



TEST REPORT J60598-2-20(H25) Luminaires Part 2: Particular requirements Section 20: Lighting Chains	
Report Number.....:	LCS200306020BS
Date of issue.....:	April 09, 2020
Total number of pages.....:	53 pages
Name of Testing Laboratory preparing the Report.....:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
Applicant's name.....:	Kaisen Electric Ltd
Address.....:	99A-31 Kalvariju str., 08219, Vilnius, Lithuania
Test specification:	
Standard.....:	J60598-2-20(H25), J60598-1(H26),
Test procedure.....:	Type Test
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60598_2_20E
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	2015-06
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Test item description :		LED Module	
Trade Mark :		KAISEN ELECTRIC	
Manufacturer :		same as the applicant	
Address :		same as the applicant	
Model/Type reference :		See model list on page 5	
Ratings :		See model list on page 5	
<input checked="" type="checkbox"/>	Testing Laboratory:		
Testing location/ address :		Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China	
Tested by :		Lydia Luo (Engineer)	
Check by :		Rebecca Qin (Director)	
Approved by :		Jesse Liu (Manager)	
List of Attachments (including a total number of pages in each attachment):			
Attachment No. 1: 2 pages of European group differences and national differences according to EN 60598-2-20:2015 used in conjunction with EN 60598-1:2015+A1:2018			
Attachment No. 2: 1 pages of report IEC/EN 62031.			
Attachment No. 3: 3 pages of report IEC/EN 62471.			
Attachment No. 4: 6 pages of photo documentation.			
Summary of testing:			
Tests performed (name of test and test clause):		Testing location:	
J60598-2-20(H25)		Shenzhen Southern LCS Compliance Testing Laboratory Ltd.	
J60598-1(H26)		101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China	
IEC 62471:2006			
IEC TR 62778:2014			
IEC 62031:2008+A1:2012+A2:2014			

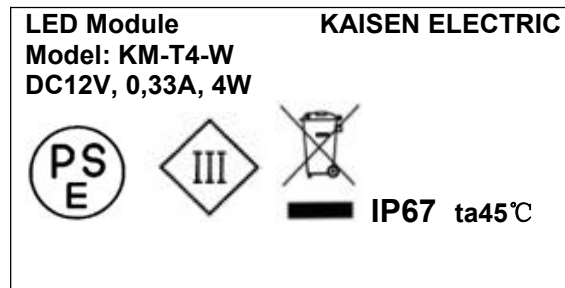
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Copy of marking plate:

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.

**Remarks:**

1. Representative markings of KM-T4-W, markings of all models are identical except for the model name and rating.
2. Height of PSE mark at least 5mm, height of WEEE symbol should not less than 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.



Test item particulars :									
Classification of installation and use: Lighting Chains									
Supply Connection: Connecting leads									
Protection Class: Class III									
Degree of Protection : IP67									
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 : March 10, 2020									
Date (s) of performance of tests : March 10, 2020 - March 23, 2020									
General remarks:									
This report shall not be reproduced except in full without the written approval of the testing laboratory. The test results presented in this report relate only to the item tested. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Clause numbers between brackets refer to clauses in IEC/EN 60598-1.									
Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.									
According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.									
Modified Information									
<table border="1"><thead><tr><th>Version</th><th>Report No.</th><th>Revision Data</th><th>Summary</th></tr></thead><tbody><tr><td>V1.0</td><td>LCS200306020BS</td><td>/</td><td>Original Version</td></tr></tbody></table>		Version	Report No.	Revision Data	Summary	V1.0	LCS200306020BS	/	Original Version
Version	Report No.	Revision Data	Summary						
V1.0	LCS200306020BS	/	Original Version						
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 02:									
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	<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) : Same as manufacturer									

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**General product information:**

- All models have similar appearance except power are difference.
- Unless otherwise specified, the model KM-T4-W was chosen as representative model to perform all test.

Model List:

Model	Rating
KM-P0-W	DC12V, 0,03A, 0,36W, IP67, ta45°C, Class III
KM-P1-W	DC12V, 0,042A, 0,5W, IP67, ta45°C, Class II
KM-P1-R	DC12V, 0,042A, 0,5W, IP67, ta45°C, Class III
KM-P1-G	DC12V, 0,042A, 0,5W, IP67, ta45°C, Class III
KM-P1-B	DC12V, 0,042A, 0,5W, IP67, ta45°C, Class III
KM-P2-W	DC12V, 0,083A, 1W, IP67, ta45°C, Class III
KM-P2-R	DC12V, 0,083A, 1W, IP67, ta45°C, Class III
KM-P2-G	DC12V, 0,06A, 0,72W, IP67, ta45°C, Class III
KM-P2-B	DC12V, 0,06A, 0,72W, IP67, ta45°C, Class III
KM-P3-W	DC12V, 0,125A, 1,5W, IP67, ta45°C, Class III
KM-P3-R	DC12V, 0,125A, 1,5W, IP67, ta45°C, Class III
KM-P3-G	DC12V, 0,1A, 1,2W, IP67, ta45°C, Class III
KM-P3-B	DC12V, 0,1A, 1,2W, IP67, ta45°C, Class III
KM-P4-W	DC12V, 0,166A, 2W, IP67, ta45°C, Class III
KM-T0-W	DC12V, 0,042A, 0,5W, IP67, ta45°C, Class III
KM-T1-W	DC12V, 0,1A, 1,2W, IP67, ta45°C, Class III
KM-T2-W	DC12V, 0,166A, 2W, IP67, ta45°C, Class III
KM-T3-W	DC12V, 0,25A, 3W, IP67, ta45°C, Class III
KM-T4-W	DC12V, 0,33A, 4W, IP67, ta45°C, Class III
KM-DS15-W	DC12V, 0,125A, 1,5W, IP67, ta45°C, Class III
KM-DS20-W	DC12V, 0,166A, 2W, IP67, ta45°C, Class III
KM-A1-75K	DC12V, 0,05A, 0,6W, IP67, ta45°C, Class III
KM-A2-75K	DC12V, 0,1A, 1,2W, IP67, ta45°C, Class III
KM-A3-75K	DC12V, 0,15A, 1,8W, IP67, ta45°C, Class III
KM-N1-7500C2	DC12V, 0,03A, 0,36W, IP67, ta45°C, Class III
KM-N2-7500C2	DC12V, 0,06A, 0,72W, IP67, ta45°C, Class III
KM-MINI3-04W-65K	DC12V, 0,033A, 0,4W, IP67, ta45°C, Class III
KM-MINI3-07W-65K	DC12V, 0,06A, 0,7W, IP67, ta45°C, Class III

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.4 (0)	GENERAL TEST REQUIREMENTS		P
20.4 (0.1)	Information for luminaire design considered..... :	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Lamp standard:	—
20.4 (0.3)	More sections applicable..... :	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Section/s:	—
20.4 (0.5)	Components	(see Annex 1)	—
20.4 (0.7)	Information for luminaire design in light sources standards		
20.4 (0.7.2)	Light source safety standard	EN 62031	—
	Luminaire design in the light source safety standard		P

20.5 (2)	CLASSIFICATION		P
20.5 (2.2)	Type of protection	Class III	P
20.5 (2.3)	Degree of protection..... :	IP67	P
20.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces..... :	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
20.5 (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"/>	—
20.5.2 (-)	Class II or Class III	Class III	P
20.5.3 (-)	Chain for outdoor use shall be IP44 or higher		P

20.6 (3)	MARKING		P
20.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
20.6 (3.3)	Additional information		P
	Language of instructions	English	P
20.6 (3.3.1)	Combination luminaires		N/A
20.6 (3.3.2)	Nominal frequency in Hz		N/A
20.6 (3.3.3)	Operating temperature		N/A
20.6 (3.3.4)	Symbol or warning notice		P
20.6 (3.3.5)	Wiring diagram		N/A
20.6 (3.3.6)	Special conditions		N/A
20.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
20.6 (3.3.8)	Limitation for semi-luminaires		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.6 (3.3.9)	Power factor and supply current		N/A
20.6 (3.3.10)	Suitability for use indoors		N/A
20.6 (3.3.11)	Luminaires with remote control		N/A
20.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
20.6 (3.3.13)	Specifications of protective shields		N/A
20.6 (3.3.14)	Symbol for nature of supply	---	P
20.6 (3.3.15)	Rated current of socket outlet		N/A
20.6 (3.3.16)	Rough service luminaire		N/A
20.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
20.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
20.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
20.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
20.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non replaceable	P
	Cautionary symbol		N/A
20.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
20.6 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
20.6 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
20.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
20.6.2 (-)	Lighting chain marking		P
	Rated voltage and wattage marked on the chain		P

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Durable non-removable label if information on the cable		P
20.6.3 (-)	Lighting chain and packing marking		P
	Marking if only for indoor use		P
20.6.4 (-)	Marking on the packing or instructions		P
	a) For all lighting chains where the packing has not been adapted for display purposes: - "Do not connect the chain to the supply while it is in the packing"		P
	b) For lighting chains with replaceable lamps: - voltage and wattage or manufacturer's article number of replacement lamps; - "Do not remove or insert lamps while the chain is connected to the supply"; - "Ensure that all lampholders are fitted with a lamp"		N/A
	c) Lighting chains designed to be used without a lamp in every lampholder: - adequate information about required blanking plug(s)		N/A
	d) For chains with replaceable series-connected lamps: - "Replace failed lamps immediately by lamps of the same type as delivered or of a type specified by the manufacturer"		N/A
	e) For lighting chains with 'fuse' lamp(s): - "Do not replace a 'fuse' lamp with a non-'fuse' lamp"; in order to indicate the difference from 'ordinary' lamps, 'fuse' lamps shall be partly coloured white; - information indicating that the chain is provided with 'fuse' lamps and explanation of their function		N/A
	f) For lighting chains with non-replaceable lamps: - "The lamps are not replaceable"		P
	g) For class II lighting chains with non-replaceable lamps, the substance of the following: - where breakage or damage to lamps occurs the chain must not be used/energised but disposed of safely		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	h) For lighting chains which rely on gaskets to provide the specified degree of protection against dust, solid objects and moisture: - "WARNING – THIS LIGHTING CHAIN MUST NOT BE USED WITHOUT ALL GASKETS BEING IN PLACE"		N/A
	i) For lighting chains intended for interconnection: - "Do not interconnect parts of this lighting chain with parts of another manufacturer's lighting chain"; - "Interconnection shall be made only by the use of the supplied connectors. Any open ends must be sealed-off before use"; - maximum system length that may be interconnected; - maximum number of lamps or max system wattage that may be interconnected		N/A
	j) For lighting chains incorporating lamp bridging device(s): - information stating that the chain is fitted with a bridging device(s)		N/A
	k) For class III lighting chains delivered without a supply source: - relevant information concerning the required supply source.		P
	l) For mains voltage lighting chains with series connected lamps: - "WARNING – RISK OF ELECTRIC SHOCK IF LAMPS ARE BROKEN OR MISSING. DO NOT USE"		N/A

20.7 (4)	CONSTRUCTION		P
20.7 (4.2)	Components replaceable without difficulty		N/A
20.7 (4.3)	Wireways smooth and free from sharp edges		P
20.7 (4.4)	Lampholders		N/A
20.7 (4.4.1)	Integral lampholder		N/A
20.7 (4.4.2)	Wiring connection		N/A
20.7 (4.4.3)	Lampholder for end-to-end mounting		N/A
*20.7 (4.4.4)	Positioning		N/A
	- pressure test (N)		—

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	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
20.7 (4.4.5)	Peak pulse voltage		N/A
20.7 (4.4.6)	Centre contact		N/A
20.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
20.7 (4.4.8)	Lamp connectors		N/A
20.7 (4.4.9)	Caps and bases correctly used		N/A
20.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
20.7 (4.5)	Starter holders		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
20.7 (4.6)	Terminal blocks		N/A
	Tails		N/A
	Unsecured blocks		N/A
20.7 (4.7)	Terminals and supply connections		P
20.7 (4.7.1)	Contact to metal parts		N/A
20.7 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
20.7 (4.7.3)	Terminals for supply conductors		N/A
20.7 (4.7.3.1)	Welded method and material		N/A
	- 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 15.6.2.3 and 15.6.2.4		N/A
20.7 (4.7.4)	Terminals other than supply connection		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
20.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
20.7 (4.8)	Switches		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
20.7 (4.9)	Insulating lining and sleeves		P
20.7 (4.9.1)	Retainment		N/A
	Method of fixing.....:		N/A
20.7 (4.9.2)	Insulated linings and sleeves:		P
	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
20.7 (4.10)	Double or reinforced insulation		N/A
20.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
20.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
20.7 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
20.7 (4.11)	Electrical connections and current-carrying parts		P

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.7 (4.11.1)	Contact pressure		P
20.7 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
20.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
20.7 (4.11.4)	Material of current-carrying parts		P
20.7 (4.11.5)	No contact to wood or mounting surface		P
20.7 (4.11.6)	Electro-mechanical contact systems		N/A
20.7 (4.12)	Screws and connections (mechanical) and glands		N/A
20.7 (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
20.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
*20.7 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :		N/A
	- lampholder; torque (Nm)..... :		N/A
	- push-button switches; torque 0,8 Nm..... :		N/A
20.7 (4.12.5)	Screwed glands; force (Nm)..... :		N/A
20.7 (4.13)	Mechanical strength		P
20.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :		N/A
	- other parts; energy (Nm)..... :	0,35Nm	P
	1) live parts		P

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Clause	Requirement + Test	Result - Remark	Verdict
	2) linings		N/A
	3) protection		P
	4) covers		N/A
20.7 (4.13.3)	Straight test finger		N/A
*20.7 (4.13.4)	Rough service luminaires		N/A
	- 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
20.7 (4.13.6)	Tumbling barrel		N/A
20.7 (4.14)	Suspensions, fixings and means of adjusting		N/A
20.7 (4.14.1)	Mechanical load:		N/A
	A) four times the weight		N/A
	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
20.7 (4.14.2)	Load to flexible cables		N/A
	Mass (kg)		—
	Stress in conductors (N/mm ²)		N/A
	Mass (kg) of semi-luminaire		N/A
	Bending moment (Nm) of semi-luminaire		N/A
20.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :		N/A
	- strands broken..... :		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- electric strength test afterwards		N/A
20.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
20.7 (4.14.5)	Guide pulleys		N/A
20.7 (4.14.6)	Strain on socket-outlets		N/A
20.7 (4.15)	Flammable materials		N/A
	- glow- wire test 650°C..... :	See Test Table 20.16 (13.3.2)	N/A
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		N/A
	- thermal protection		N/A
	- electronic circuits exempted		N/A
20.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
20.7 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear..... :	(compliance with Section 12)	P
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
20.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
20.7 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
20.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.7 (4.17)	Drain holes		N/A
	Clearance at least 5 mm		N/A
20.7 (4.18)	Resistance to corrosion		N/A
20.7 (4.18.1)	- rust- resistance		N/A
*20.7 (4.18.2)	- season cracking in copper		N/A
20.7 (4.18.3)	- corrosion of aluminium		N/A
20.7 (4.19)	Igniters compatible with ballast		N/A
*20.7 (4.20)	Rough service vibration		N/A
20.7 (4.21)	Protective shield		N/A
20.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
20.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
20.7 (4.21.3)	No direct path		N/A
20.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 20.16 (13.3.2)	N/A
20.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
20.7 (4.23)	Semi-luminaires comply Class II		N/A
20.7 (4.24)	Photobiological hazards		P
*20.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
20.7 (4.24.2)	Retinal blue light hazard	RG1	P
	Luminaires with E_{thr} :		N/A
	a) Fixed luminaires		N/A
	- 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

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	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
20.7 (4.25)	Mechanical hazard		P
	No sharp point or edges		P
*20.7 (4.26)	Short-circuit protection		N/A
*20.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
*20.7 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
20.7 (4.27)	Terminal blocks with integrated screwless earthing contacts		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
20.7 (4.28)	Fixing of thermal sensing control		N/A
	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:		N/A
	Max. temperature on adhesive material (°C)..... :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
20.7 (4.29)	Luminaires with non-replaceable light source		P
	Not possible to replace light source		P
	Live part not accessible after parts have been opened by hand or tools		N/A
20.7 (4.30)	Luminaires with non-user replaceable light source		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A
	Minimum two fixing means		N/A
20.7 (4.31)	Insulation between circuits		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	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
20.7 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage \leq ELV		P
	Insulating of SELV circuits from LV supply		P
	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		P
	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
20.7 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage \leq 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
	Socket outlets does not admit plugs of other voltage systems		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Socket-outlets does not have protective conductor contact		N/A
20.7 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- 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
20.7 (4.32)	Overvoltage protective devices		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
20.7.2 (-)	Lampholders		N/A
	Tested as part of the lighting chain if non-standardised lampholders		N/A
	E5, E10, E14 and E27 according IEC 60238		N/A
	Bayonet according IEC 61184		N/A
	Insulating piercing terminals only if SELV circuit or permanent non-rewireable connections in class II chain		N/A
	Maximum voltage used for E5, E10 and small lampholders		N/A
	Body of insulating material		N/A
20.7.3 (-)	Terminal blocks		N/A
	Clause 4.6 of IEC 60598-1 referring to terminal blocks does not apply		—
20.7.4 (-)	Terminals and supply connections		N/A
	Comply with Annex A		N/A
20.7.5 (-)	Gaskets		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Gasket weather resistant if outdoor use		N/A
	Gasket remains in place and fit tightly		N/A
20.7.6 (-)	Mechanical strength		P
	Mechanical strength requirements of 4.13 of part 1 or 15 of IEC 61184		N/A
	Accessories comply with 4.13.6 of part 1		N/A
20.7.7 (-)	Lamp bridging devices		N/A
	Protection against electric shock and fire will not be impaired by bridging lamp filaments		N/A
20.7.8 (-)	Control units		N/A
	Forming an integral part enclosed in non-flammable insulating material tested according 20.16		N/A
	Securely fixed to the cable		N/A
	Electronic control device comply with IEC 61347-2-11		N/A
	LED driver comply with IEC 61347-2-13		N/A
20.7.9 (-)	Lamp rotation		N/A
	Bulb and lamp cap of push-in lamps will not rotate with a torque of 0,025 Nm		N/A
20.7.10 (-)	Lamp insertion/withdrawal force		N/A
	Pull force up to 3 N for push-in lamps		N/A
	Push-in force up to 3 N for push-in lamps		N/A
	Pull out force of between 3 N and 10 N for push-in lamps		N/A
20.7.11 (-)	Lamp mechanical requirements		N/A
	Impact test of 0,2 Nm on lamps of Class II chain:		N/A
	- non-removable lamps		N/A
	- non-standardized lamps		N/A

20.8 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
20.8 (11.2)	Creepage distances and clearances.....:	See Table 20.8 (11.2)	P
	Working voltage (V).....:	DC12V	—
	Rated pulse voltage (kV).....:		—
	Voltage form.....:	Sinusoidal <input checked="" type="checkbox"/> Non-sinusoidal <input type="checkbox"/>	—
	PTI.....:	< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict

	Impulse withstand category (Normal category II) (Category III Annex U)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
--	--	---	---

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

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

20.11 (5)	EXTERNAL AND INTERNAL WIRING		P
20.11 (5.2)	Supply connection and external wiring		P
20.11 (5.2.1)	Means of connection.....:		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
20.11 (5.2.2)	Type of cable.....:		P
	Nominal cross-sectional area (mm ²).....:		P
	Cables equal to IEC 60227 or IEC 60245		N/A
20.11 (5.2.3)	Type of attachment, X, Y or Z		N/A
20.11 (5.2.5)	Type Z not connected to screws		N/A
20.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
20.11 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
20.11 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- tubes or guards made of insulating material		N/A
20.11 (5.2.9)	Locking of screwed bushings		N/A
20.11 (5.2.10)	Cord anchorage:		N/A
	- covering protected from abrasion		N/A
	- clear how to be effective		N/A
	- no mechanical or thermal stress		N/A
	- no tying of cables into knots etc.		N/A
	- insulating material or lining		N/A
20.11 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	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
20.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
20.11 (5.2.10.3)	Tests:		N/A
	- impossible to push cable; unsafe		N/A
	- pull test: 25 times; pull (N)..... :		N/A
	- torque test: torque (Nm)..... :		N/A
	- displacement ≤ 2 mm		N/A
	- no movement of conductors		N/A
	- no damage of cable or cord		N/A
	- function independent of electrical connection		N/A
20.11 (5.2.11)	External wiring passing into luminaire		N/A
20.11 (5.2.12)	Looping-in terminals		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
20.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
20.11 (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
20.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
20.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
20.11 (5.3)	Internal wiring		N/A
20.11 (5.3.1)	Internal wiring of suitable size and type		N/A
	Through wiring		N/A
	- 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
20.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm ²)..... :		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
20.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Adequate cross-sectional area and insulation thickness		N/A
20.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.11 (5.3.1.4)	Conductors without insulation		N/A
20.11 (5.3.1.5)	SELV current-carrying parts		N/A
20.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
20.11 (5.3.2)	Sharp edges etc.		N/A
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		N/A
20.11 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
20.11 (5.3.4)	Joints and junctions effectively insulated		N/A
20.11 (5.3.5)	Strain on internal wiring		N/A
20.11 (5.3.6)	Wire carriers		N/A
20.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
20.11 (5.4)	Test to determine suitability of conductors having a reduced cross-sectional area		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A
20.11.2 (-)	Cables for lighting chains		N/A
	Type of cable..... :		N/A
	Cables not lighter than IEC 60227 or IEC 60245 for class II chain		N/A
	Cables not lighter than insulation according to 5.3.1 of part 1 for class III chain		N/A
	Nominal cross-sectional area (mm ²)..... :		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Mechanical properties according 4.14.1 and 4.14.2 of part 1		N/A
20.11.3 (-)	Cord anchorage test		N/A
	Pull test 30 N 25 times on single-core cable		N/A
20.11.4 (-)	Plugs and cable length		N/A
	Splash-proof plug or permanent connection if for outdoor use		N/A
	Length of the cable between the plug and first lamp or lampholder not less than 1,5 m		N/A
20.11.5 (-)	Maximum length of extendable class II lighting chains		N/A
	Maximum length 100 m for 0,5 mm ² cable		N/A
	Maximum length 150 m for 0,75 mm ² cable		N/A

20.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
20.12 (8.2.1)	Live parts not accessible		N/A
	Basic insulated parts not used on the outer surface without appropriate protection		N/A
	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		N/A
	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		N/A
	Protection in any position		N/A
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
20.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
20.12 (8.2.3.a)	Class II luminaire:		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
20.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
20.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- touch current		N/A
	- no-load voltage.....		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage		N/A
20.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
20.12 (8.2.5)	Compliance with the standard test finger or relevant probe		N/A
20.12 (8.2.6)	Covers reliably secured		N/A
20.12 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N/A
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A
20.12.2 (-)	Divisible plug		N/A
	Divisible plug in compliance with Figure 1		N/A
	Parts of the connector do not separate with a pull force of 10 N		N/A
20.12.3 (-)	Electrification of decorations		N/A
	Test with flat probe		N/A
20.12.4 (-)	Contact of push-in lampholders		N/A
	Lampholder contacts in push-in lampholders is reliably secured		N/A
	Contacts move maximum 0,8 mm during the endurance test		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.12.5 (-)	Blanking plugs		N/A
	Blanking plugs provided if chain designed to be used without lamp in every lampholder		N/A
20.13 (12)	ENDURANCE TEST AND THERMAL TEST		P
20.13.1 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 20.14		N/A
20.13 (12.3)	Endurance test:		P
	- mounting- position..... :		—
	- test temperature (°C)..... :	ta45°C+10°C	—
	- total duration (h)..... :	240h	—
	- supply voltage: Un factor; calculated voltage (V).... :	1,1*DC12V	—
	- lamp used..... :	LED	—
20.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
20.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
20.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
20.13 (12.6)	Thermal test (failed lamp control gear condition):		N/A
20.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		—
	- case of abnormal conditions..... :		—
	- 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

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.13 (12.6.2)	Temperature sensing control		N/A
	- 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
20.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
20.13 (12.7.1)	Luminaire without temperature sensing control		N/A
20.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W		—
	Test according to 12.7.1.1:		N/A
	- 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:		N/A
	- 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).....:		—
	Ball-pressure test.....:	See Table 20.16 (13.2.1)	N/A
20.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- 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).....:		—

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Ball-pressure test.....:	See Table 20.16 (13.2.1)	N/A
20.13 (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
20.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- 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 20.16 (13.2.1)	N/A
20.13.2 (-)	Test voltage		N/A
	Provision of 12.3.1 d) of part 1 and if class III chain 1,1 x rated voltage of transformer/convertor		—
	Provision of 12.4.1 d) of part 1 and if class III chain 1,06 x rated voltage of transformer/convertor		—
20.13.3 (-)	Lamp bridging devices		N/A
	Lamp bridging not cause temperature which impair safety		N/A
	Temperature of lampholders and cables not exceed values in Table 12.1 when bridging device operate successively on each lamp		N/A
20.13.4 (-)	Short-circuit test of rectifier		N/A
	No emission of flames or molten material or production of flammable gases and no live parts accessible when short-circuit output of the rectifier		N/A

20.14 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
20.14 (-)	If IP > IP 20 the order of tests as specified in clause 20.13		—
20.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....:	IP67	—
	- mounting position during test.....:		—
	- fixing screws tightened; torque (Nm).....:		—

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- tests according to clauses.....:		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	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		N/A
	d) i) For luminaires without drain holes – no water entry		N/A
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		N/A
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A
	g) no trace of water on part of lamp requiring protection from splashing water		P
	h) no damage of protective shield or glass envelope		P
20.14 (9.3)	Humidity test 48 h	25°C, 93%RH	P

20.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
20.15 (-)	Metal foil procedure		—
20.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø		—
	Insulation resistance (MΩ).....:		—
	SELV		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....:	100MΩ	P
	- 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		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts of different polarity..... :		N/A
	- between live parts and mounting surface..... :		N/A
	- between live parts and metal parts..... :		N/A
	- 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
20.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V)..... :		N/A
	SELV		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface..... :	500V	P
	- 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		N/A
	- between live parts of different polarity..... :		N/A
	- between live parts and mounting surface..... :		N/A
	- between live parts and metal parts..... :		N/A
	- 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
20.15 (10.3)	Touch current or protective conductor current (mA) :		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.16 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
20.16 (13.2.1)	Ball-pressure test..... :	See Test Table 20.16 (13.2.1)	P
20.16 (13.3.1)	Needle-flame test (10 s)..... :	See Test Table 20.16 (13.3.1)	N/A
20.16 (13.3.2)	Glow- wire test (650°C)..... :	See Test Table 20.16 (13.3.2)	P
*20.16 (13.4)	Proof tracking test (IEC 60112)..... :	See Test Table 20.16 (13.4)	N/A
20.16 (-)	Edison lampholders according cl. 20 of IEC 60238		N/A
20.16 (-)	Bayonet lampholders according cl. 19 of IEC 61184		N/A

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict

20.8 (11.2)	TABLES: Creepage distances and clearances						N/A
Table 11.1	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						N/A
RMS working voltage (V) not exceeding	50	150	250	500	750	1000	
Creepage distances							
Required basic insulation, PTI ≥ 600	0,6	0,8	1,5	3	4	5,5	
Measured							
Required basic insulation, PTI < 600	1,2	1,6	2,5	5	8	10	
Measured							
Required supplementary insulation PTI ≥ 600	-	0,8	1,5	3	4	5,5	
Measured							
Required supplementary insulation PTI < 600	-	1,6	2,5	5	8	10	
Measured							
Required reinforced insulation	-	3,2	5	6	8	11	
Measured							
Clearances							
Required basic insulation	0,2	0,8	1,5	3	4	5,5	
Measured							
Required supplementary insulation	-	0,8	1,5	3	4	5,5	
Measured							
Required reinforced insulation	-	1,6	3	6	8	11	
Measured							
Table 11.2	Minimum distances (mm) for non-sinusoidal pulse voltages						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured							
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured							
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured							

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict

20.8 (11.2)	TABLES: Creepage distances and clearances					N/A
Test Location	Working voltage	Measured cl (mm)	Required cl (mm)	Measured cr (mm)	Required cr (mm)	Verdict
--	--	--	--	--	--	--

20.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics				P
Allowed impression diameter (mm)		2,0mm			—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)		Impression diameter (mm)	
Plastic parts	--	75°C		1,0mm	
Supplementary information:--					

20.16 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				N/A
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
--	--	--	--	--	--
Supplementary information:--					

20.16 (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
Plastic parts	--	30s	No		0s
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).....:					Yes
Supplementary information:--					

*20.16 (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
--	--	--	--	--	--



IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

ANNEX A	Requirements for interconnecting connectors for use in lighting chains		N/A
	This Annex A consist relevant requirements and modifications of IEC 61984		N/A
5.2	Classification according to protection against electric shock		N/A
	Only enclosed connectors		N/A
5.3	Classification according to the style of connector		N/A
	Only free connectors		N/A
5.4	Classification according to additional characteristics of connectors		N/A
	According b), d), e), f), h), and j)		N/A
6.2.1	Identification		N/A
	According a) and b)		N/A
6.4.1	Non accessibility of live parts		N/A
	Test with test finger on class II chain		N/A
6.9.1	Polarisation		N/A
	Improper connection of mating parts is prevented		N/A
	No unsafe compatibility between connectors for class II and class III chains of the same manufacturer		N/A
	Male part of class III chains not make contact in the female contact of low voltage connectors (e.g. IEC 60320)		N/A
	Manufacturer designed connectors, no unsafe compatibility with systems according IEC 60320 and IEC 60906 and national domestic plug and socket-outlet systems in the country where the chain is placed on the market		N/A
6.9.3	Connection of conductors		N/A
	Cross sectional area of the contact making part of the interconnecting coupler not less than the corresponding conductor in the interconnected cable		N/A
6.10	Design of a CBC		N/A
	Adequate breaking capacity		N/A
	Female part at the end of the chain, other than ordinary, provided with sealing device securely fixed to the coupler		N/A
6.13	Dielectric strength		N/A
	Test according clause 20.15 of this standard		N/A
6.14.2	Electrical endurance (CBC)		

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Meet the specified breaking capacity		N/A
	Number of cycles 50		—
	Test according 7.3.8		N/A
6.14.3	Bendings (non-rewirable connectors)		N/A
	Meet the specified number of bendings		N/A
	Number of cycles 1000		—
	Test according 7.3.9		N/A
6.17	Cable clamp		N/A
	Test according clause 20.11.3 of this standard		N/A

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IEC 60598-2-20			
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 ¹⁾
Internal wire	B	Dongguan Wenchang Electronic Co Ltd	1007	20AWG, 80°C, 300V	J60598-2-20(H25)	UL E214500 Test with appliance
Plastic parts	B	Chang Chun Sb(Changshu) Co Ltd	EME-5051	V-0, 130°C	J60598-2-20(H25)	UL E223871 Test with appliance
LED PCB	B	XIAMEN LED BOARD ELECTRON-TECH CO LTD	LDB-1~10	V-0, 130°C	J60598-2-20(H25)	UL E347474 Test 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

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12			P			
	Type reference.....:	KM-T4-W		—			
	Lamp used.....:	LED lamp		—			
	Lamp control gear used.....:	--		—			
	Mounting position of luminaire.....:	See product manual		—			
	Supply wattage (W).....:	4W		—			
	Supply current (A).....:			—			
	Calculated power factor.....:			—			
	Table: measured temperatures corrected for ta = 45 °C:			P			
	- abnormal operating mode.....:			—			
	- test 1: rated voltage.....:			—			
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	1,1*DC12V		—			
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:			—			
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....:			—			
	Through wiring or looping-in wiring loaded by a current of A during the test			—			
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Input wire	45°C	--	52,4	--	80	--	--
Plastic parts	45°C	--	54,3	--	Ref.	--	--
LED PCB	45°C	--	68,7	--	130	--	--
Mounting surface	45°C	--	47,8	--	90	--	--
Supplementary information:							

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3		Screw terminals (part of the luminaire)	N/A
(14)	SCREW TERMINALS		N/A
(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 ²)..... :		—
(14.3.3)	Conductor space (mm)..... :		N/A
(14.4)	Mechanical tests		N/A
(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

ANNEX 4		Screwless terminals (part of the luminaire)	N/A
(15)	SCREWLESS TERMINALS		N/A
(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

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
(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
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	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:		N/A
	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 external wiring		N/A
	Terminal size and rating		N/A
(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

(15.6.3.1)	TABLE: Contact resistance test										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										



IEC 60598-2-20											
Clause	Requirement + Test									Result - Remark	Verdict
	Voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV).....:										—
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).....:										—
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).....:										—
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).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Supplementary information:											

	ANNEX 5: EMF test result according to IEC/EN 62493	P	
4	LIMITS	P	
4.1	General	P	
	Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3	P	
4.2	Unintentional radiating part of lighting equipment	P	
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing	P	
	1) electronic controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	2) incandescent-lamp technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	3) LED-light-source technology	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	4) OLED-light-source technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	5) high-pressure discharge lamp LED-light-source technologies	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	6) low-pressure discharge lamp technologies with exposure distance ≥ 50 cm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

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IEC 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	7) independent auxiliary	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Not fulfil any of 1-7 above subject to 4.2.3		—
4.2.3	Applications of limits		N/A
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor F is ≤ 1		N/A
4.3	Intentional radiating part of lighting equipment		N/A
	Comply with one of methods in Clause 7 if intentional radiator		N/A

6	MEASUREMENT PROCEDURE FOR THE VAN DER HOOFDEN TEST		N/A
6.1	General		N/A
	Measurements carried out under conditions according Clause 6.1 – 6.6	See Table 6	N/A

7	ASSESSMENT PROCEDURE INTENTIONAL RADIATORS		N/A
7.2	Low-power exclusion method		N/A
7.2.1	Input $P_{int,rad}$:		—
	Exclusion level P_{max}:		—
	Input power $P_{int,rad} < \text{exclusion level } P_{max}$		N/A
7.3	Application of the EMF product standard for body worn-equipment		N/A
	If not Clause 7.2 is met and expose distance ≤ 0.05 m, comply with IEC 62209-2		N/A
7.4	Application of the EMF product standard for base stations		N/A
	If not Clause 7.2 is met and if intentional radiator is base station, comply with IEC 62232		N/A
7.5	Application of another EMF standard		N/A
	If not Clause 7.2 is met and if intentional radiator cannot be considered as in Clause 7.3 or 7.4, comply with IEC 62311		N/A

6	TABLE: Measurement results with Van der Hoofden test head				N/A
Location of EUT	Test model	Measuring distance	Result(F)	Limit(F)	Verdict
Reference Annex B of IEC/EN 62493:2015	--	--	--	≤ 1.0	N/A

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Attachment No.1

IEC 60598_2_20E-ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-20 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES LUMINAIRES PART 2: PARTICULAR REQUIREMENTS SECTION 20: LIGHTING CHAINS			
Differences according to..... : EN 60598-2-20:2015 used in conjunction with EN 60598-1:2015+A1:2018			

	CENELEC COMMON MODIFICATIONS (EN)		N/A
--	--	--	-----

20.6 (3)	MARKING		N/A
20.6 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A

20.7 (4)	CONSTRUCTION		N/A
20.7 (4.11.6)	Electro-mechanical contact systems		N/A

20.11 (5)	EXTERNAL AND INTERNAL WIRING		N/A
20.11 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
20.11 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		N/A

20.13 (12)	ENDURANCE TESTS AND THERMAL TESTS		N/A
20.13 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		N/A

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Attachment No.1

IEC 60598_2_20E-ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		N/A
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N/A

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Attachment No.2

IEC/EN 62031			
LED modules for general lighting - Safety specifications			
Clause	Requirement + Test	Result - Remark	Verdict
6	Classification		---
	Built-in.....:		N/A
	Independent.....:		N/A
	Integral.....:		P
7	Marking		N/A
7.1	Mandatory marking 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		N/A
11	Moisture resistance and insulation		P
12	Electric strength		P
13	Fault conditions		P
13.1	Fault conditions according to IEC 61347-1, Clause 14		P
13.2	Overpower condition	No damage	P
14	Conformity testing during manufacture		N/A
15	Construction		P
	Non Wood, cotton, silk, paper and similar fibrous material used as insulation.		P
16	Creepage distances and clearances		N/A
17	Screws, current-carrying parts and connections		N/A
18	Resistance to heat, fire and tracking		N/A
19	Resistance to corrosion		N/A
20	Information for luminaire design		N/A
21	Heat management		N/A
22	Photobiological safety		P
22.1	UV radiation		P
22.2	Blue light hazard		P
22.3	Infrared radiation		N/A
Annex A	Test		--
Annex C	Conformity testing during manufacture		--
Annex D	Information for luminaire design		--

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Attachment No.3

IEC/EN 62471			
Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict
4	EXPOSURE LIMITS (EL'S)		---
4.2	Specific factors involved in the determination and application of retinal exposure limits		P
4.2.1	Pupil diameter		P
4.2.2	Angular subtense of source and measurement field-of-view		P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		N/A
4.3.2	Near-UV hazard exposure limit for the eye		N/A
4.3.3	Retinal blue light hazard exposure limit		P
4.3.4	Retinal blue light hazard exposure limit - small source		P
4.3.5	Retinal thermal hazard exposure limit		N/A
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		P
4.3.7	Infrared radiation hazard exposure limits for the eye		N/A
4.3.8	Thermal hazard exposure limit for the skin		P
5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions		P
5.1.1	Lamp ageing (seasoning)		P
5.1.2	Test environment		P
5.1.3	Extraneous radiation		P
5.1.4	Lamp operation		P
5.1.5	Lamp system operation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
5.2.2	Radiance measurements		P
5.2.3	Measurement of source size		P
5.2.4	Pulse width measurement for pulsed sources		N/A
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
5.3.2	Calculations		P
5.3.3	Measurement uncertainty		P
6	LAMP CLASSIFICATION		P
6.1	Continuous wave lamps		P
6.1.1	Exempt group		P
6.1.2	Risk Group 1 (Low-Risk)		N/A
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
6.1.4	Risk Group 3 (High-Risk)		N/A

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Attachment No.3

IEC/EN 62471 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict
6.2	Pulsed lamps		N/A
Annex A	SUMMARY OF BIOLOGICAL EFFECTS		--
Annex B	MEASUREMENT METHOD		--
Annex C	UNCERTAINTY ANALYSIS		--
Annex D	GENERAL REFERENCES		--

Table 6.1		Emission limits for risk groups of continuous wave lamps								N/A
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	SUV(λ)	E _s	W•m ⁻²	0,001	-	-	-	-	-	
Near UV		E _{UVA}	W•m ⁻²	0,33	-	-	-	-	-	
Blue light	B(λ)	L _B	W•m ⁻² •sr ⁻¹	100	-	10000	-	4000000	-	
Blue light, small source	B(λ)	E _B	W•m ⁻²	0,01*	-	1,0	-	400	-	
Retinal thermal	R(λ)	L _R	W•m ⁻² •sr ⁻¹	28000/ α	-	28000/ α	-	71000/ α	-	
Retinal thermal, weak visual stimulus**	R(λ)	L _{IR}	W•m ⁻² •sr ⁻¹	545000	-	-	-	-	-	
				0,0017 $\leq \alpha \leq$ 0,011	-	-	-	-	-	
				6000/ α	-	-	-	-	-	
				0,011 $\leq \alpha \leq$ 0.1	-	-	-	-	-	
IR radiation, eye		E _{IR}	W•m ⁻²	100	-	570	-	3200	-	

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Attachment No.3

IEC/EN 62471			
Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps	N/A
<p>* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian. ** Involves evaluation of non-GLS source</p> <p>Note: The action functions: see Table 4.1 and Table 4.2 The applicable aperture diameters: see 4.2.1 The limitations for the angular subtenses: see 4.2.2 The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5</p>		

Table 20.7 (4.24)	Spectroradiometric measurement (IEC 62778)		--
	Measurement performed on:	Luminaire	--
	Model number	KM-T4-W	--
	Test voltage (V)	DC12V	--
	Test current (mA)	--	--
	Test frequency (Hz)	--	--
	Ambient, t (°C)	25.0	--
	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	Risk Group
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates	--	--	--	--
Blue light hazard radiance	L _B	W/(m ² •sr ¹)	103	<input type="checkbox"/> RG0: <100 <input checked="" type="checkbox"/> RG1: <10000 <input type="checkbox"/> RG2: <4000000
Blue light hazard irradiance	E _B	W/m ²	--	--
Luminance	L	cd/m ²	--	--
Illuminance	E	lx	--	--

Supplementary information:

Attachment No.4

Photo Documentation

View:
Model:
KM-T4-W

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

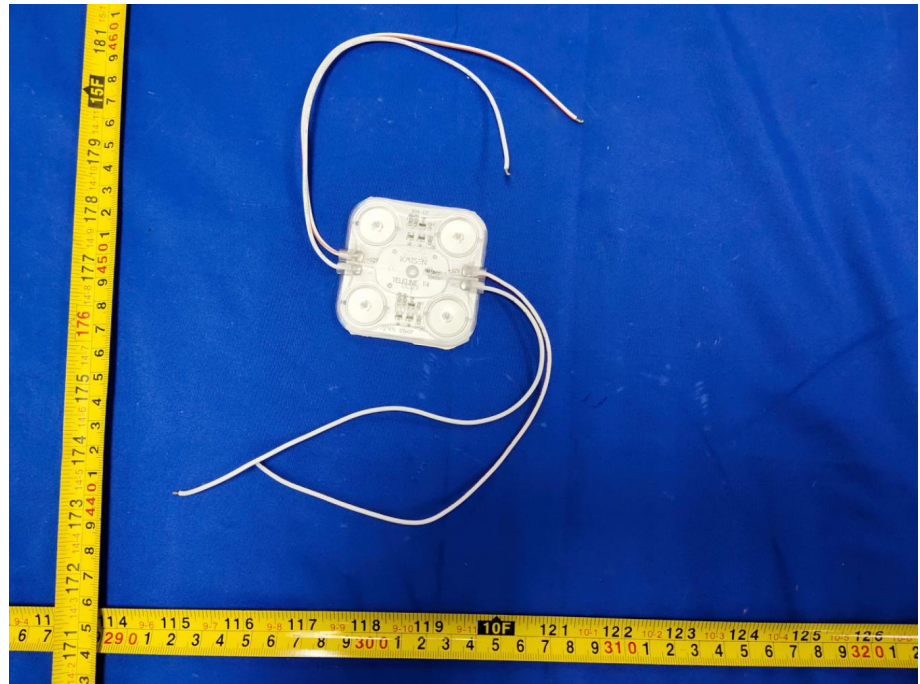


Figure 1

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

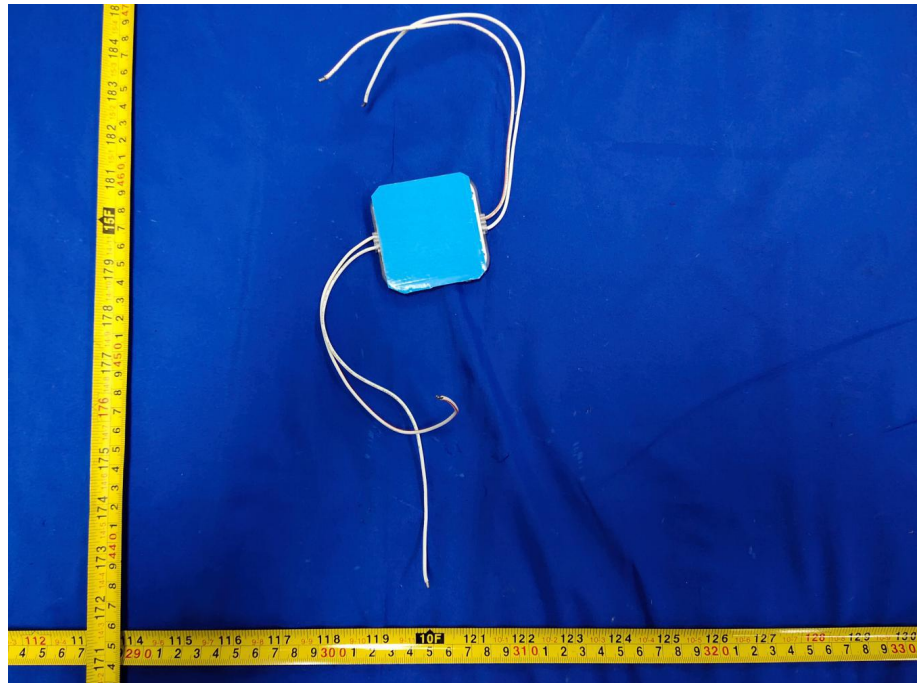


Figure 2

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Attachment No.4

Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

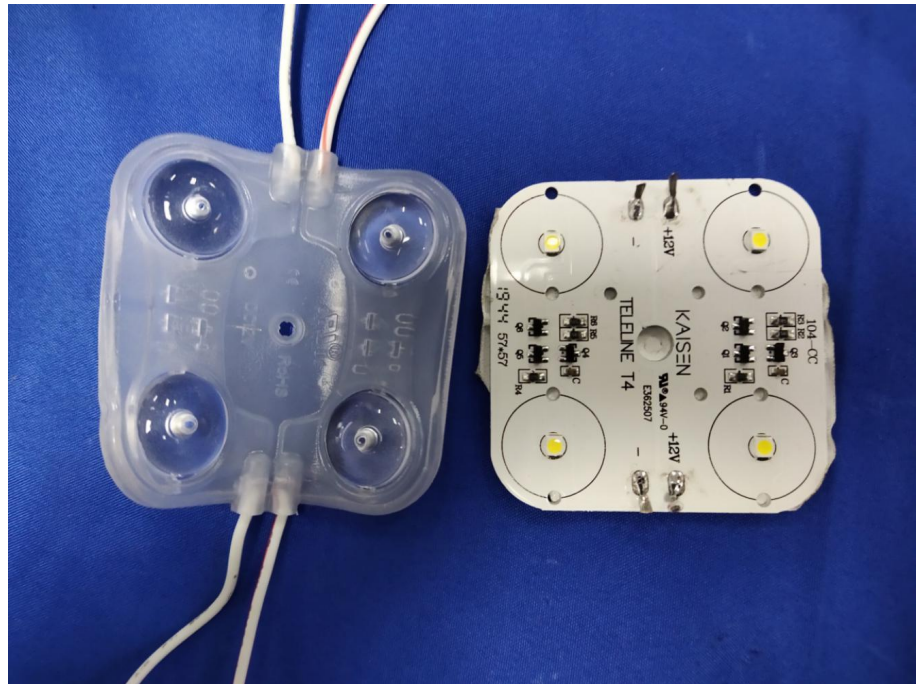


Figure 3

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

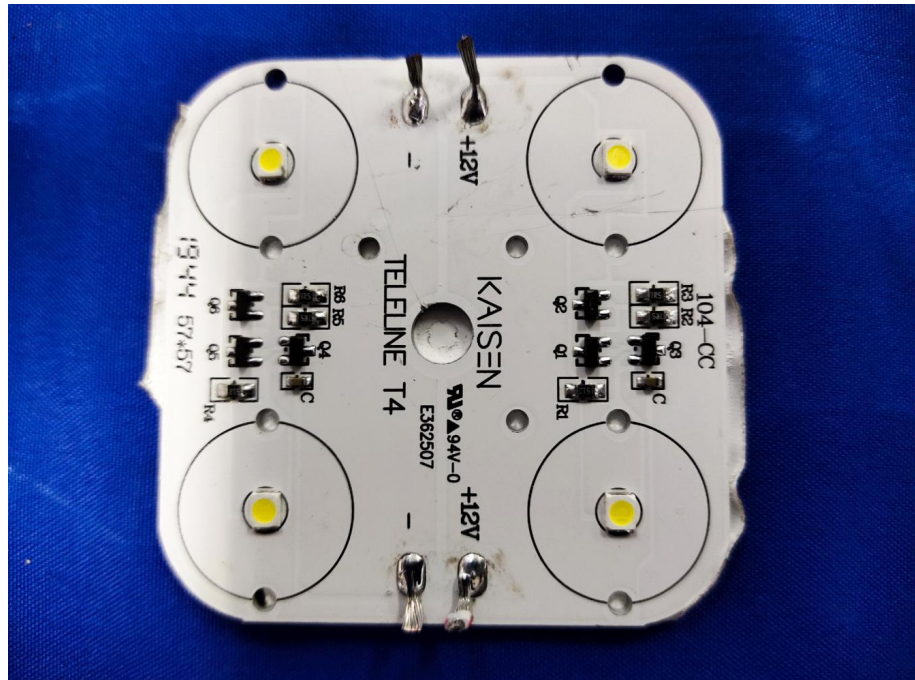


Figure 4

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Attachment No.4

Photo Documentation

View:
Model:
KM-DS20-W

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

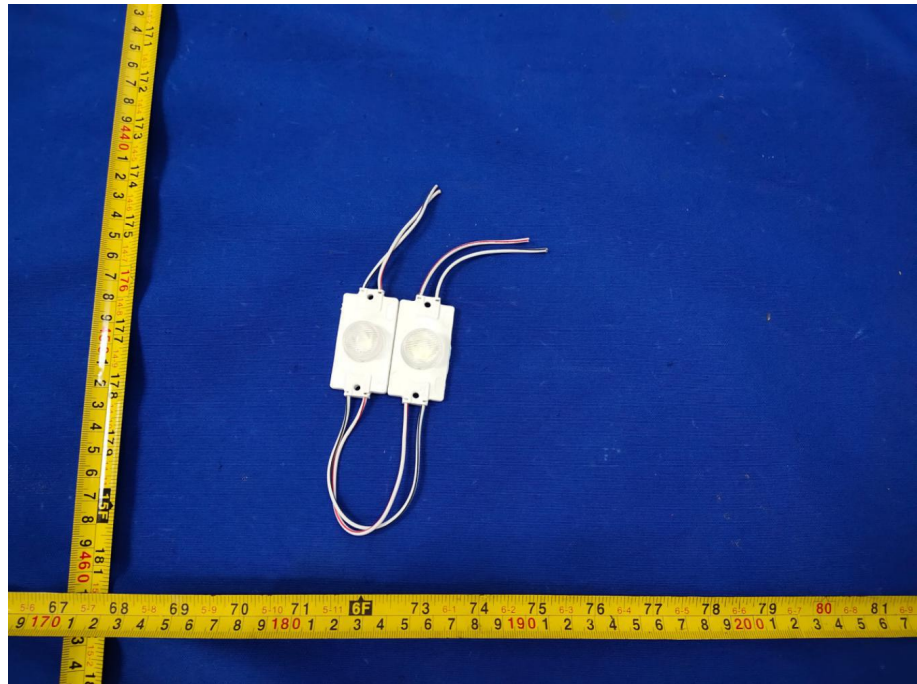


Figure 5

View:
Model:
KM-T4-W

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

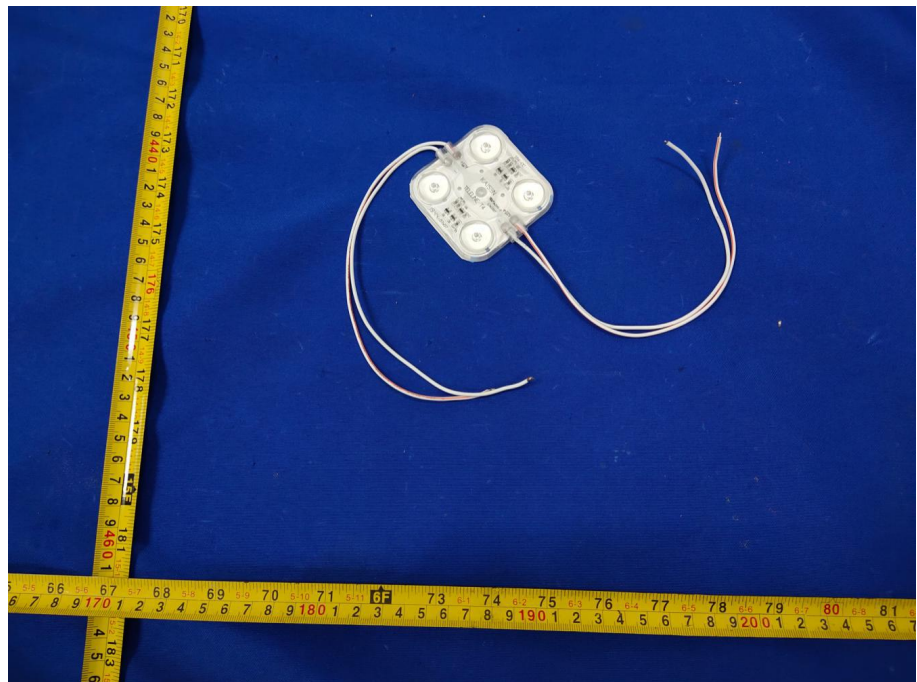


Figure 6

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Attachment No.4

Photo Documentation

View:
Model:
KM-P2-W

General
 Front
 Rear
 Internal
 Top
 Bottom
 PWB

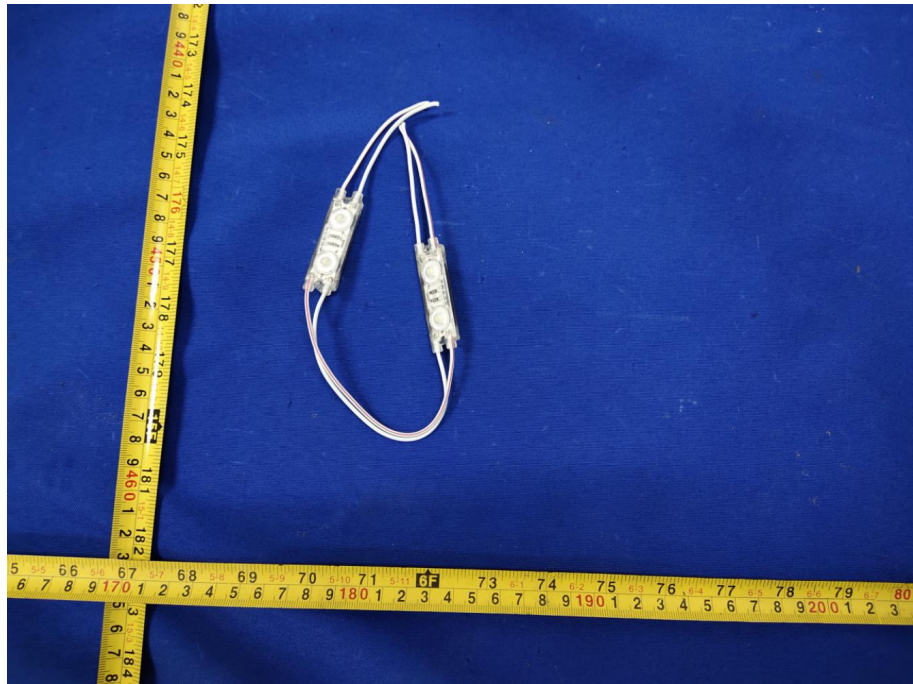


Figure 7

View:
Model:
KM-P3-W

General
 Front
 Rear
 Internal
 Top
 Bottom
 PWB

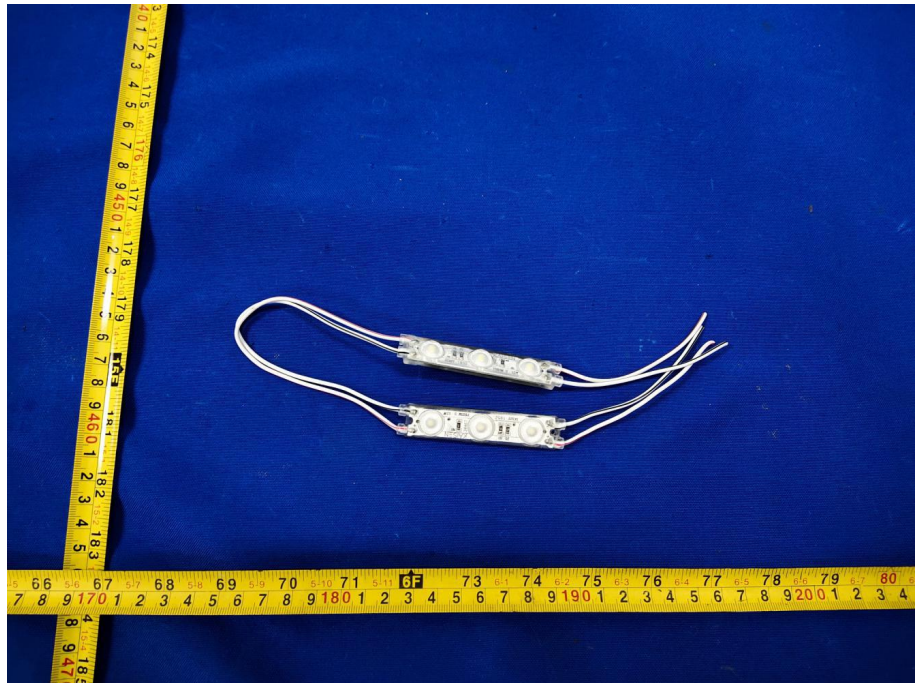


Figure 8

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Attachment No.4

Photo Documentation

View:
Model:
KM-T2-M

General
 Front
 Rear
 Internal
 Top
 Bottom
 PWB

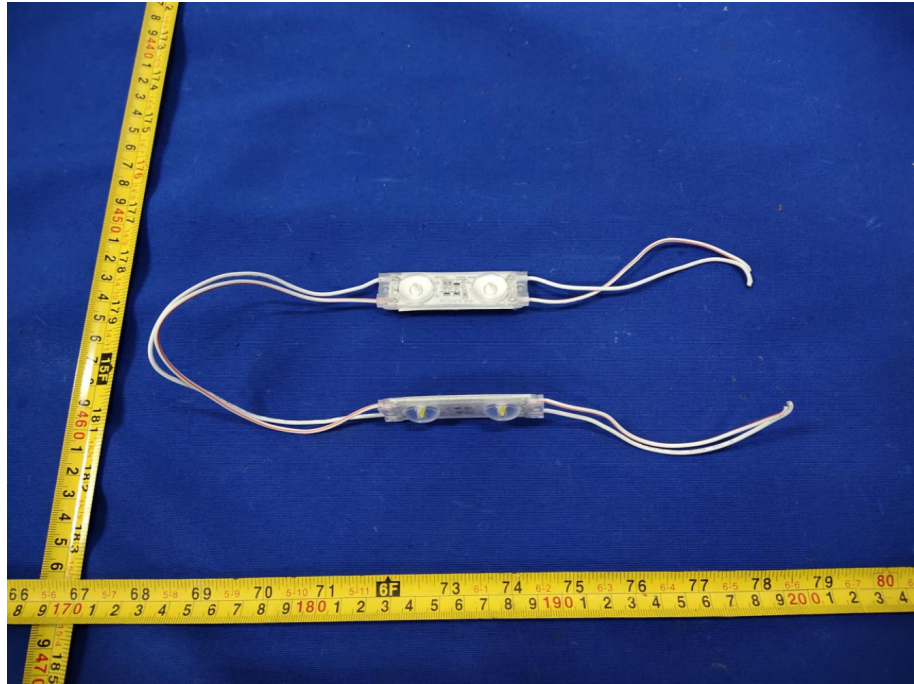


Figure 9

View:
Model:
KM-T1-W

General
 Front
 Rear
 Internal
 Top
 Bottom
 PWB

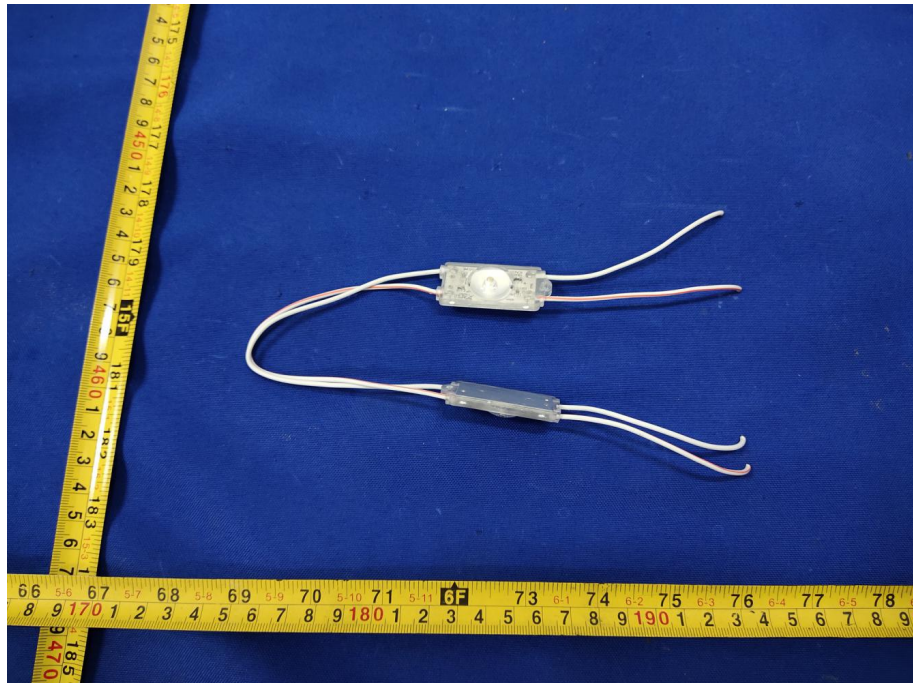


Figure 10

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Attachment No.4

Photo Documentation

View:
Model:
KM-N1-7500C2

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

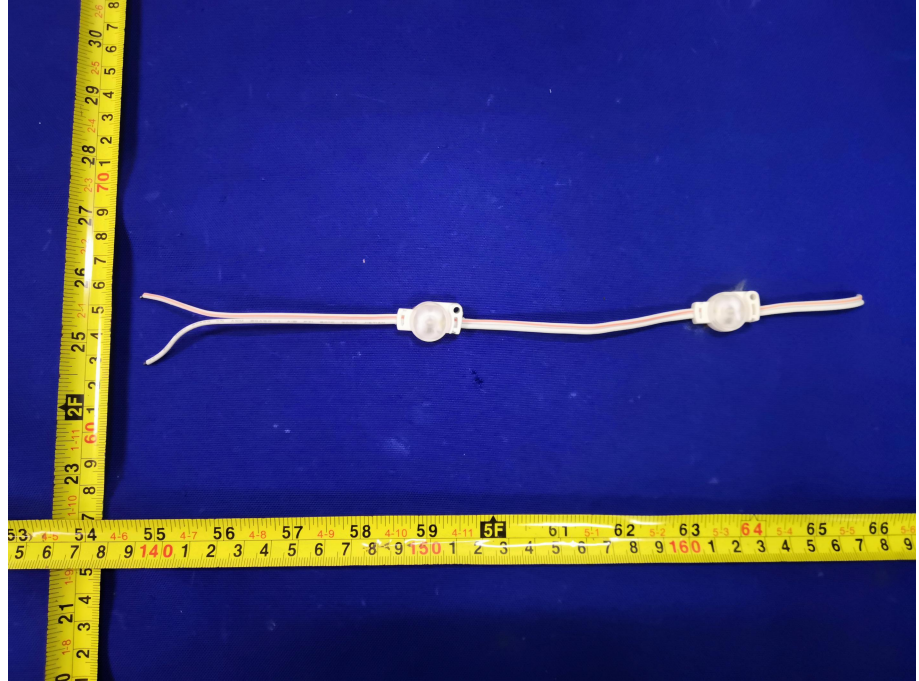


Figure 11

-----End of Test Report-----