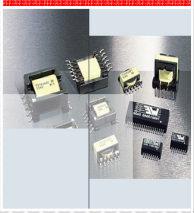
2013



Test Report

Photobiological Safety of Lamps and Lamp System

Kind of Product:LED Match Code: WL-SMCW

Match Code	Size	Models	Description
WL-SWCW	0805	150080BS75000	SMD mono-color Chip
WL-SWCW	0603	150060BS75000	SMD mono-color Chip
WL-SWCW	1206	150120BS75000	SMD mono-color Chip

Notes: these three sizes are all LED mono-color chips, and the solutions are the same among them.

Size: 0805

Model: 150080BS75000

Manufacturer: Würth Elektronik eiSos GmbH & Co. KG
EMC & Inductive Solutions
Max-Eyth-Str. 1
74638 Waldenburg
Germany

Test results of Photobiological Safety of Lamps and Lamp System

Specification	Result
EN 62471:2008	Low Risk

Find test summary on page 14

Referee: Oezguer, Harun
Company: Würth Elektronik eiSos GmbH & Co. KG
Date of issue: 2013-08-20

WÜRTH ELEKTRONIK

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Würth Elektronik eiSos GmbH & Co. KG, Max-Eyth-Str.1, D- 74638 Waldenburg
Tel.: ++49 (0) 7942 / 945-0, Fax.: ++49 (0) 7942 / 945-460

Identification of the Test Laboratory

Third Testing Party: **TÜV Rheinland (Shenzhen) Co., Ltd**

Testing Laboratory Address: No. 199 Kezhu Road, Guangzhou Science City510663 Guangzhou China

Testing Engineer: Blair Wang

Contact address: Tel: +86 (0) 755-8268-1269
eMail: blair.wang@sz.chn.tuv.com
Homepage: www.tuv.com

1.Description of the Device Under Test (DUT)

Date of receipt of test sample: 2013-08-01

Testing Start Date: 2013-08-10

Testing End: 2013-08-11

Number of received/tested samples: 2pcs 150080BS75000

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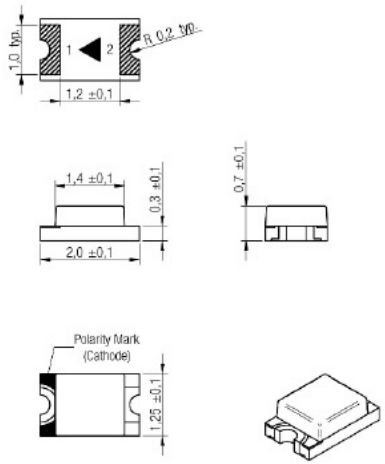
1.1 Technical data of the component

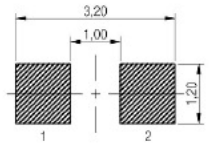
more than you expect

A Dimensions: [mm]



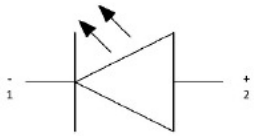
Scale - 10:1

B Recommended land pattern: [mm]



Scale - 10:1

C Schematic:



WÜRTH ELEKTRONIK

D Absolute Maximum Ratings (Ambient Temperature 25°C):

Properties	Test conditions		Value	Unit
Power dissipation		P_{Diss}	105	mW
Peak Forward Current	duty/10@1kHz	$I_{F\ Peak}$	100	mA
Continuous Forward Current		I_F	30	mA
Reverse Voltage		V_{Rev}	5	V
ESD Threshold/ Human Body Modell		$V_{ESD\ HBM}$	1000	V

E General information:

- Operating temperature: -40°C to +85°C
- Storage temperature (sealed bag): -40°C to +85°C; 60% RH max.

Optical Properties:

Properties	Value
Chip Technology	InGaN
Emitting Color	Blue
Lens Type	Chip LED

REV	DATE	BY	CHECKED
2.2	2013-04-10	SSt	SSt
2.1	2012-12-10	SSt	SSt
2.0	2012-11-05	SSt	HOe
1.0	2011-09-01	SSt	PLD

Projection

Würth Elektronik eiSos GmbH & Co. KG
EMC & Inductive Solutions
Max-Eyth-Str. 1
74638 Waldenburg
Germany
Tel. +49 (0) 79 42 945 - 0
www.we-online.com
eiSos@we-online.com

DESCRIPTION

WL-SMCW SMD mono-color chip LED waterclear

Order.- No.

150080BS75000

COMPLIANT RoHS&REACh HALOGENFREE

SIZE /4

Size: 0805

more than you expect

WÜRTH ELEKTRONIK

D Electrical & Optical Properties:

Properties	Test conditions		Value			Unit
			min.	typ.	max.	
Peak Wavelength	20 mA	λ_{Peak}		465		nm
Dominant wavelength	20 mA	λ_{Dom}		470		nm
Luminous Intensity	20 mA	I_V	90	145		mcd
Forward voltage	20 mA	V_F		3.2	3.5	V
Spectral Bandwidth	20 mA	$\Delta\lambda$		25		nm
Reverse Current	5 V	I_{Rev}			10	µA
Viewing angle	20 mA	$2\theta_{50\%}$		140		°

2.2	2013-04-10	SSt	SSt
2.1	2012-12-10	SSt	SSt
2.0	2012-11-05	SSt	HOe
1.0	2011-09-01	SSt	PLD
REV	DATE	BY	CHECKED

Projection

Würth Elektronik eiSos GmbH & Co. KG
EMC & Inductive Solutions
Max-Eyth-Str. 1
74638 Waldenburg
Germany
Tel. +49 (0) 79 42 945 - 0
www.we-online.com
eiSos@we-online.com

DESCRIPTION

WL-SMCW SMD mono-color chip LED waterclear

Order.- No.

150080BS75000

COMPLIANT RoHS&REACh HALOGENFREE

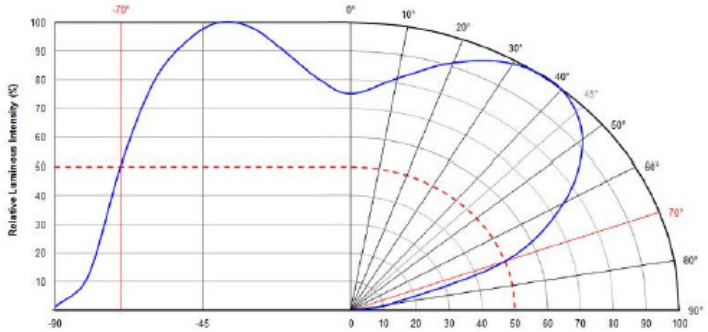
SIZE: A4

Size: 0805

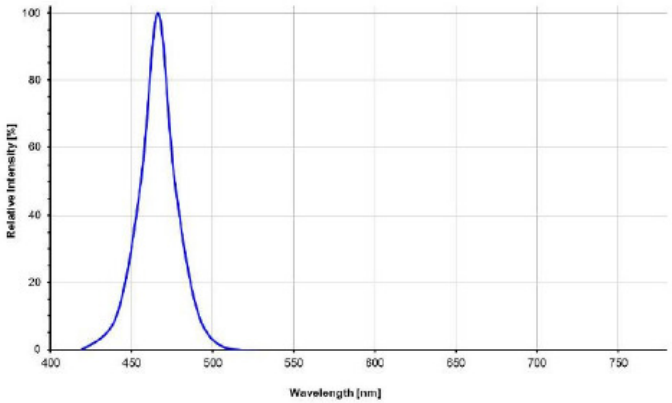
more than you expect

WÜRTH ELEKTRONIK

F Viewing Angle:



F Spectral:



REV	DATE	BY	CHECKED
2.2	2013-04-10	SSt	SSt
2.1	2012-12-10	SSt	SSt
2.0	2012-11-05	SSt	HOe
1.0	2011-09-01	SSt	PLD

Projection

Würth Elektronik eiSos GmbH & Co. KG
EMC & Inductive Solutions
Max-Eyth-Str. 1
74638 Waldenburg
Germany
Tel. +49 (0) 79 42 945 - 0
www.we-online.com
eiSos@we-online.com

DESCRIPTION

WL-SMCW SMD mono-color chip LED waterclear

Order.- No.

150080BS75000

COMPLIANT RoHS&REACh HALOGENFREE

SIZE: M

Size: 0805

Product status:

☐ Development Sample

☐ Preproduction Sample

☒ Production Sample

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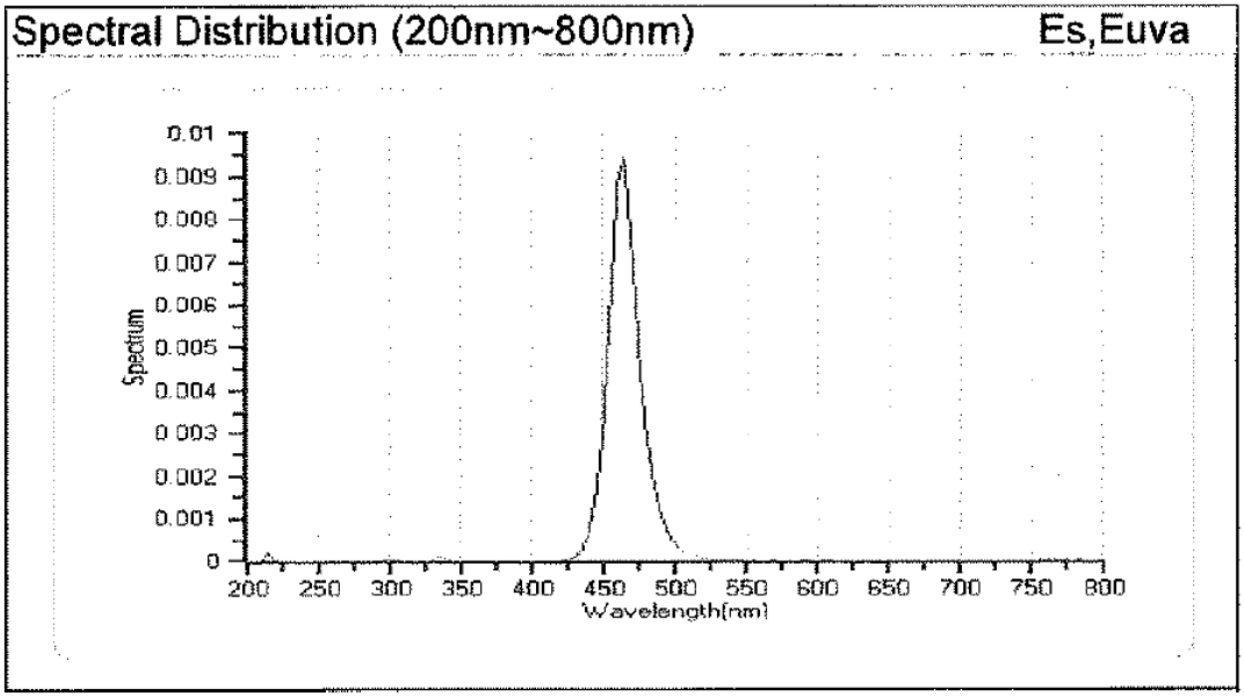
2.Test Data

Test data

Optical hazard	Test Result	Used hazard exposure limit		Ref.
1. E_S	0 W/m^2	0,003 W/m^2	200-400 nm	**P**
2. E_{UVA}	0 W/m^2	33 W/m^2	315-400 nm	**P**
3. L_B	--	10000 W/m^{2}sr	300-700 nm	**N/A**
4. $E_{B\ (small\ source)}$	4,619x10^{-2}W/m^2	1,0 W/m^2	300-700 nm	**P**
5. L_R	4,859x10^{3}W/m^{2}sr	1,647x10^7 W/m^{2}sr	380-1400 nm	**P**
6. E_{IR}	6,155x10^{-4} W/m^2	570 W/m^{2}sr	780-3000 nm	**P**
7. L_{IR}	2,977 W/m^{2}sr	5,450 x10^5 W/m^2	780-1400 nm	**P**
8. E_H	--	--	380-3000 nm	**N/A**

Spectral distribution



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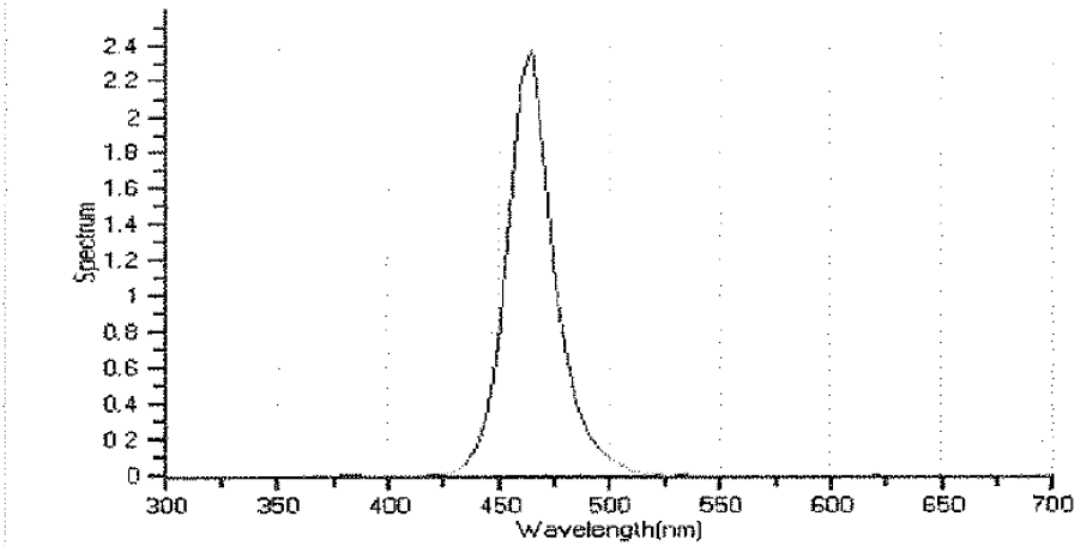
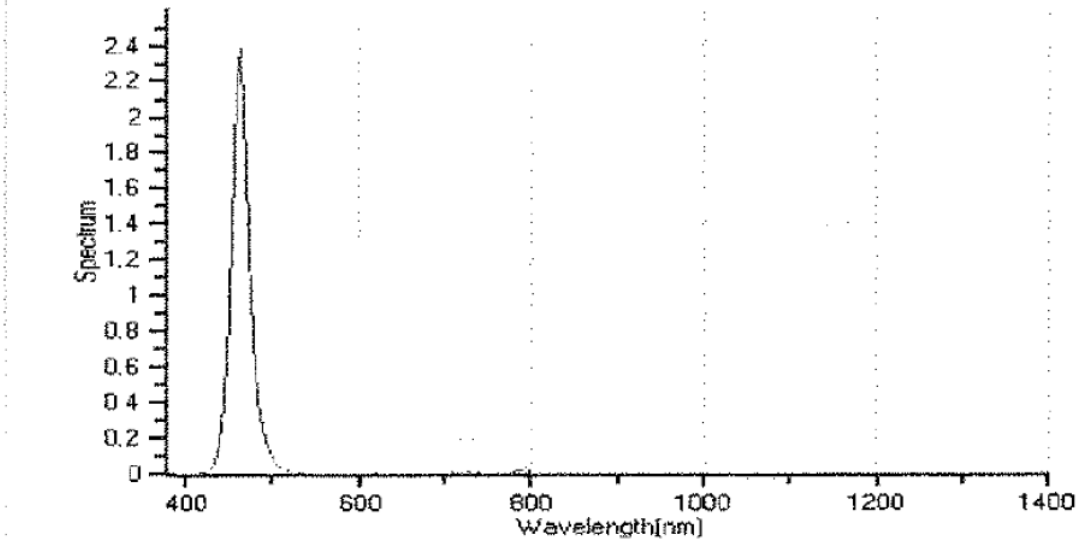
Spectral Distribution (300nm~700nm) Lb/Eb



Spectral Distribution (380nm~1400nm) Lr,Lir



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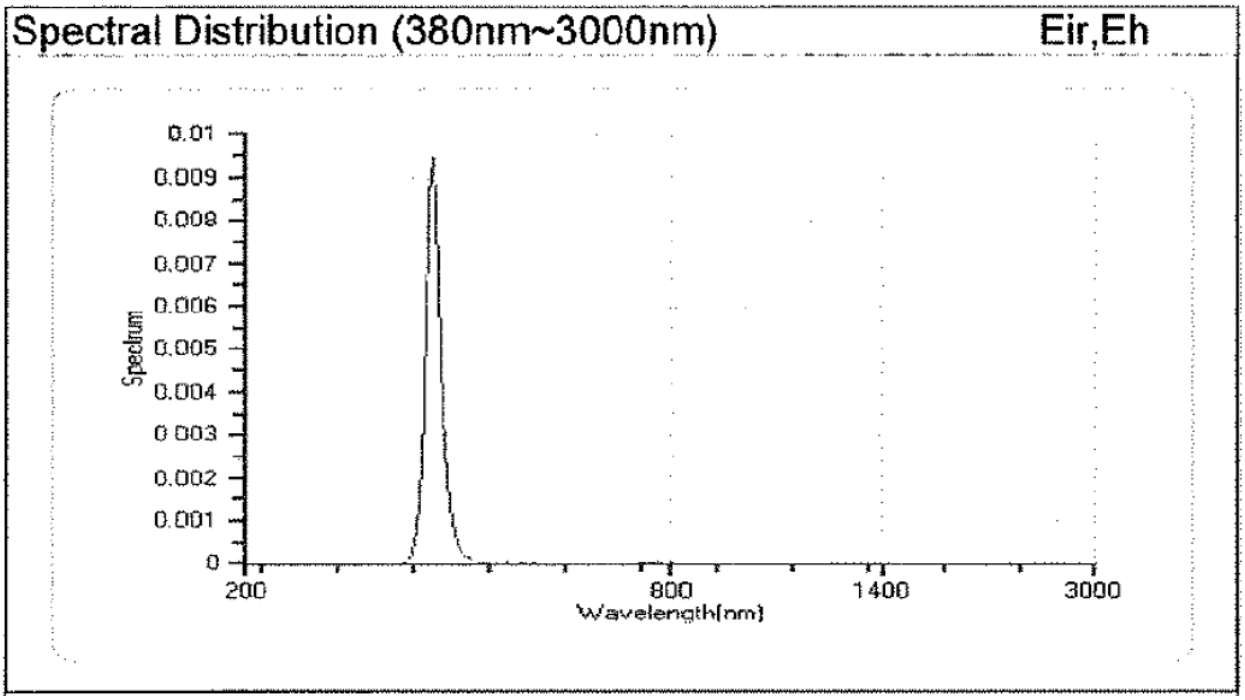

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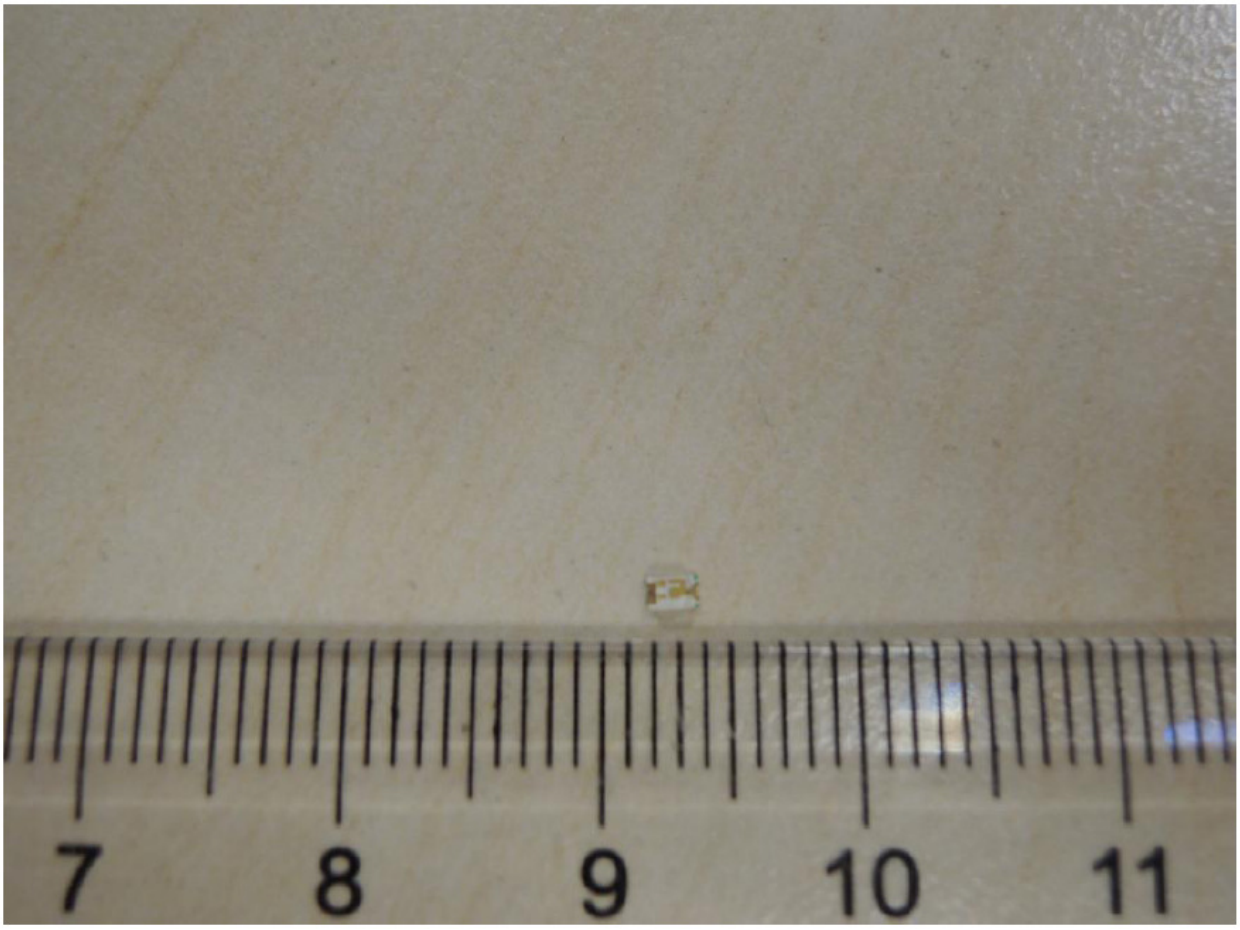
3.Test Sample



picture 1: 150080BS75000

Würth Elektronik eiSos GmbH & Co. KG, Max-Eyth-Str.1, D- 74638 Waldenburg
Tel.: ++49 (0) 7942 / 945-0, Fax.: ++49 (0) 7942 / 945-460

4.Testing Conditions and Performance Criteria

Testing Conditions

Tests performed on 150080BS75000.

(1) Ambient temperature: 23±2℃, Humidity: 64±10%

(2) Measurement distance: 150080BS75000 at a distance of 0,2 m;

(3) Angular subtense: 150080BS75000 (Whole apparatus): 1,70 mrad.

Testing Requirements

Calculation of the Hazard exposure limits for the Exempt group

The philosophical basis for the exempt group classification is that the lamp does not pose any photobiological hazard for the end points in this standard. This requirement is met by any lamp that does not pose

1. An actinic ultraviolet hazard (Es) within 8-hours exposure (30000 s), nor
2. A near-UV hazard (EUVA) within 1000 s, (about 16 min) nor
3. A retinal blue-light hazard (LB) within 10000 s (about 2,8 h), nor
4. A retinal thermal hazard (LR) within 10 s, nor
5. An infrared radiation hazard for the eye (EIR) within 1000 s.

Also, lamps that emit infrared radiation without a strong visual stimulus (i.e., less than 10 cd_m-2) and do not pose a near-infrared retinal hazard (LIR) within 1000 s are in the Exempt Group.

Calculation of the Hazard exposure limits for the Risk Group 1 (Low-Risk)

The philosophical basis for this classification is that the lamp does not pose a hazard due to normal behavioral limitations on exposure. This requirement is met by any lamp that exceeds the limits for the Exempt Group but that does not pose

1. An actinic ultraviolet hazard (Es) within 10000 s, nor
2. A near ultraviolet hazard (EUVA) within 300 s, nor
3. A retinal blue-light hazard (LB) within 100 s, nor
4. A retinal thermal hazard (LR) within 10 s, nor
5. An infrared radiation hazard for the eye (EIR) within 100 s.

Also, lamps that emit infrared radiation without a strong visual stimulus (i.e., less than 10 cd_m-2) and do not pose a near-infrared retinal hazard (LIR), within 100 s are in Risk Group 1 (Low-Risk).

5.Summary

The tests were performed according to the following standards:

Specification	Result	Remarks
EN 62471:2008	**Low Risk**	(1) Ambient temperature: 23±2℃, Humidity: 64±10% (2) Measurement distance: 150080BS75000 at a distance of 0,2 m; (3) Angular subtense: 150080BS75000 (Whole apparatus): 1,70 mrad.

Copy of marking plate and Warning Labels:

Note: No warning label is needed for this product.

Summary of testing:

This test report was issued for considering the potential radiation hazards resulting from the LED under the normal operating conditions only. The rating of LED has been considered for the testing as shown in the test result section. No further single fault and abnormal tests performed.

This product accessible emission has been tested according to standard EN 62471:2008 and found in compliance with Low Risk Group.

6.Final Judgement

The tested samples have met the requirements of the Low risk Group according to EN 62471:2008

Test Item: Photobiological Safety of Lamps and Lamp Systems

TÜV Rheinland (Shenzhen) Co., Ltd Test engineer:

Blair Wang

7.Testing Setup and Equipment List

Euipment used for testing

Equipment No.	Name of Equipment	Calibration Due Date DD.MM.YYYY Calibration Interval	Uncertainty
1.264	Spectroradiometer for safety Measurement System	2014-01-06 1 year	U=2.0%; k=2
1.264A	Retinal Radiance Meter	2014-01-06 1 year	U=4.0%; k=2
1.264B	Digital Power Meter	2013-12-15 1year	DCV: 0.01%, ACV:0.05% DCA: 0.06%,ACA:0.08% AC Power:0.1%, PF: 0.1% Frequency:0.02%, k=2
1.264C	Luminometer	2013-12-15 1year	Urel=2.0%; k=2
1.264D	Constant current power supply	2013-12-15 1year	DCA:0.1%, k=2
1.264E	VIS-IR Calibration lamp	2013-10-13 1year	Urel=1.0%; k=2
1.264F	UV Calibration lamp	2014-01-20 1year	U=15%; k=2
1.142H	Instantaneous Photometer	2014-01-06 1year	U=2.0%; k=2