

TEST REPORT IEC TR 62778 Application of IEC TR 62778 for the assessment of blue light hazard to light sources and luminaires	
Report reference No	RDG191128050-SF
Compiled by (+ signature)	Test Engineer: Zero Gao
Approved by (+ signature)	Project Engineer: Harrison Huang
Date of issue	2019-12-04
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	Lumileds Holding B.V.
Address	370 W. Trimble Road, San Jose, CA 95131, USA
Standard	IEC TR 62778:2014
Test sample(s) received.....	2019-12-02
Test in period.....	2019-12-04
Procedure deviation	N.A.
Non-standard test method	N.A.
Note: 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).	
Type of test object	2835 R series
Trademark	N.A.
Model/type reference	L128-XXXXRA35000A1, L128-XXXXRB35000A1, L128-XXXXRC35000A1, L128-XXXXRG35000A1, L128-XXXXRD35000A1, L128-XXXXRE35000A1, L128-XXXXRF35000A1
Manufacturer.....	Lumileds Holding B.V. 370 W. Trimble Road, San Jose, CA 95131, USA
Rating	See "General product information" for details
Copy of marking plate: None	

Test item particulars	
Product evaluated	<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire
Rated voltage (V)	See rating
Rated current (mA)	See rating
Rated Luminance (Mcd/m²)	Not specified
Component report data used	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp
Possible test case verdicts:	
-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)	
General remarks:	
<p>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.</p>	
Remark:	
Appendix A EUT photos	

General product information:

"EUT" as referred in this report are 2835 R series. All models have the same LED chip and package dimension. The information of all models are shown as below for details:

Model No.	Power/Current/Voltage	Difference	Details
L128-XXXXRA35000A1	0.5W max./150mA max./3V	CRI CCT	The first XX represents CCT with 2700K-6500K; the second XX represents Ra with 80-97.
L128-XXXXRB35000A1	1W/150mA/6V		
L128-XXXXRC35000A1	1W/100mA/9V		
L128-XXXXRG35000A1	1W/80mA/12V		
L128-XXXXRD35000A1	1W/60mA/18V		
L128-XXXXRE35000A1	1W/30mA /36V		
L128-XXXXRF35000A1	1W/20mA /54V		

Unless otherwise specified, model L128-6580RA35000A1, L128-6580RB35000A1 and L128-6580RC35000A1 were chosen as the representative model to perform all tests.

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
7	MEASUREMENT INFORMATION FLOW		P
7.1	Basic flow		P
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case E_{thr} value for RG2 was established the peak value was derived from angular light distribution		N
7.2	Conditions for the radiance measurement		P
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N
7.3	Special cases (I): Replacement by a lamp or LED module of another type		N
	Light source is a white light source		N
	Evaluation done based on highest luminance		N
	Evaluation done based on CCT value		N
7.4	Special cases (II): Arrays and clusters of primary light sources		N
	LED package is evaluated as : <input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited <input type="checkbox"/> RG2 unlimited		N
	E_{thr} of LED package applies to array		N
8	RISK GROUP CLASSIFICATION		P
	Risk group achieved:		P
	- .. Risk Group 0 unlimited		N
	- .. Risk Group 1 unlimited		P
	- Risk Group 2 unlimited		N
	- E_{thr} (lx) : Distance to reach RG1(mm) :	L128-6580RA35000A1: 1141 lx 100 mm L128-6580RB35000A1: 1087 lx 149 mm L128-6580RC35000A1: 1112 lx 147 mm	P

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
	TABLE: Spectroradiometric measurement		P
	Measurement performed on:	<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire	—
	Model number	L128-6580RA35000A1 L128-6580RB35000A1 L128-6580RC35000A1	—
	Test voltage (V).....	L128-6580RA35000A1: 3V L128-6580RB35000A1: 6V L128-6580RC35000A1: 9V	—
	Test current (mA)	L128-6580RA35000A1: 150mA max. L128-6580RB35000A1: 150mA L128-6580RC35000A1: 100mA	—
	Test frequency (Hz).....	--	—
	Ambient, t (°C).....	22.9°C	—
	Measurement distance	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm	—
	Source size	<input type="checkbox"/> Non-small: mm <input checked="" type="checkbox"/> Small: L128-6580RA35000A1: 0.80mm L128-6580RB35000A1: 0.91mm L128-6580RC35000A1: 1.1mm	—
	Field of view	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)	—

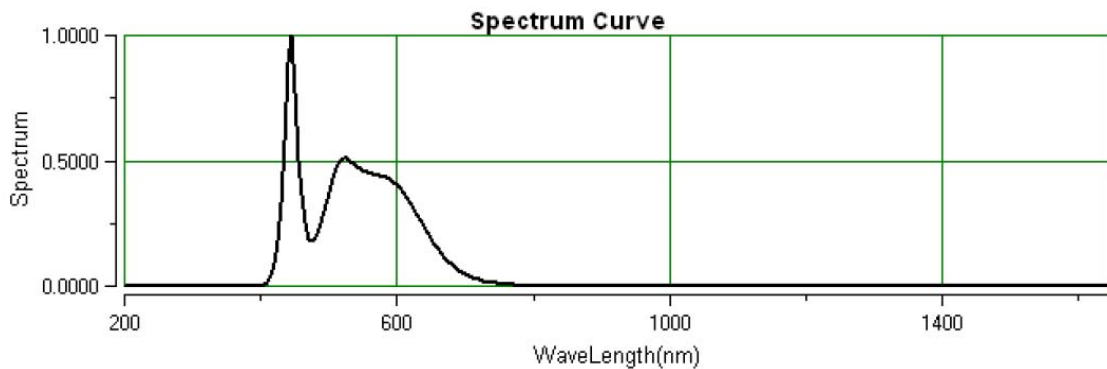
IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

For model: L128-6580RA35000A1:

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6577	--
x/y colour coordinates	x/y		0.3107/0.3336	--
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	3213	--
Blue light hazard irradiance	E_B	W/m^2	2.488×10^{-1}	--
Luminance	L_V	cd/m^2	3.666×10^6	--
Illuminance	E	lx	284	--

Supplementary information: NA

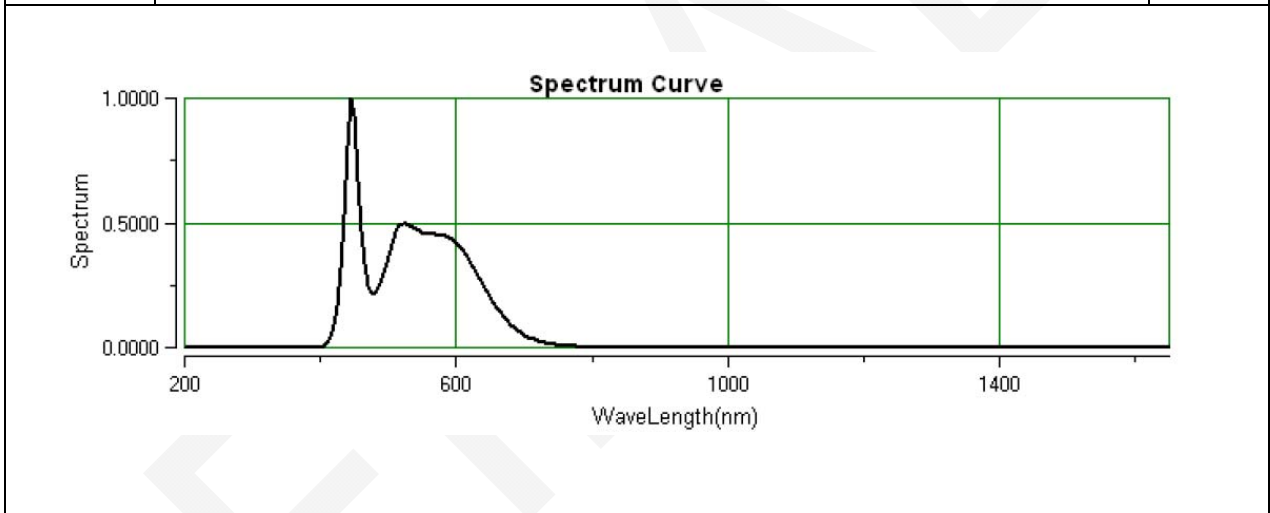
TABLE: Angular light distribution



For model: L128-6580RB35000A1:

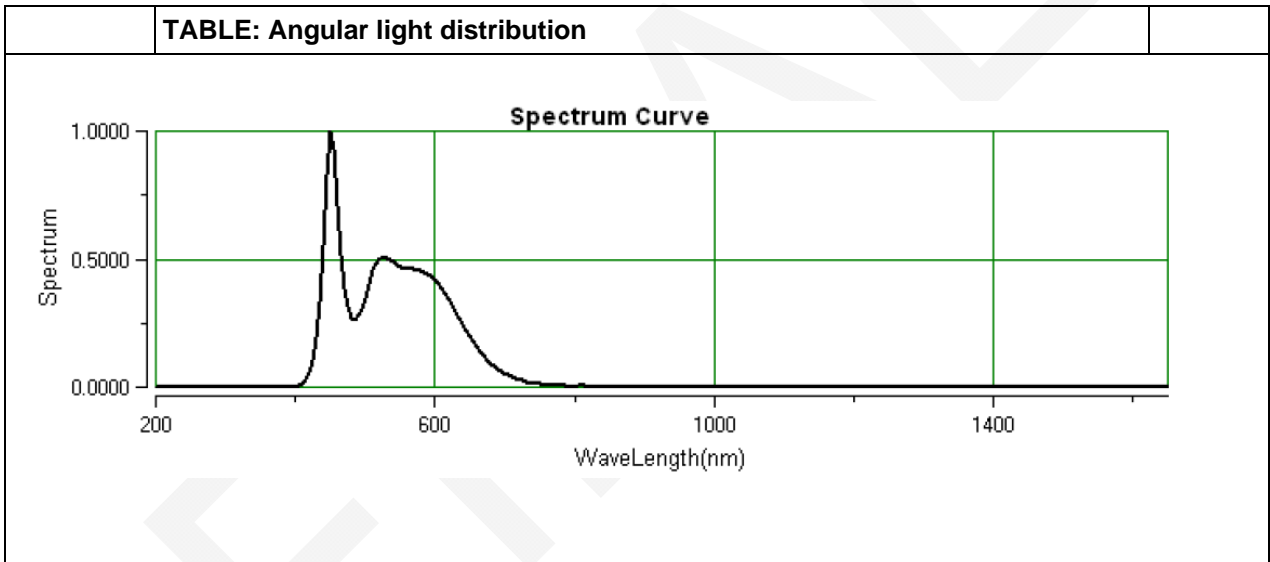
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6735	--
x/y colour coordinates	x/y		0.3094/0.3240	--
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	6463	--
Blue light hazard irradiance	E_B	W/m^2	5.541×10^{-1}	--
Luminance	L_V	cd/m^2	7.028×10^6	--
Illuminance	E	lx	603	--
Supplementary information: NA				

TABLE: Angular light distribution



For model: L128-6580RC35000A1:

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6947	--
x/y colour coordinates	x/y		0.3058/0.3240	--
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	7046	--
Blue light hazard irradiance	E_B	W/m^2	5.390×10^{-1}	--
Luminance	L_V	cd/m^2	7.836×10^6	--
Illuminance	E	lx	599	--
Supplementary information: NA				



Appendix A - EUT Photos

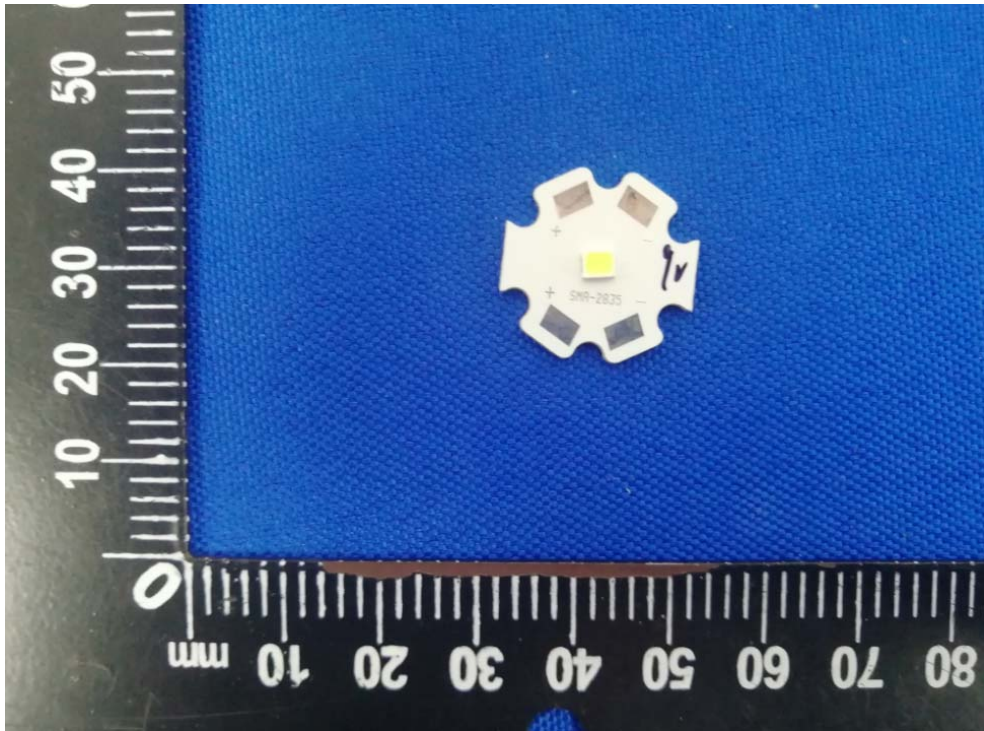
1. EUT- The overall view for model L128-6580RA35000A1



2. EUT- The overall view for model L128-6580RB35000A1



3. EUT- The overall view for model L128-6580RC35000A1



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DIRECTIONS

1. The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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*****End of report*****