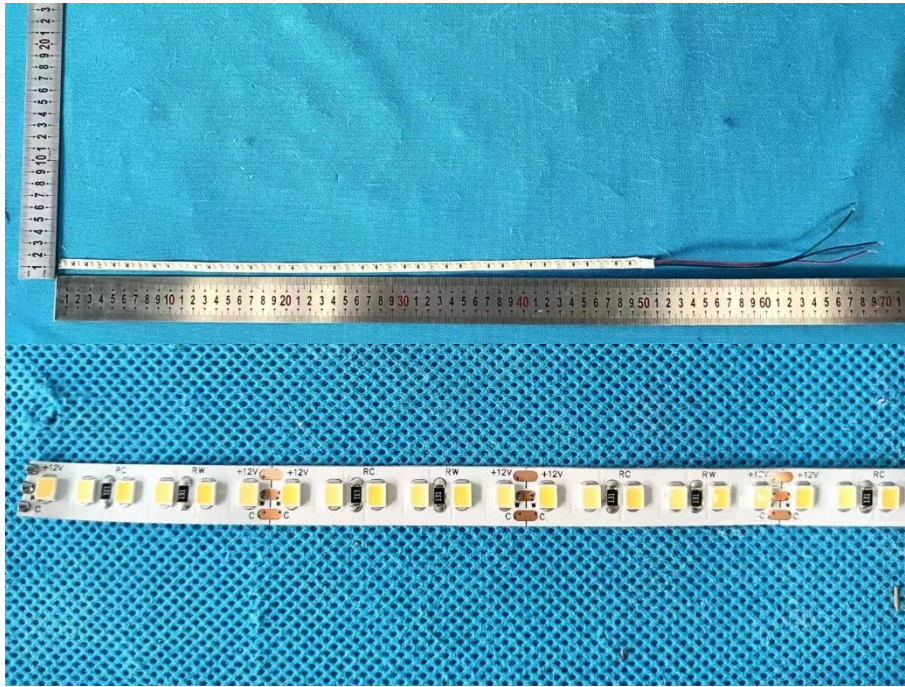
Test on 3000K



Tested on 6500K



Attachment 2: Photo Documentation



Picture 1: whole view of light source

--- End of Report ---