SAMSUNG

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

Report Number:	19-01-01
Date of issue:	2019-01-10
Total number of pages	12
Name of Testing Laboratory	SAMSUNG ELECTRONICS Co., Ltd.
preparing the Report	1, Samsung-ro, Giheung-gu, Yongin-si, Gyeonggi-do, 17113, Korea
Applicant's name:	SAMSUNG ELECTRONICS Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Test specification:	
Standard:	IEC TR 62778:2014 (Second Edition)
Test procedure:	N/A
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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General disclaimer:

The test results presented in this report relate only to the object tested.

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Р	ad	е	2	of	12
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Test	item description:	LED P	KG			
Trad	e Mark::	SΛI	MSUNG			
Manu	ufacturer:	SAMS	UNG ELECTRONICS Co., Ltd.			
		1, Sam	nsung-ro, Giheung-gu, Yongin-si, Gyeonggi-do, 17113,			
		Korea				
Mode	el/ I ype reference :	LM281				
Ratir	igs:	Const.	70 mA; DC 2,95 V; 6 500	JK		
Resp	oonsible Testing Laboratory (as a	pplicat	ble), testing procedure	and testing location(s):		
\boxtimes	Testing Laboratory:		SAMSUNG ELECTRON	NCS Co., Ltd.		
Testi	ng location/ address	:	1, Samsung-ro, Giheung 17113, Korea	g-gu, Yongin-si, Gyeonggi-do,		
	Associated CB Testing Laborato	ry:				
Testi	ng location/ address	:				
.				1		
lest	ed by (name, function, signature)	:	Jaeyun Song	Am		
Appr	oved by (name, function, signatu	re):	Dosuk Oh	Club		
\square	Testing procedure: CTF Stage 1:	-				
Testi	ng location/ address					
Test	ed by (name, function, signature)	i				
Appr	oved by (name, function, signatu	re):				
	Testing procedure: CTF Stage 2:	-				
Testi	ng location/ address					
Test	ed by (name + signature)	:				
Witn	essed by (name, function, signati	ure).:				
Appr	oved by (name, function, signatu	re):				
	Testing procedure: CTE Stage 2:					
	Testing procedure: CTF Stage 4.					
Toeti	ing location/ address					
1000						
Test	ed by (name, function, signature)	:				
Witn	essed by (name, function, signate	ure).:				
Appr	oved by (name, function, signatu	re):				

Page	Report No. 19-01-01	
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment):							
Summary of testing:							
Tests performed (name of test and test clause):	Testing location:						
	SAMSUNG ELETRONICS Co., Ltd						
All relevant tests have been performed.	1, Samsung-ro, Giheung-gu, Yongin-si, Gyeonggi- do, 17113, Korea						
Summary of compliance with National Difference	es (List of countries addressed):						

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

N/A

Test item particulars:	
Product evaluated	 □ LED package □ LED module □ Lamp □ Luminaire 2.95 V
Rated current (mA)	Const 70 mA
Rated CCT (K)	6 500 K
Bated Luminance (Mcd/m ²)	N/A
Component report data used	 Not applicable LED package LED module Lamp Report number: N/A
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:	2019-01-08
Date (s) of performance of tests:	2019-01-10
General remarks:	
"(See Enclosure #)" refers to additional information ap "(See appended table)" refers to a table appended to the Throughout this report a 🛛 comma / 🗌 point is u	opended to the report. ne report. sed as the decimal separator.
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 t	he General product information section.

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Name and address of factory (ies): SHENZHEN MTC LIGHTING CO., Ltd

MTC Industry Park, Xialilang community, Nanwan street, Longgang district, Shenzhen, China

General product information:

- Product Code Information

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S	Р	м	w	н	2	2	2	8	6	D	5	w	Α	R	0	S	3
Di	git		PKG Info	rmation		Code					Sp	ecificati	on				

1 2 3	Samsung Package Middle Power	SPM	Middle po	Middle power					
4 5	Color	WH	White	White					
6	Product Version	2	2 nd versio	2 ^{ed} version					
789	Form Factor	228	2.8 x 3.5	x 0.65 mm	; 2 pads; 1chip;				
10	Sorting Current (mA)	6	60 mA						
11	Chromaticity Coordinates	D	ANSI Sta	ndard					
12	CRI	5	Min. 80						
13 14	Forward Voltage (V)	WA or WK	2.8-3.3 WA : 4000	Bin code	A1 2.8 ~ 2.9 A2 2.9 ~ 3.0 A3 3.0 ~ 3.1 A4 3.1 ~ 3.2 A5 3.2 ~ 3.3				
		W÷	2700		W1 W2 W3 W4 W5 W6 W7 W8 W9 WA WB WC WD WE WE WG				
15 16	(CCT (K)	V☆ U☆ T☆ R☆ Q☆ P☆	3000 3500 4000 5000 5700 6500	Bin Code:	V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC, VD, VE, VF, VG U1, U2, U3, U4, U5, U6, U7, U8, U9, UA, UB, UC, UD, UE, UF, UG T1, T2, T3, T4, T5, T6, T7, T8, T9, TA, TB, TC, TD, TE, TF, TG R1, R2, R3, R4, R5, R6, R7, R8, R9,RA,RB,RC,RD,RE,RF,RG Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9,QA,QB,QC,QD,QE,QF,QG P1, P2, P3, P4, P5, P6, P7, P8, P9,PA,PB,PC,PD,PE,PF,PG				
17 18	Luminous Flux	S2 53	×. (Bin Code	S2 S3				

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item	Symbol	Rating	Unit	Condition
Ambient / Operating Temperature	T _a	-40 ~ +85	٩C	To and the second se
Storage Temperature	Tsig	-40 - +85	٩C	ũ.
LED Junction Temperature	T _i	115	°C	ā
Forward Current	le	70	mA	÷
Peak Pulsed Forward Current	lep	140	mA	Duty 1/10, pulse width 10m
Assembly Process Temperature	1.00	260 <10	°C s	-

Note:

Proper current derating must be observed to maintain junction temperature below the maximum at all time.

- Bird view of the PKG



		IEC TR 62778		
Clause	Requirement + Test		Result - Remark	Verdict

7	MEASUREMENT INFORMATION FLOW								
7.1	Basic flow								
	'Law of conservation of luminance' applied		N/A						
	Use of only true luminance/radiance values		Р						
	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 Ethr value for RG2 was established the peak value was derived from angular light distribution		N/A						
7.2	Conditions for the radiance measurement								
	Standard condition applied (200mm distance, 0,011rad field of view)		N/A						
	Non-standard condition applied		N/A						
7.3	Special cases (I): Replacement by a lamp or LED module of another type								
	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								
	LED package is evaluated as:	RG0 unlimited RG1 unlimited	N/A						
	Ethr of LED package applies to array		N/A						
8	RISK GROUP CLASSIFICATION		Р						
	Risk group achieved:	Small source							
	Risk Group 0 unlimited		N/A						
	Risk Group 1 unlimited		N/A						
	- E _{thr} (lx) : Distance to reach RG1 (m) :	1 220	Р						

	TABLE: Spectroradiometric measurement									
	Measurement perf	ormed o	on:	🛛 LED pac	kage					
				LED mod	dule					
				🗌 Lamp						
					🗌 Luminaiı					
	Model number				SPMWH222	86D5WAPMS3				
	Test voltage (V)				DC 2,95 V		_			
	Test current (mA)				70 mA					
	Test frequency (Ha	z)			-		_			
	Ambient, t (°C)				25,0					
	Measurement dist	ance			🛛 20 cm		_			
					🗌 cm					
	Source size				🗌 Non-sma	11	—			
					Small : 0,					
	Field of view				🛛 100 mrac	—				
					☐ 11 mrad					
	<u> </u>					(lor small sources)				
	Item	Symb ol	Units		Result	Remark				
Correlated of	colour temperature	ССТ	К	6 08	7					
x/y colour co	oordinates			0,32	203 / 0,3328					
Blue light ha	azard radiance	LB	W/(m ² •sr ¹)	-						
Blue light ha	azard irradiance	Ев	W/m ²	0,22	6 ± 0,023					
Luminance		L	cd/m ²	-						
Illuminance		E	lx	275	± 28					
Supplement	ary information:									



List of test equipment used:

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to CTF stage 1 or CTF stage 2 procedure has been used. Note: This page may be removed when CTF stage 1 CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
Irradiance measurements Radiance	IDR 300 Monochromator ID No.: E-65	200-1400nm	calibrated prior each measurement	N/A
Radiance measurement	TEL309 Telescope ID No.: E-65(1)	300-1400nm	calibrated prior each measurement	N/A
Radiance measurements	SRS 12 Radiance Standard (15474/3)	300-1400nm	2017.07.13	2019.07.13
Irradiance measurements	CL6 Spectral irradiance Standard (15265/5)	300-3000nm	2017.07.12	2019.07.12
Irradiance measurements	CL7 Spectral irradiance Standard (15472/3)	200-400nm	2017.07.12	2019.07.12
	Measurement / testing Irradiance measurements Radiance measurement Radiance measurements Irradiance measurements Irradiance measurements	Measurement / testingTesting / measuring equipment / material used, (Equipment ID)Irradiance measurementsIDR 300 Monochromator ID R 300 Monochromator ID No.: E-65Radiance measurementTEL309 Telescope ID No.: E-65(1)Radiance measurementsSRS 12 Radiance Standard (15474/3)Irradiance measurementsCL6 Spectral irradiance standard (15265/5)Irradiance measurementsCL7 Spectral irradiance standard (15472/3)Irradiance measurementsStandard (15472/3)Irradiance measurementsStandard (15472/3)	Measurement / testingTesting / measuring equipment / material used, (Equipment ID)Range usedIrradiance measurementsIDR 300 Monochromator ID No.: E-65200-1400nmRadiance measurementsTEL309 Telescope ID No.: E-65(1)300-1400nmRadiance measurementsTEL309 Telescope ID No.: E-65(1)300-1400nmRadiance measurementsSRS 12 Radiance Standard (15474/3)300-1400nmIrradiance measurementsCL6 Spectral irradiance Standard (15265/5)300-3000nmIrradiance measurementsCL7 Spectral irradiance Standard (15472/3)200-400nmIrradiance measurementsCL7 Spectral irradiance Standard (15472/3)200-400nm	Measurement / testingTesting / measuring equipment / material used, (Equipment ID)Range usedLast Calibration dateIrradiance measurementsIDR 300 Monochromator ID No.: E-65200-1400nmcalibrated prior each measurementRadiance measurementTEL309 Telescope ID No.: E-65(1)300-1400nmcalibrated prior each measurementRadiance measurementsTEL309 Telescope ID No.: E-65(1)300-1400nmcalibrated prior each measurementRadiance measurementsCL6 Spectral irradiance Standard (15474/3)300-1400nm2017.07.13Irradiance measurementsCL6 Spectral irradiance Standard (15265/5)300-3000nm2017.07.12Irradiance measurementsCL7 Spectral irradiance Standard (15472/3)200-400nm2017.07.12Irradiance measurementsCL7 Spectral irradiance Standard (15472/3)200-400nm2017.07.12Irradiance measurementsCL7 Spectral irradiance Standard (15472/3)200-400nm2017.07.12Irradiance measurementsInternet internet interne

End of Test Report