



Test Report issued under the responsibility of:
NCB TÜV SÜD PSB Pte. Ltd.
15 International Business Park TÜV SÜD @ IBP
Singapore 609937



TEST REPORT
IEC 62560
Self-Ballasted LED-Lamp
for general lighting services by voltage > 50V Safety specifications

Report Number. : 085-190561802-000

Date of issue : 2021-10-31

Total number of pages 16

Name of Testing Laboratory preparing the Report : TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou branch.

Applicant's name : FUMAGALLI SRL.

Address : Via Ca Bassa, 29, 21100, VARESE, Italy

Test specification:

Standard : IEC 62560:2011, AMD1:2015

Test procedure : CB Scheme

Non-standard test method : N/A

Test Report Form No. : IEC62560C

Test Report Form(s) Originator.... : DEKRA Certification B.V.

Master TRF : Dated 2018-12-21

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

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Test item description..... :	LED Lamps (Self-ballast LED lamp)
Trade Mark :	
Manufacturer..... :	Same as applicant
Model/Type reference..... :	H.LED.G53.CCT (V2), H3.LED.G53.CCT (V2), .G1K GX53 LED 3W, .D1K GX53 LED 10W
Ratings..... :	100-240V~, 50/60Hz, GX53 cap, 3W (H.LED.G53.CCT (V2), .G1K GX53 LED 3W), 10W (H3.LED.G53.CCT (V2), .D1K GX53 LED 10W), RG1.

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

<input checked="" type="checkbox"/>	Testing Laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd.Guangzhou branch.
Testing location/ address.....:		5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West Guangzhou, 510656 P. R. China.
Tested by (name, function, signature).....:		Annie Wang (Project Handler)
Approved by (name, function, signature)....:		Peter Hu (Designated Reviewer)

<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address.....:		
Tested by (name, function, signature).....:		
Approved by (name, function, signature)....:		

<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address.....:		
Tested by (name + signature)		
Witnessed by (name, function, signature)...		
Approved by (name, function, signature)....:		

<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
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List of Attachments (including a total number of pages in each attachment):**Attachment 1: IEC/TR 62778:2014(7 pages).****Photo report, 8 pages.****Summary of testing:****Tests performed (name of test and test clause):**

1. The samples submitted were tested in accordance with IEC 62560:2011, IEC 62560:2011+AMD1:2015.
2. Chose H.LED.G53.CCT (V2), H3.LED.G53.CCT (V2) for representative test.
3. According to test result of IEC/TR 62778:2014, these products can be assigned to RG1.
4. This report was based on original report: 085-190561801-000, alternated type of LED driver for these models.

Testing location:

5F, Communication Building, 163 Pingyun Rd,
Huangpu West Ave., Guangzhou, P.R. China,
510656

Summary of compliance with National Differences: N/A.

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.

H.LED.G53.CCT (V2)

100-240V ~ 50/60Hz 3W 335lm Φuse
3000K - 405lm Φtot.
4000K - 410lm Φtot.
6500K - 410lm Φtot.



.G1K GX53 LED 3W

100-240V ~ 50/60Hz 3W 335lm Φuse
3000K - 405lm Φtot.
4000K - 410lm Φtot.
6500K - 410lm Φtot.



H3.LED.G53.CCT (V2)

100-240V ~ 50/60Hz 10W 975lm Φuse
3000K - 1190lm Φtot.
4000K - 1290lm Φtot.
6500K - 1210lm Φtot.



.D1K GX53 LED 10W

100-240V ~ 50/60Hz 10W 975lm Φuse
3000K - 1190lm Φtot.
4000K - 1290lm Φtot.
6500K - 1210lm Φtot.



Remark:

1. Symbol height is greater than 5mm, text height is greater than 2mm, WEEE is greater than 7mm.

Test item particulars: Self-ballast LED lamp

Classification of installation and use.....: IP20

Supply Connection: GX53 cap

.....:

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.....: 2021-06-17

Date (s) of performance of tests: 2021-06-17 to 2021-08-28

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 IEC 60598-2-13:

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)..... : Same as applicant.

General product information and other remarks:

The products covered in this report are GX53 LED lamps for indoor use only.

The circuit diagrams are divided into two types, one is for 3W models, another is for 10W models.


The LED driver of 10W models is SELV type, while for 3W models is not SELV type.

10W models are sealed by glue except 3W models.

Model 1 and Model 2 are same products just different in model name.

Details information of the products see below table.

Model 1	Model 2	Rated Power	LED Number	Lamp cap	Enclosure	CCT
H.LED.G53.CCT (V2)	.G1K GX53 LED 3W	3W	20pcs (3000K) 20pcs (4000K) 20pcs (6500K)	GX53	plastic	3000K, 4000K, 6500K
H3.LED.G53.CCT (V2)	.D1K GX53 LED 10W	10W	44pcs (3000K) 44pcs (4000K) 44pcs (6500K)	GX53	plastic and metal	

IEC 62560			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.1	The lamp shall be so designed and constructed that in normal use cause no danger to the user.		P
4.2	Self-ballasted LED-Lamp are non-repairable.		P
5	MARKING		P
5.1	Mandatory marking		P
	- mark of origin		P
	- rated supply voltage (V)		P
	- rated wattage (W)		P
	- rated frequency (Hz)		P
5.2	Addition marking		P
	- rated current (A).....		P
	- weight significantly higher		N/A
	- special conditions or restrictions		N/A
	Not suitable for dimming; symbol used 		P
	- not suitable for water contact		P
5.3	Marking durable and legible		P
	rubbing 15 s water, 15 s petroleum; marking legible		P

6	INTERCHANGEABILITY		P
6.1	Cap interchangeability in accordance with IEC 60061-1		P
	Gauge in accordance with IEC 60061-3		P
6.2	Bending moment and mass imparted by the lamp at the lampholder		P
	Bending moment imparted by the lamp at the lampholder (Nm)	Max. 0.0088Nm	P
	Mass not exceeding value table 2 or as specified in IEC 60061-1 (kg).....	Max. 0.222kg	P

7	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		P
	Internal, basic insulated or live metal parts not accessible		P
	Tested with a test finger with a force of 10 N		P
	Compliance checked with appropriate gauges		P

IEC 62560			
Clause	Requirement + Test	Result - Remark	Verdict
8	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
8.2	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	≥ 4 MΩ for double or reinforced insulation : >100 MΩ		P
8.3	Immediately after clause 8.2 electric strength test for 1 min		P
	Double or reinforced insulation, 4U + 2000 V		P
	No flashover or breakdown		P
9	MECHANICAL STRENGTH		N/A
9.2.1	Torsion resistance of unused lamps		N/A
	B15d or E14 Cap 1,15 Nm		N/A
	B22d, E26, E26d or E27 Cap 3,0 Nm		N/A
	E11 or E12 Cap 0,8 Nm		N/A
	E17 Cap 1,5 Nm		N/A
	E39 or E40 Cap 5,0 Nm		N/A
	GX53 Cap 3,0 Nm		P
9.2.3	Compliance criteria		P
	Clause 8 shall comply after the mechanical strength test.		P
9.2.4	Axial strength of Edison caps		N/A
	After full insertion into the gauge an axial force of Table 4 is applied to the central contact (N) :		N/A
	The insulation around the central contact shall remain intact		N/A
10	CAP TEMPERATURE RISE		P
	The cap temperature rise Δt _s of the lamp shall not exceed 120 K.		P
11	RESISTANCE TO HEAT		P
	Parts of insulating material providing protection against electric shock, retaining live parts in position, ball-pressure test:	(see appended table)	P
12	RESISTANCE TO FLAME AND IGNITION		P
	External parts of insulating material preventing electric shock glow-wire test 650 °C	(see appended table)	P

IEC 62560			
Clause	Requirement + Test	Result - Remark	Verdict
13	FAULT CONDITIONS		P
13.2	Fault conditions: where diagram indicates fault condition impairs safety, electronic components have been short-circuited or disconnected	(see appended table)	P
13.3	When operated under fault conditions the lamp		P
	- does not emit flames or molten material		P
	- does not produce flammable gases or smoke		P
	- live parts not accessible		P
	After the tests the insulation resistance with d.c. 1000 V complies with requirements of Cl. 8.1		P
14 (16)	CREEPAGE DISTANCES AND CLEARANCES		P
	Creepage distances and clearances according to IEC 61347-1	(see appended table)	P
	Conductive accessible parts according to IEC 60598-1	(see appended table)	P
15	ABNORMAL OPERATION		P
	Non-dimmable self-ballasted lamps are tested on a dimmer or an electronic switch according the test circuit shown in Figure 8		P
	Operate the lamp for 8 h at most onerous dimming level		P
	When operated under abnormal operation the lamp		P
	- does not catch fire		P
	- does not produce flammable gases		P
	- live parts not accessible		P
16	TEST CONDITIONS FOR DIMMABLE LAMPS		N/A
	Test are carried out at maximum power setting for Clause 10 and Clause 17		N/A
17	PHOTOBIOLOGICAL SAFETY		P
17.1	UV radiation		N/A
	The LED lamp doesn't exceed 2mW/klm		N/A
17.2	Blue light hazard		P
	Assessed according to IEC TR 62778		P
	LED lamps shall be RG0 or RG1	RG1	P

IEC 62560			
Clause	Requirement + Test	Result - Remark	Verdict

18	INGRESS PROTECTION		N/A
18.1	Lamps shall be suitable for water contact unless marked with Figure 6		N/A
18.2	The lamp is subjected to an IPX4 test according to IEC 60598-1		N/A
	The lamp complies with the compliance provisions of 9.2 of IEC 60598-1		N/A
	Lamps constructed so that it is sealed to exclude water need not to be tested		N/A

11	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) :				—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Lens	See ANNEX 1	88.3	0.70	
Plastic material of lampholder	See ANNEX 1	125	1.33	
Bobbin of inductance	See ANNEX 1	125	0.54	
Bobbin of transformer	See ANNEX 1	125	0.41	
Supplementary information:				

12	TABLE: Resistance to heat and fire - Glow wire tests				P
Object/ Part No./ Material	Manufacturer/ trademark	Glow wire test (GWT); (°C)		Verdict	
		650			
		te	ti		
Lens	See CDF	30s	0	—	
Plastic enclosure	See CDF	30s	0		

13	TABLE: tests of fault conditions Model: H.LED.G53.CCT (V2)		P
Part	Simulated fault	Result	Hazard
RV	Short circuit	Unit shut down, fuse open.	YES/NO
C2	Short circuit	Unit shut down, can recover. Input: 1.22W.	YES/NO
C3	Short circuit	Unit shut down, can recover. Input: 1.02W.	YES/NO
U1	Short circuit	Unit shut down, can recover. Input: 0.73W.	YES/NO
Output	Short circuit	Unit shut down, can recover. Input: 1.39W.	YES/NO
Output	Open circuit	Unit shut down, can recover. Input: 1.51W.	YES/NO

IEC 62560

Clause	Requirement + Test	Result - Remark	Verdict
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Remark:

1. Repeat three times for which fault condition if fusing resistor broken.
2. The s/c or o/c operation should be introduced when appliance reached steady in normal operation.
3. After the tests, when the lamp has returned to ambient temperature, the insulation resistance measured at approximately 500 V d.c. shall be not less than 1 MΩ.

13	TABLE: tests of fault conditions Model: H3.LED.G53.CCT (V2)		P
Part	Simulated fault	Result	Hazard
Electrical cap	Short circuit	Unit shut down, can recover. Input: 1.31W.	YES/NO
D2	Short circuit	Unit shut down, can recover. Input: 0.48W.	YES/NO
U1	Short circuit	Unit shut down, can recover. Input: 0.61W.	YES/NO
Output	Short circuit	Unit shut down, can recover. Input: 0.96W.	YES/NO
Output	Open circuit	Unit shut down, can recover. Input: 0.51W.	YES/NO

Remark:

1. Repeat three times for which fault condition if fusing resistor broken.
2. The s/c or o/c operation should be introduced when appliance reached steady in normal operation.
3. After the tests, when the lamp has returned to ambient temperature, the insulation resistance measured at approximately 500 V d.c. shall be not less than 1 MΩ.

14	TABLE: Clearance And Creepage Distance Measurements						P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	
H.LED.G53.CCT (V2)							
between L and N	-	240	<u>1.5</u>	>3.5	<u>2.5</u>	>3.5	
between fuse	-	240	<u>1.5</u>	>3.5	<u>2.5</u>	>3.5	
Between live parts and accessible enclosure	-	330	<u>4.0</u>	6.16	<u>5.3</u>	6.16	
H3.LED.G53.CCT (V2)							
between L and N	-	240	<u>1.5</u>	>3.5	<u>2.5</u>	>3.5	
between fuse	-	240	<u>1.5</u>	>3.5	<u>2.5</u>	>3.5	
Between pri. Part and sec. part	-	240	<u>3.0</u>	5.3	<u>5.0</u>	5.3	
Between live parts and accessible enclosure	-	240	<u>3.0</u>	>6.5	<u>5.0</u>	>6.5	
Supplementary information:							

Appended table: Heating test, thermocouples			P
Model No.:	H.LED.G53.CCT (V2)		—

IEC 62560			
Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage (V) :	100	—
	Wattage(W) / current(A)	2.64/0.045	—
	Ambient (°C) :	25	—
Thermocouple locations	Measured temp. (°C)	Temp. rise limits (°C)	
RV	49.1	85	
C2	50.8	105	
C3	49.4	105	
Winding of L	50.4	120	
Bobbin of L	49.6	For material test	
PCB	54.1	130	
LED module PCB	53.1	130	
Lens (inner surface)	46.3	For material test	
Plastic enclosure (inner surface, hottest point)	48.1	For material test	

Appended table: Heating test, thermocouples			P
	Model No.:	H.LED.G53.CCT (V2)	—
	Test voltage (V) :	240	—
	Wattage(W) / current(A)	2.77/0.025	—
	Ambient (°C) :	25	—
Thermocouple locations	Measured temp. (°C)	Temp. rise limits (°C)	
RV	51.9	85	
C2	53.0	105	
C3	53.1	105	
Winding of L	55.2	120	
Bobbin of L	54.2	For material test	
PCB	60.1	130	
LED module PCB	55.5	130	
Lens (inner surface)	50.3	For material test	
Plastic enclosure (inner surface, hottest point)	50.7	For material test	

Appended table: Heating test, thermocouples			P
	Model No.:	H3.LED.G53.CCT (V2)	—
	Test voltage (V) :	100	—
	Wattage(W) / current(A)	10.26/0.104	—
	Ambient (°C) :	25	—

IEC 62560			
Clause	Requirement + Test	Result - Remark	Verdict
Thermocouple locations	Measured temp. (°C)	Temp. rise limits (°C)	
CY1	63.7	125	
Electrical cap	53.6	105	
Primary winding of T	63.9	120	
Secondary winding of T	53.7	120	
Bobbin of T	64.8	For material test	
PCB	58.5	90	
LED module PCB	57.2	130	
Lens (inner surface)	63.3	For material test	
Plastic enclosure (inner surface, hottest point)	48.7	For material test	

	Appended table: Heating test, thermocouples		P
	Model No.:	H3.LED.G53.CCT (V2)	—
	Test voltage (V) :	240	—
	Wattage(W) / current(A)	9.58/0.049	—
	Ambient (°C) :	25	—
Thermocouple locations	Measured temp. (°C)	Temp. rise limits (°C)	
CY1	66.1	125	
Electrical cap	53.9	105	
Primary winding of T	63.3	120	
Secondary winding of T	57.9	120	
Bobbin of T	56.8	For material test	
PCB	62.2	90	
LED module PCB	47.4	130	
Lens (inner surface)	61.4	For material test	
Plastic enclosure (inner surface, hottest point)	55.2	For material test	

ANNEX 1	TABLE: Critical components information					P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾

H.LED.G53.CCT (V2)						
Driver PCB	B	QUZHOU TIANYING ELECTRONICS CO LTD	TY-L01	V-0, 90°C	—	UL * Tested with appliance#

IEC 62560						
Clause	Requirement + Test			Result - Remark		Verdict
		CHANGSHAN YIHAI ELECTRONIC CO LTD	YH-02	V-0, 90°C	—	UL *
Fuse resistor	B	SHENZHEN GREAT ELECTRONICS CO LTD	RXF-1W Series	10Ω/1W	—	UL * Tested with appliance#
RV	B	GUANGXI NEW FUTURE INFORMATION INDUSTRY CO LTD	07D471K 07D511K	470V/510V	IEC61051-1, IEC61051-2, IEC61051-2-2	VDE*
	B	GUANGDONG HUIWAN ELECTRONICS TECHNOLOGY CO LTD	V471K07D(E) V511K07D(E)	470V/510V	IEC61051-1, IEC61051-2, IEC61051-2-2	VDE*
	B	XIAN XIWUER ELECTRONIC & INFORMATION CO LTD	MYG-7k471 MYG-7k511	470V/510V	IEC61051-1, IEC61051-2, IEC61051-2-2	VDE*
	B	HONGZHI ELECTRONIC TECHNOLOGY CO., LTD	HEL07D471K HEL07D511K	470V/510V	IEC61051-1, IEC61051-2, IEC61051-2-2	VDE*
Transformer (T1)	C	ZHEJIANG TONGDA MAGNETISM INDUSTRY CO.,LTD	EE8.3	6mH	EN 62560	Tested with appliance#
-Bobbin	B	CHANG CHUN PLASTICS CO LTD	T375J	V-0, 150°C	—	UL * Tested with appliance#
- Magnet Wire	B	ZHEJIANG SANXING ELECTRICAL TECHNOLOGY CO., LTD.	xUEW/155, QA-x/155	155°C	—	UL *
— Insulating Tape	B	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD OR EQUAL	CT	130°C, yellow	—	UL *
LED chip	C	Shenzhen MTC Lighting Co., Ltd	MTXB-2835XB-MHK	IF: 150mA, VF: max. 3.2V, Pd: 450mW, CCT: 3000K, 6500K	EN 62560	Tested with appliance#

IEC 62560						
Clause	Requirement + Test			Result - Remark		Verdict
	C	XiaMen Dacol Photoelectronics Technology CO.,LTD	DC-P2835Wxx-x	IF: 150mA, VF: max. 3.4V, Pd: 500mW, CCT: 3000K, 6500K	EN 62560	Tested with appliance#
LED PCB	B	QUZHOU TIANYING ELECTRONICS CO LTD	TY-L01	V-0, 90°C	--	UL * Tested with appliance#
	B	CHANGSHAN YIHAI ELECTRONIC CO LTD	YH-02	V-0, 90°C	--	UL *
	B	JIANGXI HONGYU CIRCUIT TECHNOLOGY CO LTD	HY-2	V-0, 130°C	--	UL *
Plastic enclosure	B	Fujian Huasu Innovative Plastics Material Co Ltd	PC	V-2	--	UL * Tested with appliance#
Plastic cover	B	Fujian Huasu Innovative Plastics Material Co Ltd	PC	V-2	--	UL * Tested with appliance#
GX53 lamp cap	C	Zhejiang Yankon Group Co., Ltd	--	--	EN 62560	Tested with appliance#
H3.LED.G53.CCT (V2)						
Driver PCB	B	MEIZHOU TONGZHENG ELECTRONIC CO LTD	EC-3	V-0, 130°C	--	UL * Tested with appliance#
	B	SHANGYU Quleng accessories co.,LTD	PC	V-2	--	UL *
Fuse resistor	B	SHENZHEN GREAT ELECTRONICS CO LTD	RXF-1W Series	1W	--	UL * Tested with appliance#
RV	B	Shanghai Boarden Industrial Co.Ltd.	CMS1206	1206V471 AC300V, 1206V511 AC320V	IEC 61051-1, IEC61051-2, IEC61051-2-2	TUV SUD*
CY1	B	Xiamen Sino Faith Electronic Technology Co. Ltd	HCY	400V/1000pF, 25/125/21	EN 60384-14	VDE *
Transformer (T1)	C	ZHEJIANG TONGDA MAGNETISM INDUSTRY	EFD20	1.7mH	EN 62560	Tested with appliance#

IEC 62560						
Clause	Requirement + Test			Result - Remark		Verdict
		CO.,LTD				
-Bobbin	B	CHANG CHUN PLASTICS CO LTD	T375J	V-0, 150°C	—	UL * Tested with appliance#
- Magnet Wire	B	ZHEJIANG SANXING ELECTRICAL TECHNOLOGY CO., LTD.	xUEW/155, QA-x/155	155°C	—	UL *
— Insulating Tape	B	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD OR EQUAL	CT	130°C, yellow	—	UL *
Internal wire	B	DONGGUAN ZHONGZHENG WIRE&CABLE TECH CO LTD	3239	24AWG, 200°C	—	UL * Tested with appliance#
	B	JUNHAO WIRE TECHNOLOGY CO LTD	3239	24AWG, 200°C	—	UL *
	B	HANGZHOU LAIEN ELECTRICAL EQUIPMENT CO LTD	3239	24AWG, 200°C	—	UL *
	B	GAOYOUSHI DINGTIAN GAOFENZI CAILIAO CO LTD	3239	24AWG, 200°C	—	UL *
	B	SHENZHEN MYSUN INSULATION MATERIALS CO LTD	3239	24AWG, 200°C	—	UL *
	B	TONGXIANG YISHENG ELECTRIC CO LTD	3239	24AWG, 200°C	—	UL *
	B	DONGGUAN ZHONGZHEN ELECTRONIC WIRE CO LTD	3239	24AWG, 200°C	—	UL *
Silicone glue	B	DONGGUAN ZHAOSHUN SILICONE THCHNOLOGY CO.,LTD	ZS-GF-5299D	V-0, 150°C	—	UL * Tested with appliance#

IEC 62560						
Clause	Requirement + Test			Result - Remark		Verdict
LED chip	C	Shenzhen MTC Lighting Co., Ltd	MTXB-2835XB-MHK	IF: 150mA, VF: max. 3.2V, Pd: 450mW, CCT: 3000K, 6500K	EN 62560	Tested with appliance#
	C	XiaMen Dacol Photoelectronic s Technology CO.,LTD	DC-P2835Wxx-x-x	IF: 150mA, VF: max. 3.4V, Pd: 500mW, CCT: 3000K, 6500K	EN 62560	Tested with appliance#
LED PCB	B	QUZHOU TIANYING ELECTRONICS CO LTD	TY-L01	V-0, 90°C	—	UL * Tested with appliance#
	B	CHANGSHAN YIHAI ELECTRONIC CO LTD	YH-02	V-0, 90°C	—	UL *
	B	JIANGXI HONGYU CIRCUIT TECHNOLOGY CO LTD	HY-2	V-0, 130°C	—	UL *
Plastic enclosure	B	Fujian Huasu Innovative Plastics Material Co Ltd	PC	V-2	—	UL * Tested with appliance#
Plastic cover	B	Fujian Huasu Innovative Plastics Material Co Ltd	PC	V-2	—	UL * Tested with appliance#
GX53 lamp cap	C	Zhejiang Yankon Group Co., Ltd	—	--	EN 62560	Tested with appliance#

Supplementary information:

¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The codes above have the following meaning:

- A - The component is replaceable with another one, also certified, with equivalent characteristics
- B - The component is replaceable if authorised by the test house
- C - Integrated component tested together with the appliance
- D - Alternative component

* License available upon request

Please refer summary of testing in TRF for the test standard publication year



Test Report issued under the responsibility of:
 NCB TÜV SÜD PSB Pte. Ltd.
 15 International Business Park TÜV SÜD @ IBP
 Singapore 609937



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

Report Number. : See main report for details
 Date of issue : See main report for details
 Total number of pages 7

Name of Testing Laboratory : See main report for details
 preparing the Report..... :

Applicant's name..... : See main report for details
 Address..... : See main report for details

Test specification:

Standard : IEC TR 62778:2014 (Second Edition)
 Test procedure : See main report for details
 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.
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Test item description..... :	See main report for details	
Trade Mark..... :	See main report for details	
Manufacturer..... :	See main report for details	
Model/Type reference..... :	See main report for details	
Ratings..... :	See main report for details	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/> CB Testing Laboratory:	See main report for details	
Testing location/ address.....:	See main report for details	
<input type="checkbox"/> Associated CB Testing Laboratory:		
Testing location/ address.....:		
Tested by (name, function, signature).....:	See main report for details	
Approved by (name, function, signature)....:	See main report for details	
Testing procedure: CTF Stage 1:		
Testing location/ address.....:		
Tested by (name, function, signature).....:		
Approved by (name, function, signature)....:		
Testing procedure: CTF Stage 2:		
Testing location/ address.....:		
Tested by (name + signature)		
Witnessed by (name, function, signature)..:		
Approved by (name, function, signature)....:		
Testing procedure: CTF Stage 3:		
Testing procedure: CTF Stage 4:		
Testing location/ address.....:		
Tested by (name, function, signature).....:		
Witnessed by (name, function, signature)..:		
Approved by (name, function, signature)....:		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment): See main report for details	
Summary of testing:	
Tests performed (name of test and test clause): See main report for details	Testing location: See main report for details
Summary of compliance with National Differences (List of countries addressed): See main report for details <input type="checkbox"/> The product fulfils the requirements of _____ (insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)	
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. See main report for details	

Test item particulars: See main report for details	
Product evaluated: <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input checked="" type="checkbox"/> Lamp <input type="checkbox"/> Luminaire	
Rated voltage (V).....: See main report for details	
Rated current (mA).....: See main report for details	
Rated CCT (K): See main report for details	
Rated Luminance (Mcd/m ²).....: N/A	
Component report data used: <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> 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: See main report for details	
Date of receipt of test item.....: See main report for details	
Date (s) of performance of tests: See main report for details	
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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC62778A:	
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.....:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies).....: See main report for details	
General product information:	
See main report for details	

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/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 : <input type="checkbox"/> RG0 unlimited <input type="checkbox"/> 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:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input checked="" type="checkbox"/> Lamp <input type="checkbox"/> Luminaire			
Model number	H3.LED.G53.CCT			
Test voltage (V)	240			—
Test current (mA)	26.6			—
Test frequency (Hz)	50			—
Ambient, t (°C)	25			—
Measurement distance.....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm			—
Source size	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm			—
Field of view	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)			—
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	/	
x/y colour coordinates	—	—	/	
Blue light hazard radiance	L _B	W/(m ² •sr ¹)	515.583	
Blue light hazard irradiance	E _B	W/m ²	/	
Luminance	L	cd/m ²	/	
Illuminance	E	lx	/	
Supplementary information: chose CCT: 6500K for representative test.				

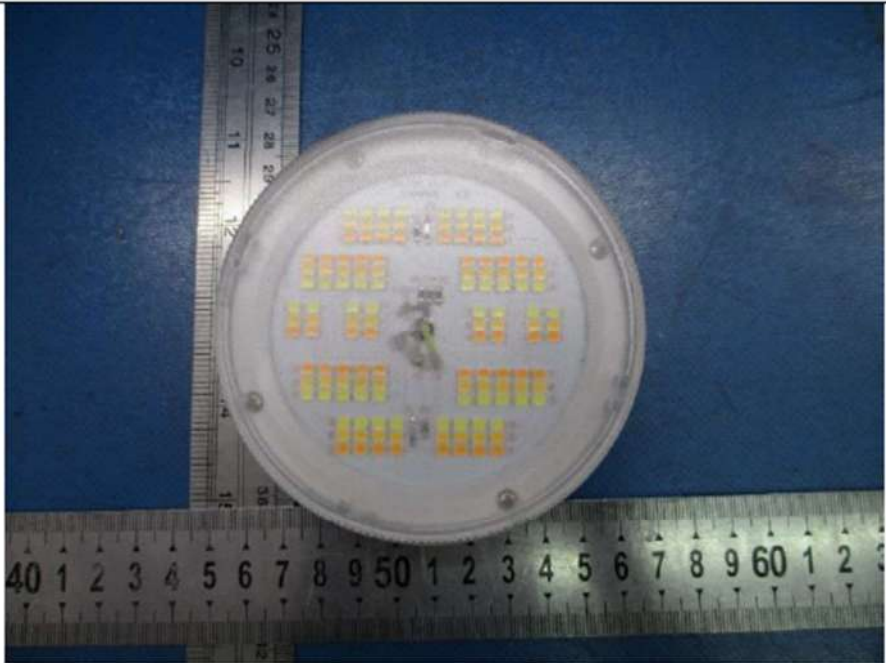
TABLE: Spectroradiometric measurement				P
Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input checked="" type="checkbox"/> Lamp <input type="checkbox"/> Luminaire			
Model number	H.LED.G53.CCT			
Test voltage (V)	240			—
Test current (mA)	46			—
Test frequency (Hz)	50			—
Ambient, t (°C)	25			—
Measurement distance.....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm			—

	Source size	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm			—
	Field of view	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)			—
Item	Symb ol	Units	Result	Remark	
Correlated colour temperature	CCT	K	/		
x/y colour coordinates	—	—	/		
Blue light hazard radiance	L _B	W/(m ² •sr ¹)	666.06		
Blue light hazard irradiance	E _B	W/m ²	/		
Luminance	L	cd/m ²	/		
Illuminance	E	lx	/		
Supplementary information: chose CCT: 6500K for representative test.					

Photo Documentation

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Details of:	General view for 10W model
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	


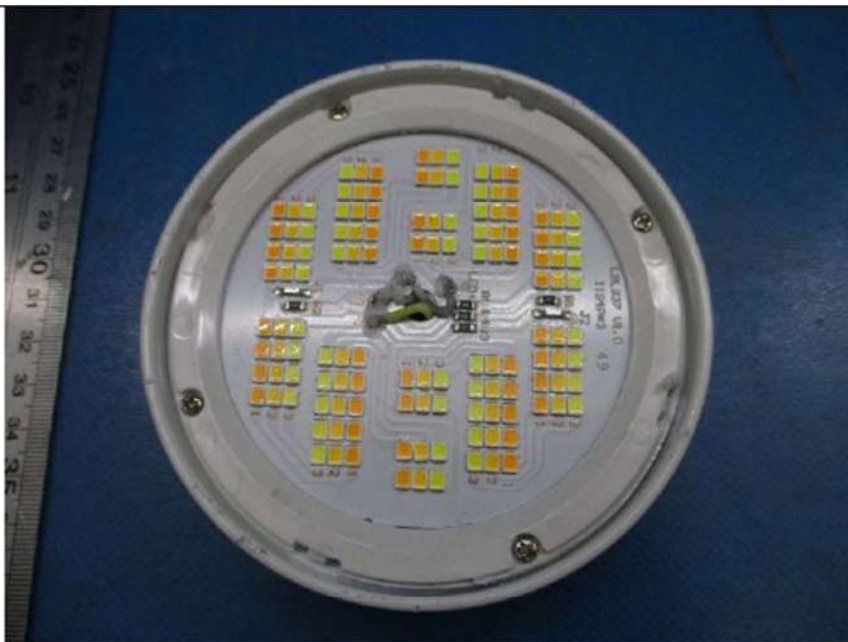
Details of:	Back view
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	

Photo Documentation

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Report No.085-190561802-000

Details of:	Front view
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	

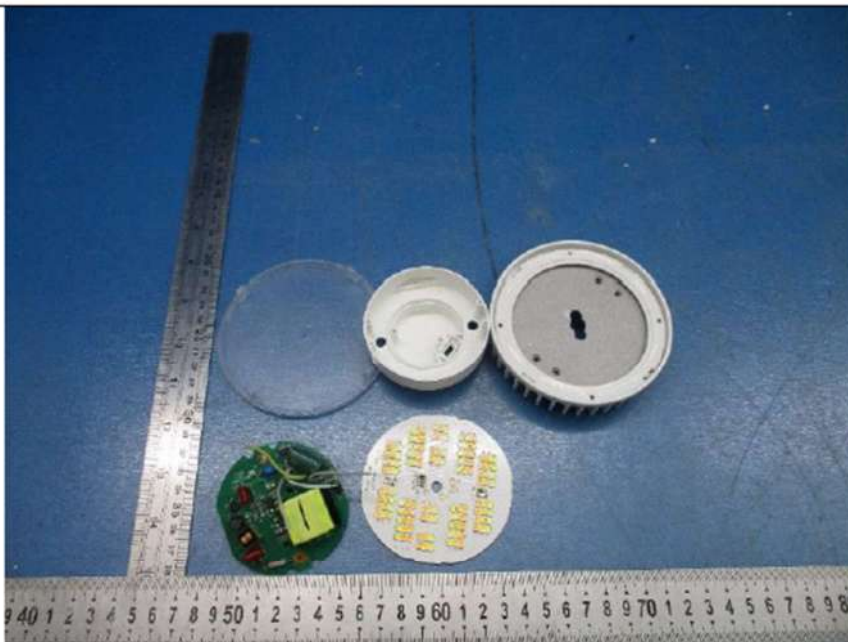
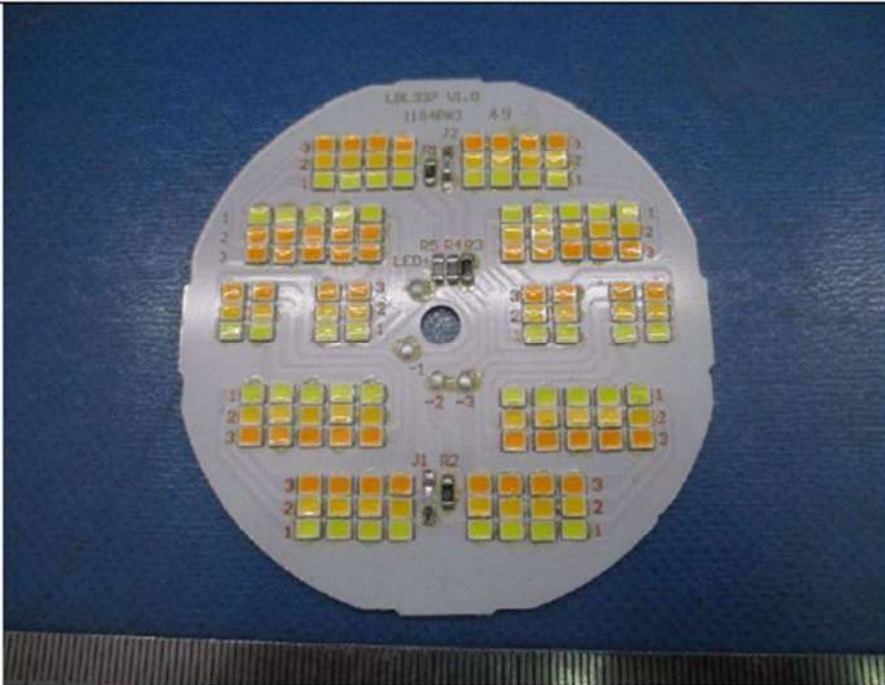
Details of:	Depart view
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	

Photo Documentation

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Details of:	LED module
View:	
<input type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

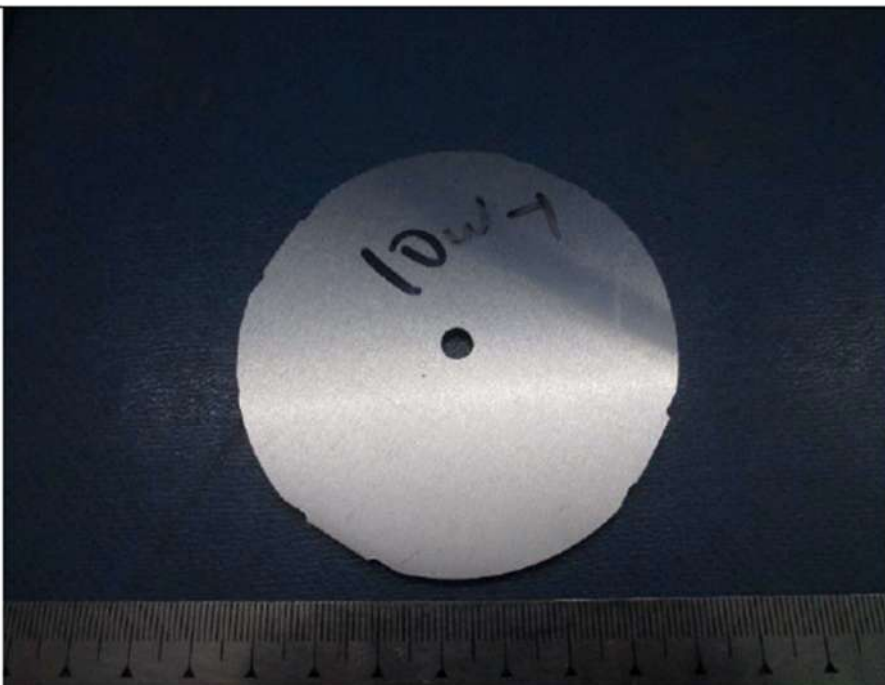
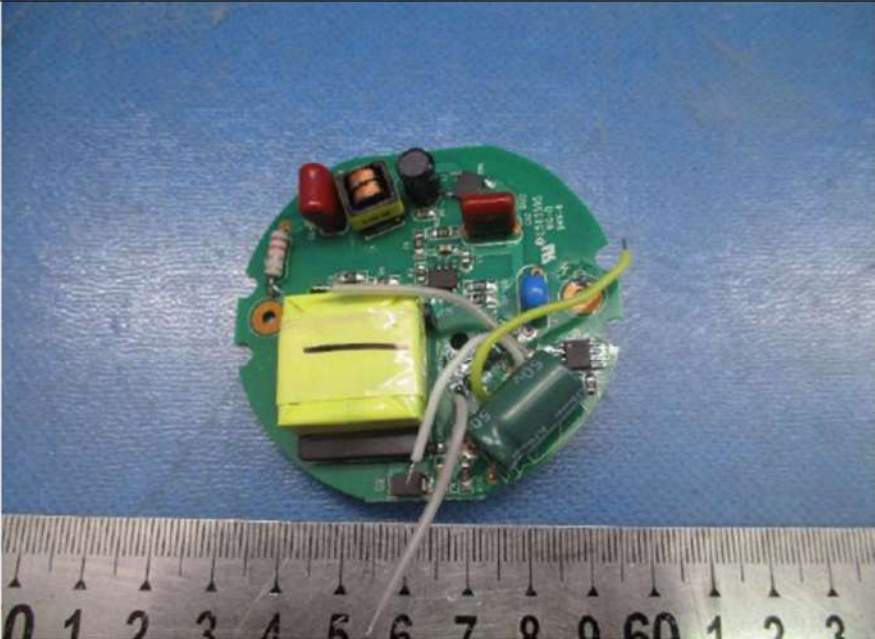
Details of:	Back view
View:	
<input type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

Photo Documentation

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Details of:	LED driver view
View:	
<input type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

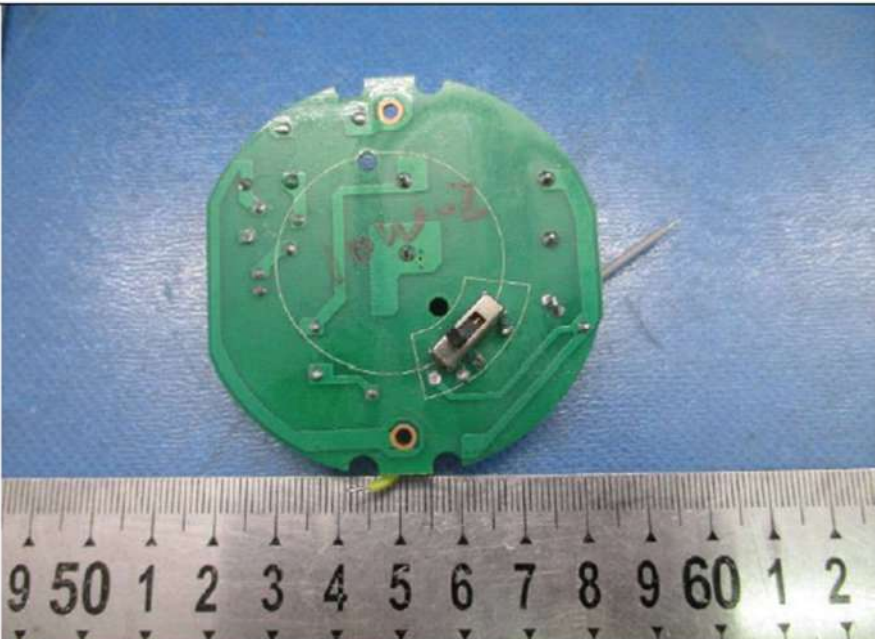
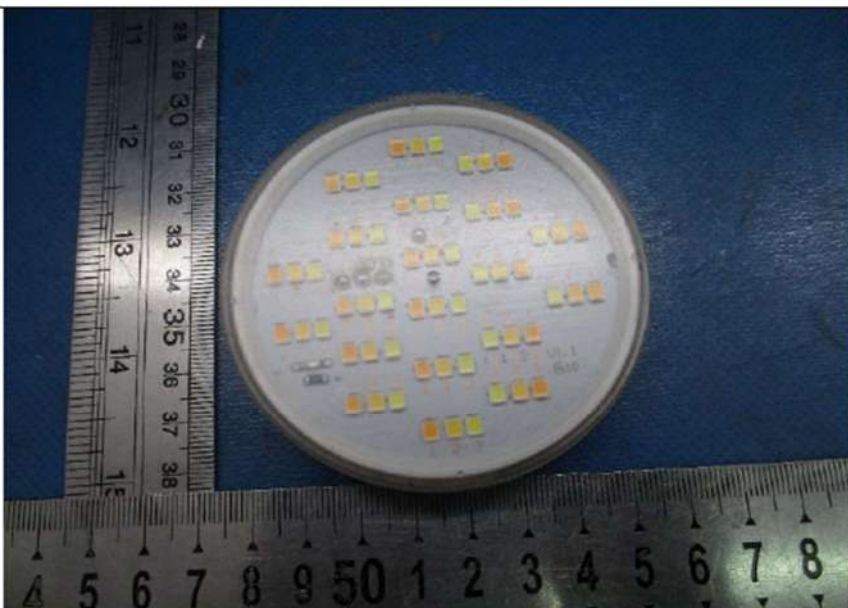
Details of:	Back view
View:	
<input type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

Photo Documentation

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Details of:	General view of 3W model
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	 <p>A photograph showing the general view of a 3W model. The device is a circular, white, flat component with a grid of small, yellow, rectangular components (likely LEDs) arranged in a circular pattern. It is placed on a blue surface next to a ruler for scale. The ruler shows measurements in centimeters, with the device's diameter being approximately 10 cm.</p>

Details of:	Back view
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	 <p>A photograph showing the back view of the 3W model. The device is a circular, white, flat component with a central circular area. It is placed on a blue surface next to a ruler for scale. The ruler shows measurements in centimeters, with the device's diameter being approximately 10 cm.</p>

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Details of:	Depart view
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	

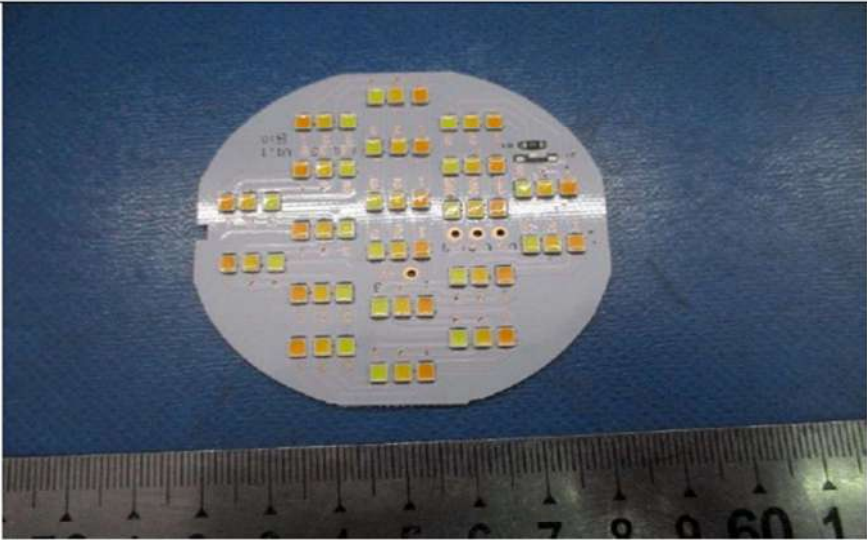
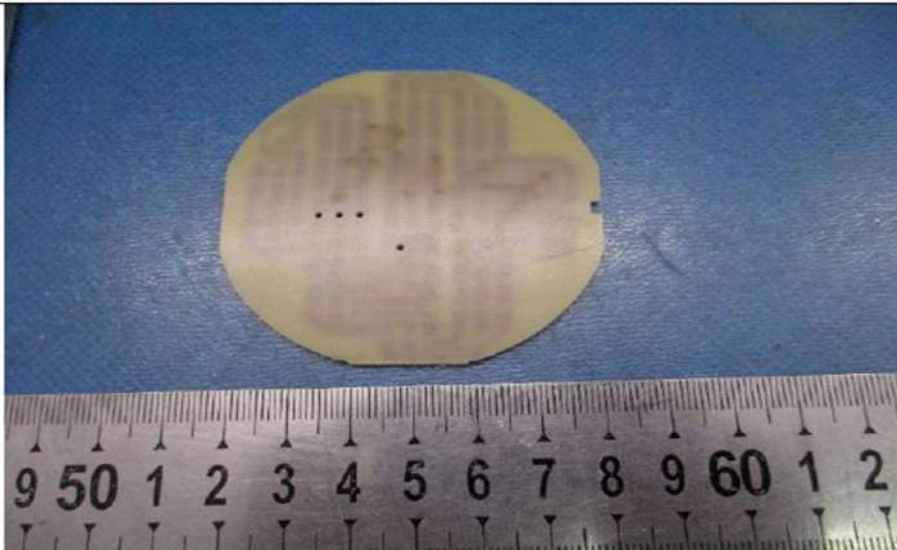
Details of:	LED module
View: <input type="checkbox"/> general <input type="checkbox"/> front <input type="checkbox"/> rear <input type="checkbox"/> right <input type="checkbox"/> left <input type="checkbox"/> top <input type="checkbox"/> bottom	

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Details of:	Back view
View:	
<input type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

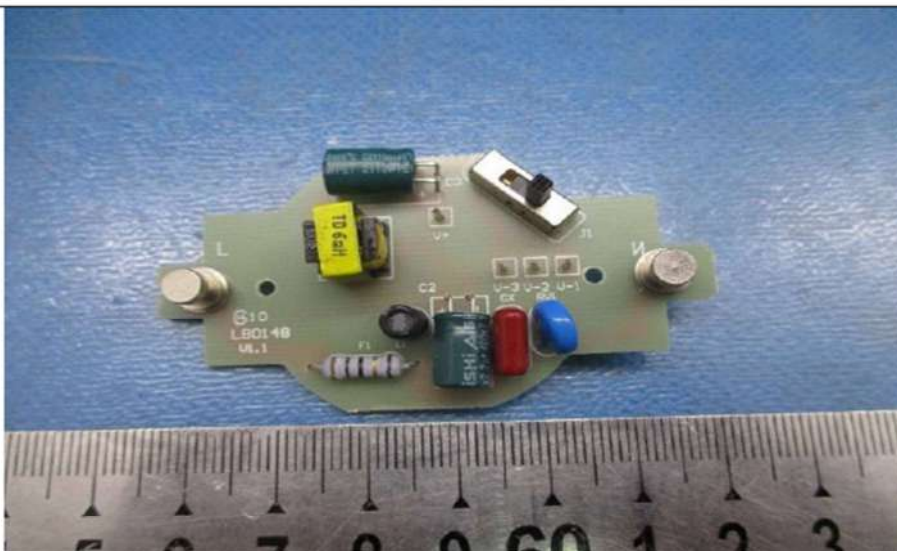
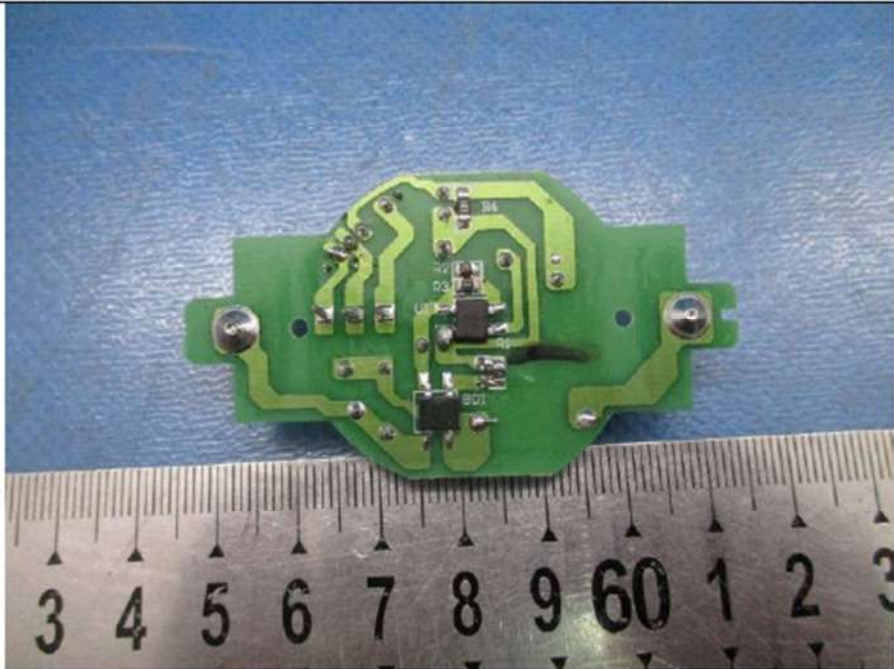
Details of:	LED driver view
View:	
<input type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

Photo Documentation

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Report No.085-190561802-000

Details of:	Back view
<p>View:</p> <p><input type="checkbox"/> general</p> <p><input type="checkbox"/> front</p> <p><input type="checkbox"/> rear</p> <p><input type="checkbox"/> right</p> <p><input type="checkbox"/> left</p> <p><input type="checkbox"/> top</p> <p><input type="checkbox"/> bottom</p>	 <p>The image shows the back view of a green printed circuit board (PCB) with various electronic components. A metal ruler is placed below the PCB for scale, showing measurements in centimeters. The PCB has a central integrated circuit (IC) labeled 'U1' and several other components labeled 'R1', 'R2', 'R3', 'R4', 'R5', 'R6', 'R7', 'R8', 'R9', 'R10', 'R11', 'R12', 'R13', 'R14', 'R15', 'R16', 'R17', 'R18', 'R19', 'R20', 'R21', 'R22', 'R23', 'R24', 'R25', 'R26', 'R27', 'R28', 'R29', 'R30', 'R31', 'R32', 'R33', 'R34', 'R35', 'R36', 'R37', 'R38', 'R39', 'R40', 'R41', 'R42', 'R43', 'R44', 'R45', 'R46', 'R47', 'R48', 'R49', 'R50', 'R51', 'R52', 'R53', 'R54', 'R55', 'R56', 'R57', 'R58', 'R59', 'R60', 'R61', 'R62', 'R63', 'R64', 'R65', 'R66', 'R67', 'R68', 'R69', 'R70', 'R71', 'R72', 'R73', 'R74', 'R75', 'R76', 'R77', 'R78', 'R79', 'R80', 'R81', 'R82', 'R83', 'R84', 'R85', 'R86', 'R87', 'R88', 'R89', 'R90', 'R91', 'R92', 'R93', 'R94', 'R95', 'R96', 'R97', 'R98', 'R99', 'R100'. The PCB is mounted on a blue surface.</p>

---End of Report---