TEST REPORT
IEC TR 62778
Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires

Report Reference No...... :	EED31K002715	
Compiled by (+ signature)…..……:	Carrie Lin	……
Reviewed by (+ signature)……..:	Torres He	……
Approved by (+ signature)……...:	Amo Liu	…… Lab Supervisor
Date of issue.....:	Sept. 03, 2018	
Testing Laboratory.....:	Centre Testing International Group Co., Ltd.	
Address..... :	Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China	
Applicant s name.....:	Shenzhen Refond Optoelectronic Co., Ltd.	
Address..... :	1 to 8th Floor, Building #1,10th Industrial Zone, Tian Liao Community, Gong Ming Area, Guang Ming New District, SHENZHEN, CHINA.	
Manufacture s name..... :	Shenzhen Refond Optoelectronic Co., Ltd.	
Address..... :	1 to 8th Floor, Building #1,10th Industrial Zone, Tian Liao Community, Gong Ming Area, Guang Ming New District, SHENZHEN, CHINA.	
Test specification:		
Standard.....:	IEC TR 62778:2014 (Second Edition)	
Test procedure..... :	Test report	
Non-standard test method……..:	N/A	
Test Report Form No..... :	IEC62778A	
TTRF Originator..... :	CTI	
Master TTRF..... :	Dated 2016-02	
Test item description.....:	LED	
Model/Type reference..... :	RF-22HI32DS-**-Q-**, RF-27HI32DS-**-Q-**, RF-30HI32DS-**-Q-**, RF-40HI32DS-**-Q-**, RF-50HI32DS-**-Q-**, RF-57HI32DS-**-Q-**, RF-65HI32DS-**-Q-** Remark: The first "**" denotes the different customer code, it can be one any capital letter such as FH, FF, EF or FD and so on. The second "**" denotes the different project application, it can be EH or 01 and so on.	
Ratings..... :	150mA, 3,1V DC	

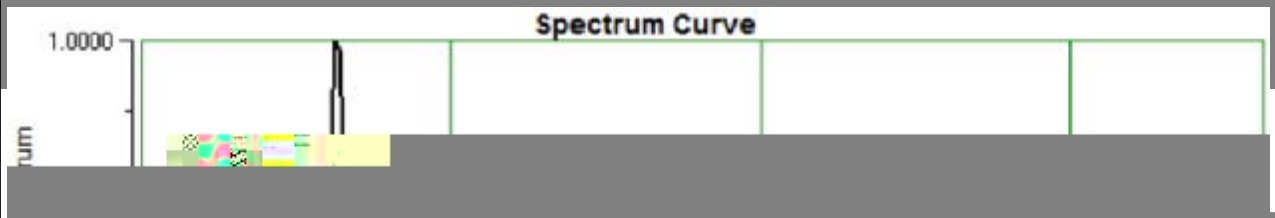
Check No.: 2447659158

Summary of testing:

Test conditions:

1. Ambient temperature: 24,3℃; Humidity: 54%;
2. Measurement distance: 200mm;
3. Aperture stop: 7mm

Spectral Distribution



Conclusion: Sample tested is considered as **Risk1 Group.**

Tests performed (name of test and test clause):	**Testing location:**
All applicable tests as described in Test Case and Measurement Sections were performed.	Centre Testing International Group Co., Ltd. Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China

Summary of compliance with National Differences:

N/A

Copy of marking plate:

N/A

Test item particulars..... :	
Product evaluated..... :	☒ LED package ☐ LED module ☐ Lamp ☐ Luminaire
Rated voltage (V)..... :	3,1V DC
Rated current (mA)..... :	150mA
Rated CCT (K)..... :	N/A
Rated Luminance (Mcd/m^2)..... :	N/A
Component report data used ..... :	☐ Not applicable ☒ LED package ☐ LED module ☐ Lamp
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..... :	Aug. 25, 2018
Date (s) of performance of tests..... :	Aug. 28, 2018
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. The tested sample(s) and the sample information are provided by the client. Throughout this report a ☒ comma / ☐ point is used as the decimal separator. Remark:"#" indicates the testing item(s) was (were) fulfilled by subcontracted lab.	
Manufacturer s Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)..... :	N/A
General product information:	
These models are same except the different color temperature, customer code and project application. According to the differences and with the request of applicant, all the tests are performed on the main model RF-65HI32DS-FH-Q-01. The test current is 150mA .	

Product information				
Model	Color temperature	Rated voltage (V)	Rated current (A)	Rated power (W)
RF-22HI32DS-**-Q-**	2200K	3,1	0,15	0,465
RF-27HI32DS-**-Q-**	2700K	3,1	0,15	0,465
RF-30HI32DS-**-Q-**	3000K	3,1	0,15	0,465
RF-40HI32DS-**-Q-**	4000K	3,1	0,15	0,465
RF-50HI32DS-**-Q-**	5000K	3,1	0,15	0,465
RF-57HI32DS-**-Q-**	5700K	3,1	0,15	0,465
RF-65HI32DS-**-Q-**	6500K	3,1	0,15	0,465

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
7	**MEASUREMENT INFORMATION FLOW**		P
7.1	**Basic flow**		N/A
	'Law of conservation of luminance' applied		N/A
	Use of only true luminance/radiance values		N/A
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		N/A
	In case E_{thr} value for RG2 was established the peak value was derived from angular light distribution		N/A
7.2	**Conditions for the radiance measurement**		P
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
7.3	**Special cases (I): Replacement by a lamp or LED module of another type**		N/A
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	**Special cases (II): Arrays and clusters of primary light sources**		P
	LED package is evaluated as ..... :	☐ RG0 unlimited ☒ RG1 unlimited	P
	E_{thr} of LED package applies to array		N/A
8 #	**RISK GROUP CLASSIFICATION**		N/A
	Risk group achieved:		N/A
	-... Risk Group 0 unlimited		N/A
	-... Risk Group 1 unlimited		P
	- E_{thr} ..... (lx) : Distance to reach RG1..... (m) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement		**P**
	Measurement performed on:	☒ LED package ☐ LED module ☐ Lamp ☐ Luminaire	
	Model number.....	RF-65HI32DS-FH-Q-01	
	Test voltage (V).....	3,1	¾
	Test current (mA).....	150	¾
	Test frequency (Hz).....	N/A	¾
	Ambient, t (°C).....	24,3	¾
	Measurement distance.....	☒ 20 cm ☐ ... cm	¾
	Source size	☐ Non-small ☒ Small : 2,2 mm	¾
	Field of view	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	¾

Item	Symbol	Units	Result
Correlated colour temperature	CCT	K	/
x/y colour coordinates	x,y	/	x=0,3195, y=0,3317
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	4800
Luminance	L	cd/m^2	5.887E+006

Photo Document

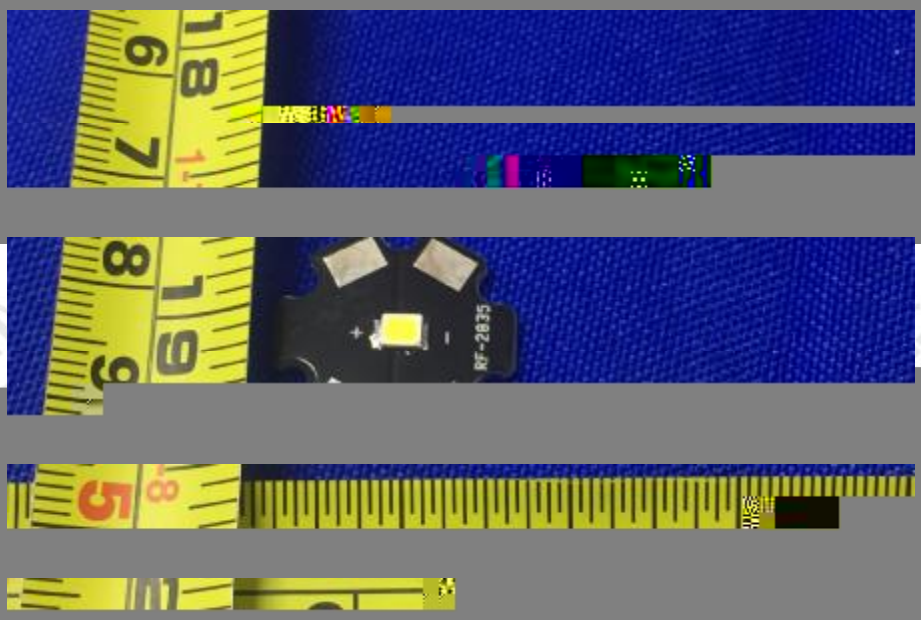

Fig. 1 - Overall view of the sample

*** End of Report ***

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