



Test Report issued under the responsibility of:



TEST REPORT
IEC 60598-2-1
Luminaires
Part 2: Particular requirements
Section 1: Fixed general purpose luminaires

Report Number..... : 170701695SHA-009
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Name of Testing Laboratory Intertek Testing Services Shanghai
preparing the Report ..... : Building No. 86, 1198 Qinzhou Road (North), Shanghai 200233, CHINA

Applicant's name ..... : Ningbo Qichi illumination lamp Co., Ltd.
Address..... : Xianggongdian Village, Chongshou Town, Cixi, Ningbo City, 315334, P. R. China

Test specification:

Standard ..... : IEC 60598-2-1 (ed.1), am1 used in conjunction with IEC 60598-1 (ed.8)
Test procedure ..... : CB Scheme
Non-standard test method ..... : N/A

Test Report Form No. .... : IEC60598\_2\_1E
Test Report Form(s) Originator .... : Intertek Semko AB
Master TRF ..... : 2016-04

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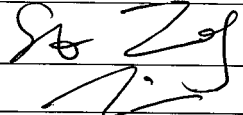
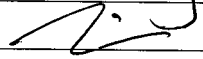
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<b>Test item description</b> ..... :	Fixed luminaire with LED
<b>Trade Mark</b> ..... :	
<b>Manufacturer</b> .....	Same as applicant above
<b>Model/Type reference</b> .....	QC-C280C-MR; QC-C280S-MR; QC-C330C-MR; QC-C330S-MR
<b>Ratings</b> .....	180-240V~; 50/60Hz; Class II; IP54; QC-C280C-MR, QC-C280S-MR: 18W; QC-C330C-MR, QC-C330S-MR: 24W.

<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	Intertek Testing Services Shanghai
<b>Testing location/ address .....</b>		Building No. 86, 1198 Qinzhou Road (North), Shanghai 200233, CHINA
<input type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name, function, signature) .....</b>		Steven Zong (Certification Engineer) 
<b>Approved by (name, function, signature)...</b>		Tim Su (Reviewer) 
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name, function, signature) .....</b>		
<b>Approved by (name, function, signature)...</b>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature) .....</b>		
<b>Witnessed by (name, function, signature)...</b>		
<b>Approved by (name, function, signature)...</b>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name, function, signature) .....</b>		
<b>Witnessed by (name, function, signature)...</b>		
<b>Approved by (name, function, signature)...</b>		
<b>Supervised by (name, function, signature) :</b>		

<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ul style="list-style-type: none"> <li>-Page 1 – 40: test reports;</li> <li>-Page 41 – 50: photos of the samples</li> </ul>	
<p><b>Summary of testing:</b></p> <p>Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.</p> <p>Some representative samples of the product covered by this report have been tested and comply with the applicable requirements of this standard.</p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>Full test</p>	<p><b>Testing location:</b></p> <p>Building No 86, 1198 Qinzhou Road (North), Shanghai 200233, CHINA</p>
<p><b>Summary of compliance with National Differences:</b></p> <p><b>List of countries addressed</b></p> <p>None.</p>	
<p><b>Copy of marking plate:</b></p> <p><b>Sample:</b></p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p><b>Model: QC-C280C-MR</b> <b>180-240V~; 50/60Hz; IP54; 18W</b></p>  </div> <p>All of the labels are the same except the model name and rated wattage. The entity (in EU) who put the product on the market must have their name and address on the product.</p>	

<b>Test item particulars</b> .....	Fixed luminaire with LED
<b>Classification of installation and use</b> .....	IP54, Class II
<b>Supply Connection</b> .....	Terminal Block
.....	
<b>Possible test case verdicts:</b>	
- 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)	
<b>Testing</b> .....	
<b>Date of receipt of test item</b> .....	July 3, 2017
<b>Date (s) of performance of tests</b> .....	July 3, 2017 – August 28, 2017
<b>General remarks:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b>          Clause numbers between brackets refer to clauses in IEC 60598-1</p> <p>This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.</p>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-1:</b>	
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"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> .....	Ningbo Qichi illumination lamp Co., Ltd Xianggongdian Village, Chongshou Town, Cixi, Ningbo City, 315334, P. R. China
<b>General product information:</b>	
These products are fixed luminaires with microwave induction for outdoor use. All models have similar construction and use the same Circuit diagram. All relevant tests are applied to QC-C300C-MR which gives the most unfavourable test result. Refer to Appendix 1 for the testing of LED module according to IEC 62031/A2:2014. Refer to Appendix 2 for the assessment of blue light hazard to light sources and luminaires module according to IEC/TR 62778:2014. Refer to Appendix 3 for the testing of LED driver according to IEC 61347-2-13:2014 used in conjunction with IEC 61347-1:2015. According clause 4.2.2 of EN 62493:2015, lighting equipment deemed to comply with the requirements of EN 62493:2015 without testing.	

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>1.2 (0)</b>	<b>GENERAL TEST REQUIREMENTS</b>		
1.2 (0.1)	Information for luminaire design considered .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Lamp standard: IEC 62031	—
1.2 (0.3)	More sections applicable .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Section/s:	—

<b>1.4 (2)</b>	<b>CLASSIFICATION OF LUMINAIRES</b>		
1.4 (2.2)	Type of protection .....	Class II	
1.4 (2.3)	Degree of protection .....	IP54	
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
1.4 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

<b>1.5 (3)</b>	<b>MARKING</b>		
1.5 (3.2)	Mandatory markings		P
	Position of the marking	On the enclosure	P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions		P
1.5 (3.3.1)	Combination luminaires		N/A
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature		N/A
1.5 (3.3.4)	Symbol or warning notice		N/A
1.5 (3.3.5)	Wiring diagram		N/A
1.5 (3.3.6)	Special conditions		N/A
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
1.5 (3.3.8)	Limitation for semi-luminaires		N/A
1.5 (3.3.9)	Power factor and supply current		N/A
1.5 (3.3.10)	Suitability for use indoors		N/A
1.5 (3.3.11)	Luminaires with remote control		N/A
1.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
1.5 (3.3.13)	Specifications of protective shields		N/A
1.5 (3.3.14)	Symbol for nature of supply	~	P
1.5 (3.3.15)	Rated current of socket outlet		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.16)	Rough service luminaire		N/A
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
1.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
1.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable	P
	Cautionary symbol		P
1.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
1.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P

<b>1.6 (4)</b>	<b>CONSTRUCTION</b>		
1.6 (4.2)	Components replaceable without difficulty		P
1.6 (4.3)	Wireways smooth and free from sharp edges		P
<b>1.6 (4.4)</b>	<b>Lampholders</b>		
1.6 (4.4.1)	Integral lampholder		N/A
1.6 (4.4.2)	Wiring connection		N/A
1.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
1.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
1.6 (4.4.5)	Peak pulse voltage		N/A
1.6 (4.4.6)	Centre contact		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
1.6 (4.4.8)	Lamp connectors		N/A
1.6 (4.4.9)	Caps and bases correctly used		N/A
1.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
<b>1.6 (4.5)</b>	<b>Starter holders</b>		
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>1.6 (4.6)</b>	<b>Terminal blocks</b>		
	Tails		N/A
	Unsecured blocks		N/A
<b>1.6 (4.7)</b>	<b>Terminals and supply connections</b>		
1.6 (4.7.1)	Contact to metal parts		P
1.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		N/A
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (4.7.3.1)	Welded method and material		
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
1.6 (4.7.4)	Terminals other than supply connection		N/A
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
1.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>1.6 (4.8)</b>	<b>Switches</b>		
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>1.6 (4.9)</b>	<b>Insulating lining and sleeves</b>		



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.9.1)	Retainment		N/A
	Method of fixing .....		N/A
1.6 (4.9.2)	Insulated linings and sleeves:		
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C).....		N/A
<b>1.6 (4.10)</b>	<b>Double or reinforced insulation</b>		
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		P
	Interference suppression capacitors according to IEC 60384-14		N/A
1.6 (4.10.2)	Assembly gaps:		
	- not coincidental		P
	- no straight access with test probe		P
1.6 (4.10.3)	Retainment of insulation:		
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
1.6 (4.10.4)	Protective impedance device		
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>1.6 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
1.6 (4.11.3)	Screw locking:		
	- spring washer		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- rivets		N/A
1.6 (4.11.4)	Material of current-carrying parts		P
1.6 (4.11.5)	No contact to wood or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		N/A
<b>1.6 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		
1.6 (4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :		N/A
	Torque test: torque (Nm); part..... :		N/A
	Torque test: torque (Nm); part..... :		N/A
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
1.6 (4.12.4)	Locked connections:		
	- fixed arms; torque (Nm) ..... :		N/A
	- lampholder; torque (Nm) ..... :		N/A
	- push-button switches; torque 0,8 Nm ..... :		N/A
1.6 (4.12.5)	Screwed glands; force (Nm)..... :		N/A
<b>1.6 (4.13)</b>	<b>Mechanical strength</b>		
1.6 (4.13.1)	Impact tests:		
	- fragile parts; energy (Nm) ..... :		N/A
	- other parts; energy (Nm)..... :	0,35Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
1.6 (4.13.3)	Straight test finger		P
1.6 (4.13.4)	Rough service luminaires		
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
1.6 (4.13.6)	Tumbling barrel		N/A
<b>1.6 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.14.1)	Mechanical load:		
	A) four times the weight		P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm)..... :		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....		N/A
	Metal rod. diameter (mm) .....		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
1.6 (4.14.2)	Load to flexible cables		
	Mass (kg) .....		—
	Stress in conductors (N/mm <sup>2</sup> ) .....		N/A
	Mass (kg) of semi-luminaire .....		N/A
	Bending moment (Nm) of semi-luminaire .....		N/A
1.6 (4.14.3)	Adjusting devices:		
	- flexing test; number of cycles..... :		N/A
	- strands broken .....		N/A
	- electric strength test afterwards		N/A
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
1.6 (4.14.5)	Guide pulleys		N/A
1.6 (4.14.6)	Strain on socket-outlets		N/A
<b>1.6 (4.15)</b>	<b>Flammable materials</b>		
	- glow-wire test 650°C .....	See Test Table 1.15 (13.3.2)	P
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>1.6 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		
	No lamp control gear..... :	(compliance with Section 12)	N/A
1.6 (4.16.1)	Lamp control gear spacing:		
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
1.6 (4.16.2)	Thermal protection:		
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>1.6 (4.17)</b>	<b>Drain holes</b>		
	Clearance at least 5 mm		N/A
<b>1.6 (4.18)</b>	<b>Resistance to corrosion</b>		
1.6 (4.18.1)	- rust-resistance		P
1.6 (4.18.2)	- season cracking in copper		P
1.6 (4.18.3)	- corrosion of aluminium		P
1.6 (4.19)	Igniters compatible with ballast		N/A
1.6 (4.20)	Rough service vibration		N/A
<b>1.6 (4.21)</b>	<b>Protective shield</b>		
1.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
1.6 (4.21.3)	No direct path		N/A
1.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment..... :	See Test Table 1.15 (13.3.2)	N/A
1.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
1.6 (4.23)	Semi-luminaires comply Class II		N/A
<b>1.6 (4.24)</b>	<b>Photobiological hazards</b>		
1.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
1.6 (4.24.2)	Retinal blue light hazard		
	Class of risk group assessed according to IEC/TR 62778 .....	RG0	—

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires with $E_{thr}$ :		
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2 .. :		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
<b>1.6 (4.25)</b>	<b>Mechanical hazard</b>		
	No sharp point or edges		P
<b>1.6 (4.26)</b>	<b>Short-circuit protection</b>		
1.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
1.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>1.6 (4.27)</b>	<b>Terminal blocks with integrated screwless earthing contacts</b>		
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Voltage drop test, resistance < 0,05 $\Omega$		N/A
<b>1.6 (4.28)</b>	<b>Fixing of thermal sensing control</b>		
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		
	Max. temperature on adhesive material ( $^{\circ}\text{C}$ ) .....		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>1.6 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>1.6 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
<b>1.6 (4.31)</b>	<b>Insulation between circuits</b>		
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
1.6 (4.31.1)	<b>SELV circuits</b>		
	Used SELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV circuits from LV supply		N/A
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
1.6 (4.31.2)	<b>FELV circuits</b>		
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
1.6 (4.31.3)	Other circuits		
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
<b>1.6 (4.32)</b>	<b>Overvoltage protective devices</b>		
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A

<b>1.7 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		
1.7 (11.2)	Creepage distances and clearances..... :	See Table 1.7 (11.2)	P
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—

<b>1.8 (7)</b>	<b>PROVISION FOR EARTHING</b>		
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 Ω..... :		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Earth makes contact first		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
1.8 (7.2.4)	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
1.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		N/A
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
1.8 (7.2.8)	Material of earth terminal		N/A
	Contact surface bare metal		N/A
1.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
1.8 (7.2.11)	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A

1.9 (14)	SCREW TERMINALS		
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N/A

1.9 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		
	Separately approved; component list..... :	(see Annex 1)	N/A
	Part of the luminaire ..... :	(see Annex 4)	N/A

1.10 (5)	EXTERNAL AND INTERNAL WIRING		
1.10 (5.2)	Supply connection and external wiring		
1.10 (5.2.1)	Means of connection .....	Terminal block	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N/A
1.10 (5.2.2)	Type of cable..... :		N/A
	Nominal cross-sectional area (mm <sup>2</sup> ) .....		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Cables equal to IEC 60227 or IEC 60245		N/A
1.10 (5.2.3)	Type of attachment, X, Y or Z		N/A
1.10 (5.2.5)	Type Z not connected to screws		N/A
1.10 (5.2.6)	Cable entries:		
	- suitable for introduction		P
	- adequate degree of protection		P
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
1.10 (5.2.8)	Insulating bushings:		
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		P
1.10 (5.2.9)	Locking of screwed bushings		P
1.10 (5.2.10)	Cord anchorage:		
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
1.10 (5.2.10.3)	Tests:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... : 60	60	P
	- torque test: torque (Nm) ..... : 0,15	0,15	P
	- displacement $\leq$ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
1.10 (5.2.11)	External wiring passing into luminaire		P
1.10 (5.2.12)	Looping-in terminals		N/A
1.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
1.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
1.10 (5.2.18)	Used plug in accordance with		
	- IEC 60083		N/A
	- other standard		N/A
<b>1.10 (5.3)</b>	<b>Internal wiring</b>		
1.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) ..... :		N/A
	- temperatures ..... :	(see Annex 2)	N/A
	Green-yellow for earth only		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		
	Cross-sectional area (mm <sup>2</sup> )..... : 24AWG		P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		
	Adequate cross-sectional area and insulation thickness		N/A
1.10 (5.3.1.3)	Double or reinforced insulation for class II		P
1.10 (5.3.1.4)	Conductors without insulation		N/A
1.10 (5.3.1.5)	SELV current-carrying parts		N/A
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
1.10 (5.3.3)	Insulating bushings:		
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
1.10 (5.3.4)	Joints and junctions effectively insulated		N/A
1.10 (5.3.5)	Strain on internal wiring		N/A
1.10 (5.3.6)	Wire carriers		N/A
1.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
<b>1.11 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		
1.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		P
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
1.11 (8.2.3.a)	Class II luminaire:		
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		N/A
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
1.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		
	Ordinary luminaire:		
	- voltage under load (V)..... :		N/A
	- no-load voltage (V)..... :		N/A
	- touch current if applicable (mA) .....		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		
	- nominal voltage (V) .....		N/A
	Class III luminaire only for connection to SELV		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Class III luminaire not provided with means for protective earthing		N/A
1.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		P
1.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 µF not exceed 50 V 1 min after disconnection		N/A
	Portable luminaire with capacitor > 0,1 µF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 µF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

<b>1.12 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		
1.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 1.13		—
1.12 (12.3)	Endurance test:		
	- mounting-position..... :	Fixed Mounted	—
	- test temperature (°C) .....	35°C	—
	- total duration (h)..... :	240h	—
	- supply voltage: Un factor; calculated voltage (V)... :	1,1 x 240V = 264V	—
	- lamp used..... :	Original LEDs	—
1.12 (12.3.2)	After endurance test:		
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
1.12 (12.6)	Thermal test (failed lamp control gear condition):		
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured mounting surface temperature (°C) at 1,1 Un ..... :		N/A
	- calculated mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
1.12 (12.6.2)	Temperature sensing control		
	- case of abnormal conditions ..... :		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		
1.12 (12.7.1)	Luminaire without temperature sensing control		
1.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		
	Test method 12.7.1.1 or Annex W ..... :		—
	Test according to 12.7.1.1:		
	- case of abnormal conditions ..... :		—
	- Ballast failure at supply voltage (V) ..... :		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :	N/A	—
	Ball-pressure test ..... :	See Table 1.15 (13.2.1)	N/A
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		
	- case of abnormal conditions ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test .....	See Table 1.15 (13.2.1)	N/A
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
1.12 (12.7.2)	Luminaire with temperature sensing control		
	- thermal link .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/exposed part (°C): .....		—
	Ball-pressure test: .....	See Table 1.15 (13.2.1)	N/A

<b>1.13 (9)</b>	<b>RESISTANCE TO DUST AND MOISTURE</b>		
1.13 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		
	- classification according to IP .....	IP54	—
	- mounting position during test .....	Fixed Mounted	—
	- fixing screws tightened; torque (Nm) .....	N/A	—
	- tests according to clauses .....	9.2.0&9.2.5	—
	- electric strength test afterwards	10.2.2	P
	a) no deposit in dust-proof luminaire		P
	b) no talcum in dust-tight luminaire		N/A
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P

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Clause	Requirement + Test	Result - Remark	Verdict
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A
1.13 (9.3)	Humidity test 48 h	25°C, R.H.93%	P

1.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....	Covered by metal foil	—
	Insulation resistance (MΩ) .....	N/A	—
	SELV		
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :		N/A
	- between current-carrying parts and metal parts of the luminaire..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		
	- between live parts of different polarity .....	199MΩ	P
	- between live parts and mounting surface .....	199MΩ	P
	- between live parts and metal parts .....	199MΩ	P
	- between live parts of different polarity through action of a switch..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 .....		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
1.14 (10.2.2)	Electric strength test		N/A
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V)..... :		P
	SELV		
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :		N/A
	- between current-carrying parts and metal parts of the luminaire..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		
	- between live parts of different polarity ..... :	1480V	P
	- between live parts and mounting surface ..... :	2960V	P
	- between live parts and metal parts ..... :	2960V	P
	- between live parts of different polarity through action of a switch..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
1.14 (10.3)	Touch current or protective conductor current (mA):	0,1mA	P

1.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		
1.15 (13.2.1)	Ball-pressure test..... :	See Test Table 1.15 (13.2.1)	P
1.15 (13.3.1)	Needle-flame test (10 s)..... :	See Test Table 1.15 (13.3.1)	P
1.15 (13.3.2)	Glow-wire test (650°C)..... :	See Test Table 1.15 (13.3.2)	P
1.15 (13.4)	Proof tracking test (IEC 60112)..... :	See Test Table 1.15 (13.4)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

<b>1.7 (11.2)</b>	<b>TABLE: Creepage distances and clearances</b>						
	<b>Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages</b>						P
	<b>Applicable part of IEC 60598-1 Table 11.1* and 11.2*</b>						
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	3	1,5	11.1	3	2.5	11.1
Working voltage (V) .....					180-240V~		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....					N/A		—
Supplementary information: Current-carrying parts of different polarity							
Distance 2:	R	6	3	11.1	6	5	11.1
Working voltage (V) .....					180-240V~		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....					N/A		—
Supplementary information: Current-carrying parts and metal accessible parts							
Distance 3:	R	6	3	11.1	6	5	11.1
Working voltage (V) .....					180-240V~		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....					N/A		—
Supplementary information: Current-carrying parts and supporting surface							

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

<b>1.15 (13.2.1)</b>	<b>TABLE: Ball Pressure Test of Thermoplastics</b>			<b>P</b>
<b>Allowed impression diameter (mm) .....</b>				2mm
Object/ Part No./ Material		Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Lampshade		See Annex 1	75	1,0
PCB		See Annex 1	125	0,8
Enclosure		See Annex 1	125	1,2
Bobbin		See Annex 1	125	0,8
Supplementary information: N/A				

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Clause	Requirement + Test	Result - Remark	Verdict

1.15 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
PCB	See Annex 1	10	No	0	P
Enclosure	See Annex 1	10	No	0	P
Bobbin	See Annex 1	10	No	0	P
Supplementary information: N/A					

1.15 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)				P
Glow wire temperature .....		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Lampshade	See Annex 1	30	No	0	
Gasket	See Annex 1	30	No	0	
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No)..... :				No	
Supplementary information: N/A					

1.15 (13.4)	TABLE: Proof tracking test (IEC 60112)			N/A
Test voltage PTI .....		175 V		—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens		Verdict
Supplementary information:				

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1		TABLE: Critical components information					
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Lampshade	C	KINGFA SCI & TECH CO LTD	JH830-R2(xy); JH830-R3(xy)	PC; 80°C; min thickness: 0,8mm	IEC 60598-1	Test with appliance	
<b>Description:</b>							
Enclosure	C	CHI MEI CORPORATION	PC-122N	PC; 115°C; min thickness: 1,5mm (UL/E56070)	IEC 60598-1	Test with appliance	
<b>Description:</b>							
Internal wire(AC)	C	DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD	3239	18/20AWG; 3KVDC; 150°C (UL/E347603)	IEC 60598-1	Test with appliance	
Alternative	D	DONGGUAN CHENG XING ELECTRONIC CO LTD	1015	18/20AWG; 600V; 105°C (UL/E249743)	IEC 60598-1	Test with appliance	
<b>Description:</b>							
Internal wire(DC)	C	DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD	3239	22/24AWG; 3KVDC; 150°C (UL/E347603)	IEC 60598-1	Test with appliance	
<b>Description:</b>							
LED	C	Foshan NationStar Optoelectronics Co., Ltd.	2835	3-3,2V; 60mA; 2700K-6500K	IEC 62471	Test with appliance	
Alternative	D	Shenzhen Refond Optoelectronics Co., Ltd.	2835	3-3,2V; 60mA; 2700K-6500K	IEC 62471	Test with appliance	
Alternative	D	Guangzhou Hongli Opto-Electronic Co., Ltd.	2835	3-3,2V; 60mA; 2700K-6500K	IEC 62471	Test with appliance	
<b>Description:</b>							
LED PCB	C	ALLSTAR TECH (ZHONGSHAN) CO LTD	ASH-E; ASH-R; ASH-RCC%%	V-0; 115°C; min thickness: 1,0mm (UL/E301444)	IEC 60598-1	Test with appliance	
Alternative	D	SHENZHEN JWJ TECHNOLOGY CO LTD	JWL-PCBAL01	V-0; 90°C; min thickness: 1,0mm (UL/E362507)	IEC 60598-1	Test with appliance	
Alternative	D	HUIZHOU LEAD TECHNOLOGY CO LTD	AL88	V-0; 130°C; min thickness: 1,0mm (UL/E333645)	IEC 60598-1	Test with appliance	

IEC 60598-2-1						
Clause	Requirement + Test			Result - Remark		Verdict
<b>Description:</b>						
PCB	C	KINGBOARD LAMINATES HOLDINGS LTD	KB-6164F; KB-7150; KB-7150C	V-0; 130°C; min thickness: 1,0mm (UL/E123995)	IEC 60598-1	Test with appliance
Alternative	D	GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD	GDM-R1; GDM-C3; ILM-R1; ILM-C3; GF432	V-0; 130°C; min thickness: 1,0mm (UL/E330731)	IEC 60598-1	Test with appliance
<b>Description:</b>						
Terminal	B	Jiang Men Krealux Electrical Appliances Co., Ltd.	P02	450V; 24A; 0,5...2,5mm <sup>2</sup> ; T110	DIN EN 60998-1 DIN EN 60998-2-1	VDE*/40021 946
<b>Description:</b>						
Gasket	B	Shanghai Zhaoguan Plastic Products Co., Ltd	Various	Silicone; min thickness: 1,0mm	IEC 60598-1	Test with appliance
<b>Description:</b>						
X capacitor	B	Tenta Electric Industrial Co. Ltd.	MEX	0,1 uF/0,22 uF; 275VAC	DIN EN 60384-14	VDE*/11911 9
Alternative	D	Dain ELECTRONICS CO LTD	MPX	0,1 uF/0,22 uF; 275VAC	DIN EN 60384-14	VDE*/40018 798
Alternative	D	DONGGUAN CITY JURCC ELECTRONICS CO LTD	MPX	0,1 uF/0,22 uF; 275VAC	DIN EN 60384-14	VDE*/40034 920
Alternative	D	Yangzhou Gaoqiang Wlectronics Co.,Ltd	CBB62 X2	0,1 uF/0,22 uF; 275VAC	DIN EN 60384-14	VDE*/40031 563
<b>Description:</b>						
Fuse resistor	B	Dongguan Hongda Electronic Technology Co., Ltd.	RXF series	1W; 4,7Ω/10Ω	DIN EN 60065	VDE*/40036 858
<b>Description:</b>						
Bobbin	B	SUMITOMO BAKELITE CO LTD	PM-9820	150°C; min thickness:1,0mm (UL/E41429)	IEC 60598-1	Test with appliance
<b>Description:</b>						
Insulation tape	B	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT-280B	130°C; min thickness: 0,19mm (UL/E165111)	IEC 60598-1	Test with appliance
<b>Description:</b>						

IEC 60598-2-1						
Clause	Requirement + Test			Result - Remark		Verdict
Heat shrinkable tube	B	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR-H	600V; 125°C (UL/E203950)	IEC 60598-1	Test with appliance
Alternative	D	DONGGUAN SALIPT CO LTD	SALIPT S-901-600	600V; 125°C (UL/E209436)	IEC 60598-1	Test with appliance
<b>Description:</b>						
Varistor	B	Kay (Wuxi) Electronic Co., Ltd.	MYG07-471; MYG07-511	10A; 1200A; AC50-350V; DC65-460V	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	TUV/B09076 8808004
Alternative	D	Brightking (Shenzhen) Co., Ltd.	07D471K; 07D511K	10A; 1750A; AC50-420V; DC65-560V	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE*/40027 827
Alternative	D	Ceramate Techn. Co., Ltd.	NFV07D471K; NFV07D511K	10A; 1750A; AC50-420V; DC65-560V	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE*/40021 606
<b>Description:</b>						
Microwave module	C	Feng Hua Chun Zhi Blectric Technology CO.,LTD	CZKJ-5820G	5,8G	IEC 60598-1	Test with appliance (170802006 SHA-001)
<p>Supplementary information:</p> <p><sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039.</p> <p>The codes above have the following meaning:</p> <p>A - The component is replaceable with another one, also certified, with equivalent characteristics</p> <p>B - The component is replaceable if authorised by the test house</p> <p>C - Integrated component tested together with the appliance</p> <p>D - Alternative component</p>						

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		
	Type reference .....	QC-C300C-MR	—
	Lamp used.....	Original LEDs	—
	Lamp control gear used.....	Built-in Driver	—
	Mounting position of luminaire .....	Fixed Mounted	—
	Supply wattage (W).....	24,14W	—
	Supply current (A) .....	0,185A	—
	Calculated power factor.....	0,513	—
	Table: measured temperatures corrected for $t_a = 25\text{ }^\circ\text{C}$ :		
	- abnormal operating mode .....	Output short-circuit	—
	- test 1: rated voltage.....	N/A	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....	1,06 x 240V = 254,4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....	1,1 x 240V = 264V	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	—

Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Lampshade	25	--	31	--	80	--	--
LED PCB	25	--	36	--	90	--	--
Gasket	25	--	28	--	230	--	--
Enclosure	25	--	40	--	115	25	130
Wire	25	--	47	--	105	--	--
Terminal	25	--	32	--	110	--	--
PCB	25	--	57	--	130	--	--
Bobbin	25	--	61	--	150	--	--
Mounting surface	25	--	26	--	90	25	130

Supplementary information: “\*” means for ball pressure test

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	Screw terminals (part of the luminaire)		
(14)	<b>SCREW TERMINALS</b>		
(14.2)	Type of terminal..... :		—
	Rated current (A)..... :		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm <sup>2</sup> )..... :		—
(14.3.3)	Conductor space (mm)..... :		N/A
(14.4)	Mechanical tests		
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) ..... :	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) ..... :		N/A
	Torque (Nm)..... :		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N)..... :		N/A
(14.4.8)	Without undue damage		N/A



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	Screwless terminals (part of the luminaire)		
<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		
(15.2)	Type of terminal..... :		—
	Rated current (A)..... :		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		
	Voltage drop (mV) after 1 h (4 samples)..... :		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		

IEC 60598-2-1												
Clause	Requirement + Test									Result - Remark	Verdict	
	Terminal size and rating										N/A	
15.6.2	Mechanical tests											
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....										N/A	
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....										N/A	
(15.6.3)	Electrical tests											
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1										N/A	
<b>(15.6.3.1)</b> <b>(15.6.3.2)</b>	<b>TABLE: Contact resistance test / Heating tests</b>										N/A	
	Voltage drop (mV) after 1 h										—	
terminal	1	2	3	4	5	6	7	8	9	10		
voltage drop (mV)												
	Voltage drop of two inseparable joints											
	Voltage drop after 10th alt. 25th cycle											
	Max. allowed voltage drop (mV) .....					N/A						—
terminal	1	2	3	4	5	6	7	8	9	10		
voltage drop (mV)												
	Voltage drop after 50th alt. 100th cycle											
	Max. allowed voltage drop (mV) .....					N/A						—
terminal	1	2	3	4	5	6	7	8	9	10		
voltage drop (mV)												
	Continued ageing: voltage drop after 10th alt. 25th cycle											
	Max. allowed voltage drop (mV) .....					N/A						—
terminal	1	2	3	4	5	6	7	8	9	10		
voltage drop (mV)												
	Continued ageing: voltage drop after 50th alt. 100th cycle											
	Max. allowed voltage drop (mV) .....					N/A						—
terminal	1	2	3	4	5	6	7	8	9	10		
voltage drop (mV)												
Supplementary information:												

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

<b>Appendix 1:</b> <b>IEC 62031/A2:2014 LED modules for general lighting -</b> <b>Safety specifications</b>			
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6	<i>Classification</i>		<b>P</b>
	Built-in; Independent; Integral	Integral	P
7	Marking		N/A
7.1	Mandatory markings for built-in or independent modules		N/A
7.2	Location of marking		N/A
7.3	Durability and legibility of marking		N/A
8	Terminals		N/A
9	Provisions for protective earthing		N/A
10	Protection against accidental contact with live parts	Evaluated in final product.	P
11	Moisture resistance and insulation	Evaluated in final product.	P
12	Electric strength	Evaluated in final product.	P
13	Fault conditions		P
13.1	Fault conditions according to IEC 61347-1, cl.14		P
13.2	Overpower conditions		P
14	Conformity testing during manufacture		N/A
15	Construction		P
	No wood, cotton, silk, paper and similar fibrous material used as insulation		P
16	Creepage distances and clearances	Evaluated in final product.	P
17	Screw, current-carrying parts and connections	Evaluated in final product.	P
18	Resistance to heat, fire and tracking	Evaluated in final product.	P
19	Resistance to corrosion	Evaluated in final product.	P

<b>13</b>	<b>TABLE: tests of fault conditions</b>	
Part	Simulated fault	Hazard
CE1	Short-circuited – Not work	No
DB1	Short-circuited – Fuse resistor broken	No
LED1	Short-circuited – Not work, recoverable	No

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

**Appendix 2:**

IEC/TR 62778: 2014: The assessment of blue light hazard to light sources and luminaires

<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		
<b>7.1</b>	<b>Basic flow</b>		
	'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
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		
	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
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		
	LED package is evaluated as .....	<input checked="" type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited	P
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		
	Risk group achieved:		P
	- .. Risk Group 0 unlimited		P
	- .. Risk Group 1 unlimited		N/A
	- $E_{thr}$ ..... (lx) : Distance to reach RG1 ..... (m) :		N/A

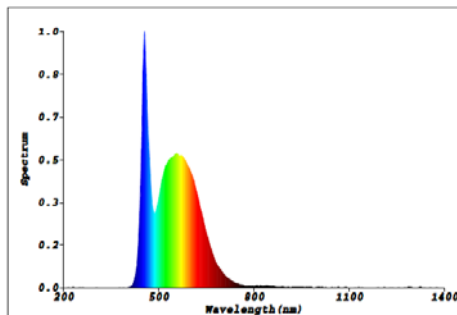
IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE: Spectroradiometric measurement			
Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
Model number .....	QC-C300C-MR		
Test voltage (V) .....	240V		—
Test current (mA) .....	176		—
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	6087	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	1,4 x 10 <sup>1</sup>	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	/	
Luminance	L	cd/m <sup>2</sup>	>10000	
Illuminance	E	lx	3665,9	

Supplementary information:

TABLE: Angular light distribution		
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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

	<p><b>Appendix 3:</b>  <b>IEC 61347-2-13 used in conjunction with IEC 61347-1</b>  <b>Lamp control gear</b>  <b>Part 2: Particular requirements</b>  <b>Section Thirteen – Particular requirements for D.C. or A.C. supplied electronic control gear for LED modules</b></p>		
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14 (14)	FAULT CONDITIONS		
	When operated under fault conditions the controlgear:		
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		N/A
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N/A
	Distances on printed boards provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	After the tests the insulation resistance with d.c. 500 V (MΩ) are ≥ 1 MΩ .....		N/A
	After the tests the accessible parts has not become live		N/A
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N/A
	Temperature declared thermally protected controlgear fulfil the requirements in Annex C		N/A
16	ABNORMAL CONDITIONS		
	Safety not impaired when the controlgear is operated at any voltage between 90% and 110% of rated voltage		P
16.1	Control gear which are of the constant voltage output type:		—
	a) No LED module inserted		P
	b) Double LED modules or equivalent load connected to the output terminals		P
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
16.2	Control gear which are of the constant current output type:		—
	a) No LED module connected		N/A
	b) Double the LED modules or equivalent load connected in series to the output terminals		N/A
	c) Output terminal short-circuited (20 cm and 200 cm or declared length )		N/A
	Maximum output voltage not exceeded		N/A
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N/A

14	TABLE: tests of fault conditions	
Part	Simulated fault	Hazard
CE2	Short-circuited – Fuse resistor broken	No
CE3	Short-circuited – Fuse resistor broken	No
CE4	Short-circuited – Not work, recoverable	No
CE5	Short-circuited – Not work, recoverable	No
CX1	Short-circuited – Fuse resistor broken	No
C2	Short-circuited – Normal work	No
C6	Short-circuited – Fuse resistor broken	No
C7	Short-circuited – Not work, recoverable	No
C8	Short-circuited – Not work, recoverable	No
D2	Short-circuited – Fuse resistor broken	No
D4	Short-circuited – Not work, recoverable	No
DZ1	Short-circuited – Not work, recoverable	No
Q1	Short-circuited – Not work, recoverable	No
Q2	Short-circuited – Not work, recoverable	No
U2	Short-circuited – Not work	No
U4	Short-circuited – Not work, recoverable	No
DB1	Short-circuited – Fuse resistor broken	No

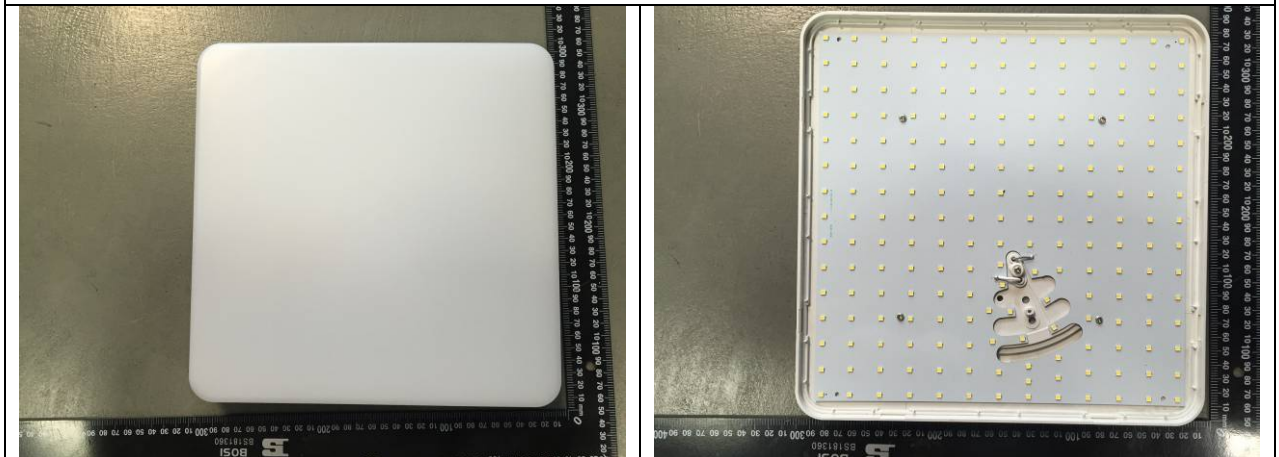


Remarks

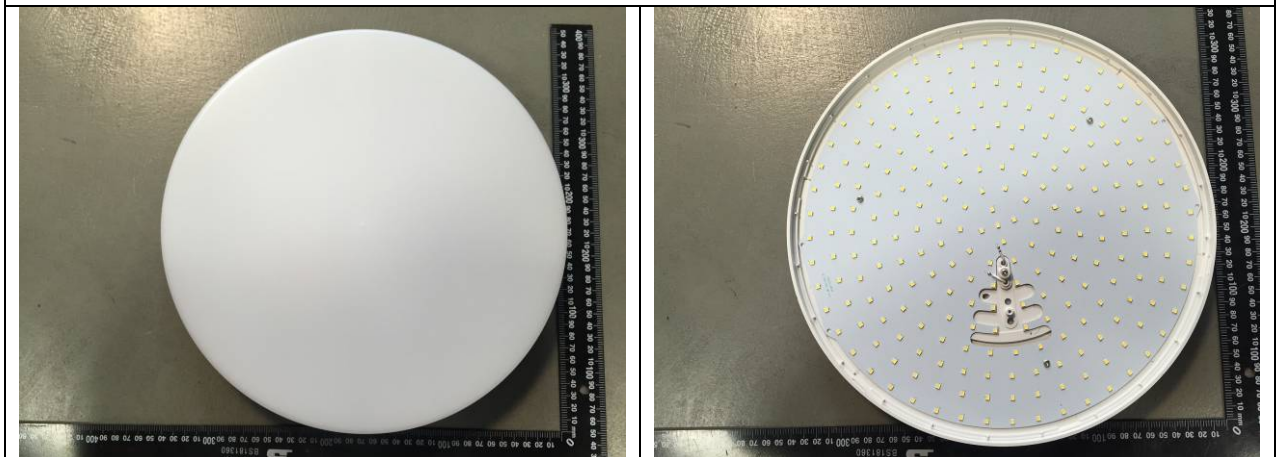
Overview



QC-C280C-MR



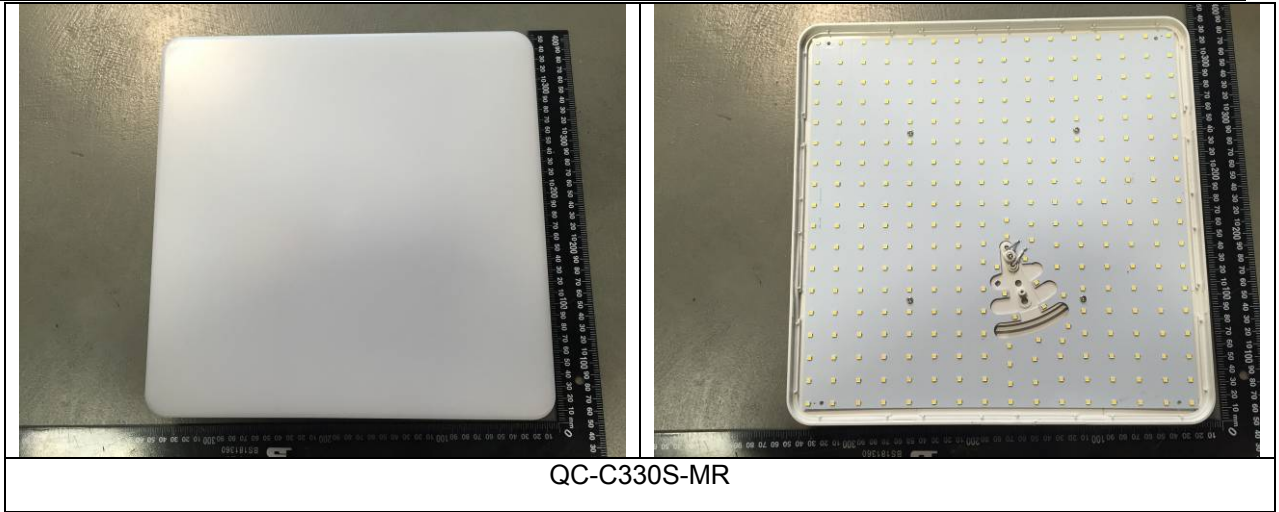
QC-C280S-MR



QC-C330C-MR

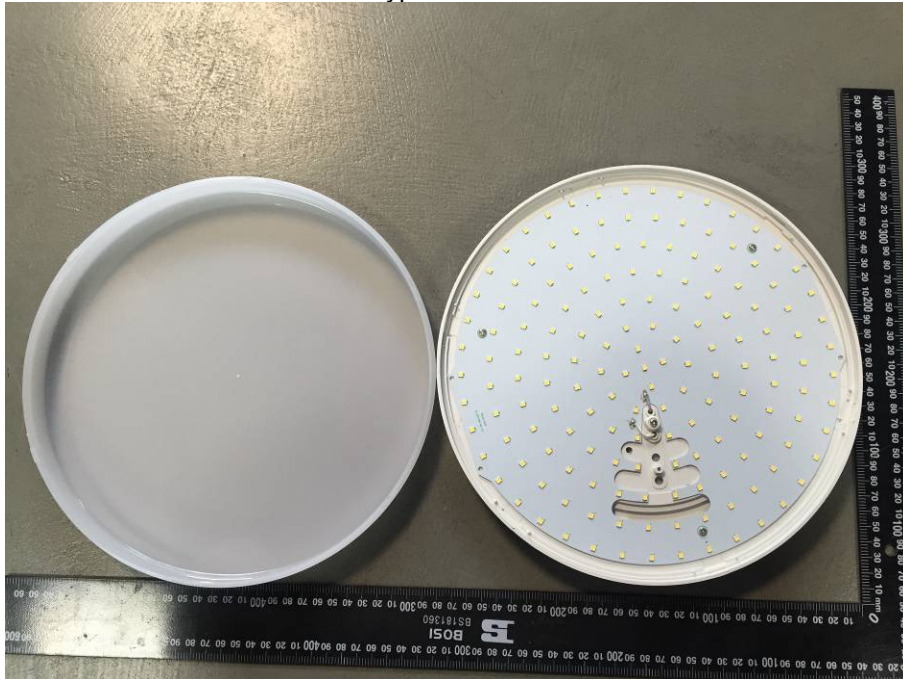


Remarks



Remarks

Construction of typical model QC-C280C-MR



Remarks

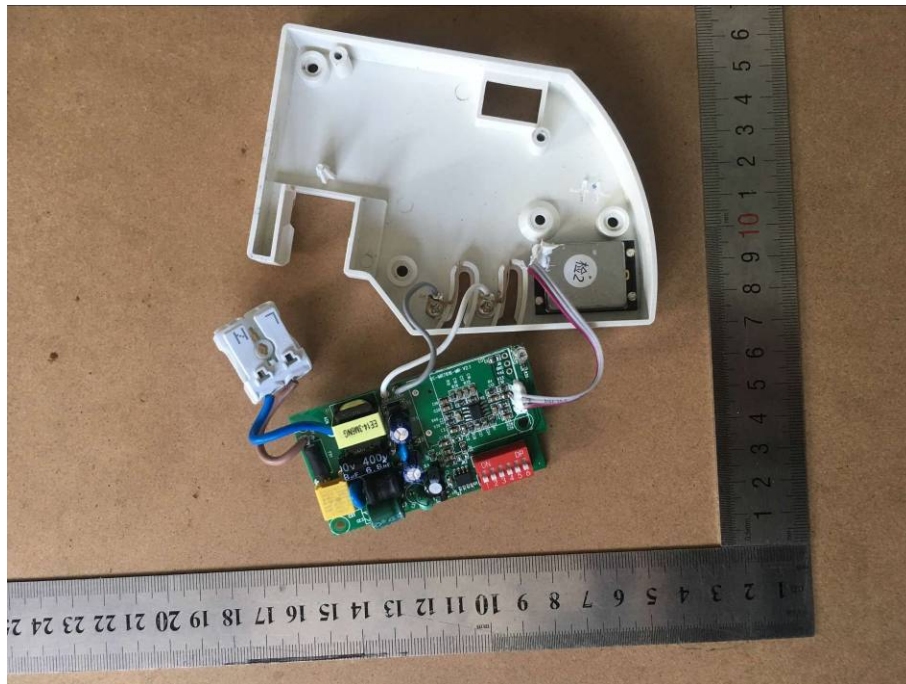
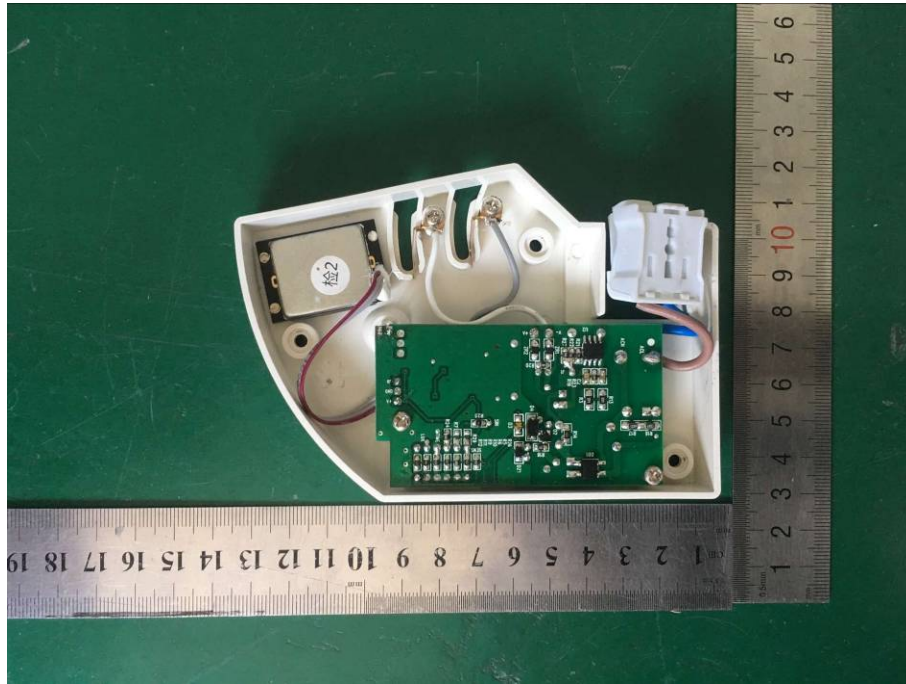


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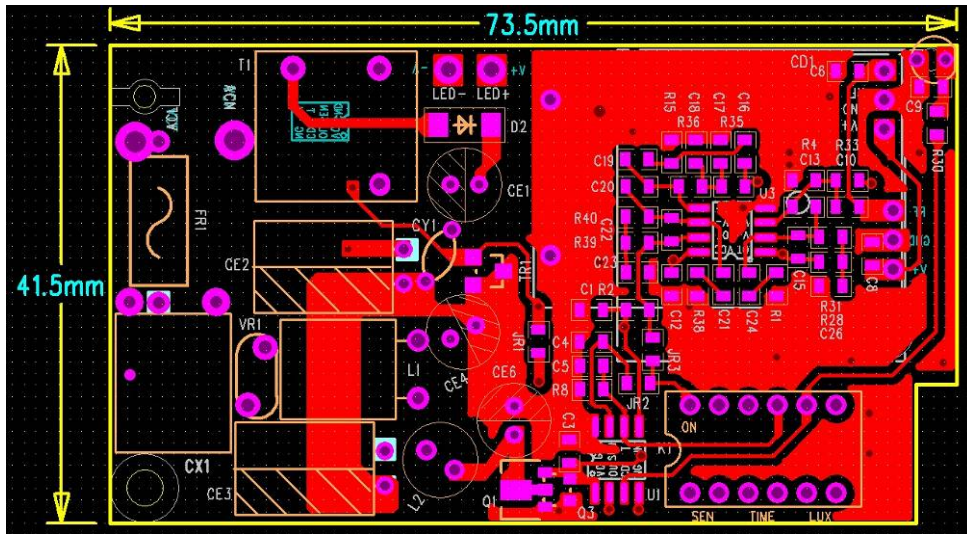


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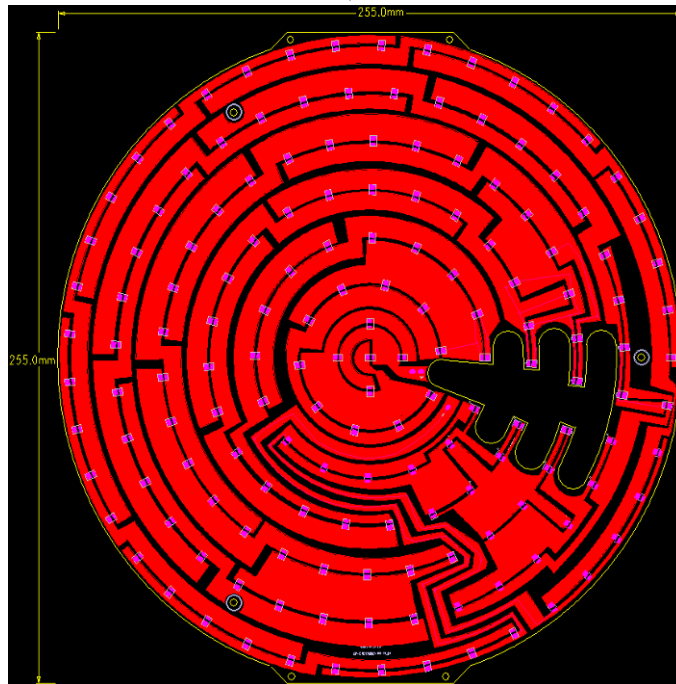




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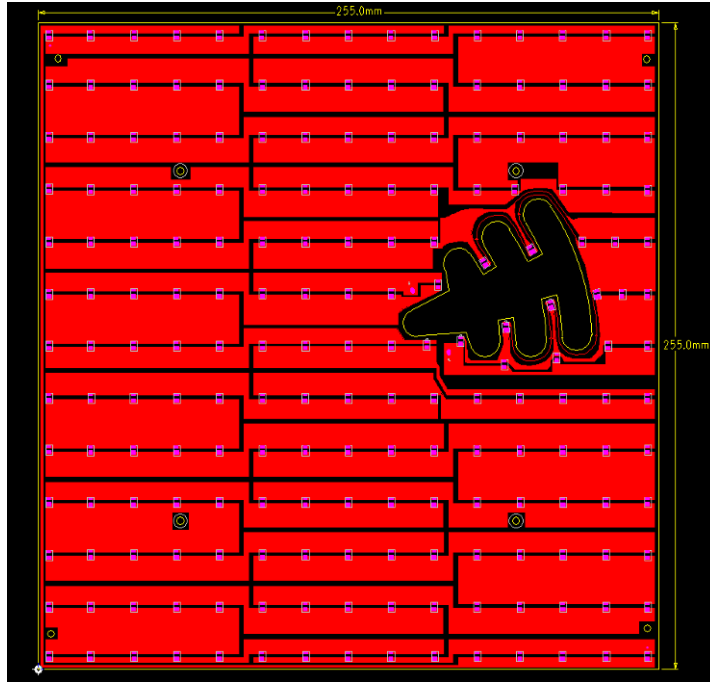


LED PCB of QC-C280C-MR

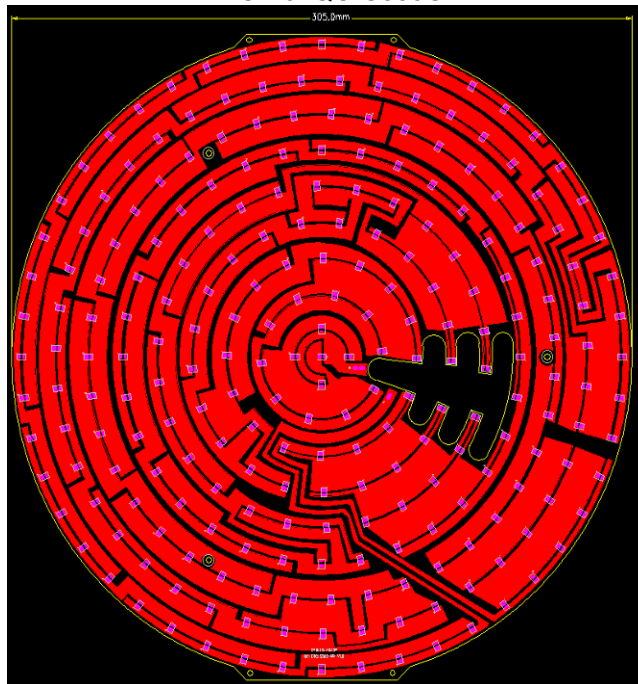


Remarks

LED PCB of QC-C280S-MR



LED PCB of QC-C330C-MR





Remarks

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LED PCB of QC-C330S-MR

