

Test Report issued under the responsibility of:



AB-0823-T

202100297TUR-001

07.05.2021

TEST REPORT
IEC 62031
LED modules for general lighting – Safety specifications

Report Number..... : 202100297TUR-001

Date of issue..... : 07.05.2021

Total number of pages 31

Name of Testing Laboratory
preparing the Report : Intertek Test Hizmetleri A.Ş. Electrical Laboratory

Applicant's name : BSI Aydınlatma Elektrik Elektronik San. ve Tic. A.Ş.

Address..... : Konutkent Mah. 3029 Cad. No:3/91 Azel Urhan Tower, 06810,
Çankaya/Ankara/TURKEY

Test specification:

Standard : IEC 62031:2018

Test procedure : LVD

Non-standard test method : N/A

Test Report Form No. : IEC62031F

Test Report Form(s) Originator : Intertek Semko AB

Master TRF : 2018-06-14

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Test item description..... :	Built-in LED module
Trade Mark..... :	msm aydınlatma
Manufacturer :	Msm Aydınlatma San. ve Tic. Ltd. Şti.
Model/Type reference :	001-015, 001-021, 001-014, 001-018, 001-028, 001-016
Ratings :	700mA 18Vdc 12W for model 001-015 450mA 27Vdc 12W or 900mA 27Vdc 24W for model 001-021 350mA 36Vdc 12W or 700mA 36Vdc 24W for model 001-014 1000mA 36Vdc 36W or 1350mA 36Vdc 48W for model 001-018 1000mA 45Vdc 36W or 1350mA 45Vdc 48W for model 001-028 670mA 108Vdc 72W or 1000mA 108Vdc 108W or 1350mA 108Vdc 144W for model 001-016

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Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	CB Testing Laboratory:	Intertek Test Hizmetleri A.Ş. Electrical Laboratory
Testing location/ address.....:		Merkez Mah. Sanayi Cd. No:23 Altındağ Plaza 34197 Yenibosna/İstanbul/TURKEY
Tested by (name, function, signature).....:		Lokman TUNÇ Senior Project Engineer
Approved by (name, function, signature)....:		Zafer YÜCESOY Laboratory Manager <i>zafer yucesoy</i>
Testing procedure: CTF Stage 1:		
Testing location/ address.....:		
Tested by (name, function, signature).....:		
Approved by (name, function, signature)....:		
Testing procedure: CTF Stage 2:		
Testing location/ address.....:		
Tested by (name + signature)		
Witnessed by (name, function, signature) .:		
Approved by (name, function, signature)....:		
Testing procedure: CTF Stage 3:		
Testing procedure: CTF Stage 4:		
Testing location/ address.....:		
Tested by (name, function, signature).....:		
Witnessed by (name, function, signature) .:		
Approved by (name, function, signature)....:		
Supervised by (name, function, signature) :		

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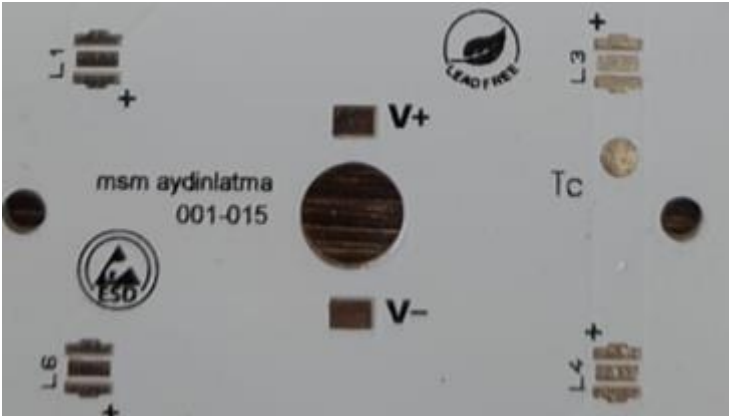
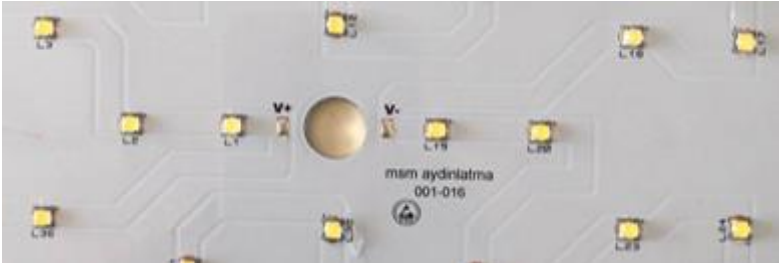
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List of Attachments: - Differences according to EN 62031:2008+A1:2013 (1 page) - List of test equipment (1 page) - Photos (3 pages)	
Summary of testing: The EUT is in compliance with the requirements of the applied standard within this test report.	
Tests performed: IEC 62031:2018 EN 62031:2008+A1:2013 The EN requirements listed above also added to this TRF, see appendixes for differences. Models of 001-021, 001-014, 001-028, 001-016 were tested completely.	Testing location: Intertek Test Hizmetleri A.Ş. Electrical Laboratory Merkez Mah. Sanayi Cd. No:23 Altındağ Plaza 34197 Yenibosna/İstanbul/TURKEY
Summary of compliance with National Differences: CCA national differences for Europe	

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Copy of marking plate:



Test item particulars.....:	Built-in LED module
Classification of installation and use.....:	Class III, built-in
Supply Connection	Integral terminals for connection to LED driver output
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)
Date of receipt of test item	26.04.2021
Test item serial number	Engineering samples
Test item receipt number.....:	S21.558, S21.559, S21.560, S21.561, S21.562, S21.563
Date (s) of performance of tests	06.05.2021
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. The whole and/or the part of this report shall not be reproduced and shall not be shared with third parties, nor to be used for juridical – official and PR activities without the written permission of Intertek Test Hizmetleri A.S. The results given herein apply to the submitted sample only. Reports are invalid without signature / seal. The Intertek Turkey Electrical Laboratory applies the shared risk decision rule. The results are reported with an expanded uncertainty calculated using a coverage factor k of 2 which gives a level of confidence of approximately 95%. The product or test method requires a declaration of conformity in the laboratory report. However, if there is no information about the effects of confidence level and measurement uncertainty in evaluating the conformity with the relevant standards or legislation, the laboratory can evaluate whether the obtained test result is within the specified limits or not as appropriate or not, without considering the level of confidence and measurement uncertainty. Throughout this report a ☐ comma / ☒ point is used as the decimal separator. Clause numbers between brackets refer to clauses in IEC 61347-1	
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	☐ Yes ☒ Not applicable Not for a CB certificate
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	Msm Aydınlatma San. ve Tic. Ltd. Şti 1274. Sokak No:2, 06374 Ostim OSB Yenimahalle/Ankara/TURKEY

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General product information:

Tested products are Class III built-in LED modules for outdoor floodlights.

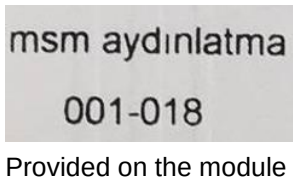
LED modules are intended to be supplied with SELV output controlgear.

Models covered by this test report have no integrated controlgear.

This test report covers models listed below:

Model	Diameter (mm)	Number of LED on PCB	Voltage (Vdc)	Current (mA)	Power (W)
001-015	70	6	18	700	12
001-021	90	9	27	450 or 900	12 or 24
001-014	70	12	36	350 or 700	12 or 24
001-018	113	12	36	1000 or 1350	36 or 48
001-028	103	15	45	1000 or 1350	36 or 48
001-016	160	36	108	670 or 1000 or 1350	72 or 108 or 144

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.2	Classification		
	Built-in module : Yes ☒ No ☐		—
	Independent module..... : Yes ☐ No ☒		—
	Integral module : Yes ☐ No ☒		—
4.6	Independent modules comply with requirements in IEC 60598-1:2014/AMD1:2017	Built-in LED module	N/A
4.8	Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11.	No integrated controlgear	N/A

6	MARKING		P
6.2	Contents of marking for built-in and for independent LED modules		P
	a) mark of origin	 Provided on the module	P
	b) model number, type reference	001-015, 001-021, 001-014, 001-018, 001-028, 001-016 Provided on the module	P
	c1) constant voltage module; rated supply voltage and supply frequency	Provided on the datasheet	P
	c2) constant current module; rated supply current and supply frequency	Constant voltage	N/A
	d) rated power	Provided on the datasheet	P
	e) indication of connections, wiring diagram		N/A
	f) value of t_c and place on the module	Provided on the datasheet 120°C, no specific place on the module	P
	g) E_{thr} if required		N/A
	h) symbol for built-in modules	Provided on the datasheet 	P
	i) heat transfer temperature t_d		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	j) power for heat-conduction P_d		N/A
	k) working voltage for insulation		N/A
6.3	Location of marking for built-in LED modules		P
	- marking of a) and b) in 6.2 on the modules		P
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		P
6.4	Location of marking for independent LED modules		N/A
	- marking of a), b), c) and f) in 6.2 on the modules		N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		N/A
6.5	Marking of integral LED modules		N/A
	- information in 6.2 a) to g) in data sheet, leaflet or website		N/A
6.6	Durable and legibility of marking		P
	- marking on the LED module legible after test with water		P
	- marking not on the LED module legible		P
7	TERMINALS		N/A
7.1	Integral terminals		N/A
	Screw terminals comply with section 14 of IEC 60598-1		N/A
	Screwless terminals comply with section 15 of IEC 60598-1		N/A
7.2	Terminals other than integral terminals		N/A
	Separately approved; component list		N/A
	Ratings suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8 (9)	EARTHING		N/A
- (9.1)	Provisions for protective earthing		N/A
	Terminal complying with clause 8	No provision for earthing	N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
	Test according 7.2.3 of IEC 60598-1		N/A
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
	Functional earth insulated from live parts by double or reinforced insulation		N/A
- (9.3)	Lamp controlgear with conductors for protective earthing by tracks on printed circuit board		N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$	No controlgear	N/A
- (9.4)	Earthing of built-in lamp controlgear		N/A
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	Earthing via independent controlgear		N/A
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm ² and of copper or equivalent		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A
9 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		N/A
- (10.1)	Controlgear protected against accidental contact with live parts	No controlgear provided with the LED modules	N/A
- (A2)	Voltage measured with 50 k Ω		N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impedance device		N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		N/A
- (10.2)	Capacitors > 0,5 μ F: voltage after 1 min (V): < 50 V	No controlgear	N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated from earth by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. :	No controlgear	N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	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
10 (11)	MOISTURE RESISTANCE AND INSULATION		N/A
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (M Ω):		N/A
	For basic insulation ≥ 2 M Ω :	No controlgear	N/A
	For double or reinforced insulation ≥ 4 M Ω :		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A
11 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		N/A
	Basic insulation for SELV, test voltage 500 V	Applied for SELV parts 500V is applied between mounting surface and different polarities of supply	P
	Working voltage ≤ 50 V, test voltage 500 V		P
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N/A
	Basic insulation, 2U + 1000 V	1250V applied for module with rated voltage 108Vdc	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	No flashover or breakdown	No breakdown	P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A
12 (14)	FAULT CONDITIONS		P
- (14.1)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material	No controlgear but tested for surface mounted resistor on module	P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	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	Shorted	P
- (14.2)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5)		N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	Considered for surface mounted resistor	P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile		N/A
- (14.5)	Short-circuit across electrolytic capacitors	No such component	N/A
	Short-circuit or interruption of SPDs		N/A
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$	>2 M Ω	P
	No flammable gases		P
	No accessible parts have become live		P

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Clause	Requirement + Test	Result - Remark	Verdict
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply	No high-power AC supply	—
12.2	Overpower condition		P
	Module withstands overpower condition >15 min.	Module withstands overpower condition	P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.	No protective device	N/A
	No fire, smoke or flammable gas is produced	No fire or smoke	P
	Molten material does not ignite tissue paper, spread below the module	No molten material, no ignition of tissue paper	P
14 (15)	CONSTRUCTION		P
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation	No such construction	P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P
15 (16)	CREEPAGE DISTANCES AND CLEARANCES		N/A
- (16.1)	General		N/A
	Creepage distances and clearances according to 16.2 and 16.3	No controlgear	N/A
	Controlgears providing SELV comply with additional requirements in Annex L		N/A
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P		N/A
- (16.2)	Creepage distances		N/A
- (16.2.2)	Minimum creepage distances for working voltages		N/A
	Creepage distances according to Table 7		N/A
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N/A
	Creepage distances according to Table 8		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
- (16.3)	Clearances		N/A
- (16.3.2)	Clearances for working voltages		N/A
	Clearances distances according to Table 9		N/A
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N/A
	Clearances distances for basic or supplementary insulation according to Table 10		N/A
	Clearances distances for reinforced insulation according to Table 11		N/A
16 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		N/A
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		—
(4.11)	Electrical connections		N/A
(4.11.1)	Contact pressure	No controlgear	N/A
(4.11.2)	Screws:		N/A
	- self-tapping screws	No screw or the like	N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		N/A
(4.11.5)	No contact to wood or mounting surface		N/A
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :	No screw or the like	N/A
	Torque test: torque (Nm); part..... :		N/A
	Torque test: torque (Nm); part..... :		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm) :	No locked connections	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- lampholder; torque (Nm)		N/A
	- push-button switches; torque 0,8 Nm		N/A
(4.12.5)	Screwed glands; force (Nm).....		N/A
17 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
- (18.1)	Ball-pressure test		N/A
- (18.2)	Test of printed boards	See Test Table 17 (18.2)	P
- (18.3)	Glow-wire test (650°C)	See Test Table 17 (18.3)	P
- (18.4)	Needle-flame test (10 s)	See Test Table 17 (18.4)	P
- (18.5)	Proof tracking test		N/A
18	RESISTANCE TO CORROSION		N/A
	Comply with requirements according 4.18 of IEC 60598-1		N/A
20	HEAT MANAGEMENT		P
20.1	General		P
	Fulfil clause 20 if replaceable LED module and when heat conducting thermal interface is needed.		P
20.2	Thermal interface material		P
	Thermal interface material delivered with the module if necessary		P
20.3	Heat protection		P
	Not impair safety when operated under poor heat-conduction conditions according Annex D	No ignition of wrapping tissue	P
22	PHOTOBIOLOGICAL SAFETY		P
22.1	UV radiation		P
	Luminous radiation not exceed 2mW/klm	Reference report number: 210520008GZU-001	P
22.2	Blue light hazard		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Assessed according to IEC TR 62778	RG1 Reference report number: 210520008GZU-001	P
22.3	Infrared radiation		N/A
	Requirements for infrared radiation when required		N/A
A	ANNEX A - TESTS		N/A
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		N/A
12 (14)	TABLE: tests of fault conditions		P
Part	Simulated fault		Hazard
Resistor	Short-circuit		NO
Module	Overpower		NO

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

15 (16)	TABLE: clearance and creepage distance measurements (mm)						N/A
Applicable part of IEC 61347-1 Table 7 – 11*							
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI.....					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV)							—
Pulse voltage if applicable (kV)							—
Supplementary information:							
Distance 2:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI.....					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV)							—
Pulse voltage if applicable (kV)							—
Supplementary information:							
Distance 3:							
Working voltage (V)							—
Frequency if applicable (kHz)							—
PTI.....					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV)							—
Pulse voltage if applicable (kV)							—
Supplementary information:							

** Insulation type: B – Basic; S – Supplementary; R – Reinforced

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Clause	Requirement + Test	Result - Remark	Verdict

17 (18.1)	TABLE: Ball Pressure Test of Thermoplastics				N/A
Allowed impression diameter (mm) :			2		—
Object/ Part No./ Material		Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Supplementary information:					

17 (18.2)	TABLE: Test of printed boards				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
PCB for LED module	Msm Aydınlatma	30	No	0	Pass
Supplementary information:					

17 (18.3)	TABLE: Glow-wire test				N/A
Glow wire temperature : 650°C				—	
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
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) :					
Supplementary information:					

17 (18.4)	TABLE: Needle-flame test				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 for LED module	Msm Aydınlatma	30	No	0	Pass
Supplementary information:					

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Clause	Requirement + Test			Result - Remark	Verdict
17 (18.5)	TABLE: Proof tracking test				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:					

(A)	ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK			N/A
(A.1)	Comply with A.2 or A.3			N/A
(A.2)				N/A

ANNEX 1	LED MODULES WITH INTEGRAL CONTROLGEAR PROVIDING SELV			N/A
(L.5)	Protection against electric shock			N/A
	Comply with 9.2 of IEC 61558-1	No integrated controlgear		N/A
(L.6)	Heating			N/A
	No excessive temperatures in normal use			N/A
	Value if capacitor tc marked			—
	Winding insulation classified as Class			—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments			N/A
(L.7)	Short-circuit and overload protection			N/A
	Comply with tests of clause 15 of IEC 61558-1 with adjustments			N/A
(L.8)	Insulation resistance and electric strength			N/A
(L.8.1)	Conditioned 48 h between 91 % and 95 %			N/A
(L.8.2)	Insulation resistance			N/A
	Between input- and output circuits not less than 5 MΩ			N/A
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ			N/A

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	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ		N/A
(L.8.3)	Electric strength		N/A
	1) Between live parts of input circuits and live parts of output circuits		N/A
	2) Over basic or supplementary insulation between:		N/A
	a) live parts having different polarity		N/A
	b) live parts and body if intended to be connected to protective earth		N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord		N/A
	d) live parts and an intermediate metal part		N/A
	e) intermediate metal parts and the body		N/A
	f) each input circuit and all other input circuits		N/A
	3) Over reinforced insulation between the body and live parts		N/A
(L.9)	Construction		N/A
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N/A
	HF transformer comply with 19 of IEC 61558-2-16		N/A
(L.10)	Components		N/A
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A
(L.11)	Creepage distances, clearances and distances through insulation		N/A
	Creepage distances and clearances not less than in Clause 16		N/A
	Distance through insulation according Table L.5 in IEC 61347-1		N/A
	1) Basic distance through insulation		N/A
	Required distance (mm)		—
	Measured (mm)		N/A
	Supplementary information		—
	2) Supplementary distance through insulation		N/A
	Required distance (mm)		—

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	Measured (mm)		N/A
	Supplementary information		—
	3) Reinforced distance through insulation		N/A
	Required distance (mm)		—
	Measured (mm)		N/A
	Supplementary information		—

ANNEX 2 TABLE: Critical components information						P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
PCB for LED module for all models	B	Msm Aydınlatma	Various	Aluminium 1mm thickness Diameter can be between 70mm-160mm	IEC/EN 62031	Tested with appliance
LED	B	Nichia	NVSW219CT	Vf:3.1-3.2V If:700mA RG1 3.5*3.5*2mm	IEC/EN 62471	Intertek 210520008GZU-001
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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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

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Clause	Requirement + Test	Result - Remark	Verdict

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
(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		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A
(15.6.2)	Mechanical tests		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)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

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Clause	Requirement + Test						Result - Remark				Verdict
(15.6.3.1) (15.6.3.2)	TABLE: Contact resistance test / Heating tests										N/A
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Voltage drop of two inseparable joints										N/A
	Voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Continued ageing: voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Continued ageing: voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
Supplementary information:											

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ATTACHMENT TO TEST REPORT IEC 62031 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES LED MODULES FOR GENERAL LIGHTING – SAFETY SPECIFICATIONS	
Differences according to	EN 62031:2008 + A1:2013
Attachment Form No.	EU_GD_IEC62031B
Attachment Originator	Intertek Semko AB
Master Attachment	2013-10
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	CENELEC COMMON MODIFICATIONS (EN)	P
	No Common modifications	P

ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)	P
	No special National conditions	P

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)	P
	No National deviations	P

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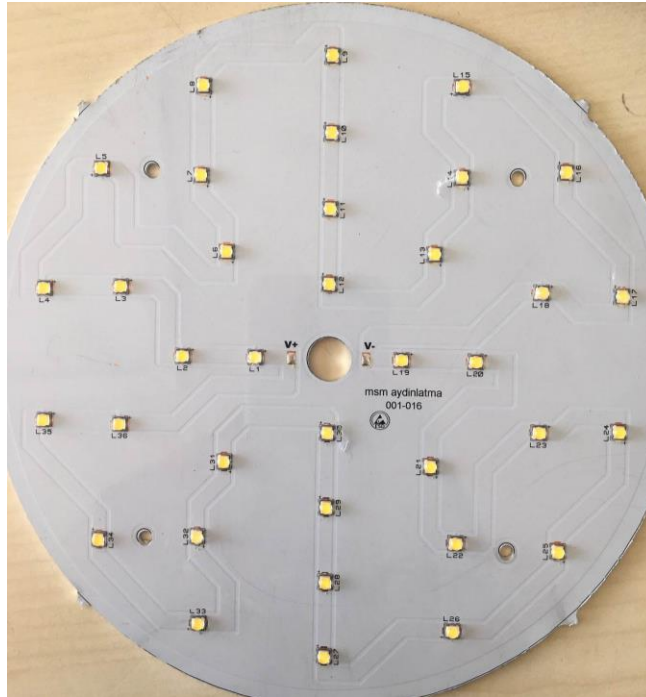
List of test equipment used:

Measurement / testing	Testing / measuring equipment / material used,	Equipment ID	Last Calibration date	Calibration due date
Variable stabilized power source	CHROMA 61612	EN 23	initial calibration	initial calibration
Mono-phase power meter	YOKOGAWA WT310	EN 033	10.2020	10.2021
Temperature recorder	YOKOGAWA MV2040	EN 34	10.2020	10.2021
Hand-held multimeter	FLUKE 289	EN 05	09.2020	09.2021
Electrical safety analyzer	CHROMA 19032-P	EN 21	09.2020	09.2021
Chronometer	CASIO HS-80TW	EN 114	01.2021	01.2022
Calliper	MITUTOYO 573-635	EN 37	09.2020	09.2021
Needle flame burner	Testing Europe	EN 046	01.2021	01.2022

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Photos:



1) Model 001-16 top view



2) Model 001-016 rear view

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3) Model 001-014 top view



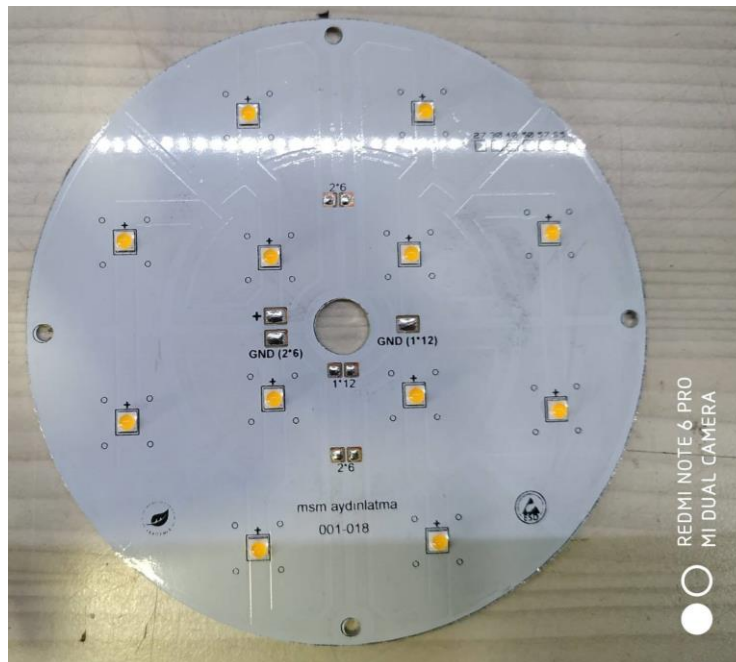
4) Model 001-014 rear view

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5) Model 001-015 top view



6) Model 001-018 top view