

Report reference No: RDG190429050-SF	
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Approved by (+ signature)	Project Engineer: Harrison Huang <i>Harrison Huang</i>
Date of issue	2019-04-30
Testing laboratory	Bay Area Compliance Laboratories Corp. (Dongguan)
Address	No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China
Testing location	Same as above
Applicant	Guangzhou Tianxin Photoelectric Co., Ltd.
Address	#56 Magangling Shima Village Junhe Street Baiyun District Guangzhou P.R.China 510440
Standard	IEC 62471:2006 EN 62471:2008
Test sample(s) received.....	2018-06-07
Test in period.....	2018-06-11
Procedure deviation	N.A.
Non-standard test method	N.A.
<p>The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).</p>	
Type of test object	Tunable White COB Series
Trademark	N.A.
Model/type reference	1512SW
Manufacturer.....	Guangzhou Tianxin Photoelectric Co., Ltd. #56 Magangling Shima Village Junhe Street Baiyun District Guangzhou P.R.China 510440
Rating	Input: 34Vdc-37Vdc, 350mA
Copy of marking plate:	
None	

Tested lamp: Tunable White COB Series
 Tested lamp system: N.A

 Lamp cap: N.A
 Bulb.....: N.A
 Rated of the lamp: See rating
 Furthermore marking on the lamp.....: N.A.
 Seasoning of lamps according EN standard: No seasoning
 Used measurement instrument.....: See appendix B for details
 Temperature by measurement.....: 25.5°C
 Information for safety use.....: N.A

:
 -test case does not apply to the test object.....:N(.A.)
 -test object does meet the requirement.....:P(ass)
 -test object does not meet the requirement.....:F(ail)

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 Enclosure #)" 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.
 List of test equipment must be kept on file and available for review.

"EUT" as referred in this report is Tunable White COB Series. Input: 34Vdc-37Vdc, 350mA.

IEC/EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict
	Operation of the test lamp shall be provided in accordance with:		P
	– the appropriate EN lamp standard, or		N
	– the manufacturer' s recommendation		P
5.1.5	Lamp system operation		N
	The power source for operation of the test lamp shall be provided in accordance with:		N
	– the appropriate EN standard, or		N
	– the manufacturer' s recommendation		N
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.		P
	Maximum aperture diameter 50 mm.		P
	The measurement shall be made in that position of the beam giving the maximum reading.		P
	The measurement instrument is adequate calibrated.	See appendix B	P
5.2.2	Radiance measurements		P
5.2.2.1	Standard method		P
	The measurements made with an optical system.		P
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.		P
5.2.2.2	Alternative method		N
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.		N
5.2.3	Measurement of source size		P
	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source.	$\alpha = 0.0435$	P
5.2.4	Pulse width measurement for pulsed sources		N
	The determination of Δt , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		N
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.		N
5.3.2	Calculations		P

IEC/EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N
	– an actinic ultraviolet hazard (ES) within 1000 s exposure, nor		N
	– a near ultraviolet hazard (EUVA) within 100 s, nor		N
	– a retinal blue-light hazard (LB) within 0,25 s (aversion response), nor		N
	– a retinal thermal hazard (LR) within 0,25 s (aversion response), nor	r	N
	– an infrared radiation hazard for the eyzn infra00W1 2uv72 2sh1-.0105 (EUVAase), nor		

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IEC/EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict

Spectral weighting function for assessing ultraviolet hazards for skin and eye			-
200	0,030	313*	0,006
205	0,051	315	0,003
210	0,075	316	0,0024
215	0,095	317	0,0020
220	0,120	318	0,0016
225	0,150	319	0,0012
230	0,190	320	0,0010
235	0,240	322	0,00067
240	0,300	323	0,00054
245	0,360	325	0,00050
250	0,430	328	0,00044
254*	0,500	330	0,00041
255	0,520	333*	0,00037
260	0,650	335	0,00034
265	0,810	340	0,00028
270	1,000	345	0,00024
275	0,960	350	0,00020
280*	0,880	355	0,00016
285	0,770	360	0,00013
290	0,640	365*	0,00011
295	0,540	370	0,000093
297*	0,460	375	0,000077
300	0,300	380	0,000064
303*	0,120	385	0,000053
305	0,060	390	0,000044
308	0,026	395	0,000036
310	0,015	400	0,000030

¹ Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.

* Emission lines of a mercury discharge spectrum.

IEC/EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict
	Spectral weighting functions for assessing retinal hazards from broadband optical sources		-
	300	0,01	-
	305	0,01	-
	310	0,01	-
	315	0,01	-
	320	0,01	-
	325	0,01	-
	330	0,01	-
	335	0,01	-
	340	0,01	-
	345	0,01	-
	350	0,01	-
	355	0,01	-
	360	0,01	-
	365	0,01	-
	370	0,01	-
	375	0,01	-
	380	0,01	0,1
	385	0,013	0,13
	390	0,025	0,25
	395	0,05	0,5
	400	0,10	1,0
	405	0,20	2,0
	410	0,40	4,0
	415	0,80	8,0
	420	0,90	9,0
	425	0,95	9,5
	430	0,98	9,8
	435	1,00	10,0
	440	1,00	10,0
	445	0,97	9,7
	450	0,94	9,4
	455	0,90	9,0
	460	0,80	8,0
	465	0,70	7,0
	470	0,62	6,2
	475	0,55	5,5
	480	0,45	4,5
	485	0,40	4,0
	490	0,22	2,2
	495	0,16	1,6
	500-600	$10^{[(450-\lambda)/50]}$	1,0
	600-700	0,001	1,0
	700-1050	0,013	$10^{[(700-\lambda)/500]}$
	1050-1150	0,025	0,2
	1150-1200	0,05	$0,2 \cdot 100 \cdot 0,2^{(1150-\lambda)}$
	1200-1400	0,10	0,02

* Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.

IEC/EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict

For IEC 62471:

Table 6.1	Emission limits for risk groups of continuous wave lamps		P
Risk			

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IEC/EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict

For EN 62471:

Table 6.1	Emission limits for risk groups of continuous wave lamps based on Directive(2006/25/EC)								P
Risk	Action spectrum	Units	Symbol	Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	Suv(λ)	W.m ⁻²	E _S	0.001	-	0.003	4.3x10 ⁻⁴	0.03	-
Near UV		W.m ⁻²	E _{UVA}	0.33	-	33	1.3x10 ⁻³	100	-
Blue light	B(λ)	W.m ⁻² .sr ⁻¹	L _B	100	-	10000	8.63x10 ³	4000000	-
Blue light,small source	B(λ)	W.m ⁻²	E _B	0.01	-	1.0	-	400	-
Retinal thermal	R(λ)	W.m ⁻² .sr ⁻¹	L _R	28000/ α ($\alpha=0.0435$)	-	28000/ α ($\alpha=0.0435$)	1.1x10 ⁵	71000/ α ($\alpha=0.0435$)	-
Retinal thermal, Weak visual stimulus**	R(λ)	W.m ⁻² .sr ⁻¹	L _{IR}	6000/ α ($\alpha=0.0435$)	-	6000/ α ($\alpha=0.0435$)	4.7 x10 ¹	6000/ α ($\alpha=0.0435$)	-
IR radiation Eye		W.m ⁻²	E _{IR}	100	-	570	4.4	3200	-

* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.

** Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2

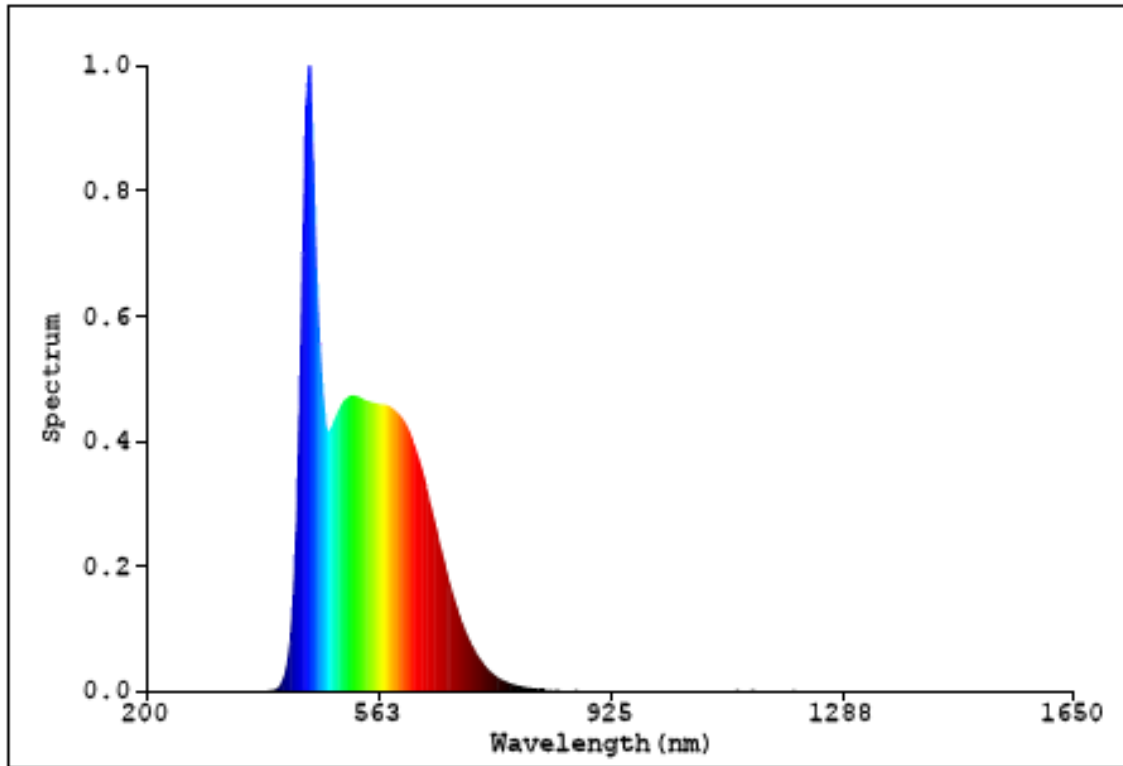
The applicance apertuer diameters: see 4.2.1

The limitations for the angular subtenses: see 4.2.2

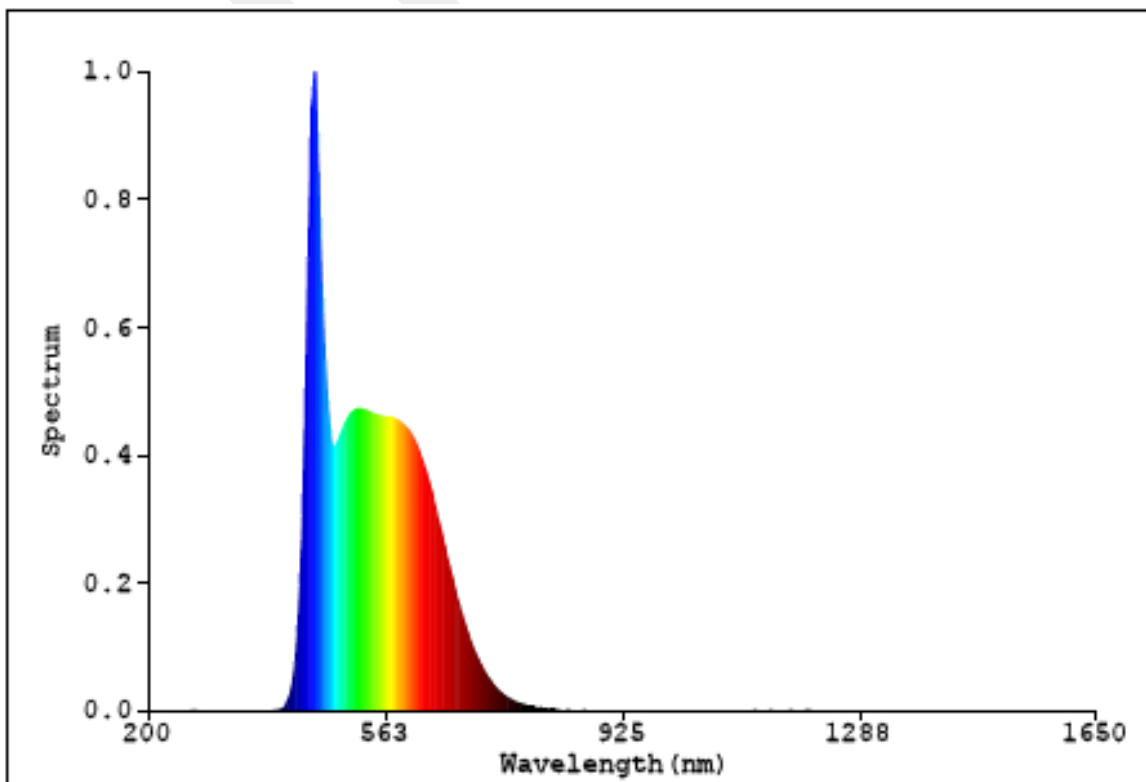
The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5

Figure of Spectral distribution

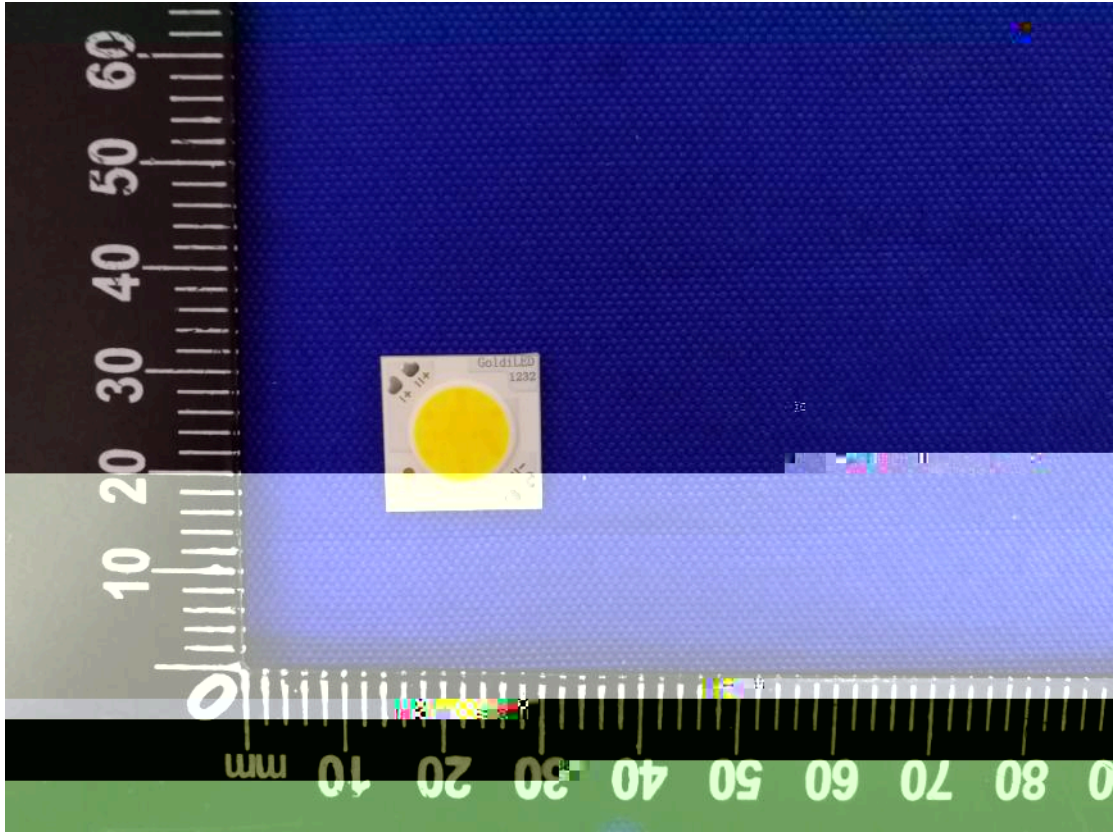
For IEC 62471



For EN 62471



Appendix A - EUT Photos



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Appendix B - Test equipment list

