

Prüfbericht-Nr.: <i>Test Report No.:</i>	16074931 001	Auftrags-Nr.: <i>Order No.:</i>	174047341	Seite 1 von 19 Page 1 of 19	
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2016-4-20		
Auftraggeber: <i>Client:</i>	SHINY TIME INC LIMITED Junpu Industrial Park, Housha Road, Houjie Town, Dongguan City, Guangdong Province China				
Prüfgegenstand: <i>Test item:</i>	LED DISCO LAMPS				
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	KDS-8108-1A; KDS-8108-1C; KDS-8108-2A; KDS-8108-2C; KDS-8108-3A; KDS-8108-3B; KDS-8122A; KDS-8122B; KDS-8107 A; KDS-8107 B; KDS-8109 A; KDS-8109 B; KDS-8111 A; KDS-8111 B; KDS-07; KDS-09; KDS-9950; KDS-01A; KDS-01C; KDS-9910C; KDS-9904C; KDS-9905C				
Auftrags-Inhalt: <i>Order content:</i>	Type examination				
Prüfgrundlage: <i>Test specification:</i>	EN 62471: 2008				
Wareneingangsdatum: <i>Date of receipt:</i>	2016-04-12	Detaillierte Fotodokumentation siehe Anlage zu diesem Bericht Detailed photo documentation see appendix to this report			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000332500-001~006				
Prüfzeitraum: <i>Testing period:</i>	2016-04-12 ~ 2016-04-19				
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Guangdong) Ltd.				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Guangdong) Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von / tested by:		kontrolliert von / reviewed by:			
Leo Mao Apr 25, 2016 Leo Mao / Engineer 2016.04.25 Mars Yan / Supervisor		Mars Yan 2016.04.25 Ivy Lu / Reviewer Ivy Lu.			
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other:					
- Optical output testing based on Photobiological safety, exempt group. - Other than optical hazards have not been considered during investigation.					
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested					
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

Equipment used for testing:

Equip. no.	Name of Equipment	Calibration Due Date DD.MM.YYYY Calibration interval	Uncertainty/Range
1.264	Spectroradiometer for safety evaluation	2016-12-01 1 years	U=20%
1.264A	Retinal Radiance Meter	2016-12-01 1 years	U=4%
1.264B	Digital Power Meter	2016-11-16 1 year	DCV:0.1%,ACV:0.05%, DCA:0.06,ACA:0.08%, AC power:0.1%,PF:0.1%,Fr equency:0.02%
1.264K	UV Calibration lamp	2018-03-23 or after use 50h	U=7%,k=2
1.264J	Luminous Intensity Standard Lamp	2018-04-09 or after use 50h	Urel=2.1%,k=2
1.265E	Humidity/Temperature Datalogger	2016-11-18 1 year	Temperature: 0.3°C Humidity: 1.0%R.H

TEST REPORT EN 62471 Photobiological Safety of Lamps and Lamp Systems	
Report Reference No:	See cover page.
Tested by (name + signature).....:	See cover page.
Approved by (name + signature) ..:	See cover page.
Date of issue	See cover page.
Total number of pages	See cover page.
CB Testing Laboratory:	See cover page.
Address	See cover page.
Applicant's name:	See cover page.
Address	See cover page.
Test specification:	
Standard	See cover page.
Test procedure	Test report only
Non-standard test method.....:	N/A
Test item description:	LED DISCO LAMPS
Trade Mark	Not specified by client
Manufacturer	Same as applicant
Model/Type reference	KDS-8108-1A; KDS-8108-1C; KDS-8108-2A; KDS-8108-2C; KDS-8108-3A; KDS-8108-3B; KDS-8122A; KDS-8122B; KDS-8107 A; KDS-8107 B; KDS-8109 A; KDS-8109 B; KDS-8111 A; KDS-8111 B; KDS-07; KDS-09; KDS-9950; KDS-01A; KDS-01C; KDS-9910C; KDS-9904C; KDS-9905C
Ratings	Battery; DC4,5V

Test item particulars	
Equipment mobility :	N/A
Protection Class of equipment	Class III
Mass of equipment (kg) :	N/A
Lamp classification	
Lamp system group of the equipment :	Exempt group
Lamp system group of the radiation employed:	Exempt group
Maximum classification of the embedded lamp	N/A
(if an embedded lamp is employed)	
Test case verdicts	
Test case does not apply to the test object ...:	N/A
Test item does meet the requirement :	P(ass)
Test item does not meet the requirement :	F(ail)
Testing	
Date of receipt of test item :	2016-04-12
Date(s) of performance of test :	2016-04-12 ~ 2016-04-19
<u>General remarks:</u>	
<p>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 remark #)” refers to a remark appended to the report. “(see Annex #)” refers to an annex 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.</p> <p>Factory: SHINY TIME INC LIMITED Address 1: Junpu Industrial Park, Housha Road, Houjie Town, Dongguan City, Guangdong Province China Address 2: Block 3, No. 58 Puxia Road, Liuyue Community, Henggang Town, Longgang District, Shenzhen City Guangdong Province China</p>	
Copy of marking plate and Warning Labels:	
Not specified by client	
Summary of testing:	
<p>This test report was issued for considering the potential radiation hazards resulting from the LED Lamp under the normal operating conditions only. The rating of LED Lamp has been considered for the testing as shown in the test result section. No further single fault and abnormal tests performed. These products accessible emission has been tested according to standard EN 62471 and found in compliance exempt group. Models KDS-8108-1C; KDS-8122A; KDS-8107 B; KDS-8109 A; KDS-8111 B were selected to perform test.</p>	

General product information:

- Products covered by this report are LED DISCO LAMPS.
- Details see below.

Model no.	Photo	Input voltage	Type of LED chip	LED quantity (pcs)	Manufacturer of LED chip
KDS-8108-1A		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	3	Dongguan City, Pengyuan Optoelectronic s Technology Co., Ltd
KDS-8108-1C		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	15	
KDS-8108-2A		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	3	
KDS-8108-2C		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	15	
KDS-8108-3A		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	3	
KDS-8108-3B		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	3	
KDS-8122A		3 * AA DC4.5V	PE-R2C3AA-TO PE-G2C3AA-TO PE-B2C3AA-TO	3	
KDS-8122B		3 * AA DC4.5V	PE-R2C3AA-TO PE-G2C3AA-TO PE-B2C3AA-TO	3	
KDS-8107 A		3 * AA DC4.5V	48WR4D-Y-T 48WG4D-Y-T 48WB4D-Y-T	6	
KDS-8107 B		3 * AA DC4.5V	48WR4D-Y-T 48WG4D-Y-T 48WB4D-Y-T	6	
KDS-8109 A		3 * AA DC4.5V	5RGB4-Y-T-K	12	
KDS-8109 B		3 * AA DC4.5V	5RGB4-Y-T-K	12	

Model no.	Photo	Input voltage	Type of LED chip	LED quantity (pcs)	Manufacturer of LED chip
KDS-8111 A		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	3	Dongguan City, Pengyuan Optoelectronics Technology Co., Ltd
KDS-8111 B		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL 5RGB4-Y-T-K	7	
KDS-07		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL	3	
KDS-09		3 * AA DC4.5V	5WR2-Y-T-PL 5WB2-Y-T-PL 5WG2-Y-T-PL	3	
KDS-9950		3 * AA DC4.5V	5WR2-Y-T 5WG2-Y-T 5WB2-Y-T 5WW4-Y-T	4	
KDS-01A		3 * AA DC4.5V	PE-R2C3AA-TO PE-G2C3AA-TO PE-B2C3AA-TO	3	
KDS-01C		3 * AA DC4.5V	PE-R2C3AA-TO PE-G2C3AA-TO PE-B2C3AA-TO	3	
KDS-9910C		3 * AA DC4.5V	PE-R2C3AA-TO PE-G2C3AA-TO PE-B2C3AA-TO	3	
KDS-9904C		3 * AA DC4.5V	PE-R2C3AA-TO PE-G2C3AA-TO PE-B2C3AA-TO	3	
KDS-9905C		3 * AA DC4.5V	PE-R2C3AA-TO PE-G2C3AA-TO PE-B2C3AA-TO	3	

4	EXPOSURE LIMITS (EL'S)		P
4.1	General		P
4.2	Specific factors involved in the determination and application of retinal exposure limits	See below	P
4.2.1	Pupil diameter	7mm	P
4.2.2	Angular subtense of source and measurement field-of-view	(See appended test data)	P
4.3	Hazard exposure limits	See below	P
4.3.1	Actinic UV hazard exposure limit for the skin and eye	(See appended test data)	P
4.3.2	Near-UV hazard exposure limit for the eye	(See appended test data)	P
4.3.3	Retinal blue light hazard exposure limit	(See appended test data)	P
4.3.4	Retinal blue light hazard exposure limit- small source	(See appended test data)	N/A
4.3.5	Retinal thermal hazard exposure limit	(See appended test data)	P
4.3.6	Retinal thermal hazard exposure limit — weak visual stimulus	(See appended test data)	P
4.3.7	Infrared radiation hazard exposure limits for the eye	(See appended test data)	P
4.3.8	Thermal hazard exposure limit for the skin		N/A
Remark: The original Clause 4 of EN 62471:2006 contains provisions governing limiting values for the exposure of persons falling within the area of the health and safety of workers. Within Europe those limiting values are already covered by the Artificial Optical Radiation Directive of the directive have to be applied instead of those fixed in EN 62471:2006. For information the original Clause 4 of EN 62471:2006 was moved to the informative Annex ZB under retention of the respective numbering.			

5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions	See below	P
5.1.1	Lamp ageing (seasoning)	Sample was stable after being operated with 1 hours.	P
5.1.2	Test environment	See appended test data.	P
5.1.3	Extraneous radiation	Considered	P
5.1.4	Lamp radiation		P
5.1.5	Lamp system operation		P
5.2	Measurement procedure.....	See below	P
5.2.1	Irradiance measurements		P
5.2.2	Radiance measurements		P
5.2.3	Measurement of source size.....	(See appended test data)	P
5.2.4	Pulse width measurement for pulsed sources	CW	N/A

5.3	Analysis methods	See below.	P
5.3.1	Weighting curve interpolations		P
5.3.2	Calculations		P
5.3.3	Measurement uncertainty	See page 2.	P

6	LAMP CLASSIFICATION		P
6.1	Continuous wave lamps	See below	P
6.1.1	Exempt group		P
6.1.2	Risk Group 1 (Low-Risk)		N/A
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
6.1.4	Risk Group 3 (High-Risk)		N/A
6.2	Pulsed lamps	CW	N/A

	EQUIPMENT MANUFACTURE INFORMATION (DATA SHEET) ABOUT THE COMPONENT CONTAINING LAMP SYSTEM		P
	Manufacturer	See page 5 & 6	P
	Type designation	See page 5 & 6	P
	Structure		N/A
	Wavelength	See spectrum distribution.	P
	Output power (min. and max.)	Not specified by client	N/A
	Radiation	Visible radiation	P
	Continuous	CW	P
	Pulsed		N/A
	Pulse time		N/A
	Pulse repetition frequency		N/A
	Others		N/A

	MEASUREMENT EQUIPMENT		P
	Type of equipment	See page 2.	P
	Manufacturer		P
	Type designation		P
	Others		P

Details of measurement procedure and measurement results:

Conditions

1. Test performed on LED disco lamps; Input: 4,5VDC.
2. Ambient temperature: 23±2°C, Humidity: 64±10%.
3. Measurement distance:

Model no.	KDS-8107B	KDS-8108-1C	KDS-8109A	KDS-8111B	KDS-8122A
Measurement distance (m)	0,2	0,2	0,2	0,2	0,2

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.

These lamps are in the exempt group.

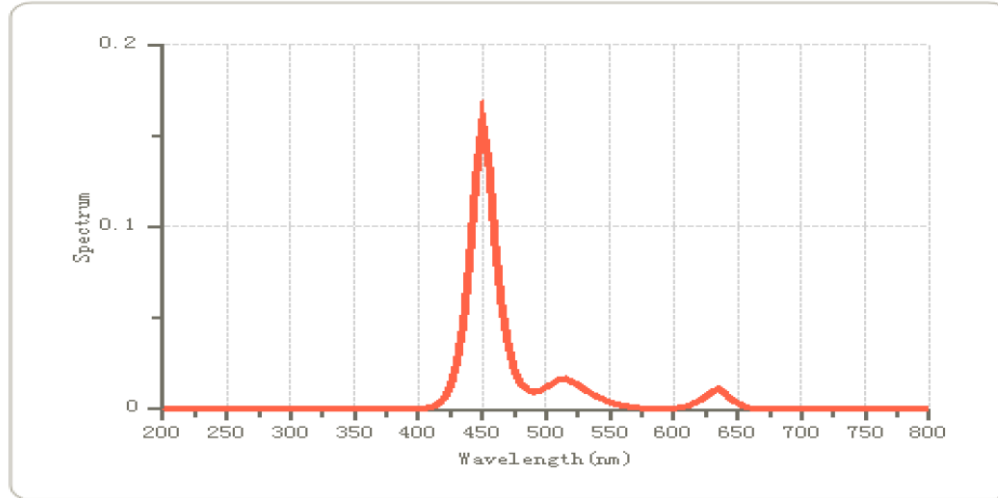
Also, lamps that emit infrared radiation without a strong visual stimulus (i.e., less than 10 cd • m⁻²) and do not pose a near-infrared retinal hazard (LIR) within 1000 s are in the exempt group.

See the test data.

1. LED disco lamp; Input: 4,5VDC model KDS-8107B

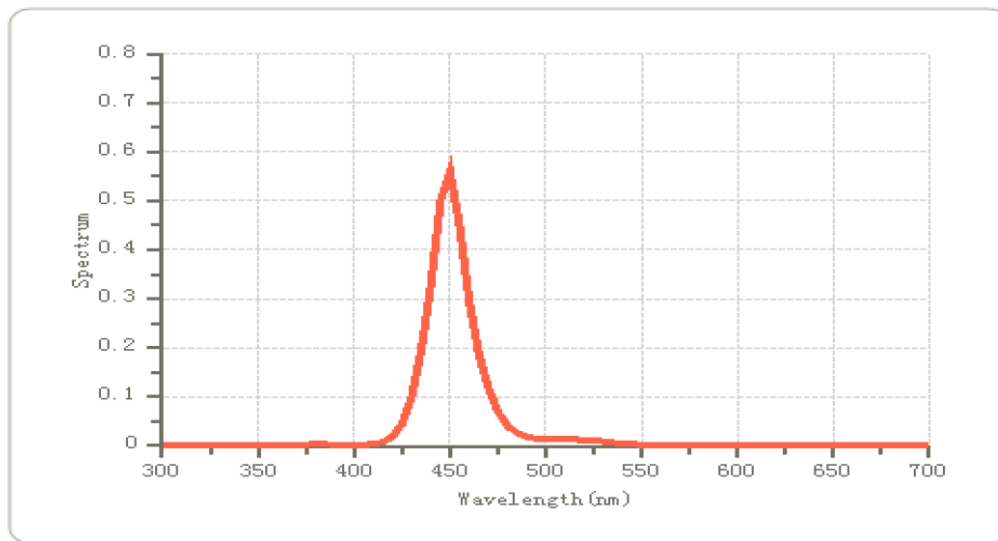
Spectral Distribution (200nm~800nm)

Es,Euva



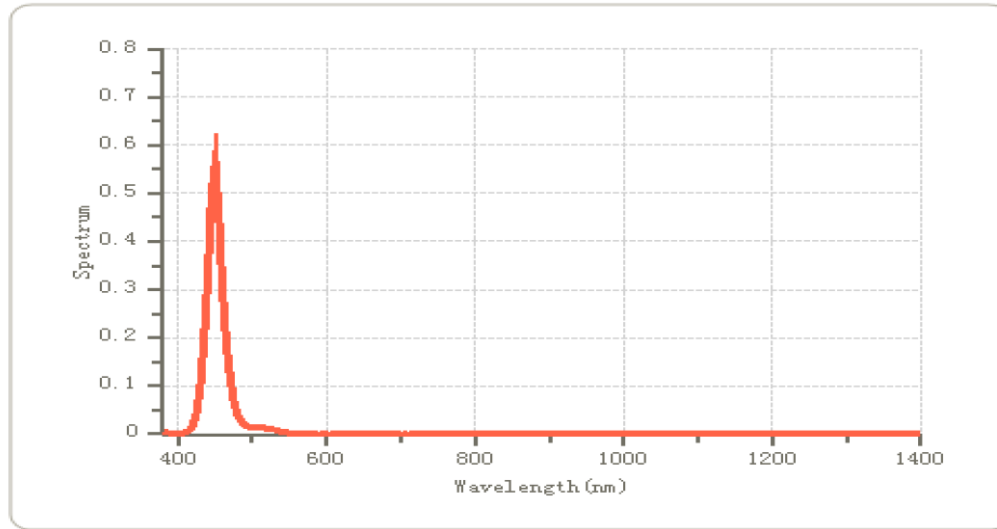
Spectral Distribution (300nm~700nm)

Lb/Eb



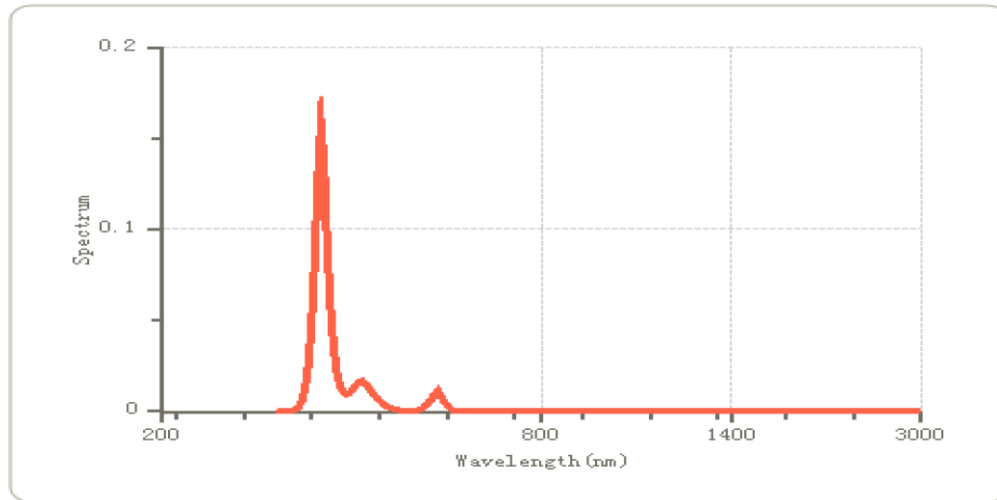
Spectral Distribution (380nm~1400nm)

Lr,Lir



Spectral Distribution (380nm~3000nm)

Eir,Eh



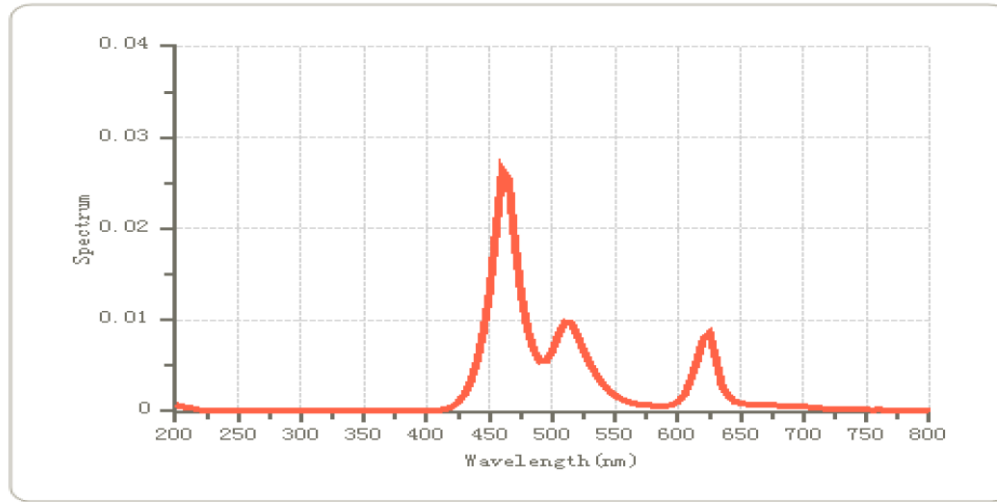
Test data:

Optical hazard	Test result	Used hazard exposure limit	Ref.
1. E_s	$4.008 \times 10^{-4} \text{ W/m}^2$	0.001 W/m^2	200-400 nm P
2. E_{UVA}	$3.175 \times 10^{-3} \text{ W/m}^2$	0.33 W/m^2	315-400 nm P
3. L_B	$2.684 \text{ W/m}^2\text{sr}$	$100 \text{ W/m}^2\text{sr}$	300-700 nm P
4. E_B (small source)	-	-	300-700 nm N/A
5. L_R	$1.236 \times 10^3 \text{ W/m}^2\text{sr}$	$1.251 \times 10^7 \text{ W/m}^2\text{sr}$	380-1400 nm P
6. L_{IR}	$0 \text{ W/m}^2\text{sr}$	$2.682 \times 10^6 \text{ W/m}^2\text{sr}$	780-1400 nm P
7. E_{IR}	0 W/m^2	100 W/m^2	780-3000 nm P
8. E_H	1.032 W/m^2	3556.56 W/m^2	380-3000 nm P

2. LED disco lamp; Input: 4,5VDC model KDS-8108-1C

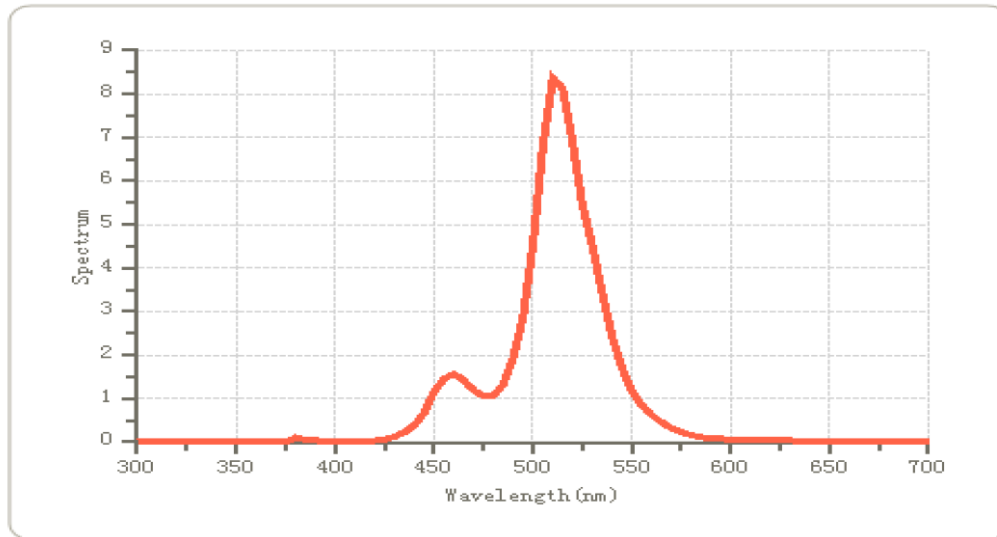
Spectral Distribution (200nm~800nm)

Es, Euva



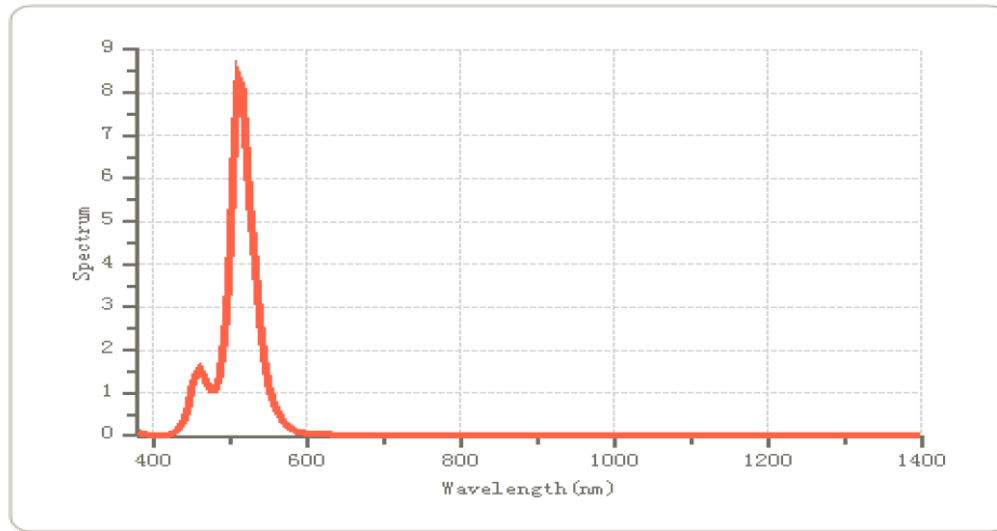
Spectral Distribution (300nm~700nm)

Lb/Eb



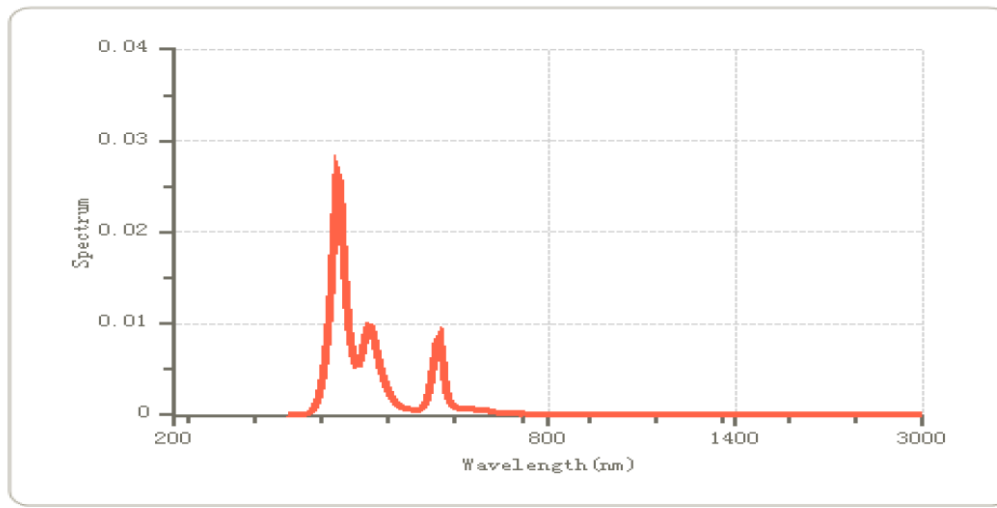
Spectral Distribution (380nm~1400nm)

Lr,Lir



Spectral Distribution (380nm~3000nm)

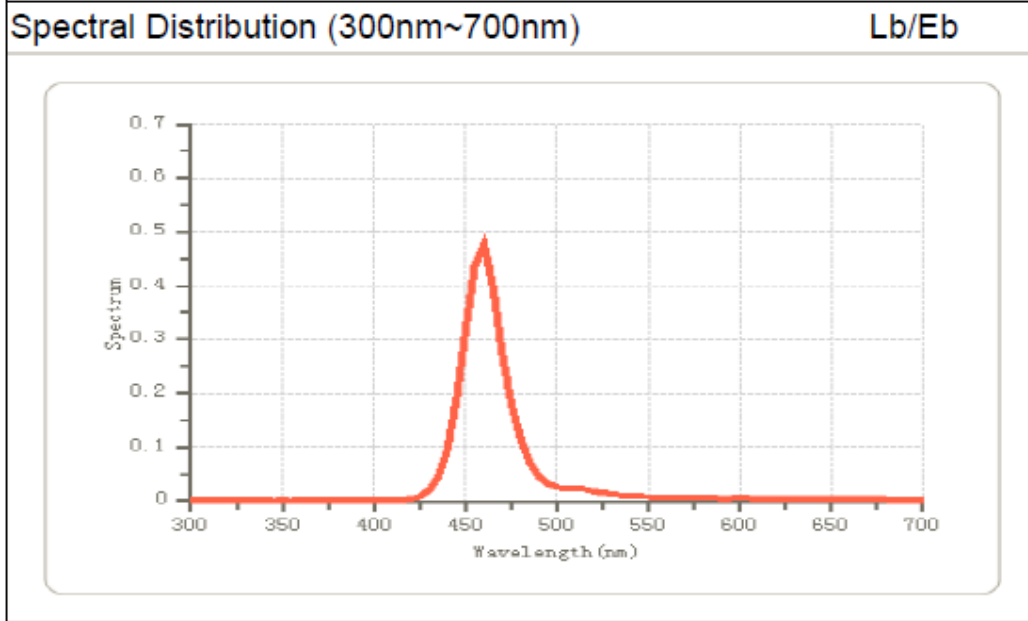
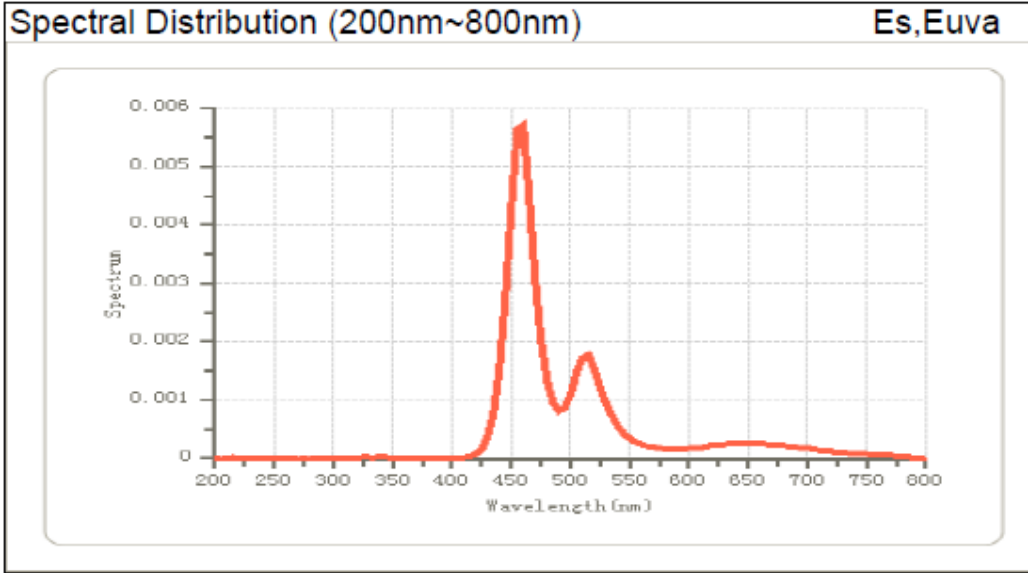
Eir,Eh



Test data:

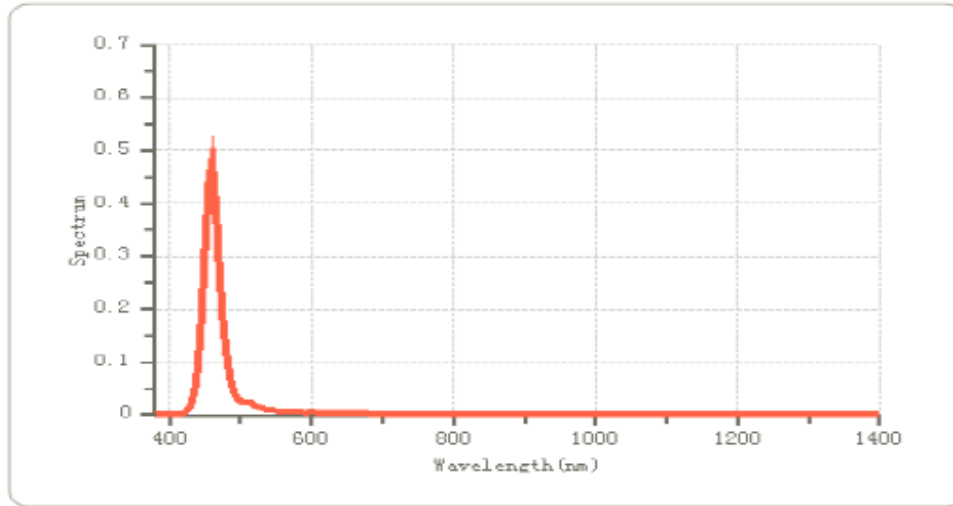
Optical hazard	Test result	Used hazard exposure limit	Ref.
1. E_s	$4.038 \times 10^{-4} \text{ W/m}^2$	0.001 W/m^2	200-400 nm P
2. E_{UVA}	$5.992 \times 10^{-4} \text{ W/m}^2$	0.33 W/m^2	315-400 nm P
3. L_B	$1.231 \times 10^1 \text{ W/m}^2\text{sr}$	$100 \text{ W/m}^2\text{sr}$	300-700 nm P
4. E_B (small source)	-	-	300-700 nm N/A
5. L_R	$1.488 \times 10^3 \text{ W/m}^2\text{sr}$	$5.016 \times 10^5 \text{ W/m}^2\text{sr}$	380-1400 nm P
6. L_{IR}	$7.507 \times 10^{-1} \text{ W/m}^2\text{sr}$	$1.075 \times 10^5 \text{ W/m}^2\text{sr}$	780-1400 nm P
7. E_{IR}	$2.178 \times 10^{-4} \text{ W/m}^2$	100 W/m^2	780-3000 nm P
8. E_H	$2.882 \times 10^{-1} \text{ W/m}^2$	3556.56 W/m^2	380-3000 nm P

3. LED disco lamp; Input: 4,5VDC model KDS-8109A



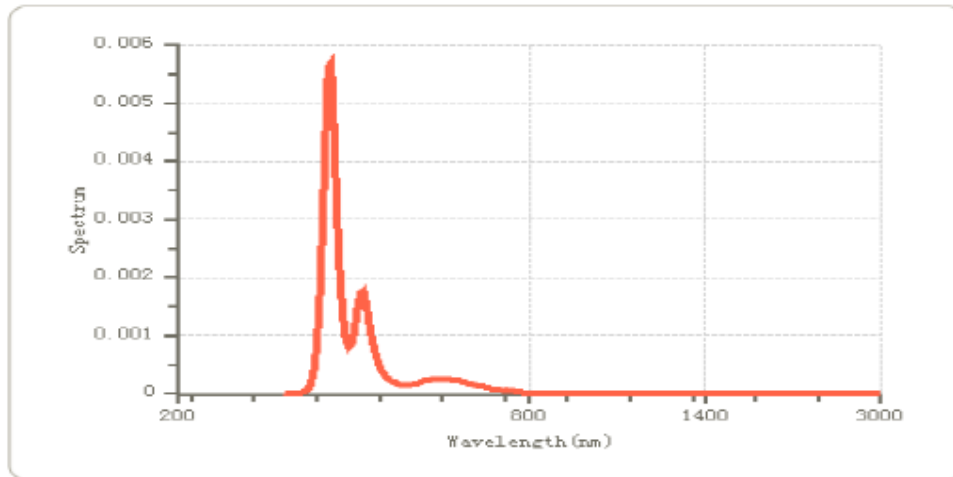
Spectral Distribution (380nm~1400nm)

Lr,Lir



Spectral Distribution (380nm~3000nm)

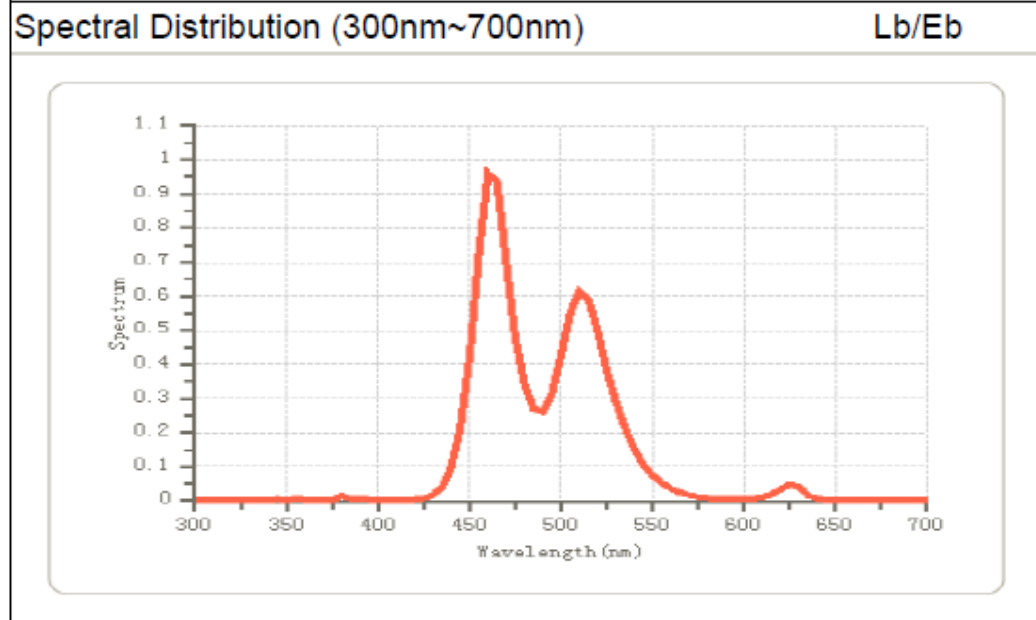
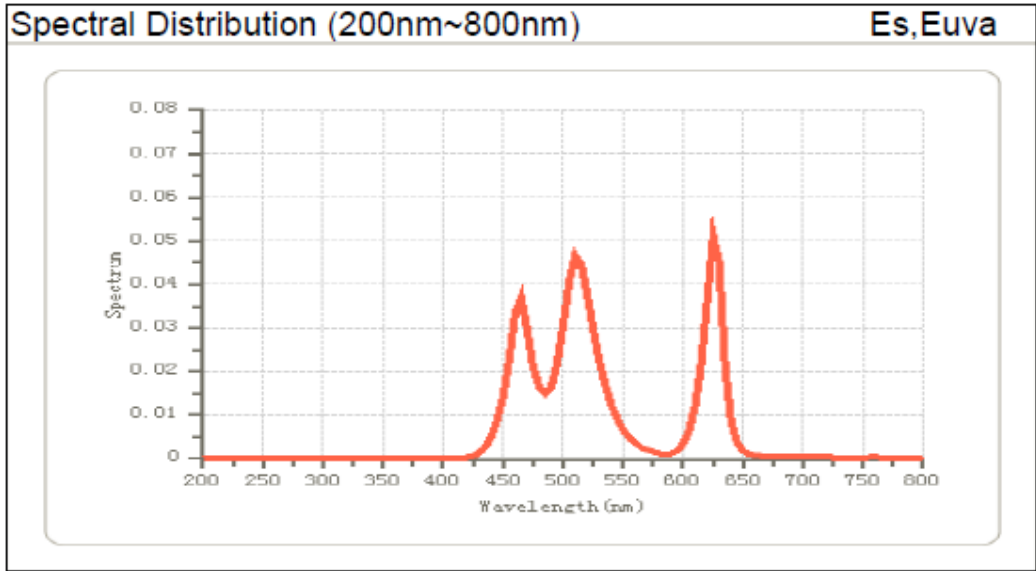
Eir,Eh



Test data:

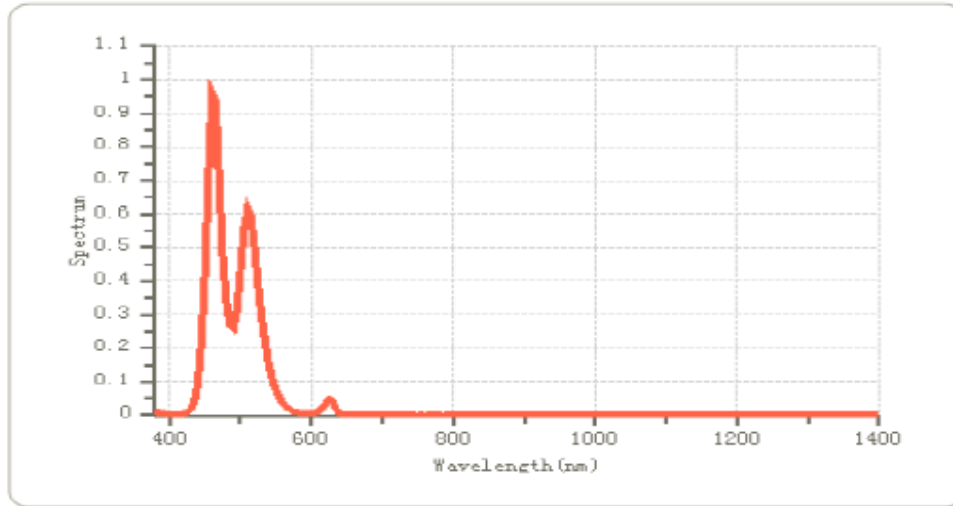
Optical hazard	Test result	Used hazard exposure limit	Ref.	
1. E_s	0 W/m ²	0.001 W/m ²	200-400 nm	P
2. E_{UVA}	3.187x10 ⁻⁴ W/m ²	0.33 W/m ²	315-400 nm	P
3. L_B	2.204 W/m ² sr	100 W/m ² sr	300-700 nm	P
4. E_B (small source)	-	-	300-700 nm	N/A
5. L_R	1.102x10 ³ W/m ² sr	1.499 x10 ⁷ W/m ² sr	380-1400 nm	P
6. L_{IR}	2.784x10 ⁻¹ W/m ² sr	3.213 x10 ⁶ W/m ² sr	780-1400 nm	P
7. E_{IR}	1.056x10 ⁻⁴ W/m ²	100 W/m ²	780-3000 nm	P
8. E_H	5.484x10 ⁻² W/m ²	3556.56 W/m ²	380-3000 nm	P

4. LED disco lamp; Input: 4,5VDC model KDS-8111B



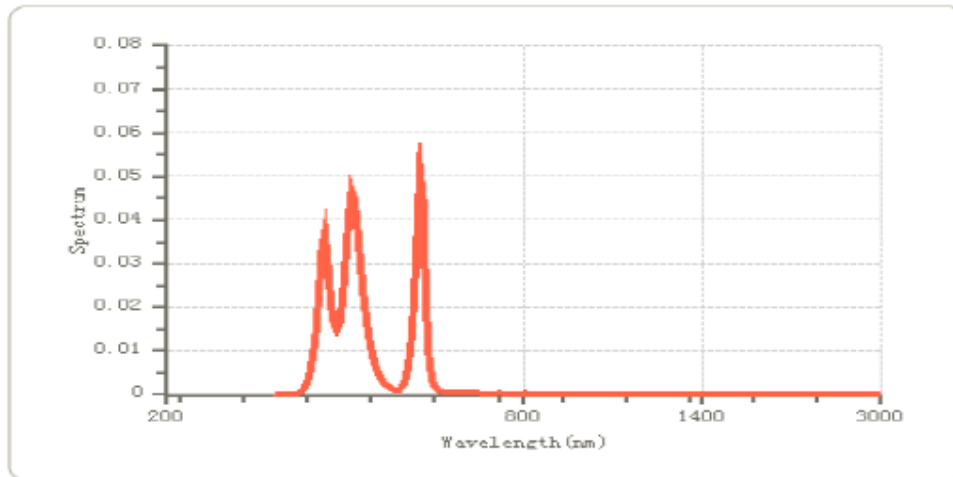
Spectral Distribution (380nm~1400nm)

Lr,Lir



Spectral Distribution (380nm~3000nm)

Eir,Eh



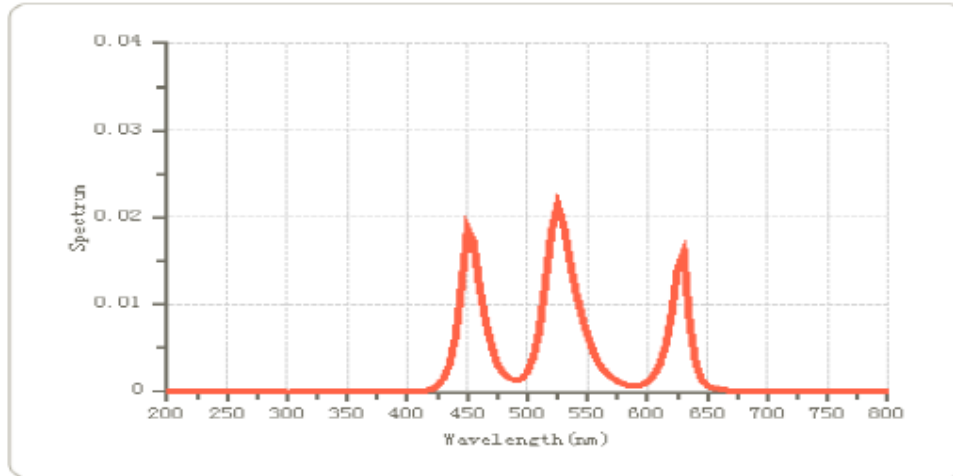
Test data:

Optical hazard	Test result	Used hazard exposure limit	Ref.
1. E_s	$2.471 \times 10^{-4} \text{ W/m}^2$	0.001 W/m^2	200-400 nm P
2. E_{UVA}	$1.207 \times 10^{-3} \text{ W/m}^2$	0.33 W/m^2	315-400 nm P
3. L_B	$4.179 \text{ W/m}^2\text{sr}$	$100 \text{ W/m}^2\text{sr}$	300-700 nm P
4. E_B (small source)	-	-	300-700 nm N/A
5. L_R	$1.074 \times 10^3 \text{ W/m}^2\text{sr}$	$1.647 \times 10^7 \text{ W/m}^2\text{sr}$	380-1400 nm P
6. L_{IR}	$4.953 \times 10^{-2} \text{ W/m}^2\text{sr}$	$3.529 \times 10^6 \text{ W/m}^2\text{sr}$	780-1400 nm P
7. E_{IR}	$1.234 \times 10^{-3} \text{ W/m}^2$	100 W/m^2	780-3000 nm P
8. E_H	$7.891 \times 10^{-1} \text{ W/m}^2$	3556.56 W/m^2	380-3000 nm P

5. LED disco lamp; Input: 4,5VDC model KDS-8122A

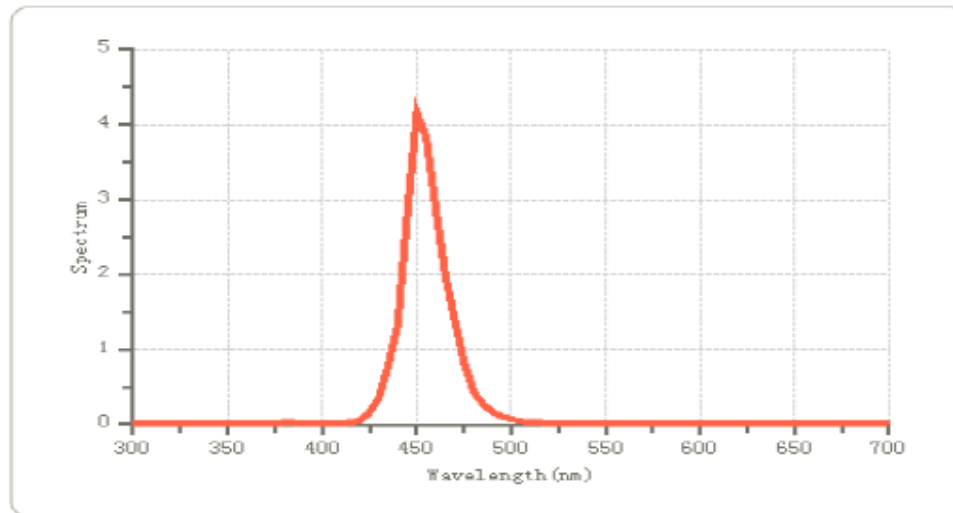
Spectral Distribution (200nm~800nm)

Es, Euva



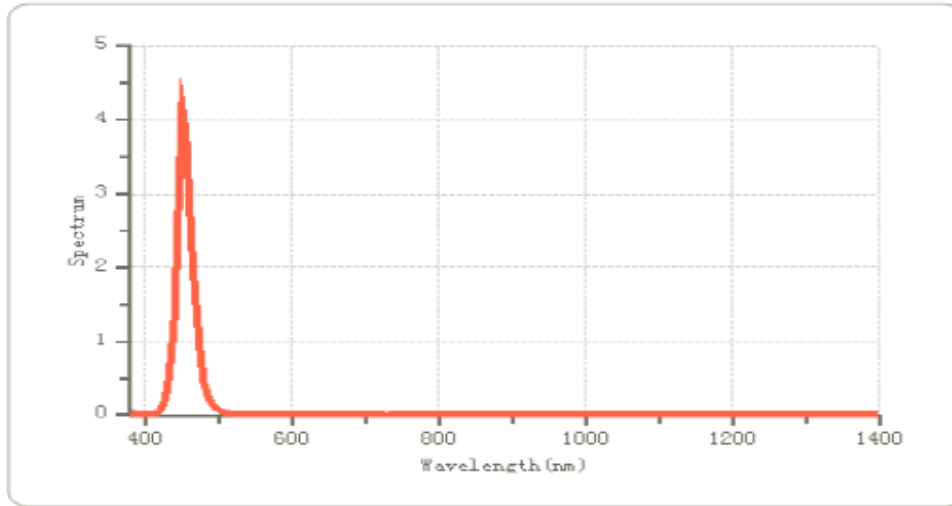
Spectral Distribution (300nm~700nm)

Lb/Eb



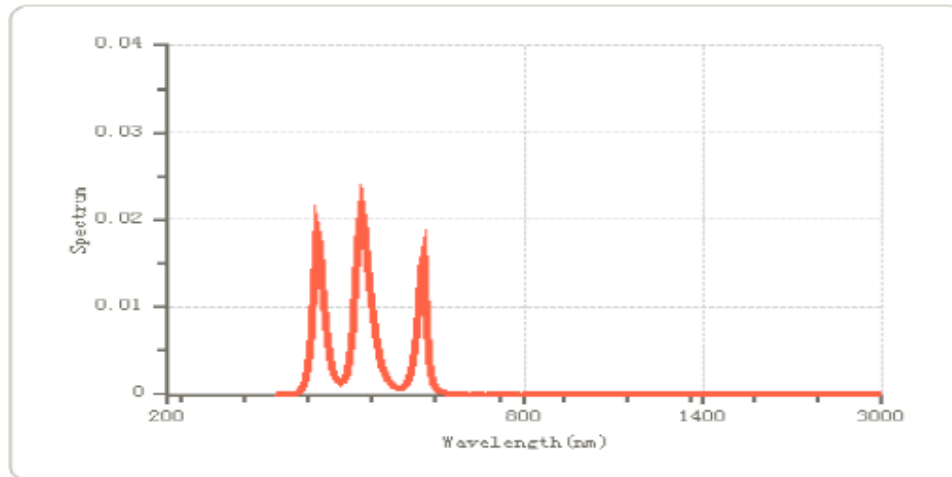
Spectral Distribution (380nm~1400nm)

Lr,Lir



Spectral Distribution (380nm~3000nm)

Eir,Eh



Test data:

Optical hazard	Test result	Used hazard exposure limit		Ref.
1. E_s	0 W/m ²	0.001 W/m ²	200-400 nm	P
2. E_{UVA}	5.468x10 ⁻⁴ W/m ²	0.33 W/m ²	315-400 nm	P
3. L_B	1.828x10 ¹ W/m ² sr	100 W/m ² sr	300-700 nm	P
4. E_B (small source)	-	-	300-700 nm	N/A
5. L_R	2.005x10 ³ W/m ² sr	4.091x10 ⁶ W/m ² sr	380-1400 nm	P
6. L_{IR}	2.010x10 ⁻¹ W/m ² sr	8.766x10 ⁵ W/m ² sr	780-1400 nm	P
7. E_{IR}	9.436x10 ⁻⁵ W/m ²	100 W/m ²	780-3000 nm	P
8. E_H	3.044x10 ⁻¹ W/m ²	3556.56 W/m ²	380-3000 nm	P