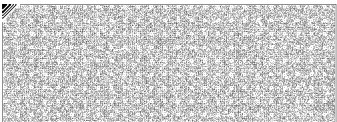
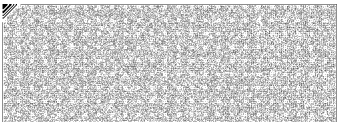




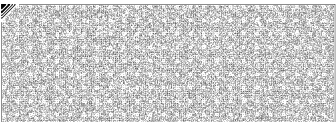
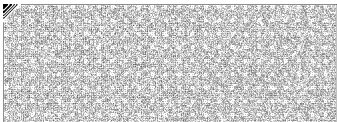
Test Report is issued under the responsibility of:



TEST REPORT IEC TR 62778 Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires	
Report Number.....	KIEL2408-U09539
Date of issue	August 20, 2024
Total number of pages.....	10 pages
Name of Testing Laboratory preparing the Report..... KIEL Institute	
Applicant's name Seoul Semiconductor Co., Ltd.	
Address 97-11, Sandan-ro 163beon-gil, Danwon-gu, Ansan-si, Gyeonggi-do, Korea	
Test specification:	
Standard.....	IEC TR 62778:2014 (Second Edition)
Test procedure.....	CE-LVD
Non-standard test method.....	N/A
Test Report Form No. IEC62778A	
Test Report Form(s) Originator.... TÜV SÜD Product Service GmbH	
Master TRF Dated 2016-02	
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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.	
General disclaimer:	
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 CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	



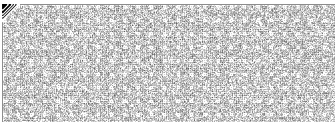
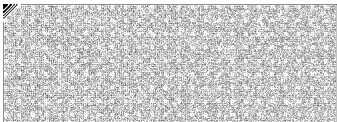
Test item description	LED Package	
Trade Mark	N/A	
Manufacturer	Same as applicant	
Model/Type reference	STWxA12D-E3	
Ratings	3 Vdc, 200 mA	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒ Testing Laboratory:	KIEL Institute	
Testing location/ address	A-403 Daewoo Technopark, 261, Doyak-ro, Wonmi-gu, Bucheon-si, Gyeonggi-do, Korea 14523	
Tested by (name, function, signature)	Hyoseok Oh Research Engineer	
Approved by (name, function, signature) ..	EunCheol Jung Technical Manager	



List of Attachments (including a total number of pages in each attachment):	
- Relative Spectrum graph	1 page
- Photographs	1 page
Summary of testing:	
Tests performed (name of test and test clause): These tests fulfil the requirements of standard ISO/IEC 17025. Fulfil the requirements of standard IEC TR 62778.	Testing location: KIEL Institute A-403 Daewoo Technopark, 261, Doyak-ro, Wonmi-gu, Bucheon-si, Gyeonggi-do, Korea 14523
Copy of marking plate: None	

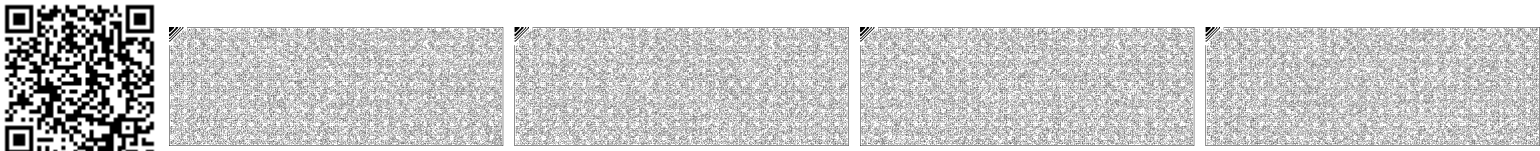


Test item particulars.....: LED package	
Product evaluated.....: ☒ LED package ☐ LED module ☐ Lamp ☐ Luminaire	
Rated voltage (V): 3	
Rated current (mA): 200	
Rated CCT (K).....: 6 500	
Rated Luminance (Mcd/m2): Not specified	
Component report data used: ☒ Not applicable ☐ LED package ☐ LED module ☐ Lamp Report number: --	
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: 2024-06-22 Date (s) of performance of tests.....: 2024-06-25	
General remarks: "(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 ☐ comma / ☒ point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC62778A:	
The application for obtaining a 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)	1. Seoul Semiconductor. Co. Ltd 97-11, 163, Sandan-ro, Danwon-gu, Ansan-city, Gyeonggi-do, Korea 2. Seoul Semiconductor. Co. Ltd 18th, Jinnan Economic Development Area, Tianjin, China 3. Seoul Semiconductor. Co. Ltd Dong Van 1 Industrial Zone, Bach Thuong ward, Duy Tien town, Ha Nam province, Vietnam
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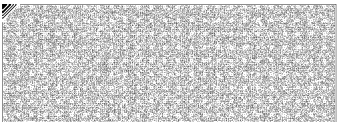
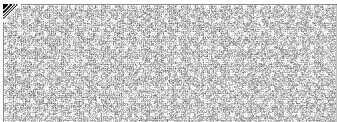


General product information:
In order to determinate (according to IEC TR 62778) the highest L_B value of the module, the radiance measurement was carried out at the distance of 200 mm from detector, in the direction of maximum light output.

Model difference
All models have same LED package size and number of chip except below difference.

LED package size	Basic model	Test model	Cover model		Input current	Note.
			No zener Type	In zener Type		
3528	STWxA12D-E3	STW8A12D-E3	STWxA12D-S1	STWxA12D-S1(IZ)	200 mA	'x' = CRI (7=CRI70/8=CRI80/9=CRI90/H=CRI95/S=CRI95)
			STWxA12D	STWxA12D-IZ		
			STWxA12D-E1	STWxA12D-E1-IZ		
				STWxA12D-1S		
			STWxA12D-E2	STWxA12D-E2-IZ		
				STWxA12D-2S		
			STWxA12D-E3	-		
			STWxA12D-B0	-		
			STWxA12D-B1	-		

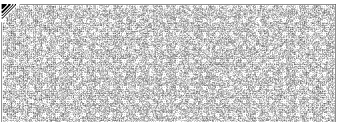
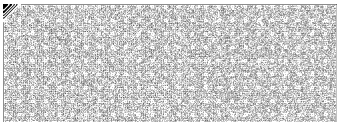
Model STW8A12D-E3 was tested in this report as representative.

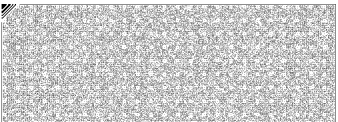
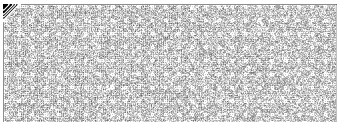
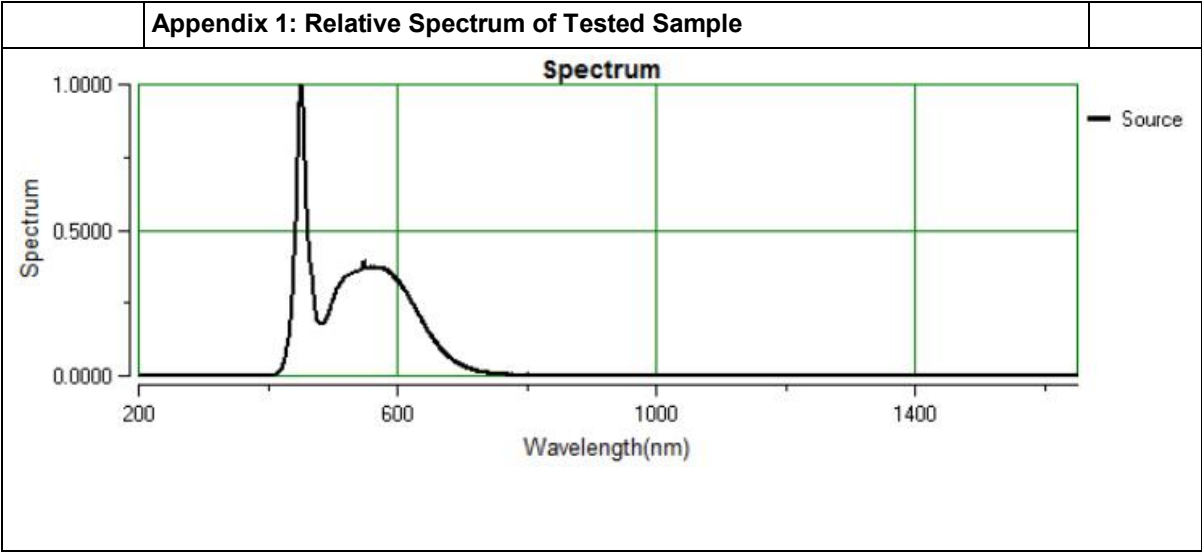


IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
7	MEASUREMENT INFORMATION FLOW		P
7.1	Basic flow		P
	'Law of conservation of luminance' applied		N/A
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions 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/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		N/A
	LED package is evaluated as: ☐ RG0 unlimited ☐ RG1 unlimited		N/A
	E_{thr} of LED package applies to array		N/A
8	RISK GROUP CLASSIFICATION		P
	Risk group achieved:		P
	-... Risk Group 0 unlimited		N/A
	-... Risk Group 1 unlimited		P
	- E_{thr} (lx) : Distance to reach RG1 (m) :		N/A



TABLE: Spectroradiometric measurement					P
Measurement performed on:		☒ LED package ☐ LED module ☐ Lamp ☐ Luminaire			
Model number.....		STW8A12D-E3			
Test voltage (V).....		3.18			
Test current (mA).....		200			
Test frequency (Hz)		-			
Ambient, t (°C)		25 °C			
Measurement distance		☒ 20 cm ☐ ... cm			
Source size		☒ Non-small ☐ Small : mm			
Field of view		☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)			
Item		Symb ol	Units	Result	Remark
Correlated colour temperature		CCT	K	7 018	
x/y colour coordinates				0.306 2 / 0.315 9	
Blue light hazard radiance		L _B	W/(m²•sr¹)	8.125e+003	
Blue light hazard irradiance		E _B	W/m²	8.484e-001	
Luminance		L	cd/m²	8.759e+006	
Illuminance		E	Lx	915	
Supplementary information: RG1 unlimited					





Appendix 2: Photo graphs



< Front view of LED package>

