Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT
IEC 61347-2-13
Part 2: Particular requirements:
Section 13 – d.c. or a.c. supplied electronic controlgear for LED modules

Report Number. .....:	CN22WQ7V 001
Date of issue .....:	Apr.11, 2022
Total number of pages.....	53 pages
Name of Testing Laboratory preparing the Report .....:	TÜV Rheinland (Shenzhen) Co., Ltd.
Applicant's name.....:	Xiamen AcTEC Electronics Co., Ltd.
Address .....:	No. 4, Tongfu Road, Tong'an Industrial Center, Tong'an District, Xiamen, 361100 Fujian, P.R. China
Test specification:	
Standard .....:	IEC 61347-2-13:2014, AMD1:2016 used in conjunction with IEC 61347-1:2015, AMD1:2017
Test procedure .....:	CB Scheme
Non-standard test method .....:	N/A
Test Report Form No.....:	IEC61347_2_13G
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	2017-12-01

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	LED Driver
Trade Mark ..... :	AcTEC® or POWER LED
Manufacturer ..... :	Same as applicant.
Model/Type reference ..... :	1) MINI-4-xxx, 2) MINI-6-yyy, 3) MINI-10-zzz (for variables "xxx", "yyy", "zzz" refer to general product information table A for details.)
Ratings ..... :	I/P: 220-240Vac, 50/60Hz 1) 0.05A; 2) 0.07A;, 3) 0.08A; O/P: See general product information table B for details; Built-in type; SELV; Constant current; Ta 60°C, Tc: 85°C, IP65.

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	TÜV Rheinland (Shenzhen) Co., Ltd.	
Testing location/ address ..... :		1601-1604, 17-18F, Tower A Building 2, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Street, Xili Community Shenzhen 518052 Nanshan District China	
Tested by (name, function, signature) ..... :			
Approved by (name, function, signature)... :			
☒	**Testing procedure: CTF Stage 1:**	Xiamen AcTEC Electronics Co., Ltd.	
Testing location/ address ..... :		No. 4, Tongfu Road, Tong'an Industrial Center, Tong'an District, Xiamen, 361100 Fujian, P.R. China	
Tested by (name, function, signature) ..... :		Jason Zheng Project Handler	Jason Zheng
Approved by (name, function, signature)... :		Jammy Zhang Technical Certifier	Jammy Zhang
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address ..... :			
Tested by (name + signature) ..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature)... :			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address ..... :			
Tested by (name, function, signature) ..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature)... :			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment):

ATTACHMENT 1: Measurement section including below parts: (18 pages)
ANNEX 1: Test result for creepage distances and clearances;
ANNEX 2: Temperature measurements, thermal tests;
ANNEX 3: Practical testing for MM mark according to VDE 0710;

ATTACHMENT 2: Photo documentation (23 pages)

Total number of pages in each attachment is indicated in individual attachment.

Summary of testing:

Tests performed (name of test and test clause):

Clause(s)	Test(s)
IEC 61347-1	
7.2	Marking test
10	Protection against accidental contact with live parts test
Annex A	Test to establish whether a conductive part is a live part which may cause an electric shock
Annex L.5	Capacitor discharge test
11& annex L.8.2	Moisture resistance and insulation test
12& annex L.8.3	Electric strength test
14	Fault condition test
Annex L.6	Normal Heating test
15.3 & Annex L.7	Abnormal Heating test
16	Working voltage test
16 & Annex L.11	Creepage distance and clearance, DTI
18	Material test

The EUTs passed the test.

Testing location:

All tests as described in Test Case and Measurement Sections were performed at the laboratory described on page 2.

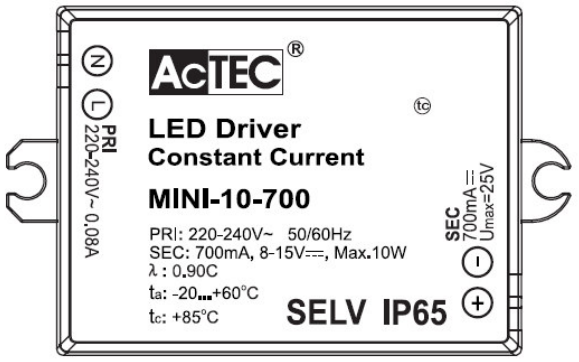
Summary of compliance with National Differences:

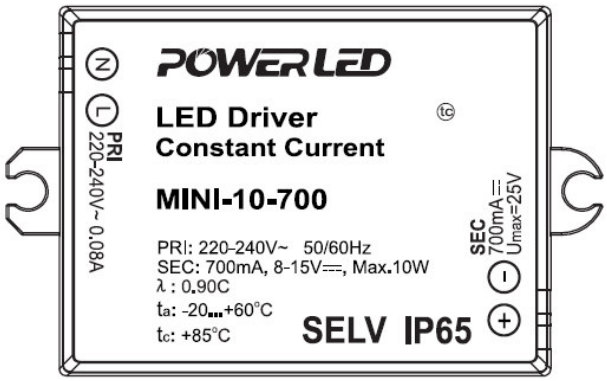
List of countries addressed:

--

Copy of marking plate

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





Note:

1. All models' labels are identical except for model name and some parameters. Above labels are representing other models.

2. The company name and address is optionally marked on the label, ID code used in label only for European market.

3. 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.

4. The height of the letters is not less than 2 mm; the height of the symbol is not less than 5 mm except WEEE symbol is 7 mm

Test item particulars ..... :	LED driver
Classification of installation and use..... :	Built-in type SELV
Supply Connection..... :	Leading wire
..... :	
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 ..... :	Mar.20, 2022
Date (s) of performance of tests ..... :	Mar.20, 2022 to Apr.10, 2022

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Clause numbers between brackets refer to clauses in IEC 61347-1

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... : Same as applicant

General product information:

1. These products are double insulation built-in type LED driver for LED module only, SELV, constant current output;

2. IP65, Ta -20..60°C, Tc: 85°C.

3. MM mark considered on model MINI-4-xxx, MINI-6-yyy only and all models were performed tests with potting material.

4. The protection against electric shock, dust, solid objects and moisture and rely upon the enclosure of luminaires or other appliance which comply with the relevant standards.

5. Unless specification, model MINI-4-700, MINI-6-700, MINI-10-700 were chosen for full test, model MINI-4-200, MINI-6-160, MINI-10-260 were chosen for thermal deviation test.

6. This report considered the EU Group differences and Australia national differences, fulfils the requirements of EN 61347-2-13:2014 + A1:2017, EN 61347-1:2015 and AS 61347.2.13:2018, AS/NZS 61347.1:2016+A1:2018.

7. Other information see below table for details;

Table A: Definition of variables

Variable:	Range variable:	Content:
xxx	200 - 700	3 digits number which represents the output current in ampere after dividing by 1000 in a step of 0.01A, for example, 200 represents the output voltage is 0.2A, 700 represents the output voltage is 0.7A.
yyy	160 - 700	3 digits number which represents the output current in ampere after dividing by 1000 in a step of 0.01A, for example, 160 represents the output voltage is 0.16A, 700 represents the output voltage is 0.7A.
zzz	260-700	3 digits number which represents the output current in ampere after dividing by 1000 in a step of 0.01A, for example, 260 represents the output voltage is 0.26A, 700 represents the output voltage is 0.7A.

Table B: Model list

No	Model No.	Input voltage/ Frequency	Rated input current (A)	Output voltage (V)	Output current (mA)	Max. Output power (W)	Dimensions (LxWxH) (mm)	Transformer
1	MINI-4-200	220-240V~ 50/60Hz	0.05	10-20	200	4	53x27x21	EE13 N1a(2-3): φ0.12mm, 102Ts; N2(10-NC): φ0.12mm, 49Ts; N3(F1-F2): TEX-E, φ0.40mm; N1b(3-1): φ0.12mm, 102Ts;
2	MINI-4-210		0.05	10-19	210	4	53x27x21	
3	MINI-4-220		0.05	9-18	220	4	53x27x21	
4	MINI-4-230		0.05	9-17	230	4	53x27x21	
5	MINI-4-240		0.05	8-17	240	4	53x27x21	
6	MINI-4-250		0.05	8-16	250	4	53x27x21	
7	MINI-4-260		0.05	8-15	260	4	53x27x21	
8	MINI-4-270		0.05	7-15	270	4	53x27x21	
9	MINI-4-280		0.05	7-14	280	4	53x27x21	
10	MINI-4-290		0.05	7-14	290	4	53x27x21	
11	MINI-4-300		0.05	7-14	300	4	53x27x21	
12	MINI-4-310		0.05	6-13	310	4	53x27x21	
13	MINI-4-320		0.05	6-13	320	4	53x27x21	
14	MINI-4-330		0.05	6-12	330	4	53x27x21	
15	MINI-4-340		0.05	6-12	340	4	53x27x21	
16	MINI-4-350		0.05	6-12	350	4	53x27x21	
17	MINI-4-360		0.05	6-11	360	4	53x27x21	
18	MINI-4-370		0.05	5-11	370	4	53x27x21	
19	MINI-4-380		0.05	5-11	380	4	53x27x21	
20	MINI-4-390		0.05	5-10	390	4	53x27x21	
21	MINI-4-400		0.05	5-10	400	4	53x27x21	
22	MINI-4-410		0.05	5-10	410	4	53x27x21	
23	MINI-4-420		0.05	5-10	420	4	53x27x21	
24	MINI-4-430		0.05	5-9	430	4	53x27x21	

25	MINI-4-440		0.05	5-9	440	4	53x27x21	
26	MINI-4-450		0.05	4-9	450	4	53x27x21	
27	MINI-4-460		0.05	4-9	460	4	53x27x21	
28	MINI-4-470		0.05	4-9	470	4	53x27x21	
29	MINI-4-480		0.05	4-9	480	4	53x27x21	
30	MINI-4-490		0.05	4-8	490	4	53x27x21	
31	MINI-4-500		0.05	4-8	500	4	53x27x21	
32	MINI-4-510		0.05	4-8	510	4	53x27x21	
33	MINI-4-520		0.05	4-8	520	4	53x27x21	
34	MINI-4-530		0.05	4-8	530	4	53x27x21	
35	MINI-4-540		0.05	4-7	540	4	53x27x21	
36	MINI-4-550		0.05	4-7	550	4	53x27x21	
37	MINI-4-560		0.05	4-7	560	4	53x27x21	
38	MINI-4-570		0.05	4-7	570	4	53x27x21	
39	MINI-4-580		0.05	3-7	580	4	53x27x21	
40	MINI-4-590		0.05	3-7	590	4	53x27x21	
41	MINI-4-600		0.05	3-7	600	4	53x27x21	
42	MINI-4-610		0.05	3-7	610	4	53x27x21	
43	MINI-4-620		0.05	3-6	620	4	53x27x21	
44	MINI-4-630		0.05	3-6	630	4	53x27x21	
45	MINI-4-640		0.05	3-6	640	4	53x27x21	
46	MINI-4-650		0.05	3-6	650	4	53x27x21	
47	MINI-4-660		0.05	3-6	660	4	53x27x21	
48	MINI-4-670		0.05	3-6	670	4	53x27x21	
49	MINI-4-680		0.05	3-6	680	4	53x27x21	
50	MINI-4-690		0.05	3-6	690	4	53x27x21	
51	MINI-4-700		0.05	2.5-6	700	4	53x27x21	
52	MINI-6-160		0.07	19-38	160	6	53x27x21	EE13 N1a(2-3): φ0.13mm, 93Ts; N2(10-NC): φ0.13mm, 47Ts; N3(F1-F2): TEX-E, φ0.45mm; N1b(3-1): φ0.13mm, 93Ts;
53	MINI-6-170		0.07	18-35	170	6	53x27x21	
54	MINI-6-180		0.07	17-33	180	6	53x27x21	
55	MINI-6-190		0.07	16-32	190	6	53x27x21	
56	MINI-6-200		0.07	15-30	200	6	53x27x21	
57	MINI-6-210		0.07	14-29	210	6	53x27x21	
58	MINI-6-220		0.07	14-27	220	6	53x27x21	
59	MINI-6-230		0.07	13-26	230	6	53x27x21	
60	MINI-6-240		0.07	13-25	240	6	53x27x21	
61	MINI-6-250		0.07	12-24	250	6	53x27x21	
62	MINI-6-260		0.07	12-23	260	6	53x27x21	
63	MINI-6-270		0.07	11-22	270	6	53x27x21	
64	MINI-6-280		0.07	11-21	280	6	53x27x21	
65	MINI-6-290		0.07	10-21	290	6	53x27x21	

66	MINI-6-300		0.07	10-20	300	6	53x27x21	
67	MINI-6-310		0.07	10-19	310	6	53x27x21	
68	MINI-6-320		0.07	9-19	320	6	53x27x21	
69	MINI-6-330		0.07	9-18	330	6	53x27x21	
70	MINI-6-340		0.07	9-18	340	6	53x27x21	
71	MINI-6-350		0.07	9-17	350	6	53x27x21	
72	MINI-6-360		0.07	8-17	360	6	53x27x21	
73	MINI-6-370		0.07	8-16	370	6	53x27x21	
74	MINI-6-380		0.07	8-16	380	6	53x27x21	
75	MINI-6-390		0.07	8-15	390	6	53x27x21	
76	MINI-6-400		0.07	8-15	400	6	53x27x21	
77	MINI-6-410		0.07	7-15	410	6	53x27x21	
78	MINI-6-420		0.07	7-14	420	6	53x27x21	
79	MINI-6-430		0.07	7-14	430	6	53x27x21	
80	MINI-6-440		0.07	7-14	440	6	53x27x21	
81	MINI-6-450		0.07	7-13	450	6	53x27x21	
82	MINI-6-460		0.07	7-13	460	6	53x27x21	
83	MINI-6-470		0.07	6-13	470	6	53x27x21	
84	MINI-6-480		0.07	6-13	480	6	53x27x21	
85	MINI-6-490		0.07	6-12	490	6	53x27x21	
86	MINI-6-500		0.07	6-12	500	6	53x27x21	
87	MINI-6-510		0.07	6-12	510	6	53x27x21	
88	MINI-6-520		0.07	6-12	520	6	53x27x21	
89	MINI-6-530		0.07	6-11	530	6	53x27x21	
90	MINI-6-540		0.07	6-11	540	6	53x27x21	
91	MINI-6-550		0.07	5-11	550	6	53x27x21	
92	MINI-6-560		0.07	5-11	560	6	53x27x21	
93	MINI-6-570		0.07	5-11	570	6	53x27x21	
94	MINI-6-580		0.07	5-10	580	6	53x27x21	
95	MINI-6-590		0.07	5-10	590	6	53x27x21	
96	MINI-6-600		0.07	5-10	600	6	53x27x21	
97	MINI-6-610		0.07	5-10	610	6	53x27x21	
98	MINI-6-620		0.07	5-10	620	6	53x27x21	
99	MINI-6-630		0.07	5-10	630	6	53x27x21	
100	MINI-6-640		0.07	5-9	640	6	53x27x21	
101	MINI-6-650		0.07	5-9	650	6	53x27x21	
102	MINI-6-660		0.07	5-9	660	6	53x27x21	
103	MINI-6-670		0.07	4-9	670	6	53x27x21	
104	MINI-6-680		0.07	4-9	680	6	53x27x21	
105	MINI-6-690		0.07	4-9	690	6	53x27x21	
106	MINI-6-700		0.07	4-9	700	6	53x27x21	

107	MINI-10-260		0.08	20-40	260	10	58x36x20	EE10 N1(8-5): φ0.18mm, 91Ts; N2(F1-F2): TEX-E, φ0.40mm;
108	MINI-10-270		0.08	19-37	270	10	58x36x20	
109	MINI-10-280		0.08	18-36	280	10	58x36x20	
110	MINI-10-290		0.08	17-34	290	10	58x36x20	
111	MINI-10-300		0.08	17-34	300	10	58x36x20	
112	MINI-10-310		0.08	16-32	310	10	58x36x20	
113	MINI-10-320		0.08	16-31	320	10	58x36x20	
114	MINI-10-330		0.08	15-30	330	10	58x36x20	
115	MINI-10-340		0.08	15-29	340	10	58x36x20	
116	MINI-10-350		0.08	15-29	350	10	58x36x20	
117	MINI-10-360		0.08	14-28	360	10	58x36x20	
118	MINI-10-370		0.08	14-27	370	10	58x36x20	
119	MINI-10-380		0.08	13-26	380	10	58x36x20	
120	MINI-10-390		0.08	13-26	390	10	58x36x20	
121	MINI-10-400		0.08	13-25	400	10	58x36x20	
122	MINI-10-410		0.08	12-24	410	10	58x36x20	
123	MINI-10-420		0.08	12-24	420	10	58x36x20	
124	MINI-10-430		0.08	12-23	430	10	58x36x20	
125	MINI-10-440		0.08	11-23	440	10	58x36x20	
126	MINI-10-450		0.08	11-22	450	10	58x36x20	
127	MINI-10-460		0.08	11-22	460	10	58x36x20	
128	MINI-10-470		0.08	11-21	470	10	58x36x20	
129	MINI-10-480		0.08	10-21	480	10	58x36x20	
130	MINI-10-490		0.08	10-20	490	10	58x36x20	
131	MINI-10-500		0.08	10-20	500	10	58x36x20	
132	MINI-10-510		0.08	10-20	510	10	58x36x20	
133	MINI-10-520		0.08	10-19	520	10	58x36x20	
134	MINI-10-530		0.08	9-19	530	10	58x36x20	
135	MINI-10-540		0.08	9-19	540	10	58x36x20	
136	MINI-10-550		0.08	9-18	550	10	58x36x20	
137	MINI-10-560		0.08	9-18	560	10	58x36x20	
138	MINI-10-570		0.08	9-18	570	10	58x36x20	
139	MINI-10-580		0.08	9-17	580	10	58x36x20	
140	MINI-10-590		0.08	8-17	590	10	58x36x20	
141	MINI-10-600		0.08	8-17	600	10	58x36x20	
142	MINI-10-610		0.08	8-16	610	10	58x36x20	
143	MINI-10-620		0.08	8-16	620	10	58x36x20	
144	MINI-10-630		0.08	8-16	630	10	58x36x20	
145	MINI-10-640		0.08	8-16	640	10	58x36x20	
146	MINI-10-650		0.08	8-15	650	10	58x36x20	
147	MINI-10-660		0.08	8-15	660	10	58x36x20	

148	MINI-10-670		0.08	7-15	670	10	58x36x20	
149	MINI-10-680		0.08	7-15	680	10	58x36x20	
150	MINI-10-690		0.08	8-15	690	10	58x36x20	
151	MINI-10-700		0.08	8-15	700	10	58x36x20	

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

4 (4)	**GENERAL REQUIREMENTS**		**P**
- (4)	Insulation materials for double or reinforced insulation according requirements in Annex N of IEC 61347-1		N/A
- (4)	Compliance of independent controlgear enclosure with IEC 60598-1		N/A
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	P
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1	(see Annex L)	P
4 (-)	Transformer comply with IEC 61558		P
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V		P

6 (6)	**CLASSIFICATION**		**P**
	Built-in controlgear .....:	Yes ☒ No ☐	—
	Independent controlgear .....:	Yes ☐ No ☒	—
	Integral controlgear .....:	Yes ☐ No ☒	—
6 (-)	Auto-wound controlgear .....:	Yes ☐ No ☒	—
	Separating controlgear .....:	Yes ☒ No ☐	—
	Isolating controlgear .....:	Yes ☒ No ☐	—
	SELV controlgear .....:	Yes ☒ No ☐	—

7 (7)	**MARKING**		**P**
7.1 (7.1)	**Mandatory markings**		**P**
	a) mark of origin	See copy of marking plate	P
	b) model number or type reference	See copy of marking plate	P
	c) symbol for independent controlgear, if applicable		N/A
	d) correlation between interchangeable parts and controlgear marked		N/A
	e) rated supply voltage (V)	See copy of marking plate	P
	supply frequency (Hz)	See copy of marking plate	P
	supply current (A)	See copy of marking plate	P
	f) earthing symbol	Class II	N/A
	k) wiring diagram		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	l) value of tc	See copy of marking plate	P
	m) symbol for declared temperature		N/A
	t) LUM earthing symbol		N/A
	u) if not SELV maximum working voltage U_{out} between:		N/A
	- output terminals (V) .....:		N/A
	- output terminals and earth (V) .....:		N/A
7.1 (-)	Constant voltage type:	Yes ☐ No ☒	—
	- rated output power P_{rated} (W) .....:		N/A
	- rated output voltage U_{rated} (V) .....:		N/A
	Constant current type:	Yes ☒ No ☐	—
	- rated output power P_{rated} (W) .....:	See “General product information” for details	P
	- rated output current I_{rated} (A) .....:	See “General product information” for details	P
	Indication if for LED modules only	Named as “LED driver”	P
7.1 (7.2)	Marking durable and legible		P
	Rubbing 15 s water, 15 s petroleum; marking legible		P
7.2 (7.1)	**Information to be provided, if applicable**		**P**
	h) declaration of protection against accidental contact		N/A
	i) cross-section of conductors (mm²)		N/A
	j) number, type and wattage of lamp(s)		N/A
	s) SELV symbol		P
7.2 (-)	- declaration of mains connected windings		P

8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
- (10.1)	Controlgear protected against accidental contact with live parts	The EUT is built in type, shall be considered in the end product.	N/A
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:		N/A
- (10.3)	**Controlgear providing SELV**		**P**
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear	Built-in type, input lead wire part rely on enclosure of luminaire. Other insulation part see below.	P
	No connection between output circuit and the body or protective earthing circuit		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1	(see Annex L)	P
- (10.4)	**Accessible conductive parts in SELV circuits**		**P**
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.	The EUT is built in type, shall be considered in the end product.	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. .....:		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	Double or reinforced insulation bridged by one Y1 capacitor.	P
	Y1 or Y2 capacitors comply with IEC 60384-14	Y1 capacitor comply with IEC 60384-14.	P
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A

9 (8)	**TERMINALS**		**N/A**
- (8.1)	**Integral terminals**		**N/A**
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	(see Annex 2)	N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	(see Annex 3)	N/A
- (8.2)	**Terminals other than integral terminals**		**N/A**
	Comply with relevant IEC standard	(see Annex 1)	N/A
	Suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N/A**
- (9.1)	**Provisions for protective earthing**		**N/A**
	Terminal complying with clause 8		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
	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 or earthing contact and each of the accessible metal parts; measured resistance (Ω) at $\geq$ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω .....:		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**

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7 of IEC 60598-1		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 or earthing contact 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
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
- (11)	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance:		P
	For basic insulation ≥ 2 MΩ .....:	Between L and N after removing fuse: > 100 MΩ; Between different poles of fuse: > 100 MΩ.	P
	For double or reinforced insulation ≥ 4 MΩ .....:	Between L/N and plastic enclosure covered with metal foil: >100MΩ Between L/N and output lead wire: >100MΩ	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1	(see annex L)	P
12 (12)	**ELECTRIC STRENGTH**		**P**
- (12)	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		N/A
	Working voltage ≤ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	Between L and N after removing fuse: 1480V Between different poles of fuse: 1480V	P
	Supplementary insulation, 2U + 1000 V		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Double or reinforced insulation, 4U + 2000 V	Between L/N and plastic enclosure covered with metal foil: 3000V Between L/N and output terminal: 3000V	P
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A

14 (14)	**FAULT CONDITIONS**		**P**
- (14.1)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		P
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	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)	(see appended table)	N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	P
	Short-circuit or interruption of SPDs	(see appended table)	P
14 (-)	Reversed voltage polarity if d.c. supplied control gear	(see appended table)	N/A
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ .....:	>100 MΩ	P
	No flammable gases		P
	No accessible parts have become live		P
	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		—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		P
15 (-)	**TRANSFORMER HEATING**		**P**
15.1	**General**		**P**
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		P
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		P
15.2 (-)	**Normal operation**		**P**
	Comply with clause L.6 of IEC 61347-1		P
15.3 (-)	**Abnormal operation**		**P**
	Comply with clause L.7 of IEC 61347-1		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		N/A
	Double LED modules or equivalent load connected in serial to the output terminals of constant current type		P
15 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
16 (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		P
- (15.2)	**Printed circuits**		**P**
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	**Plugs and socket-outlets used in SELV or ELV circuits**		**N/A**
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A
- (15.4)	**Insulation between circuits and accessible parts**		**P**
- (15.4.2)	SELV circuits		P
	Source used to supply SELV circuits:		P
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		N/A
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		P
	- another source		N/A
	Voltage in the circuit not higher than ELV		P
	SELV circuits insulated from LV by double or reinforced insulation		P
	SELV circuits insulated from non SELV circuits by double or reinforced insulation		N/A
	SELV circuits insulated from FELV circuits by supplementary insulation		N/A
	SELV circuits insulated from other SELV circuits by basic insulation		N/A
	SELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A
- (15.4.3)	FELV circuits		N/A
	Source used to supply FELV circuits:		N/A
	- separating transformer in accordance with relevant part 2 of IEC 61558		N/A
	- separating controlgear providing basic insulation between input and output circuits in accordance with relevant part 2 of IEC 61347		N/A
	- another source		N/A
	- source in circuits separated by the LV supply by basic insulation		N/A
	Voltage in the circuit not higher than ELV		N/A
	FELV circuits insulated from LV supply by at least basic insulation		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	FELV circuits insulated from other FELV circuits if functional purpose		N/A
	FELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A
	Plugs and socket-outlets for FELV system comply with:		N/A
	- plugs not able to enter socket-outlets of other voltage systems		N/A
	- socket-outlets not admit plugs of other voltage systems		N/A
	- socket-outlets have a protective conductor contact		N/A
- (15.4.4)	Other circuits		N/A
	Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5.		N/A
- (15.4.5)	Insulation between circuits and accessible conductive parts		N/A
	Accessible conductive parts insulated from active parts of electric circuits by insulating according Table 6		N/A
	Requirements for Class II construction with equipotential bonding for protection against indirect contact with live parts:		N/A
	- all conductive parts are connected together		N/A
	- conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3		N/A
	- conductive parts comply with requirements of Annex A in case of insulation fault		N/A
17 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16.1)	**General**		**P**
	Creepage distances and clearances according to 16.2 and 16.3	(see appended table)	P
	Controlgears providing SELV comply with additional requirements in Annex L		P
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P	(see Annex P)	N/A
- (16.2)	**Creepage distances**		**P**
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N/A
	Creepage distances according to Table 8	(see appended table)	N/A
- (16.3)	**Clearances**		**P**
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (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	(see appended table)	N/A
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	N/A
18 (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)		N/A
(4.11)	**Electrical connections**		**N/A**
(4.11.1)	Contact pressure		N/A
(4.11.2)	Screws:		N/A
	- self-tapping screws		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 ..... :		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)..... :		N/A
	- lampholder; torque (Nm) ..... :		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- push-button switches; torque 0,8 Nm..... :		N/A
(4.12.5)	Screwed glands; force (Nm)..... :		N/A
19 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
- (18.1)	Ball-pressure test ..... :	See Test Table 19 (18.1)	P
- (18.2)	Test of printed boards ..... :	See Test Table 19 (18.2)	P
- (18.3)	Glow-wire test ..... :	See Test Table 19 (18.3)	P
- (18.4)	Needle flame test ..... :	See Test Table 19 (18.4)	P
- (18.5)	Tracking test ..... :	See Test Table 19 (18.5)	P
20 (19)	**RESISTANCE TO CORROSION**		**N/A**
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A
21 (-)	**MAXIMUM WORKING VOLTAGE (U_{out}) IN ANY LOAD CONDITION**		**P**
	Not exceed declared maximum working voltage U_{out} in any load condition		P
14	**TABLE: tests of fault conditions**		**P**
Part	Simulated fault		Hazard
Model MINI-4-700			
Output	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
Output	Open-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
BD1 AC-DC	Short-circuited: Unit shut down immediately, Fusing resistor Rf damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
BD1 AC-DC	Open-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
D1	Short-circuited: Unit abnormal working, Input: 0.020A, 2.49W. no damaged, no high temp. was observed.		NO
D2	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
CE1 E-capacitor	Short-circuited: Unit shut down immediately, Fusing resistor Rf damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
CE3 E-capacitor	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
U1 pin 1-5	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
U1 pin 1-4	Short-circuited: Unit shut down immediately, Fusing resistor Rf and Chip Resistor R5,R6 damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
U1 pin 1-8	Short-circuited: Unit shut down immediately, Fusing resistor Rf damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
Model MINI-6-700			
Output	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
Output	Open-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
BD1 AC-DC	Short-circuited: Unit shut down immediately, Fusing resistor Rf damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
BD1 AC-DC	Open-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
D1	Short-circuited: Unit abnormal working, Input: 0.029A, 3.76 W. no damaged, no high temp. was observed.		NO
D2	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
CE1 E-capacitor	Short-circuited: Unit shut down immediately, Fusing resistor Rf damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
CE3 E-capacitor	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
U1 pin 1-5	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
U1 pin 1-4	Short-circuited: Unit shut down immediately, Fusing resistor Rf and Chip Resistor R5,R6 damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
U1 pin 1-8	Short-circuited: Unit shut down immediately, Fusing resistor Rf damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
Model MINI-10-700			
Output	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
Output	Open-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
BD1 AC-DC	Short-circuited: Unit shut down immediately, Fusing resistor F1 damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
BD1 AC-DC	Open-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
CE1 E-capacitor	Short-circuited: Unit shut down immediately, Fusing resistor F1 damaged, no output, no high temp. was observed, Unrecoverable. Repeat with each source of fuse 10 times with same result.		NO
D8	Short-circuited: Unit shutdown immediately, Input: 0A/0W .no output, no damaged, no high temp.Recoverable.		NO
D6	Short-circuited: Unit shutdown immediately, Input: 0.027-0.029A/085-1.58W .no output, no damaged, no high temp.Recoverable.		NO
D5	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.16W .no output, no damaged, no high temp.Recoverable.		NO
Q1 B-C	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.17W .no output, no damaged, no high temp.Recoverable.		NO
Q1 C-E	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.17W .no output, no damaged, no high temp.Recoverable.		NO
Q1 B-E	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.17W .no output, no damaged, no high temp.Recoverable.		NO
Q2 B-C	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.17W .no output, no damaged, no high temp.Recoverable.		NO
Q2 C-E	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.17W .no output, no damaged, no high temp.Recoverable.		NO
Q2 B-E	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.17W .no output, no damaged, no high temp.Recoverable.		NO
U1 pin 1-3	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.17W .no output, no damaged, no high temp.Recoverable.		NO
U1 pin 1-4	Short-circuited: Unit shutdown immediately, Input: 0.018A/0.16W .no output, no damaged, no high temp.Recoverable.		NO
U1 pin 1-6	Short-circuited: Unit shutdown immediately, Input: 0.021A/0.55W .no output, no damaged, no high temp.Recoverable.		NO

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

17 (16)	TABLE: clearance and creepage distance measurements (mm) *(See ATTACHMENT 1 for details.)*							P
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

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

19 (18.1)	TABLE: Ball Pressure Test			P
Allowed impression diameter (mm) .....:		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Plastic enclosure	See ANNEX 1	108	1.31	
PCB	See ANNEX 1	125	0.85	
Bobbin of transformer	See ANNEX 1	125	1.09	
Supplementary information: Test for all sources of each component/part, with maximum result recorded.				

19 (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	See ANNEX 1	10s	No	1.3s	P
Supplementary information:					

19 (18.3)	TABLE: Glow-wire test			P
Glow wire temperature ..... :	650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
Plastic enclosure	See ANNEX 1	No	0	P
Supplementary information: Test for all sources of plastic enclosure.				

19 (18.4)	TABLE: Needle-flame test				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	See ANNEX 1	10	No	0	P
Bobbin of transformer	See ANNEX 1	10	No	0	P
Supplementary information: Test for all sources of each component/part.					

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

19 (18.5)	**TABLE: Proof tracking test**				**P**
Test voltage PTI ..... :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
PCB	See ANNEX 1	50	50	50	**P**
Supplementary information:					

(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		P
(A.1)	Comply with A.2 or A.3		P
(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c ..... :	See below	P
(A.3)	If voltage measured according Clause A.2 exceeds the limit value; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ..... :	To enclosure: Max. 0.07mA To output lead wire: Max. 0.23mA	P
	Comply with Annex G.2 of IEC 60598-1		N/A

(C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		N/A
(C3)	**GENERAL REQUIREMENTS**		N/A
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		N/A
	Renewable only by means of a tool		N/A
	If function depending on polarity, for cord-connected equipment protection means in both leads		N/A
	Thermal links comply with IEC 60691		N/A
	Electrical controls comply with IEC 60730-2-3		N/A
(C3.2)	No risk of fire by breaking (clause C7)		N/A
(C5)	**CLASSIFICATION**		N/A
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description .. :		—
(C6)	**MARKING**		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(C6.1)	Symbol for temperature declared thermally protected ballasts		N/A
(C6.2)	Declaration of the type of protection provided		N/A
(C7)	**LIMITATION OF HEATING**		N/A
(C7.1)	**Preselection test:**		N/A
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		N/A
	No operation of the protection device		N/A
(C7.2)	**Functioning of protection means:**		N/A
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (t_c +0; -5) °C is obtained		N/A
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14.2 to 14.5		N/A
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N/A
	Increasing of the current through the windings continuously until operation of the protection means		N/A
	Continuous measuring of the highest surface temperature		N/A
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		N/A
	Ballasts according to C5 b) working 6 times		N/A
	Ballasts according to C5 c) and C5) d) working once		N/A
	Highest temperature does not exceed the marked value		N/A
	Any overshoot of 10% over the marked value within 15 min		N/A
	After 15 min value not exceed marked value		N/A

(D)	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		P
	Tests in C7 performed in accordance with Annex D, if applicable		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(F)	**ANNEX F – DRAUGHT-PROOF ENCOSURE**		P
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N/A
(H)	**ANNEX H - TESTS**		P
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I (L)	**ANNEX I IN THIS PART 2 – PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEARS FOR LED MODULES**		P
(L.3)	**Classification**		P
	Class I	Yes ☐ No ☒	—
	Class II	Yes ☐ No ☒	—
	Class III	Yes ☐ No ☒	—
	non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☒	—
	fail safe controlgear	Yes ☐ No ☒	—
	non-short-circuit proof controlgear	Yes ☐ No ☒	—
(L.4)	**Marking**		P
	Adequate symbols are used		P
(L.5)	**Protection against electric shock**		P
	Comply with clause 9.2 of IEC 61558-1	0V after 5sec for all models	P
(L.6)	**Heating**		P
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked ..... :	Not applied.	—
	Winding insulation classified as Class ..... :	Class B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P
(L.7)	**Short-circuit and overload protection**		P
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		P
(L.8)	**Insulation resistance and electric strength**		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(L.8.1)	Conditioned 48 h between 91 % and 95 %		P
(L.8.2)	Insulation resistance		P
	Between input- and output circuits not less than 5 MΩ ..... :	>100 MΩ	P
	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
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ ..... :	>100 MΩ	P
(L.8.3)	Electric strength		P
	1) Between live parts of input circuits and live parts of output circuits ..... :	3750V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts having different polarity ..... :	1875V	P
	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 ..... :	3750V	P
(L.9)	**Construction**		P
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		P
	HF transformer comply with 19 of IEC 61558-2-16		N/A
(L.10)	**Components**		P
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		P
(L.11)	**Creepage distances, clearances and distances through insulation**		P
	Creepage distances and clearances not less than in Clause 16	See Annex 1 on ATTACHMENT 1 for details.	P
	Distance through insulation according Table L.5 in IEC 61347-1		P
	1) Basic distance through insulation		N/A
	Required distance (mm) ..... :		—
	Measured (mm) ..... :		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Supplementary information		—
	2) Supplementary distance through insulation		N/A
	Required distance (mm) ..... :		—
	Measured (mm) ..... :		N/A
	Supplementary information		—
	3) Reinforced distance through insulation		P
	Required distance (mm) ..... :		—
	Measured (mm) ..... :	See Annex 1 on ATTACHMENT 1 for details.	P
	Supplementary information		—
J (-)	**ANNEX J IN THIS PART 2 – PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING**		N/A
J.1	**General**		N/A
	Intended for centralized emergency power supply	Yes ☐ No ☐	—
J.2	**Marking**		N/A
J.2.1	Mandatory markings		N/A
	a) symbol EL		N/A
	b) rated emergency supply voltage (V)		N/A
J.2.2	Information to be provided if applicable		N/A
	a) Limits of ambient temperature		N/A
	b) Emergency output factor (EOF_X)		N/A
	c) Information if intended for use in luminaires for high-risk task area lighting		N/A
J.3	General notes on tests		N/A
	Length of output cable in tests ..... :		N/A
	Load instead of LED lamps/modules ..... :		N/A
J.4	Starting conditions		N/A
	Start rated load in emergency mode without adversely affecting the performance		N/A
J.5	Operating condition		N/A
	Comply with the requirements of 7.2 of IEC 62384 at 90% and 110% of rated emergency supply voltage		N/A
J.6	Emergency supply current		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Emergency supply current not differ more than ±15 %		N/A
	Supply of low impedance and low inductance		N/A
J.7	EMC immunity		N/A
	Comply with the requirements of IEC 61547		N/A
J.8	Pulse voltage from central battery systems		N/A
	Withstand pulses according Table J.1		N/A
J.9	Tests for abnormal conditions		N/A
	Comply with the requirements of 12 of IEC 62384		N/A
J.10	Comply with the requirements of 13 of IEC 62384		N/A
J.11	Functional safety (EOF_x)		N/A
	Declared emergency output factor (EOF_x) achieved during emergency operation		N/A
(N)	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		N/A
(N.4)	**General requirements**		N/A
(N.4.1)	Material comply with IEC 60085 and IEC 60216 series		N/A
(N.4.2)	**Solid insulation**		N/A
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N/A
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % to 5,5 kV or 1,5 x test voltage in Table N.1		N/A
(N.4.3)	**Thin sheet insulation**		N/A
(N.4.3.1)	Thickness and composition of thin sheet insulation		N/A
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		N/A
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N/A
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N/A
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N/A
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		N/A
	Electric strength test after mandrel test:		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N/A
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	No flashover or breakdown occurred		N/A
(O)	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		P
(O.6)	**Marking**		P
	Marking according clause 7 (7)	See clause 7	P
	Special symbol		P
	Meaning of the special symbol explained in catalogue		P
(O.7)	**Protection against accidental contact with live parts**		P
	Requirements of clause 8 (10)	See clause 8	P
	Test finger not possible to make contact with basic insulated metal parts		P
(O.8)	**Terminals**		N/A
	Clause 9 (8)	See clause 9	N/A
(O.9)	**Provision for earthing**		N/A
	Functional earthing terminals comply with clause 9 of part 1		N/A
	No protective earthing terminal		N/A
(O.10)	**Moisture resistance and insulation**		P
	Clause 11 (11)	See clause 11	P
(O.11)	**Electric strength**		P
	Clause 12 (12)	See clause 12	P
(O.13)	**Fault conditions**		P
	Clause 14 (14)	See clause 14	P
	End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test according clause 12 reduced to 35 % of values according Table 3 in part 1		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ		P
(O.14)	**Construction**		P
	Clause 17 (15)	See clause 17	P
	Accessible metal parts insulated from live parts by double or reinforced insulation		P
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		P
(O.15)	**Creepage distances and clearances**		P
	Clause 18 (16)	See clause 18	P
	Comply with corresponding values for luminaries in IEC 60598-1		P
(O.16)	**Screws, current-carrying parts and connections**		P
	Clause 19 (17)	See clause 19	P
(O.17)	**Resistance to heat and fire**		P
	Clause 20 (18)	See clause 20	P
(O.18)	**Resistance to corrosion**		N/A
	Clause 21 (19)	See clause 21	N/A
(P)	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		N/A
(P.1)	**General**		N/A
	P.2 applies if creepage distances less than the minimum in Table 7 and 8		N/A
	P.3 applies if clearance less than the minimum in Table 9, 10 and 11		N/A
(P.2)	**Creepage distances**		N/A
(P.2.2)	Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1)		N/A
	Basic or supplementary insulation:		N/A
	Required creepage ..... :		—
	Measured..... :		N/A
	Supplementary information		—
	Reinforced insulation:		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Required creepage ..... :		—
	Measured..... :		N/A
	Supplementary information		—
(P.2.3)	Creepage distances for working voltages with frequencies above 30 kHz (Table P.2)		N/A
	Voltage $\hat{U}_{out}$ kV ..... :		—
	Frequency..... :		—
	Required distance ..... :		—
	Measured..... :		N/A
	Supplementary information		—
(P.2.4)	Compliance with the required creepage distances		N/A
(P.2.4.1)	Compliance in accordance with 16.3.3 and test according P.2.4.2		N/A
(P.2.4.3)	Electrical tests after conditioning		N/A
(P.2.4.3.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3)	**Distance through isolation**		N/A
(P.3.4)	Electrical tests after conditioning		N/A
(P.3.4.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3.4.2)	Impulse voltage dielectrical test		N/A
	Basic or supplementary insulation:		N/A
	Working/rated voltage ..... :		—
	Impulse voltage ..... :		N/A
	Supplementary information		—
	Reinforced insulation:		N/A
	Working/rated voltage ..... :		—
	Impulse voltage ..... :		N/A
	Supplementary information		—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information	P

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Enclosure	B,C	COVESTRO DEUTSCHLAND AG	2805 + (z)(f1)	PC, V-2, 125°C	UL94	UL E41613
(Alternative)	D	MITSUBISHI ENGINEERING-PLASTICS CORP	S-1000V+(f1)	PC, V-2, 125°C	UL94	UL E41179
(Alternative)	D	CHI MEI CORPORATION	PC-110(+)	PC, V-2, 125°C	UL94	UL E56070
(Alternative)	D	SABIC JAPAN L L C	945(GG)/9925AU/LUX7630C/945U(f1)(GG)	PC, V-0, 120°C	UL94	UL E207780
(Alternative)	D	Sabic Innovative Plastics US L L C	945(GG)	PC, V-0, 120°C	UL94	UL E121562
(Alternative)	D	COVESTRO DEUTSCHLAND AG [PC RESINS]	6485 + (z)(f1)	PC, V-0, 125°C	UL94	UL E41613
(Alternative)	D	Covestro Deutschland AG	FR3010 + (z), FR110 +	PC, V-0, 95°C	UL 94	UL E41613
(Alternative)	D	LG CHEM LTD	LUPOY EF-1006F(m)(f1)	PC, V-0, 125°C	UL94	UL E67171
PCB	B,C	Quanzhou Jintian Electron Circuit Board Co.,Ltd	JAL-2/JAL-4/JAL-5/JAL-6/JFR-1/JFR-4/JCEM-1/JCEM--3	V-0, 130°C	UL94	UL E239807
(Alternative)	D	Fujian Milky-Way Technology Co.,Ltd	MW-2 / MW-1/ MW-1A / MW-R4/MW-ML/MW-CEM1	V-0, 130°C	UL94	UL E168066
(Alternative)	D	FUJIAN YI QUAN ELECTRONIC CO LTD	YQ-006/YQ-004/YQ-005	V-0, 130°C	UL94	UL E323292

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	Xiamen Topsun Electronic Technology Co.,Ltd	TS-002 /TS-005/ TS-006/TS-003/ TS-004	V-0, 130°C	UL94	UL E252242
(Alternative)	D	Xiamen Led Board Electron-tech Co.,Ltd	LDB-03,LDB-04,LDB-09,LDB-10,LDB-11,LDB-12,LDB-3D	V-0, 130°C	UL94	UL E347474
(Alternative)	D	Wuping Feitian Electronics Co.,Ltd	SH-01A/SH-02A	V-0, 130°C	UL94	UL E314919
(Alternative)	D	JIANGXI YONGZHAO ELECTRONICS CO LTD	CHT-1/CHT-3	V-0, 130°C	UL94	UL E336650
(Alternative)	D	GUANGDONG HETONG TECHNOLOGY CO LTD	FR4/HT-M/CEM1/HT-52	V-0, 130°C	UL94	UL E243157
(Alternative)	D	CAMELOT ELECTRONIC TECHNOLOGY CO LTD	JL-2/JL-4//JL-5//JL-7(Note1)/JL-3/JL-1/JL-6/JL-8(Note2)	V-0, 130°C	UL94	UL E350325
(Alternative)	D	Shenzhen Stariver Circuits Co.,Ltd	SR-01A/SR-10/SR-12/SR-02A/SR-11/SR-13/SR-01/SR-02/SR-03	V-0, 130°C	UL94	UL E258603
(Alternative)	D	Rich Electronic Ltd	RL-D/RL-M	V-0, 130°C	UL94	UL E350220
(Alternative)	D	HUIZHOU WELGAO ELECTRONICS CO LTD	W-2/W-3/W-4&/W-1/W-5	V-0, 130°C	UL94	UL E310226
(Alternative)	D	JIANGXI BAISHUN CIRCUIT TECHNOLOGY CO LTD	BS-1/BS-2	V-0, 130°C	UL94	UL E464559
(Alternative)	D	ZHEJIANG JUNHAO ELECTRONICS	XMZ-1, JH-1	V-0, 130°C	UL94	UL E250425

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

		CO., LTD				
(Alternative)	D	SHENZHEN UNIWELL CIRCUITS CO LTD	UW01/UWHM(Note1)/UW03/UW04/UW02/UWHD(Note1)	110°C/125°C/130°C	UL94	UL E314500
(Alternative)	D	HUIZHOU TRUSTWIN ELECTRONICS DEVELOPMENT CO LTD	TW-6/TW-8	V-0, 130°C	UL94	UL E340729
(Alternative)	D	HUIZHOU YONGSHENGLONG ELECTRONIC TECHNOLOGY CO LTD	Y-1/Y-2/Y-4/Y-6	V-0, 130°C	UL94	UL E311130
(Alternative)	D	SHENZHEN XUNJIEXING TECHNOLOGY CO LTD	J17998M4/JX 02/JX 01	V-0, 130°C	UL94	UL E305654
(Alternative)	D	HUIZHOU GLORYSKY ELECTRONICS CO LTD	GS-003/GS-M/GS-M1/GS-M2(%)/GS-M3/GS-MR1/GS-MR2/GS-MS1	V-0, 105°C/110°C/130°C	UL94	UL E257384
(Alternative)	D	PUTIAN LONGTENG ELECTRONIC TECHNOLOGY CO.LTD	L-4/L-M/LT-06/L-2/L-2A	V-0, 130°C	UL94	UL E320803
(Alternative)	D	TEAN ELECTRONIC (DA YA BAY) CO LTD	ML1/ML2A/DS1	V-0, 130°C	UL94	UL E120339
Potting material	B,C	GUANGZHOU HUITIAN FINE CHEMICAL LTD	5295（#）	V-0, 150°C	UL94, UL746C	UL E306078
(Alternative)	D	DOW CORNING (SHANGHAI) CO LTD	CN-8760	V-0, 150°C	UL94, UL746C	UL E251343
(Alternative)	D	LORD CORPORATION	SC-305（d)	V-0, 150°C	UL94, UL746C	UL E84716
(Alternative)	D	HUNTSMAN ADVANCED MATERIALS(SWITZ	VB U 6942 + VB U001/B	V-0, 130°C	UL94, UL746C	UL E96722

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

		ERLAND)GMBH [E96722]				
Input wire	B,C	Guangzhou Tang Yao Wires Co.Ltd.	7726/TY1990	300/500V 0.5mm², 0.75mm²	DIN 57250 Teil 106	VDE 40002540
(Alternative)	D	Guangzhou Tang Yao Wires Co.Ltd.	7656/TY1989	300/500V 0.5mm², 0.75mm²	DIN 57250 Teil 106	VDE 135486
Output wire	B,C	Xinya Electronic Co.,Ltd	1015	18-22AWG, 105°C	UL 758	UL E170689
(Alternative)	D	DONGGUAN NISTAR TRANSMITTING TECHNOLOGY CO INC	1015	18-22AWG, 105°C	UL 758	UL E214184
(Alternative)	D	Guangdong Haerkn New Energy Co., Ltd.	1015	18-22AWG, 105°C	UL 758	UL E300956
(Alternative)	D	WENZHOU HU TAI ELECTRIC WIRE & CABLE CO LTD	1015	18-22AWG, 105°C	UL 758	UL E238824
(Alternative)	D	NIZING ELECTRIC CO LTD	1015	18-22AWG, 105°C	UL 758	UL E215834
(Alternative)	D	KUNSHAN XINGHONGMENG ELECTRONIC CO LTD	1015	18-22AWG, 105°C	UL 758	UL E315421
(Alternative)	D	DONGGUAN RI ZHAN HIGH TEMPERATURE WIRE CO LTD	1015	18-22AWG, 105°C	UL 758	UL E353571
(Alternative)	D	DONGGUAN WORLDFUL ELECTRIC WIRE CO LTD	1015	18-22AWG, 105°C	UL 758	UL E317806
(Alternative)	D	Guangzhou Tang Yao Wires Co.Ltd.	7726/TY1990	300/500V 0.2-0.5mm²	DIN 57250 Teil 106	VDE40002540
(Alternative)	D	Guangzhou Tang Yao Wires Co.Ltd.	7656/TY1989	300/500V 0.2-0.5mm²	DIN 57250 Teil 106	VDE135486
Fuse (F1) for models MINI-10-zzz	B,C	AEM COMPONENTS (SUZHOU) CO LTD	MF2410F	MAX 2A, 250V	IEC/EN 60127-1/-4 UL 248-1	VDE 40034853 UL E232989
(Alternative)	D	AEM COMPONENTS (SUZHOU) CO LTD	MF2410F2	MAX 2A, 250V	IEC/EN 60127-1/-4 UL 248-1	VDE 40034853 UL E232989

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	WALTER ELECTRONIC CO LTD	2410H/2410F	250V, 2A	IEC/EN 60127-1/-4 UL 248-1	TUV J 50298144 UL E56092
(Alternative)	D	SUZHOU WALTER ELECTRONIC CO LTD	2410LT	250V, 2A	IEC/EN 60127-1/-4 UL 248-1	TUV J 50419412 UL E56092
(Alternative)	D	Nanjing Sart Science & Technology Development Co., Ltd.	S6125-H2-xA S6125-M2-xA	250V, 2A	IEC/EN 60127-1/-4 UL 248-1	TUV J 50260452 UL E319512
(Alternative)	D	AEM COMPONENTS (SUZHOU) CO LTD	MF2410F	MAX 2A, 250V	IEC/EN 60127-1/-4 UL 248-1	VDE 40034853 UL E232989
Fusing Resistors (RF) for models MINI-4-xxx MINI-6-yyy	B, C	Nanjing Shagon Electronics Co.,Ltd	RXF-1W	10Ω±5%, 1W		
(Alternative)	D	TZAI YUAN ENTERPRISE CO LTD	KNF1W	10Ω±5%, 1W	UL 1412	UL E355632
(Alternative)	D	ZHANG ZHOU SHENGHUAOU ELECTRONIC TECHNOLOGY CO LTD	RXF 1W	10Ω±5%, 1W	UL 1412	UL E492937
(Alternative)	D	XIAMEN SET ELECTRONICS CO LTD	RXF21S/RXF21/TRXF1S/TRXF1/TRXF2	10Ω±5%, 1W	IEC/EN 62368-1 UL 1412	VDE 40035527 UL E324712
--Heat-shrinkable tubing on fusing resistors for models MINI-4-xxx MINI-6-yyy	B, C	ShenZhen Woer Heat- shrinkable Material Co.,Ltd	RSFR-H	600V, 125℃	UL 224	UL E203950
(Alternative)	D	CHANGYUAN ELECTRONICS GROUP CO.,LTD	CB-HFT/CB-HFT(XY)/CYG-MT	600V, 125℃	UL 224	UL E180908
(Alternative)	D	DONGGUAN SALIPT CO LTD	SALIPT S-901-300	300 V, 125°C	UL 224	UL E209436

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	DONGGUAN SALIPT CO LTD	SALIPT S-901-600	600 V, 125°C	UL 224	UL E209436
Y1-capacitor (CY1) for models MINI-10-zzz	B,C	Xiamen Wanming Electrical Co., Ltd.	HJ	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40034438
(Alternative)	D	Murata Mfg. Co., Ltd.	KX	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40002831
(Alternative)	D	TDK Corporation	CD	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40029780
(Alternative)	D	WALSIN TECHNOLOGY CORP	AH	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VED 40001804
(Alternative)	D	Yinan Don's Electronic Component Co., Ltd.,	CT81	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 135256
(Alternative)	D	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	CD/CE	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40025748
(Alternative)	D	WALSIN TECHNOLOGY CORP	AS	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40039265
(Alternative)	D	Interchangeable	Interchangeable	2200pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE
Y1-capacitor (CY1) for models MINI-4-xxx MINI-6-yyy	B,C	Murata Mfg. Co., Ltd.	KX	3300pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40002831
(Alternative)	D	TDK Corporation	CD	3300pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40029780
(Alternative)	D	WALSIN TECHNOLOGY CORP	AH	3300pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VED 40001804
(Alternative)	D	Yinan Don's Electronic Component Co., Ltd.,	CT81	3300pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 135256

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	CD/CE	3300pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40025748
(Alternative)	D	WALSIN TECHNOLOGY CORP	AS	3300pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE 40039265
(Alternative)	D	Interchangeable	Interchangeable	3300pF, AC250V, 125°C, Y1 type	IEC/EN 60384-14	VDE
X2-capacitor (CX1) for models MINI-10-zzz	B,C	Fuxin Pan Ocean Electronic Ltd.	MPX-X2	AC 250/275/310V, 0.15uF, 125°C	IEC/EN 60384-14	VDE 40015756
(Alternative)	D	Nistronics (Jiangxi) Co., Ltd.	MPR	AC310V, 0.15uF, 110°C	IEC/EN 60384-14	VDE 40032056
(Alternative)	D	Xiamen Faratronic Co., Ltd.	MKP62	AC275/305V, 0.15uF, 110°C	IEC/EN 60384-14	VDE 40000358
(Alternative)	D	Ultra Tech Xiphi Enterprise CO.,Ltd.	HQX	AC275V, 0.15uF, 110°C	IEC/EN 60384-14	VDE 40015608
(Alternative)	D	Carli Electronics Co., Ltd.	MPX	AC275V, 0.15uF, 110°C	IEC/EN 60384-14	VDE 40008520
(Alternative)	D	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	MPX	AC275/305/310V, 0.15uF, 110°C	IEC/EN 60384-14	VDE 40034679
(Alternative)	D	ZHEJIANG HONGFA WUFENG CAPACITOR CO LTD	CBB62, HCBB62	AC310V, 0.15uF, 110°C	IEC/EN 60384-14	VDE 125834
(Alternative)	D	Murata Mgf Co., Ltd.	GB	Min.250Vac, 0.15uF, 125°C	IEC/EN 60384-14	VDE 094729
X2-capacitor (C1) for models MINI-10-zzz	B,C	Fuxin Pan Ocean Electronic Ltd.	MPX-X2	AC 250/275/310V, 0.1uF, 125°C	IEC/EN 60384-14	VDE 40015756
(Alternative)	D	Nistronics (Jiangxi) Co., Ltd.	MPR	AC310V, 0.1uF, 110°C	IEC/EN 60384-14	VDE 40032056
(Alternative)	D	Xiamen Faratronic Co., Ltd.	MKP62	AC275/305V, 0.1uF, 110°C	IEC/EN 60384-14	VDE 40000358
(Alternative)	D	Ultra Tech Xiphi Enterprise CO.,Ltd.	HQX	AC275V, 0.1uF, 110°C	IEC/EN 60384-14	VDE 40015608
(Alternative)	D	Carli Electronics Co., Ltd.	MPX	AC275V, 0.1uF, 110°C	IEC/EN 60384-14	VDE 40008520

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd.	MPX	AC275/305/310 V, 0.1uF, 110°C	IEC/EN 60384-14	VDE 40034679
(Alternative)	D	ZHEJIANG HONGFA WUFENG CAPACITOR CO LTD	CBB62, HCBB62	AC310V, 0.1uF, 110°C	IEC/EN 60384-14	VDE 125834
(Alternative)	D	Murata Mgf Co., Ltd.	GB	Min.250Vac, 0.1uF, 125°C	IEC/EN 60384-14	VDE 094729
Transformer (TR1) for models MINI-4-xxx	B,C	Haining Fulida Electronics Co., Ltd.	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Xiamen Chuang Wei Ye Industry & Trade Co, Ltd	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Xiamen Cost Industry And Trade Co., Ltd.	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HAINING HAOHUA ELECTRONICS CO LTD	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Zhangzhou jinli electron co.,ltd.	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Fujian Fupei Electronic Technology Co., Ltd	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Jiangxi Jirui Technology Co., Ltd	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HAINING LIANFENG DONGJIN ELECTRONICS CO LTD	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HUIZHOU BOODY TECHNOLOGY CO LTD	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	LONG SAIL ELECTRONIC CO LTD	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	Shenzhen JingQuanHua Electronics Co.,ltd.	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Zhejiang Wanyang Electronics Co Ltd	EE13	Class B, 4.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
Transformer (TR1) for models MINI-6-yyy	B,C	Haining Fulida Electronics Co., Ltd.	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Xiamen Chuang Wei Ye Industry & Trade Co, Ltd	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Xiamen Cost Industry And Trade Co., Ltd.	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HAINING HAOHUA ELECTRONICS CO LTD	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Zhangzhou jinli electron co.,ltd.	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Fujian Fupei Electronic Technology Co., Ltd	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Jiangxi Jirui Technology Co., Ltd	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HAINING LIANFENG DONGJIN ELECTRONICS CO LTD	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HUIZHOU BOODY TECHNOLOGY CO LTD	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	LONG SAIL ELECTRONIC CO LTD	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Shenzhen JingQuanHua Electronics Co.,ltd.	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	Zhejiang Wanyang Electronics Co Ltd	EE13	Class B, 3.5mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
Transformer (TR1) for models MINI-10-zzz	B,C	Haining Fulida Electronics Co., Ltd.	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Xiamen Chuang Wei Ye Industry & Trade Co, Ltd	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Xiamen Cost Industry And Trade Co., Ltd.	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HAINING HAOHUA ELECTRONICS CO LTD	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Zhangzhou jinli electron co.,ltd.	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Fujian Fupei Electronic Technology Co., Ltd	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Jiangxi Jirui Technology Co., Ltd	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HAINING LIANFENG DONGJIN ELECTRONICS CO LTD	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	HUIZHOU BOODY TECHNOLOGY CO LTD	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	LONG SAIL ELECTRONIC CO LTD	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Shenzhen JingQuanHua Electronics Co.,ltd.	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance
(Alternative)	D	Zhejiang Wanyang Electronics Co Ltd	EE10	Class B, 6.0mH	IEC/EN 61347-1 IEC/EN 61347-2-13	Tested with appliance

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

-Bobbin	B,C	Jiangyin Jihua New Material	PBT4308G30	PBT, V-0, 130°C	UL 94	UL E139063
(Alternative)	D	ZHEJIANG JIAMIN PLASTIC CO LTD	PF2A2-141	V-0, 150°C	UL 94	UL E231508
(Alternative)	D	SUMITOMO BAKELITE CO LTD	PM-9630；PM-9820；PM-9850	V-0, 150°C	UL 94	UL E41429
(Alternative)	D	CHANGSHU SOUTH-EAST PLASTIC CO LTD	PF2A5-151J(b)	V-0, 150°C	UL 94	UL E136137
(Alternative)	D	CHANG CHUN PLASTICS CO.,LTD	T-355J/T355J/T375HF/T375J/T200HF/T220NA	V-0, 150°C	UL 94	UL E59481
-Magnet wire	B,C	ZHEJIANG WUGU COPPER INDUSTRY CO LTD	xUEW/155, QA-x/155	155℃	UL 1466	UL E336659
(Alternative)	D	SHANGHAI ASIA PACIFIC ELECTRIC CO LTD	UEW	155℃	UL 1466	UL E214423
(Alternative)	D	ROSHOW TECHNOLOGY CO LTD	xUEW@/155, QA@-x/155	155℃	UL 1466	UL E215691
(Alternative)	D	ZHEJIANG HONGBO TECHNOLOGY CO LTD	xUEW@/130, QA@-x/130	130℃	UL 1466	UL E221719
(Alternative)	D	HANGZHOU WEIFENG ELECTRONIC CO LTD	UEWF-@, QA-@/155	155℃	UL 1466	UL E229341
(Alternative)	D	DONG GUAN YIDA INDUSTRIAL CO LTD	xUEW/155, QA-x/155	155℃	UL 1466	UL E344055
(Alternative)	D	HUZHOU SANXING CABLE CO LTD	xUEW/155, QA-x/155	155℃	UL 1466	UL E327855
(Alternative)	D	ZHEJIANG HONGBO TECHNOLOGY CO.,LTD	MW28/75/79/80/82/83	155℃	UL 1466	UL E221719
(Alternative)	D	ZHEJIANG GRANDWALL ELECTRIC SCIENCE &	xUEW/155 or QA-x/155	155℃	UL 1466	UL E206121

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

		TECHNOLOG CO LTD				
-Insulation tape	B,C	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT* (c)(g)，CT* (b)(g)，CT-280B，PZ* (b)	130℃	UL 510	UL E165111
(Alternative)	D	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PF* (d)(g)	180℃	UL 510	UL E165111
(Alternative)	D	WU XI HUA RUN SPECIAL TAPE CO LTD	HR-310Y	130℃	UL 510	UL E214552
(Alternative)	D	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	CT* (c)(g)/CT/PZ/WF	130℃	UL 510	UL E324093
(Alternative)	D	CHANG SHU LIANG YI TAPE INDUSTRY CO.,LTD	LY-19-01-40a	130℃	UL 510	UL E246820
(Alternative)	D	JINGJIANG JINGYANG INSULATING PRODUCT CO LTD	JY-133	130℃	UL 510	UL E309872
(Alternative)	D	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD	JY25-A(b)	130℃	UL 510	UL E246950
(Alternative)	D	HAINING CHULONG TAPE CO LTD	CL	130℃	UL 510	UL E464604
-Triple insulation wire	B,C	Shanghai Chuanye Electronic	GPX-B	130°C	IEC/EN 62368-1	TUV J 50071757
(Alternative)	D	HUIZHOU HUILI INDUSTRIAL CO LTD	MIW-F(x)	155℃	IEC/EN 62368-1	VDE 40029142
(Alternative)	D	Shanghai Xiangxiang Electron Co.,Ltd	TKW-B	130°C;	IEC/EN 62368-1	VDE 40026588
(Alternative)	D	SHANGHAI TOPKING SPECIAL CABLE CO LTD	TKW-B	130°C;	IEC/EN 62368-1	VDE 40026588
(Alternative)	D	SHANGHAI SURAN ELECTRONICS FACTORY	TIW-B*	130°C;	IEC/EN 62368-1	VDE 40039647

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(Alternative)	D	SHENZHEN SHENGRUIYANG PRECISION TECHNOLOGY CO LTD	TWD-B	130°C;	IEC/EN 62368-1	VDE 40039268
(Alternative)	D	SUZHOU YUSHENG ELECTRONIC CO LTD	TIW-B*,TWE-3*	155℃	IEC/EN 62368-1	VDE 40033527
(Alternative)	D	COSMOLINK CO. Ltd.	TIW-M	130℃	IEC/EN 62368-1	VDE 138053
(Alternative)	D	FURUKAWA ELECTRIC CO LTD	TEX-E	130℃	IEC/EN 62368-1	VDE 006735
(Alternative)	D	COSMOLINK CO LTD	TIW-B	130℃	IEC/EN 62368-1	VDE 138053
-Teflon tube	B,C	ShenZhen Woer Heat- shrinkable Material Co.,Ltd	WF	600V, 200℃	UL94	UL E203950
(Alternative)	D	P LEO & CO LTD	2T-TFL (150V)	150V, 200℃	UL94	UL E176865
(Alternative)	D	CHANGYUAN ELECTRONICS GROUP CO LTD	CB-TT-L	300V, 200℃	UL94	UL E180908
(Alternative)	D	DONG GUAN NAN DIAN INSULATION MATERIALS CO LTD	ND-LL	150V, 200℃	UL94	UL E350651
(Alternative)	D	GREAT HOLDING INDUSTRIAL CO LTD	TFL	150V, 200℃	UL94	UL E156256
(Alternative)	D	ShenZhen Woer Heat- shrinkable Material Co.,Ltd	WF	600V, 200℃	UL94	UL E203950

Supplementary information:

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

2. 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

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**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 (mm²) ..... :		—
(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)..... :		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) ..... :		N/A
	Torque (Nm)..... :		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N)..... :		N/A
(14.4.8)	Without undue damage		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**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)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....:		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		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
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

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

(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)										
	Voltage drop of two inseparable joints									
	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:										

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

List of test equipment used:

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

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
--	--	Ac power supply	60kVA	2021.11.10	2022.11.9
7 (Annex L.4)	Marking	Stopwatch	Accuracy: 0.1-0.2s	2022.3.6	2023.3.5
8 (Annex A, L.5)	Protection against accidental contact with live parts	Leakage Current Tester	30uA~600uA	2021.11.10	2022.11.9
		Mixed Domain Oscilloscope	0-1000V	2021.11.10	2022.11.9
		DC Electronic Load	0-30A, 0-120V	2022.3.6	2023.3.5
9	Terminals	Power Cable Pull Twist Tester	60N(±5%)	2022.3.6	2023.3.5
		Torque Screwdriver	0-120cN.m	2022.3.6	2023.3.5
		Electronic digital calipers	0-300mm	2022.3.6	2023.3.5
11 (Annex L.8)	Moisture resistance and insulation	High and low temperature hot and humid test chamber	-40~+150°C, 25~98%RH	2022.3.6	2023.3.5
		DC Electronic Load	0-30A, 0-120V	2022.3.6	2023.3.5
		AC/DC Withstanding Voltage/Insulation Resistance Tester	0-5 kVA	2021.11.10	2022.11.9
12 (Annex N.4.2)	Electric strength	AC/DC Withstanding Voltage/Insulation Resistance Tester	0-5 kVA	2021.11.10	2022.11.9
14	Fault conditions	LED automatic adjustment load cabinet	160～176A	2021.11.10	2022.11.9
		Digital Power Meter	50V-300V, 0.1A-10A, 30W-300W	2022.3.6	2023.3.5
		DC Electronic Load	0-30A, 0-120V	2022.3.6	2023.3.5
15 (Annex L.6, L.7)	Transformer heating	Paperless Recorder	-50°C ~200°C	2022.3.6	2023.3.5
		DC Electronic Load	0-30A, 0-120V	2022.3.6	2023.3.5
		Digital Power Meter	50V-300V, 0.1A-10A, 30W-300W	2022.3.6	2023.3.5

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

17 (Annex L.11)	Creepage distance and clearances	30 size creepage test card	1.0-10.0mm	2022.3.6	2023.3.5
		Electronic digital calipers	0-300mm	2022.3.6	2023.3.5
18.1	Ball-pressure	Ball-pressure Apparatus	20N±0.2N, 5mm±0.05mm	2022.3.6	2023.3.5
		High temperature test chamber	75°C~200°C	2022.3.6	2023.3.5
		Stopwatch	Accuracy:0.1-0.2s	2022.3.6	2023.3.5
		Electronic digital calipers	0-300mm	2022.3.6	2023.3.5
18.3	Glow-wire test	Glow-wire Tester	0-960°C	2022.3.6	2023.3.5
18.4	Needle flame test	Needle Flame Tester	12±1mm	2022.3.6	2023.3.5
Annex C	Thermal Protection	Paperless Recorder	-50°C ~200°C	2022.3.6	2023.3.5
		Thermally Protected Ballast Heating Chamber	0-60°C	2022.3.6	2023.3.5
		DC Electronic Load	0-30A, 0-120V	2022.3.6	2023.3.5
		Digital Power Meter	50V-300V, 0.1A-10A, 30W-300W	2022.3.6	2023.3.5
Practical testing for MM mark according to VDE 0710					
6.3	MM mark	Paperless Recorder	-50°C ~200°C	2022.3.6	2023.3.5
		Thermally Protected Ballast Heating Chamber	0-60°C	2022.3.6	2023.3.5
		DC Electronic Load	0-30A, 0-120V	2022.3.6	2023.3.5
		Digital Power Meter	50V-300V, 0.1A-10A, 30W-300W	2022.3.6	2023.3.5

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: Test result for Creepage distances and clearances	**P**

clearance cl and creepage distance dcr at/of:	**U peak (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**Required dcr (mm)**	**dcr (mm)**
Model: MINI-4-700						
L and N before fuse	350	240	1.5	3.50	2.5	3.50
Different pin of fuse	350	240	1.5	3.50	2.5	3.50
CY1 primary pin to secondary pin	350	240	3.0(4.5)[1)]	7.80	5.0(4.8)[1)]	7.80
Hazardous live parts to accessible enclosure	350	240	3.0(4.5)[1)]	8.20	5.0(4.8)[1)]	8.20
TR1 primary trace to secondary trace on trace side	350	240	3.0(4.5)[1)]	7.00	3.0(4.5)[1)]	7.00
TR1 core/primary winding to secondary pin	350	240	3.0(4.5)[1)]	7.80	3.0(4.5)[1)]	7.80
TR1 core/primary winding to secondary component CE2	350	240	3.0(4.5)[1)]	>10.0	3.0(4.5)[1)]	>10.0
Enclosure	1.30mm>0.83mm					

Note:
1. Measured according to IEC/EN 61558-1:2005+A1:2009.
2. Max. working altitude not exceeding 2000m;
3. Transformer core is considered as primary;
4. Max. measured working voltage between primary and secondary:
   CY1: 240Vrms, 420Vpeak;
   TR1: 135Vrms, 344Vpeak.

clearance cl and creepage distance dcr at/of:	**U peak (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**Required dcr (mm)**	**dcr (mm)**
Model: MINI-6-700						
L and N before fuse	350	240	1.5	3.50	2.5	3.50
Different pin of fuse	350	240	1.5	3.50	2.5	3.50
CY1 primary pin to secondary pin	350	240	3.0(4.5)[1)]	7.80	5.0(4.8)[1)]	7.80
Hazardous live parts to accessible enclosure	350	240	3.0(4.5)[1)]	8.20	5.0(4.8)[1)]	8.20
TR1 primary trace to secondary trace on trace side	350	240	3.0(4.5)[1)]	7.00	3.0(4.5)[1)]	7.00
TR1 core/primary winding to secondary pin	350	240	3.0(4.5)[1)]	7.80	3.0(4.5)[1)]	7.80
TR1 core/primary winding to secondary component CE2	350	240	3.0(4.5)[1)]	>10.0	3.0(4.5)[1)]	>10.0
Enclosure	1.30mm>0.83mm					

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Note:
1. Measured according to IEC/EN 61558-1:2005+A1:2009.
2. Max. working altitude not exceeding 2000m;
3. Transformer core is considered as primary;
4. Max. measured working voltage between primary and secondary:

CY1: 240Vrms, 420Vpeak;
TR1: 133Vrms, 328Vpeak.

clearance cl and creepage distance dcr at/of:	**U peak (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**Required dcr (mm)**	**dcr (mm)**
Model: MINI-10-700						
L and N before fuse	350	240	1.5	3.28	2.5	3.28
Different pin of fuse	350	240	1.5	3.32	2.5	3.32
CY1 primary pin to secondary pin	350	240	3.0(4.5)[1)]	7.20	5.0(4.8)[1)]	7.20
Hazardous live parts to accessible enclosure	350	240	3.0(4.5)[1)]	8.20	5.0(4.8)[1)]	8.20
TR1 primary trace to secondary trace on trace side	350	240	3.0(4.5)[1)]	6.00	3.0(4.5)[1)]	6.00
TR1 core/primary winding to secondary pin	350	240	3.0(4.5)[1)]	7.80	3.0(4.5)[1)]	7.80
TR1 core/primary winding to secondary component CE2	350	240	3.0(4.5)[1)]	>10.0	3.0(4.5)[1)]	>10.0
Enclosure	1.30mm>0.83mm					

Note:
1. Measured according to IEC/EN 61558-1:2005+A1:2009.
2. Max. working altitude not exceeding 2000m;
3. Transformer core is considered as primary;
4. Max. measured working voltage between primary and secondary:

CY1: 240Vrms, 420Vpeak;
TR1: 97Vrms, 280Vpeak.

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 2: Temperature measurements, thermal tests		**P**

	Type reference.....:	MINI-4-200	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	On the black testing board	—
	Ta.....:	60°C	—
	- test 1: rated voltage.....:	220-240V	—
	- test 2: test voltage(normal).....:	Input: 1.06 x 220V=233.2V; Input: I= 0.041A, P= 5.37W Input: 1.06 x 240V=254.4V; Input: I= 0.037A, P= 5.37W	—
	- test 3: test voltage(abnormal).....:	**1. Fault condition** Input: I= 0.037A, P= 5.35W **2. Double the LED modules or equivalent load** Input: I= 0A, P= 0W **3. The output terminals shall be short-circuited.** Input: I= 0A, P= 0W **4.Over load**: Input: I= 0.051A, P= 7.78W	—

Normal operation

temperature (°C) of part	233.2V/60Hz	254.4V50Hz	limit
Input wire	80.1	79.8	105
Output wire	81.6	81.4	105
L1 winding	80.1	79.9	155
L1 bobbin	80.6	80.5	150
CE1 E-capacitor	82.6	82.5	105
CE2 E-capacitor	83.6	83.4	105
CE3 E-capacitor	81.7	81.4	105
TR1 primary winding	85.3	85.0	155
TR1 secondary winding	85.7	85.5	110
TR1 bobbin	85.9	85.8	150
CY1 Y-capacitor	84.0	84.0	125
PCB near DB1	82.4	82.3	130
PCB near TR1	87.7	87.8	130
PCB near U1	94.9	95.6	130
PCB near L1	82.2	82.1	130

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Support	83.4		83.1		90
Enclosure inside (near TR1)	89.1		89.4		Ref.
Enclosure outside (tc point)	85.0		85.0		85
Ambient (tested under Tc)	66.4		66.0		--
Fault condition (Q1 D-S short)					
temperature (°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	--	190
TR1 secondary winding	--	--	--	--	190
TR1 bobbin	--	--	--	--	190
Support	--	--	--	--	105
Enclosure outside (tc)	--	--	--	--	105
Ambient	--	--	--	--	--
Double the LED modules or equivalent load					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					
The output terminals shall be short-circuited					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					
Over load condition					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	99.7	190
TR1 secondary winding	--	--	--	100.1	190
Support	--	--	--	95.9	105
Enclosure outside (tc)	--	--	--	101.5	105
Ambient	--	--	--	60.0	--

	Type reference.....:	MINI-4-700	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	On the black testing board	—
	Ta.....:	60°C	—
	- test 1: rated voltage.....:	220-240V	—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	- test 2: test voltage(normal) ..... :	Input: 1.06 x 220V=233.2V; Input: I= 0.040A, P= 5.49W Input: 1.06 x 240V=254.4V; Input: I= 0.037A, P= 5.49W	—
	- test 3: test voltage(abnormal) ..... :	**1. Fault condition** Input: I= 0.037A, P= 5.52W **2. Double the LED modules or equivalent load** Input: I= 0A, P= 0W **3. The output terminals shall be short-circuited.** Input: I= 0A, P= 0W **4.Over load**: Input: I= 0.055A, P= 8.31W	—

Normal operation

temperature (°C) of part	233.2V/60Hz	254.4V50Hz	limit
Input wire	82.6	82.0	105
Output wire	82.5	82.4	105
L1 winding	82.3	81.6	155
L1 bobbin	82.8	82.2	150
CE1 E-capacitor	85.1	84.6	105
CE2 E-capacitor	85.7	85.1	105
CE3 E-capacitor	84.7	84.6	105
TR1 primary winding	87.5	87.0	155
TR1 secondary winding	88.2	87.7	110
TR1 bobbin	87.9	87.4	150
CY1 Y-capacitor	86.1	85.7	125
PCB near DB1	84.7	84.0	130
PCB near TR1	88.8	88.5	130
PCB near U1	93.4	93.3	130
PCB near L1	84.5	83.9	130
Support	84.8	84.3	90
Enclosure inside (near TR1)	89.0	88.9	Ref.
Enclosure outside (tc point)	85.0	85.0	85
Ambient (tested under Tc)	68.6	67.8	--

Fault condition (Q1 D-S short)

temperature (°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

TR1 primary winding	--	--	--	--	190
TR1 secondary winding	--	--	--	--	190
TR1 bobbin	--	--	--	--	190
Support	--	--	--	--	105
Enclosure outside (tc)	--	--	--	--	105
Ambient	--	--	--	--	--
Double the LED modules or equivalent load					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					
The output terminals shall be short-circuited					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					
Over load condition					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	103.8	190
TR1 secondary winding	--	--	--	103.8	190
Support	--	--	--	96.6	105
Enclosure outside (tc)	--	--	--	103.9	105
Ambient	--	--	--	60.0	--

	Type reference.....:	MINI-6-160	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	On the black testing board	—
	Ta.....:	60°C	—
	- test 1: rated voltage.....:	220-240V	—
	- test 2: test voltage(normal).....:	Input: 1.06 x 220V=233.2V; Input: I= 0.053A, P= 7.38W Input: 1.06 x 240V=254.4V; Input: I= 0.049A, P= 7.37W	—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	- test 3: test voltage(abnormal).....:	**1. Fault condition** Input: I= 0.048A, P= 7.36W **2. Double the LED modules or equivalent load** Input: I= 0A, P= 0W **3. The output terminals shall be short-circuited.** Input: I= 0A, P= 0W **4.Over load**: Input: I= 0.053A, P= 8.19W	—

Normal operation

temperature (°C) of part	233.2V/60Hz	254.4V50Hz	limit
Input wire	79.0	77.6	105
Output wire	79.5	78.1	105
L1 winding	81.1	79.9	155
L1 bobbin	82.0	81.0	150
CE1 E-capacitor	84.2	83.7	105
CE2 E-capacitor	85.0	84.5	105
CE3 E-capacitor	81.4	80.2	105
TR1 primary winding	86.5	86.1	155
TR1 secondary winding	86.8	86.3	110
TR1 bobbin	87.3	87.3	150
CY1 Y-capacitor	84.9	84.4	125
PCB near DB1	84.2	83.6	130
PCB near TR1	88.5	89.1	130
PCB near U1	94.6	97.8	130
PCB near L1	83.5	82.8	130
Support	83.6	82.8	90
Enclosure inside (near TR1)	91.3	93.0	Ref.
Enclosure outside (tc point)	85.0	85.0	85
Ambient (tested under Tc)	64.9	61.7	--

Fault condition (Q1 D-S short)

temperature (°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	--	190
TR1 secondary winding	--	--	--	--	190
TR1 bobbin	--	--	--	--	190
Support	--	--	--	--	105
Enclosure outside (tc)	--	--	--	--	105

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Ambient	--	--	--	--	--
Double the LED modules or equivalent load					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					
The output terminals shall be short-circuited					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					
Over load condition					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	95.1	190
TR1 secondary winding	--	--	--	95.1	190
Support	--	--	--	90.3	105
Enclosure outside (tc)	--	--	--	94.7	105
Ambient	--	--	--	60.0	--

	Type reference.....:	MINI-6-700	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	On the black testing board	—
	Ta.....:	60°C	—
	- test 1: rated voltage.....:	220-240V	—
	- test 2: test voltage(normal).....:	Input: 1.06 x 220V=233.2V; Input: I= 0.057A, P= 8.04W Input: 1.06 x 240V=254.4V; Input: I= 0.054A, P= 8.10W	—
	- test 3: test voltage(abnormal).....:	**1. Fault condition** Input: I= 0.053A, P= 8.12W **2. Double the LED modules or equivalent load** Input: I= 0A, P= 0W **3. The output terminals shall be short-circuited.** Input: I= 0A, P= 0W **4.Over load**: Input: I= 0.065A, P= 10.20W	—
Normal operation			

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

temperature (°C) of part	233.2V/60Hz	254.4V50Hz	limit
Input wire	80.1	79.5	105
Output wire	81.2	80.9	105
L1 winding	80.9	80.4	155
L1 bobbin	81.6	81.1	150
CE1 E-capacitor	85.0	84.8	105
CE2 E-capacitor	85.1	84.8	105
CE3 E-capacitor	83.4	83.1	105
TR1 primary winding	88.1	88.1	155
TR1 secondary winding	88.3	88.2	110
TR1 bobbin	88.8	88.9	150
CY1 Y-capacitor	85.7	85.6	125
PCB near DB1	84.0	83.5	130
PCB near TR1	90.7	90.9	130
PCB near U1	97.5	98.8	130
PCB near L1	83.4	83.1	130
Support	82.7	82.5	90
Enclosure inside (near TR1)	91.8	92.4	Ref.
Enclosure outside (tc point)	85.0	85.0	85
Ambient (tested under Tc)	62.3	61.3	--

Fault condition (Q1 D-S short)

temperature (°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	--	190
TR1 secondary winding	--	--	--	--	190
TR1 bobbin	--	--	--	--	190
Support	--	--	--	--	105
Enclosure outside (tc)	--	--	--	--	105
Ambient	--	--	--	--	--

Double the LED modules or equivalent load

temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					

The output terminals shall be short-circuited

temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					
Over load condition					
temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	92.5	190
TR1 secondary winding	--	--	--	92.2	190
Support	--	--	--	86.1	105
Enclosure outside (tc)	--	--	--	88.1	105
Ambient	--	--	--	60.0	--

	Type reference.....:	MINI-10-260	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	On the black testing board	—
	Ta.....:	60°C	—
	- test 1: rated voltage.....:	220-240V	—
	- test 2: test voltage(normal).....:	Input: 1.06 x 220V=233.2V; Input: I= 0.055A, P= 11.90W Input: 1.06 x 240V=254.4V; Input: I= 0.053A, P= 12.00W	—
	- test 3: test voltage(abnormal).....:	**1. Fault condition** Input: I= 0.052A, P= 12.00W **2. Double the LED modules or equivalent load** Input: I= 0A, P= 0W **3. The output terminals shall be short-circuited.** Input: I= 0A, P= 0W **4.Over load**: Input: I= 0.054A, P= 12.70W	—

Normal operation			
temperature (°C) of part	233.2V/60Hz	254.4V50Hz	limit
Input wire	73.9	73.1	105
Output wire	81.9	81.5	105
CX1 X-capacitor body	78.2	77.3	85
C1 X-capacitor body	77.7	76.5	85
L1 winding	80.1	78.6	155
L1 bobbin	79.9	78.4	150
T1 winding	88.2	88.2	155

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

L3 winding	93.1	93.8	155
L3 bobbin	91.5	92.2	150
CE1 E-capacitor	83.0	82.4	105
CE2 E-capacitor	83.6	83.1	105
TR1 primary winding	89.5	89.4	155
TR1 secondary winding	89.7	89.6	110
TR1 bobbin	91.0	91.1	150
CY1 Y-capacitor	81.9	81.1	125
PCB near DB1	84.8	83.7	130
PCB nearTR1	88.0	87.9	130
PCB near T1, L3	89.5	89.7	130
PCB near U1	91.0	91.3	130
Support	87.0	87.2	90
Enclosure inside (near TR1)	87.9	87.9	Ref.
Enclosure outside (tc point)	85.0	85.0	85
Ambient (tested under Tc)	64.4	63.8	--

Fault condition (Q1 D-S short)

temperature (°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	--	190
TR1 secondary winding	--	--	--	--	190
TR1 bobbin	--	--	--	--	190
Support	--	--	--	--	105
Enclosure outside (tc)	--	--	--	--	105
Ambient	--	--	--	--	--

Double the LED modules or equivalent load

temperature (K/°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					

The output terminals shall be short-circuited

temperature (K/°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					

Over load condition

temperature (K/°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

TR1 primary winding	--	--	--	93.8	190
TR1 secondary winding	--	--	--	94.0	190
Support	--	--	--	91.4	105
Enclosure outside (tc)	--	--	--	90.1	105
Ambient	--	--	--	60.0	--

	Type reference.....:	MINI-10-700	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	On the black testing board	—
	Ta.....:	60°C	—
	- test 1: rated voltage.....:	220-240V	—
	- test 2: test voltage(normal).....:	Input: 1.06 x 220V=233.2V; Input: I= 0.060A, P= 13.00W Input: 1.06 x 240V=254.4V; Input: I= 0.056A, P= 13.00W	—
	- test 3: test voltage(abnormal).....:	**1. Fault condition** Input: I= 0.055A, P= 13.10W **2. Double the LED modules or equivalent load** Input: I= 0A, P= 0W **3. The output terminals shall be short-circuited.** Input: I= 0A, P= 0W **4.Over load**: Input: I= 0.069A, P= 16.30W	—

Normal operation			
temperature (°C) of part	233.2V/60Hz	254.4V50Hz	limit
Input wire	72.3	71.4	105
Output wire	82.8	83.1	105
CX1 X-capacitor body	78.3	76.2	85
C1 X-capacitor body	77.7	75.9	85
L1 winding	83.2	79.3	155
L1 bobbin	82.5	78.6	150
T1 winding	90.8	89.9	155
L3 winding	98.8	98.4	155
L3 bobbin	97.3	99.6	150
CE1 E-capacitor	87.0	82.0	105
CE2 E-capacitor	92.7	87.2	105

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

TR1 primary winding	92.9	92.3	155
TR1 secondary winding	95.0	92.2	110
TR1 bobbin	86.3	94.4	150
CY1 Y-capacitor	87.6	85.0	125
PCB near DB1	90.2	85.6	130
PCB nearTR1	92.3	89.9	130
PCB near T1, L3	89.4	91.6	130
PCB near U1	90.3	89.0	130
Support	87.0	89.8	90
Enclosure inside (near TR1)	89.1	88.8	Ref.
Enclosure outside (tc point)	85.0	85.0	85
Ambient (tested under Tc)	55.8	57.3	--

Fault condition (Q1 D-S short)

temperature (°C) of part	normal		Abnormal		
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	--	190
TR1 secondary winding	--	--	--	--	190
TR1 bobbin	--	--	--	--	190
Support	--	--	--	--	105
Enclosure outside (tc)	--	--	--	--	105
Ambient	--	--	--	--	--

Double the LED modules or equivalent load

temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					

The output terminals shall be short-circuited

temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
Operating for 1 h, no defect impairing safety nor smoke or flammable gases produced					

Over load condition

temperature (K/°C) of part	normal			Abnormal	
	test 1	test 2	limit	test 3	limit
TR1 primary winding	--	--	--	101	190
TR1 secondary winding	--	--	--	100.8	190
Support	--	--	--	97.1	105
Enclosure outside (tc)	--	--	--	92.8	105

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Ambient	--	--	--	60.0	--

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 3: Practical testing for MM mark according to VDE 0710	**P**

Clause	Requirement – Test	Result – Remark	Verdict
6.3	Luminaries with mark must be so constructed that for the intended use and normal operation none temperature of 95°C are exceeded.		P
	Check by : measurement	(See appended table)	P
6.3.1	For these luminaries for glow lamps and with integrated ballast the temperature at the installation surface and at neighbouring surface of should not exceed 115°C, in the normal and abnormal operation, both with 1,1facher rated voltage, as well as in fault condition of the ballast.		N/A
6.3.2	Determination of the temperatures in the abnormal operation and in fault condition of the ballast		P
6.3.2.1	Luminaries without temperature-limiting devices:		P
	Under rated conditions the temperature in the hottest places must be measured. For the measurement in the abnormal operation and in fault condition of the ballast, 20% of the lamp electric circuits, at least however one circuit, are abnormal operated. Here the circuit is chosen, which will cause max. thermal influence. The rest electric circuits are in normal operation with the rated voltage. The tests are performed with 0.9times, 1.05times, 1.1 times rated voltage, for each case until the steady state is reached.	(See appended table)	P
	Here for each test the winding temperature of the abnormally operated ballast and the temperature on the hottest place of the mounting surface must be determined. The luminaries are tested according to the test method which are described in VDE 0710 Part 1/3.69, § 15b).	(See appended table)	P
	The measured values, which must be based on an ambient temperature of 25°C or on rated ambient temperature, shall be marked in the diagram and connected by a straight line (Fig. 3). This straight line may not cross the boundary line 115°C within the drawn range.	(See appended table)	P
6.3.2.2	luminaries with temperature-limiting devices:	(See appended table)	N/A
	In the normal and abnormal operation, both with 1.1 times rated voltage, the temperature at the installation surface and at neighbouring surfaces of furniture must be measured.	(See appended table)	N/A
6.4	For luminaries, where the excess of the limit values is prevented by temperature dependent devices, It must be proved by the following examinations if the	(See appended table)	N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	temperature dependent device will switch off before or when reaching indicated limit values.		
	Checked by: After tests of section 6.2 or 6.3, the temperature will be increased gradually in the abnormal operation through increasing the voltage in steps of 5 %, until the temperature-dependent device switches off.	(See appended table)	P
	The limit temperatures of 180 °C for M - Luminaries and 115 °C for M M - Luminaries should not be exceeded.		P
	Note: Fluctuation of the temperature within maximal 15 minutes up to 15 K is allowed.		P

Heating
Install the luminaire as the minimum space described below: Test enclosure was made of heat resistant material 25mm thickness. Left: 3mm, Right: 3mm, Front: 3mm, Behind: 3mm.Up: 3mm. Duration: Operated until steady conditions. Operation: heating test is under at ta condition.

	Type reference .....:	See appended table.	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	As normal use	—
	Ta.....:	60°C	—
	- test 1: operated until the steady condition.	0.9×220 V = 198V	
	- test 2: operated until the steady condition.	1.06×240 V = 254.4V	—
	- test 3: operated until the steady condition.	1.1 ×240 V = 264V	—
	- test 4: Increase the overload at 5%. At each step, operated until steady conditions are established. This process is operated until steady conditions are established or the output is cut off.	1.1×240 V = 264V The voltage is increased in a step of 5%, The fuse is open till the input voltage reach to [395] V	—

Model MINI-4-700

Normal operation

(deg.)	Test 1	Test 2	Test 3	Test 4	Limit (deg.)
Outer surface (support)	82.5	81	81.9	--	95
Outer surface (top)	87.4	85.1	86.4	--	95
Outer surface (side)	83.4	81.6	82.5	--	95

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Abnormal operation					
(deg.)	Test 1	Test 2	Test 3	Test 4	Limit (deg.)
Shutdown or normal operation					
Outer surface (support)	--	--	--	--	115
Outer surface (top)	--	--	--	--	115
Outer surface (side)	--	--	--	--	115
Overload					
(deg.)	Test 1	Test 2	Test 3	Test 4	Limit (deg.)
Outer surface (support)	--	--	--	90.2	115
Outer surface (top)	--	--	--	106.9	115
Outer surface (side)	--	--	--	95.7	115

	Type reference .....:	See appended table.	—
	Load used.....:	Equivalent load or LED module	—
	Mounting position of luminaire.....:	As normal use	—
	Ta.....:	60°C	—
	- test 1: operated until the steady condition.	0.9×220 V = 198V	
	- test 2: operated until the steady condition.	1.06×240 V = 254.4V	—
	- test 3: operated until the steady condition.	1.1 ×240 V = 264V	—
	- test 4: Increase the overload at 5%. At each step, operated until steady conditions are established. This process is operated until steady conditions are established or the output is cut off.	1.1×240 V = 264V The voltage is increased in a step of 5%, The fuse is open till the input voltage reach to [389] V	—

Model MINI-12-1050F

Normal operation					
(deg.)	Test 1	Test 2	Test 3	Test 4	Limit (deg.)
Outer surface (support)	84.5	86.7	86.5	--	95
Outer surface (top)	87.5	91.4	91.0	--	95
Outer surface (side)	86.2	89.2	88.9	--	95
Abnormal operation					
(deg.)	Test 1	Test 2	Test 3	Test 4	Limit (deg.)
Shutdown or normal operation					
Outer surface (support)	--	--	--	--	115
Outer surface (top)	--	--	--	--	115

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

Outer surface (side)	--	--	--	--	115
Overload					
(deg.)	Test 1	Test 2	Test 3	Test 4	Limit (deg.)
Outer surface (support)	--	--	--	92.6	115
Outer surface (top)	--	--	--	98.3	115
Outer surface (side)	--	--	--	95.9	115

Product: LED Driver

Type Designation: See in main report

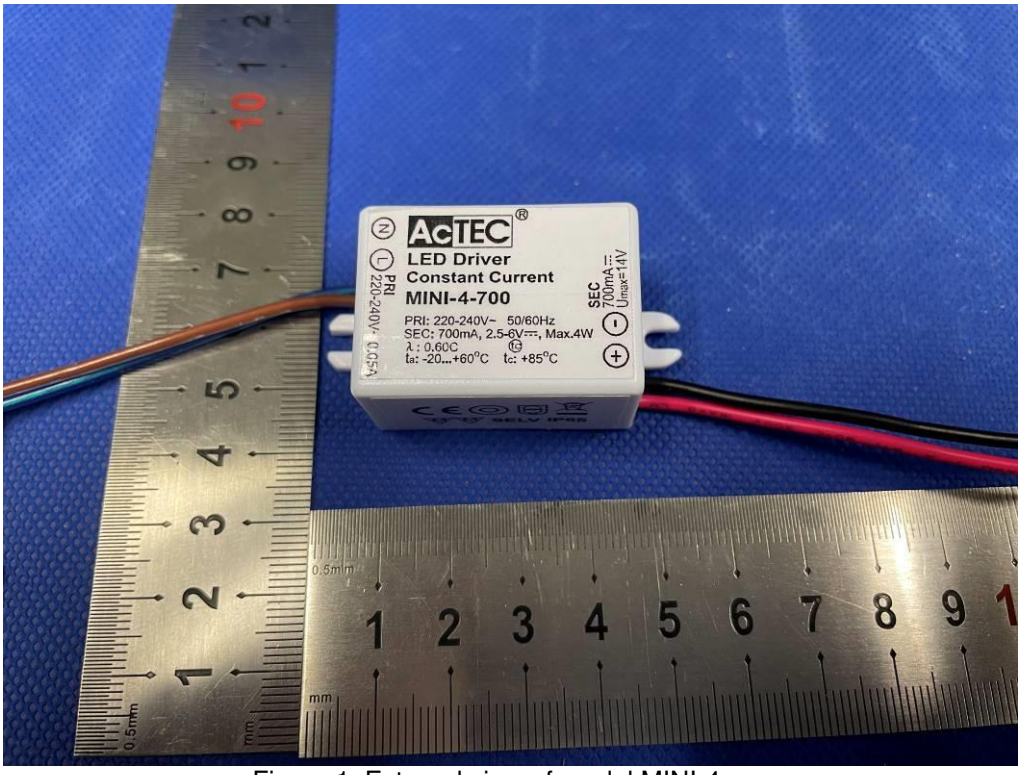


Figure 1. External view of model MINI-4-xxx

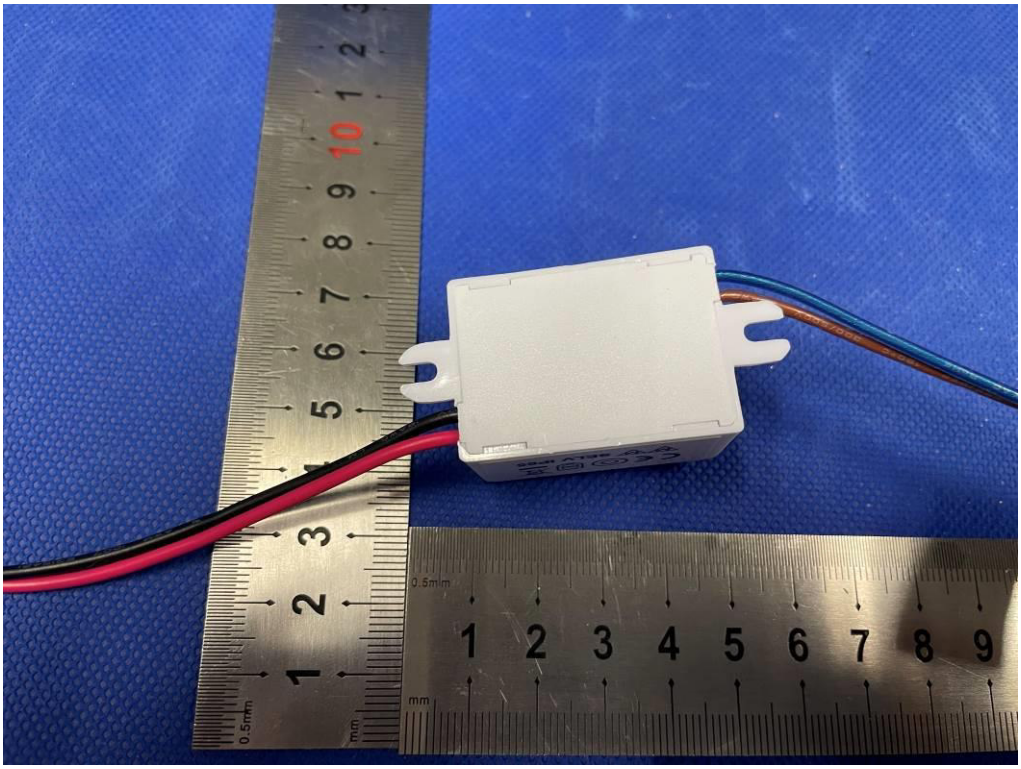


Figure 2. External view of model MINI-4-xxx

Product: LED Driver

Type Designation: See in main report

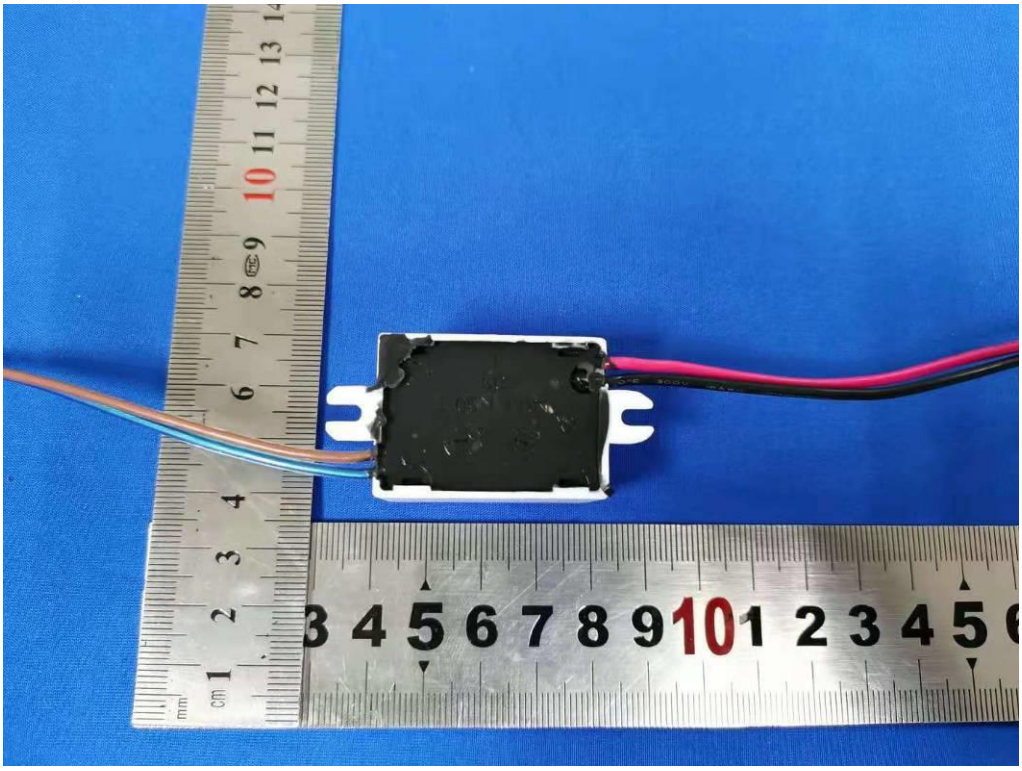


Figure 3. Internal view of model MINI-4-xxx

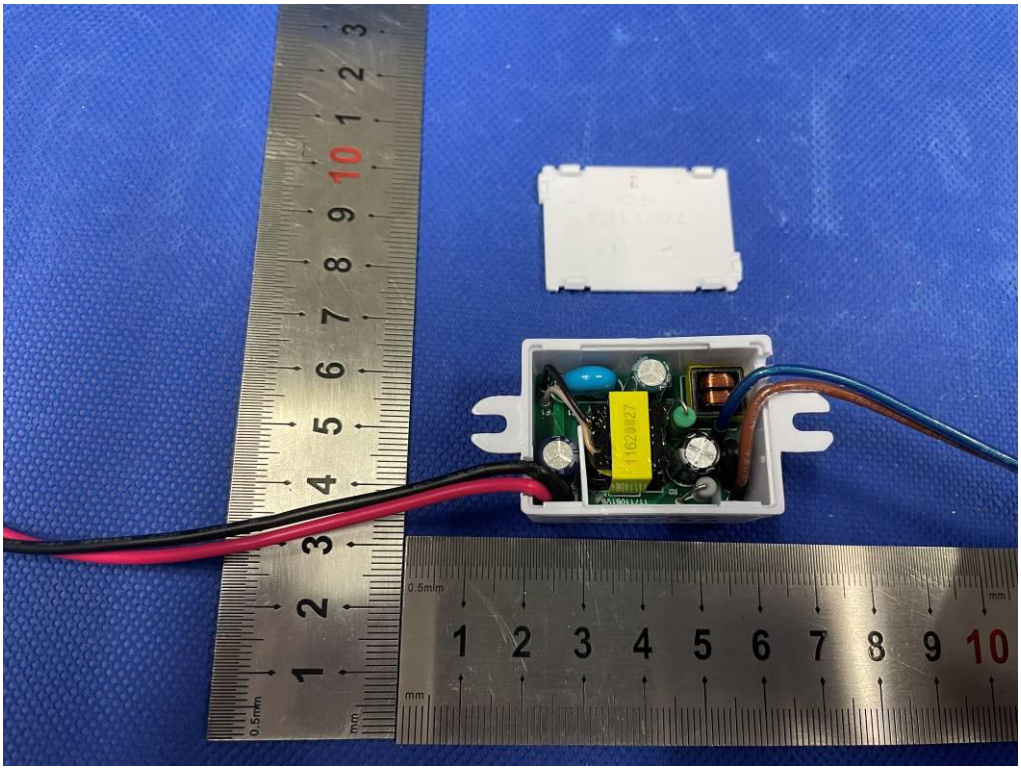


Figure 4. Internal view of model MINI-4-xxx after remove potting material

Product: LED Driver

Type Designation: See in main report

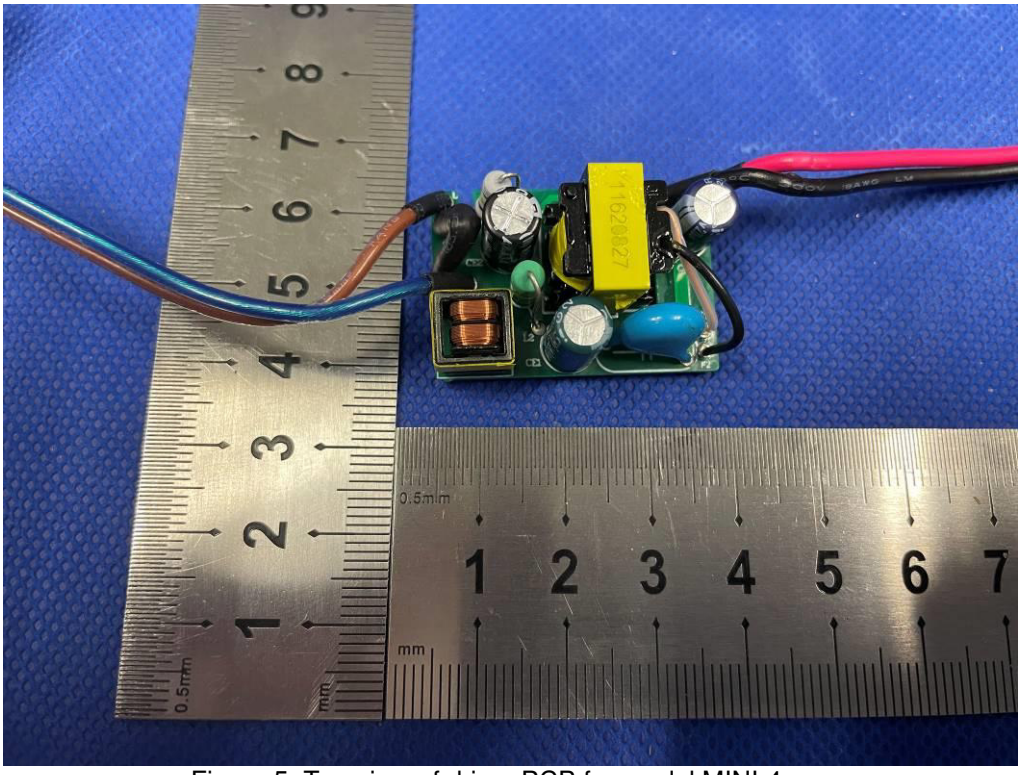


Figure 5. Top view of driver PCB for model MINI-4-xxx

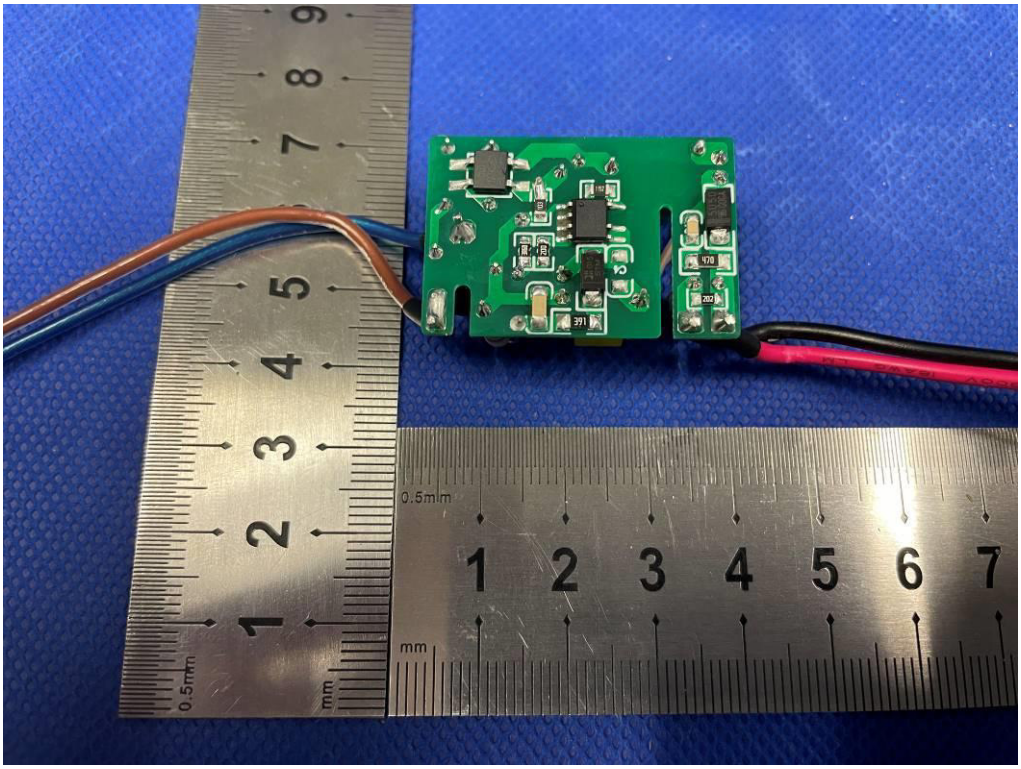


Figure 6. Bottom view of driver PCB for model MINI-4-xxx

Product: LED Driver

Type Designation: See in main report

Figure 7. Transformer of model MINI-4-xxx

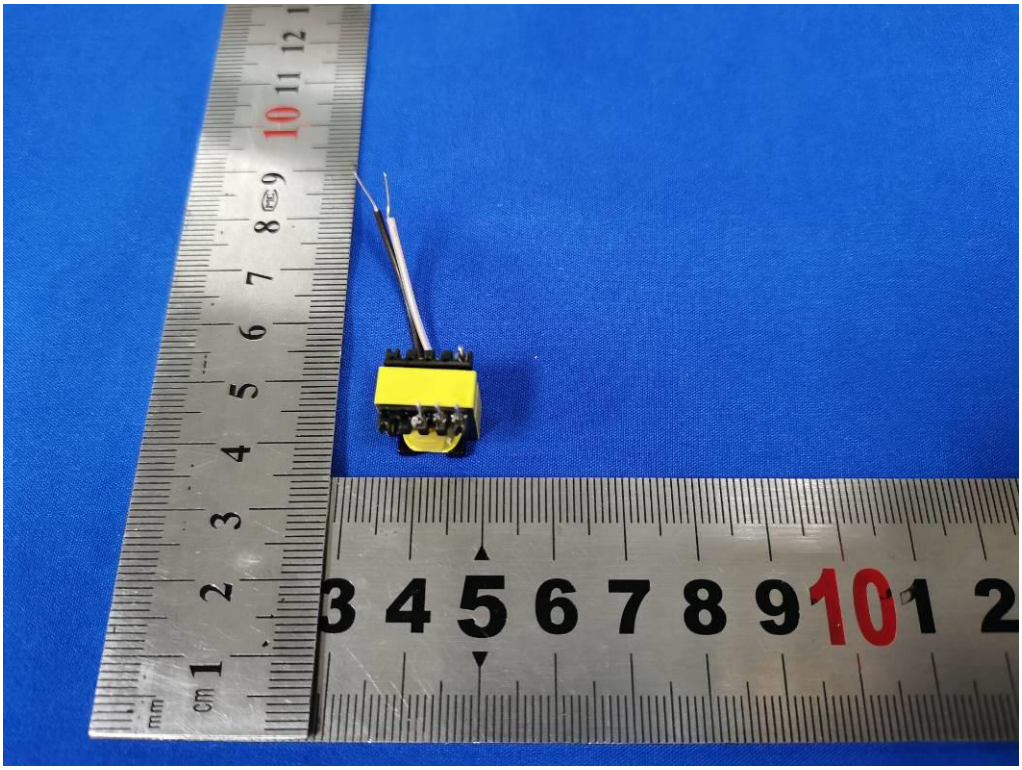


Figure 8. Transformer of model MINI-4-xxx

Product: LED Driver

Type Designation: See in main report

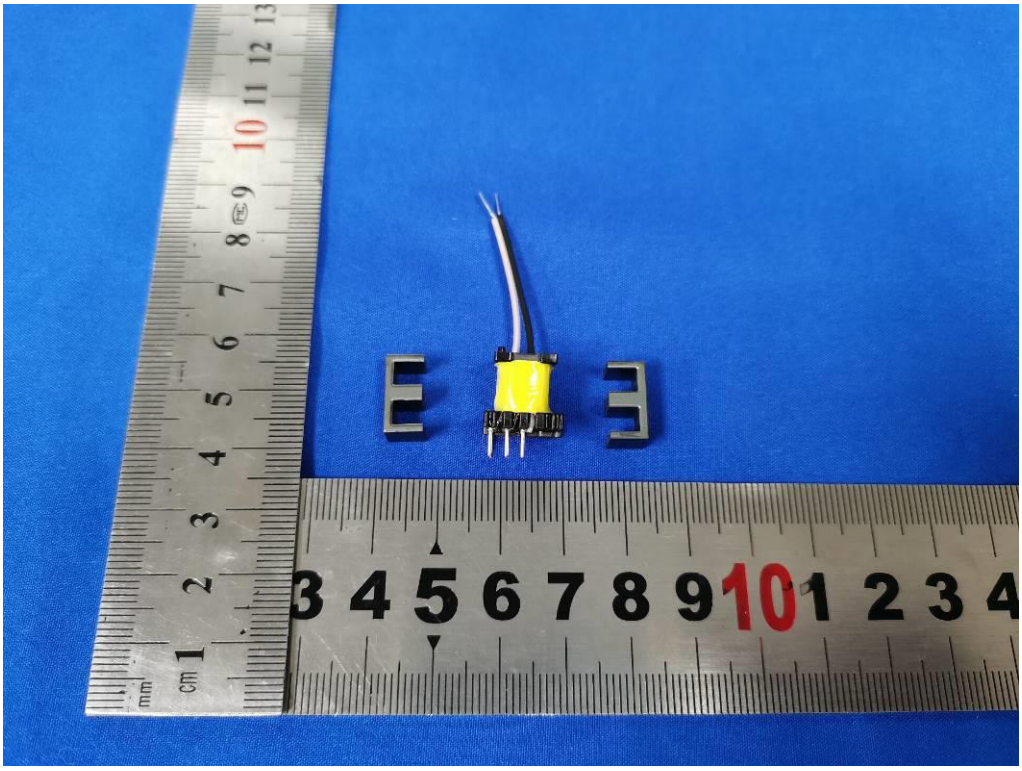


Figure 9. Transformer of model MINI-4-xxx

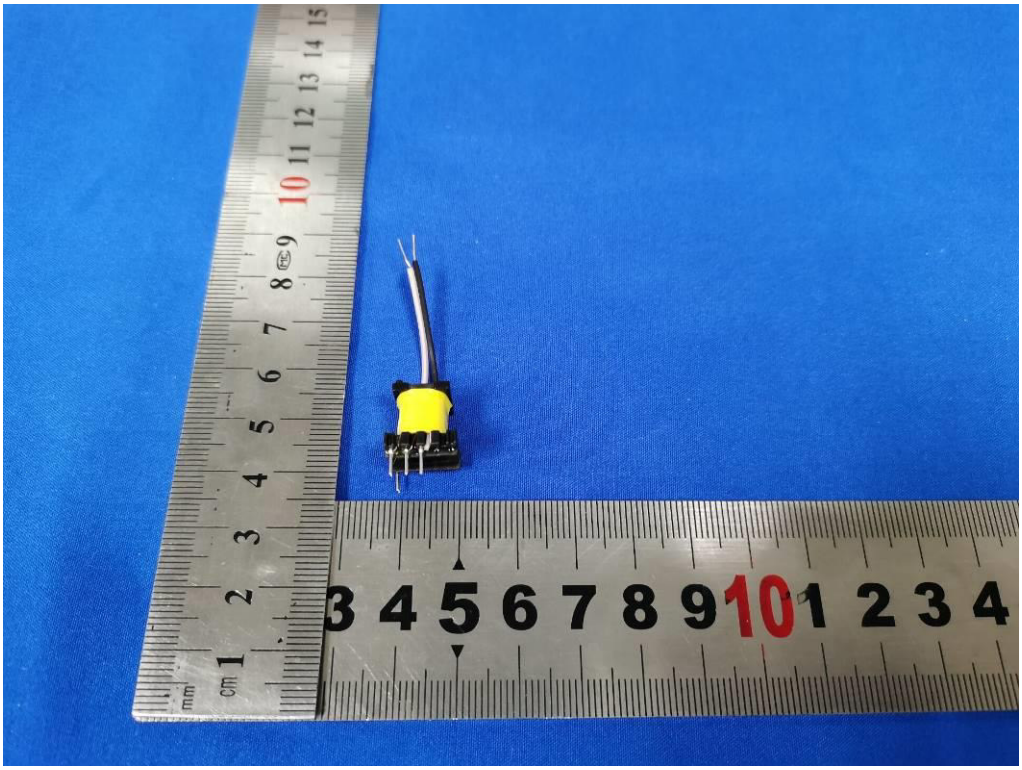


Figure 10. Transformer of model MINI-4-xxx

Product: LED Driver

Type Designation: See in main report

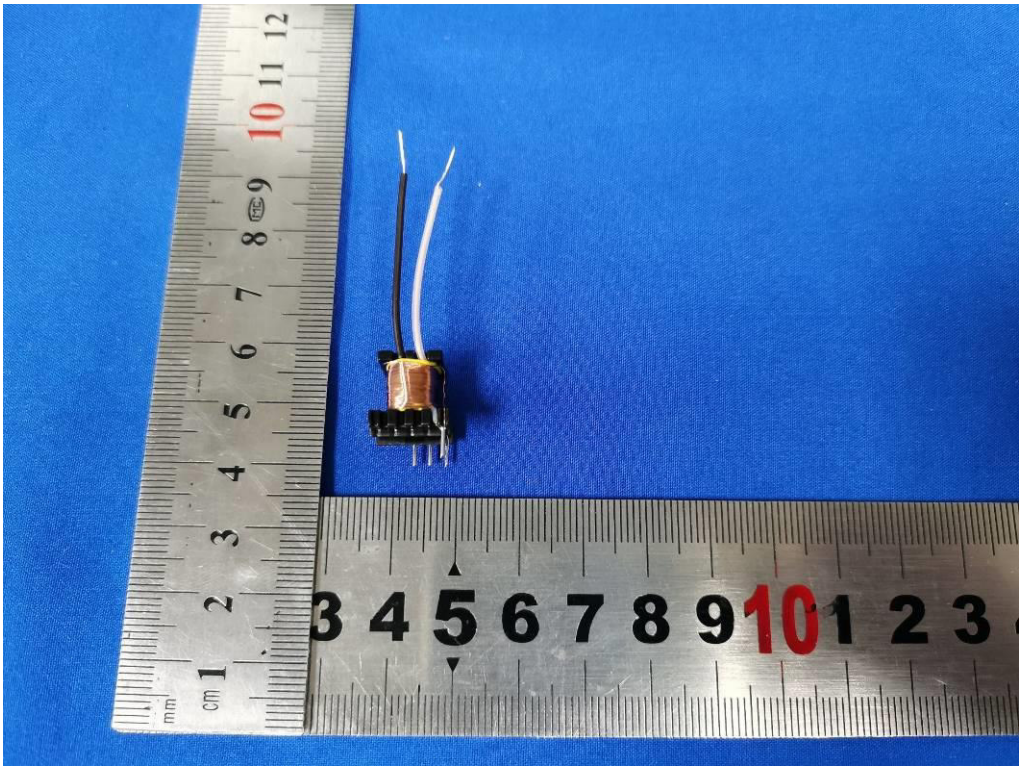


Figure 11. Transformer of model MINI-4-xxx

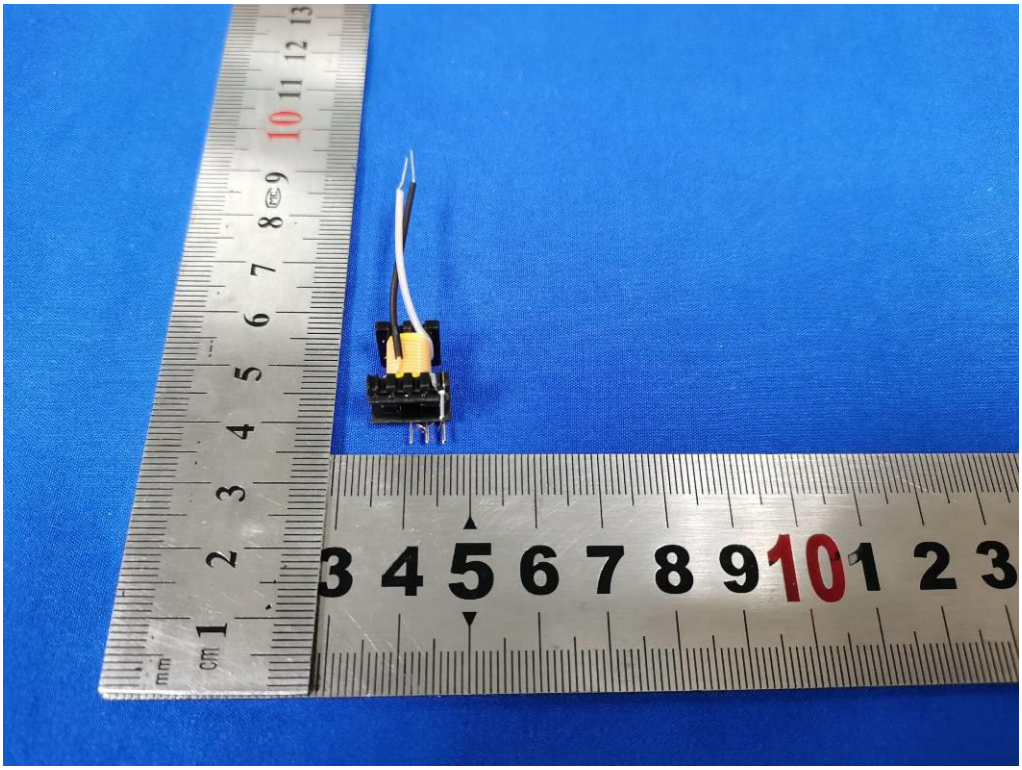


Figure 12. Transformer of model MINI-4-xxx

Product: LED Driver

Type Designation: See in main report

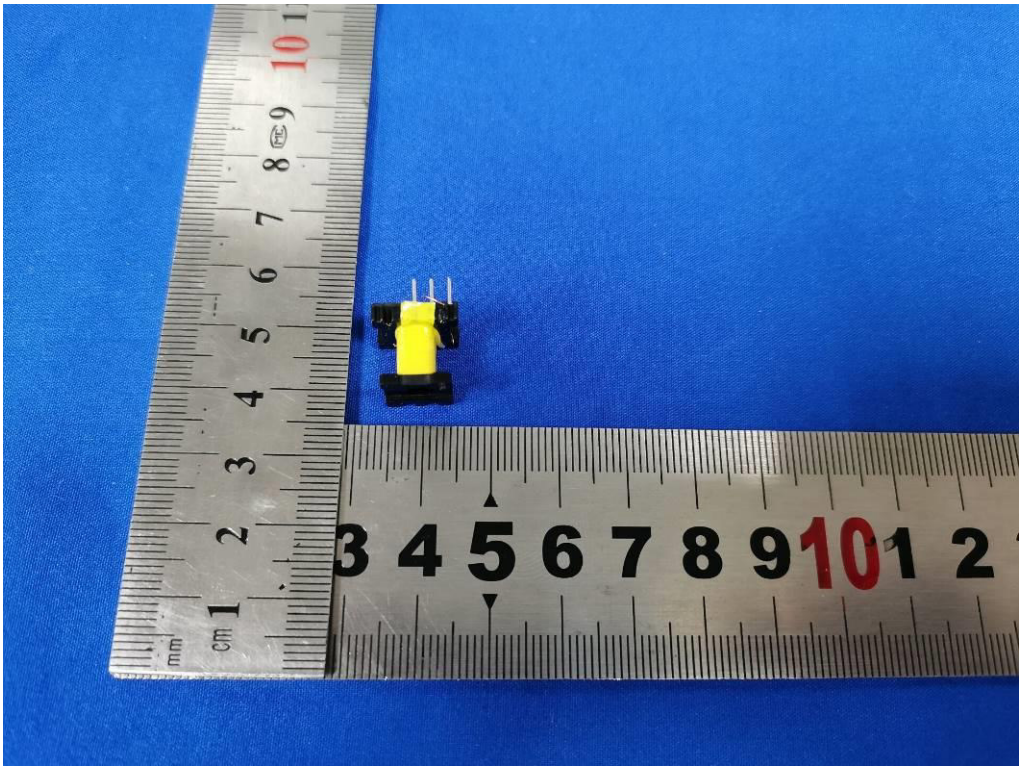


Figure 13. Transformer of model MINI-4-xxx

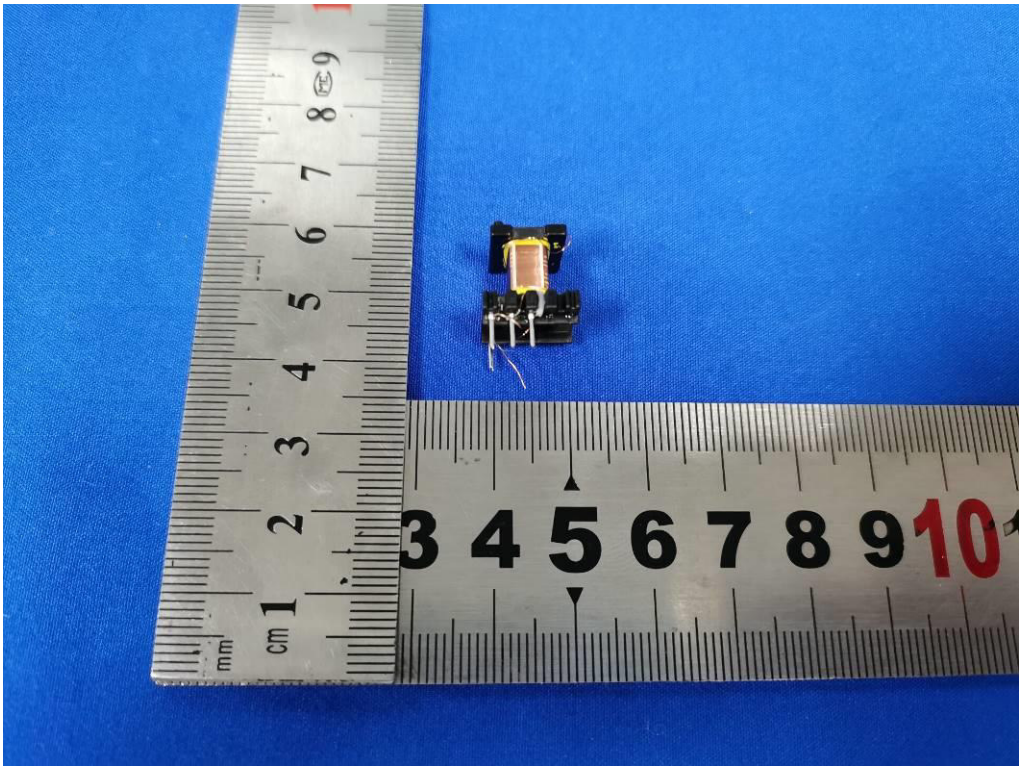


Figure 14. Transformer of model MINI-4-xxx

Product: LED Driver

Type Designation: See in main report

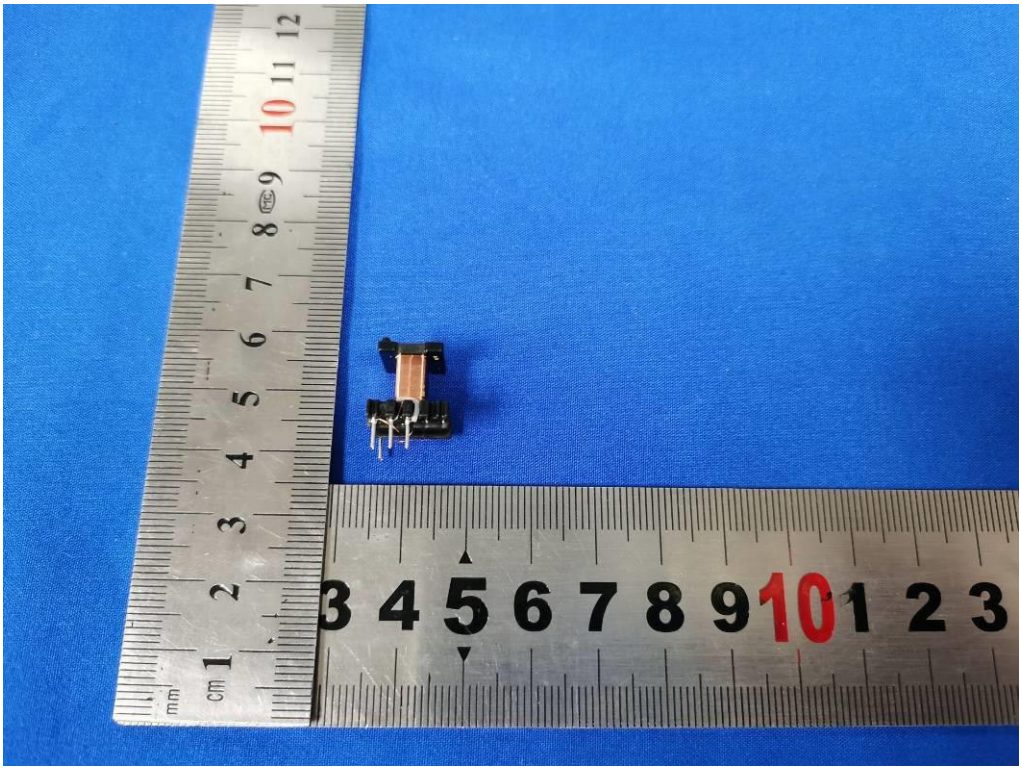


Figure 15. Transformer of model MINI-4-xxx

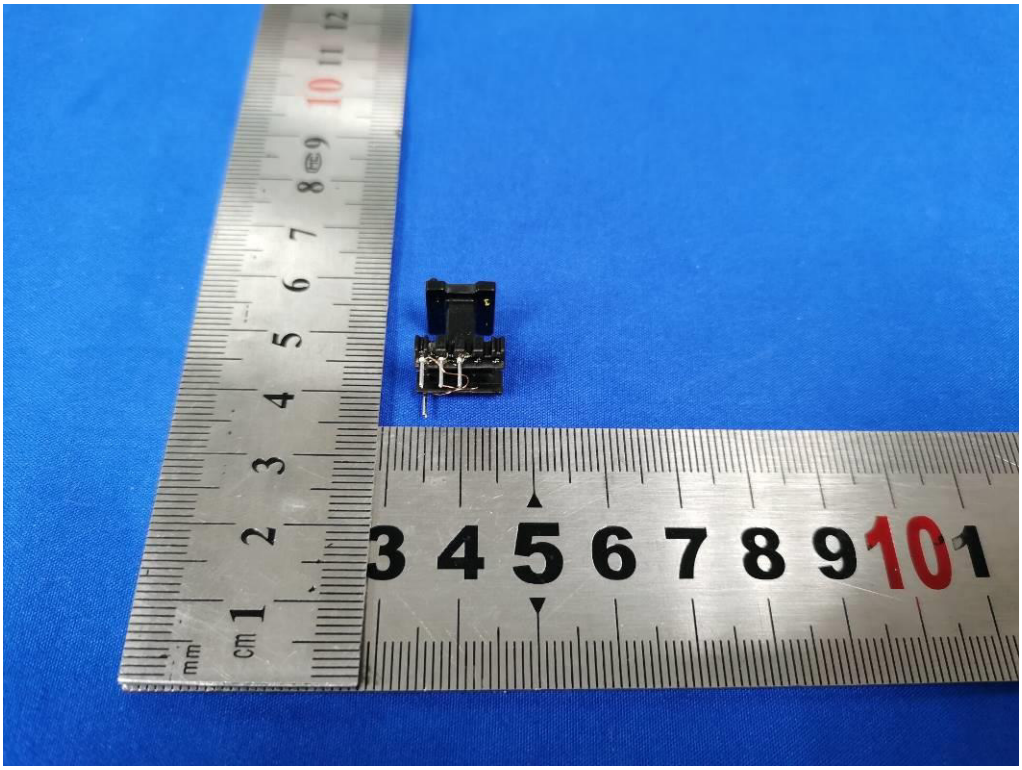


Figure 16. Transformer of model MINI-4-xxx

Product: LED Driver

Type Designation: See in main report

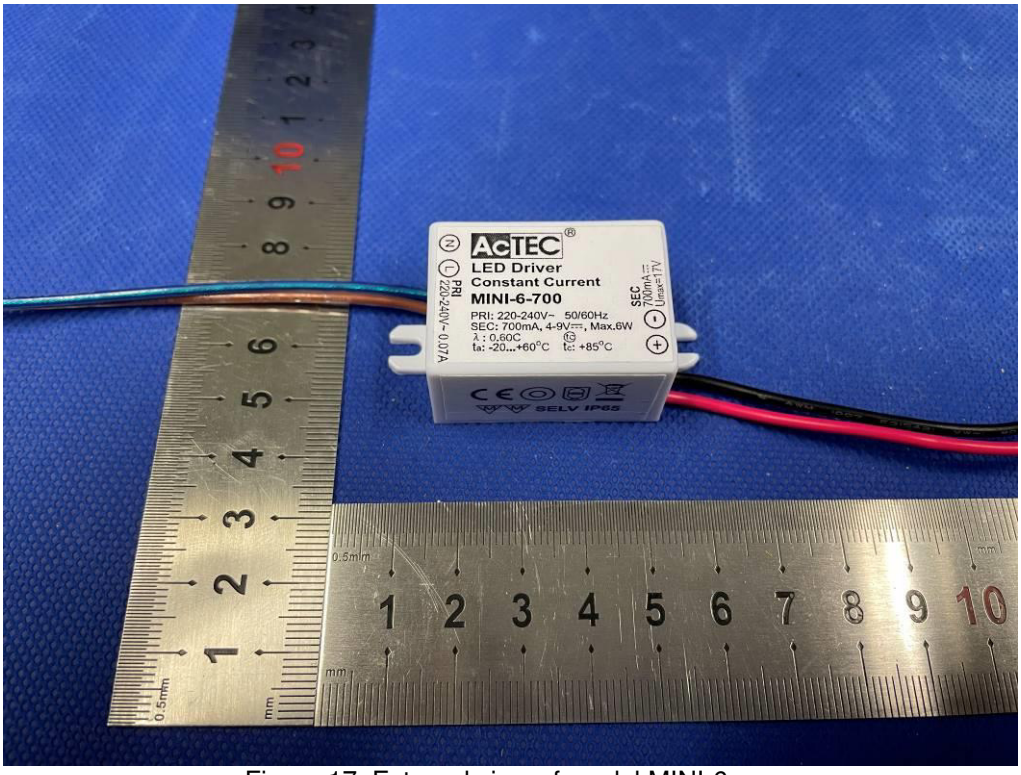


Figure 17. External view of model MINI-6-yyy

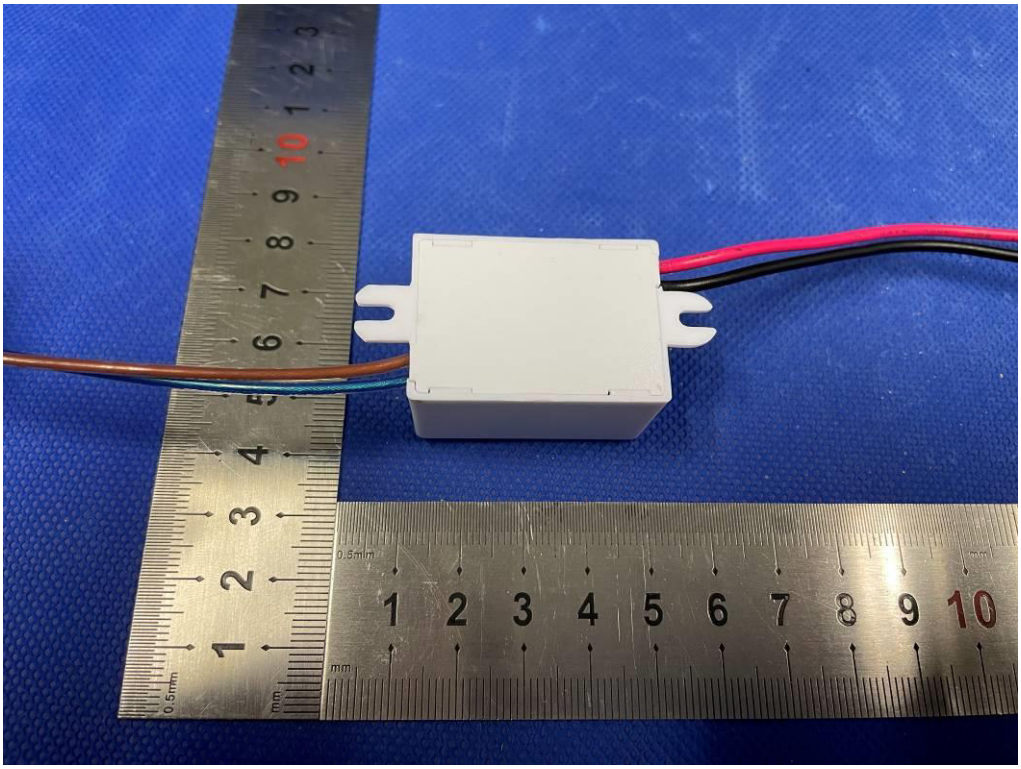


Figure 18. External view of model MINI-6-yyy

Product: LED Driver

Type Designation: See in main report

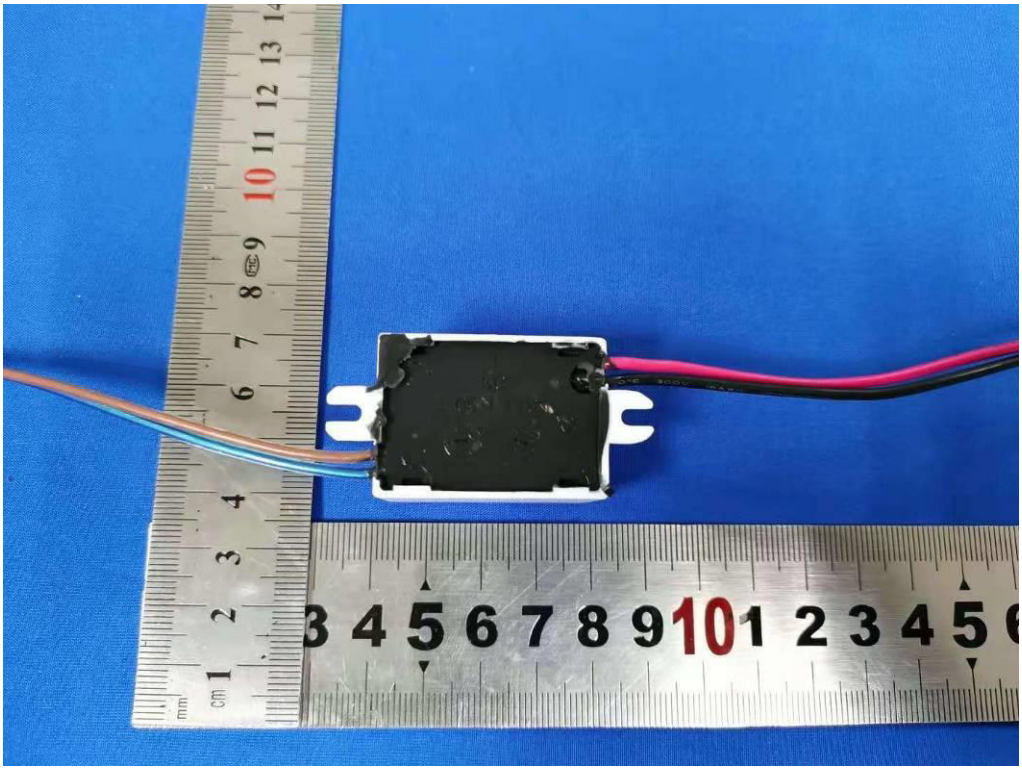


Figure 19. Internal view of model MINI-6-yyy

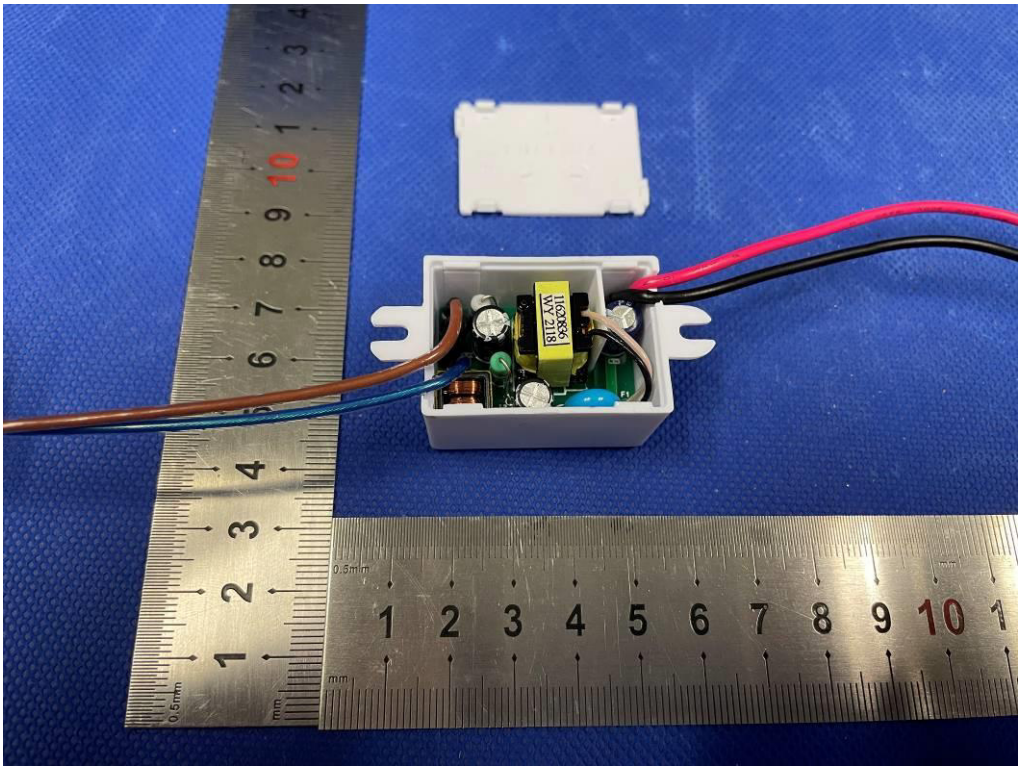


Figure 20. Internal view of model MINI-6-yyy after remove potting material

Product: LED Driver

Type Designation: See in main report

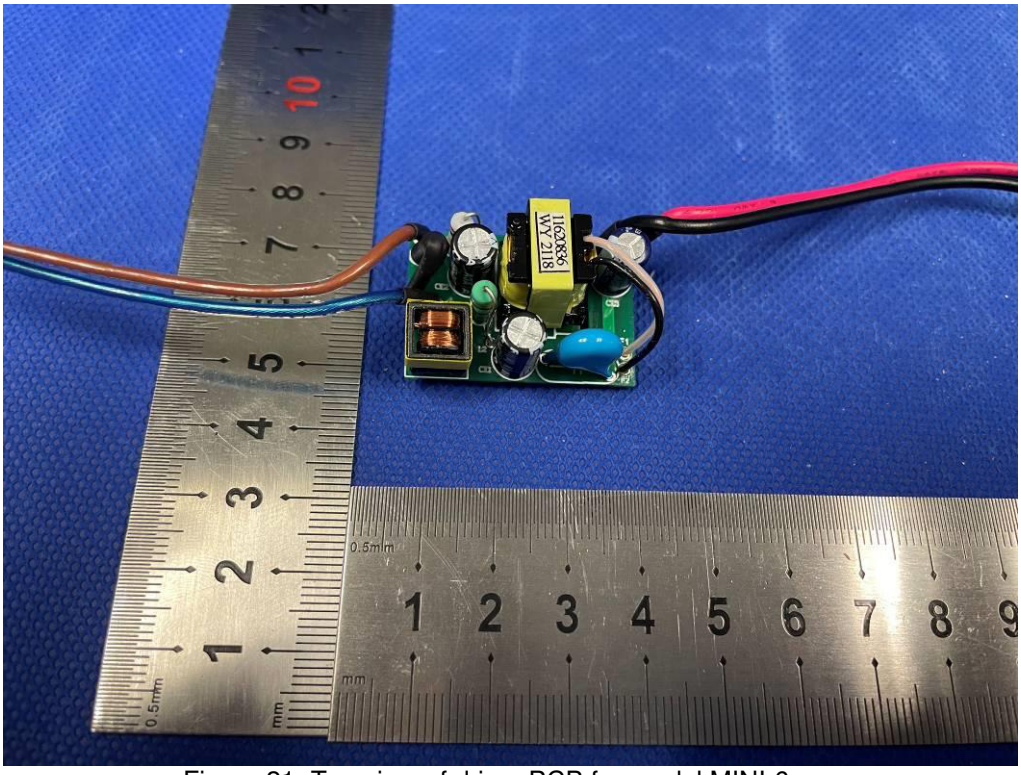


Figure 21. Top view of driver PCB for model MINI-6-yyy

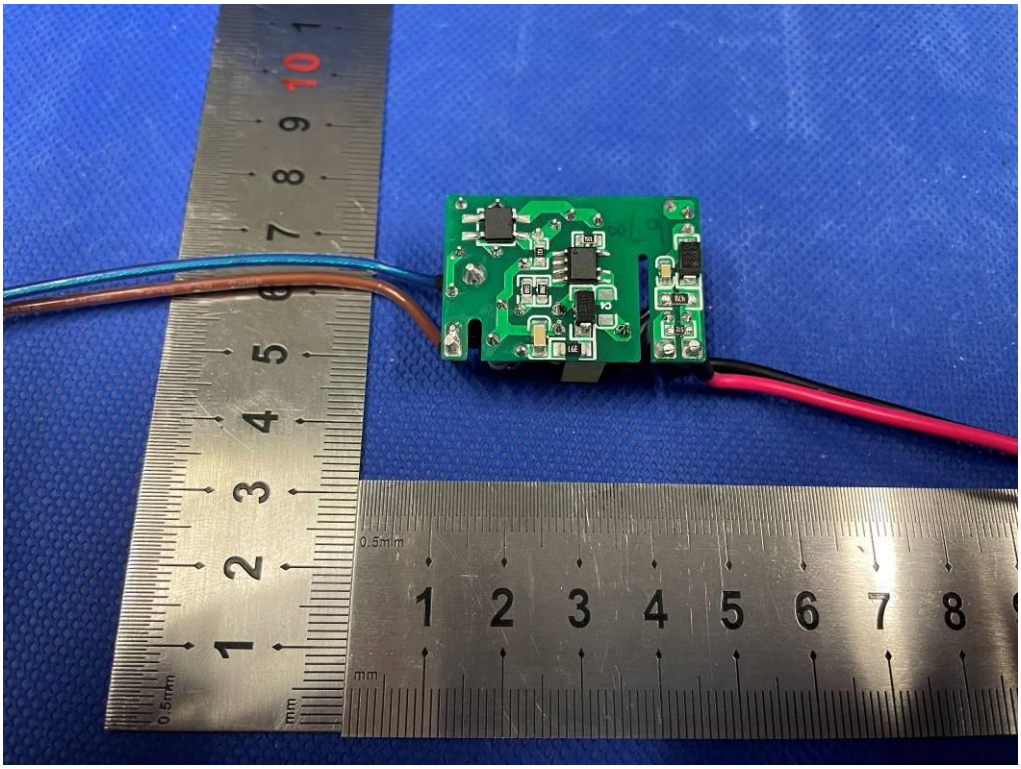


Figure 22. Bottom view of driver PCB for model MINI-6-yyy

Product: LED Driver

Type Designation: See in main report

Figure 23. Transformer of model MINI-6-yyy

Figure 24. Transformer of model MINI-6-yyy

Product: LED Driver

Type Designation: See in main report

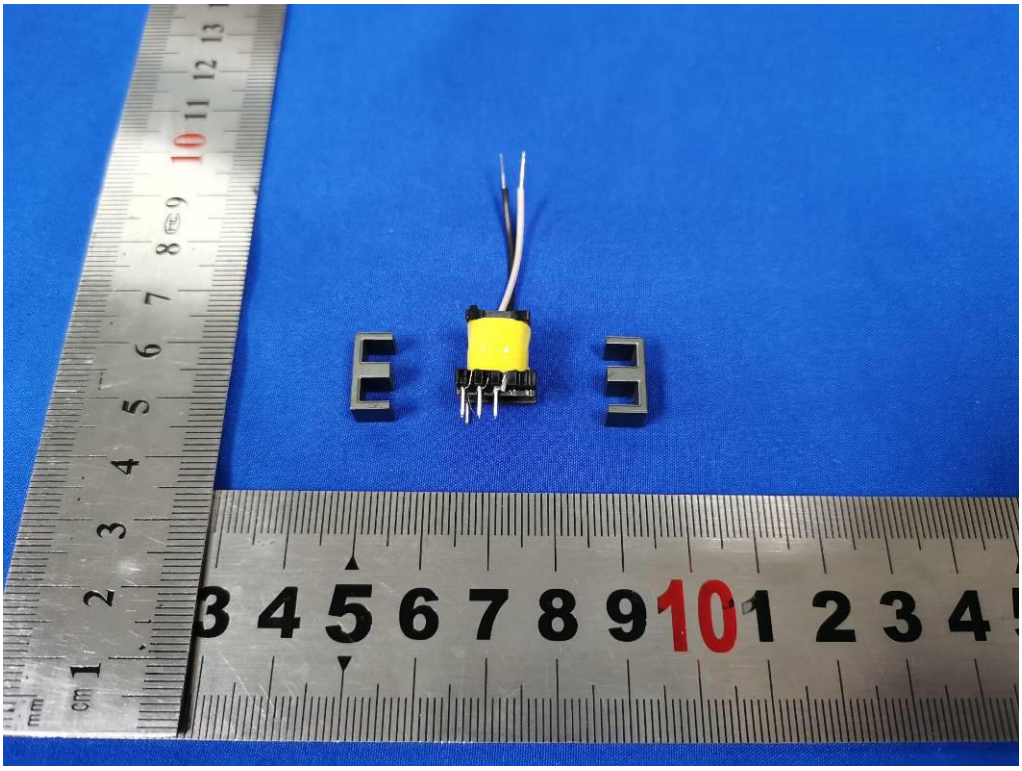


Figure 25. Transformer of model MINI-6-yyy

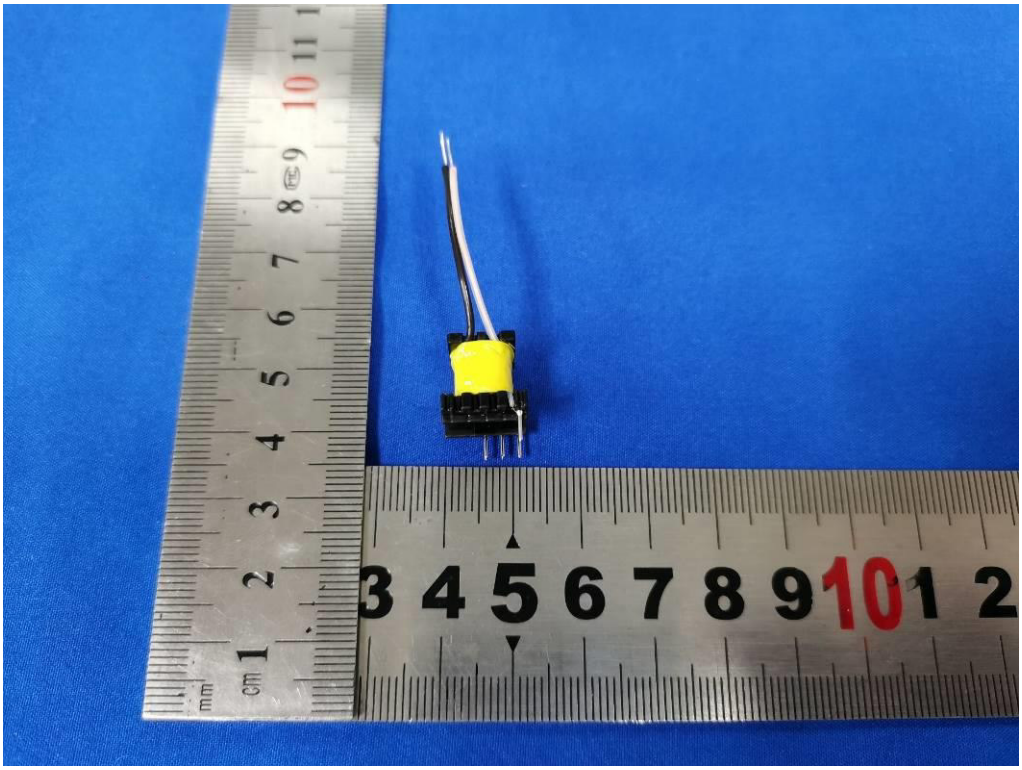


Figure 26. Transformer of model MINI-6-yyy

Product: LED Driver

Type Designation: See in main report

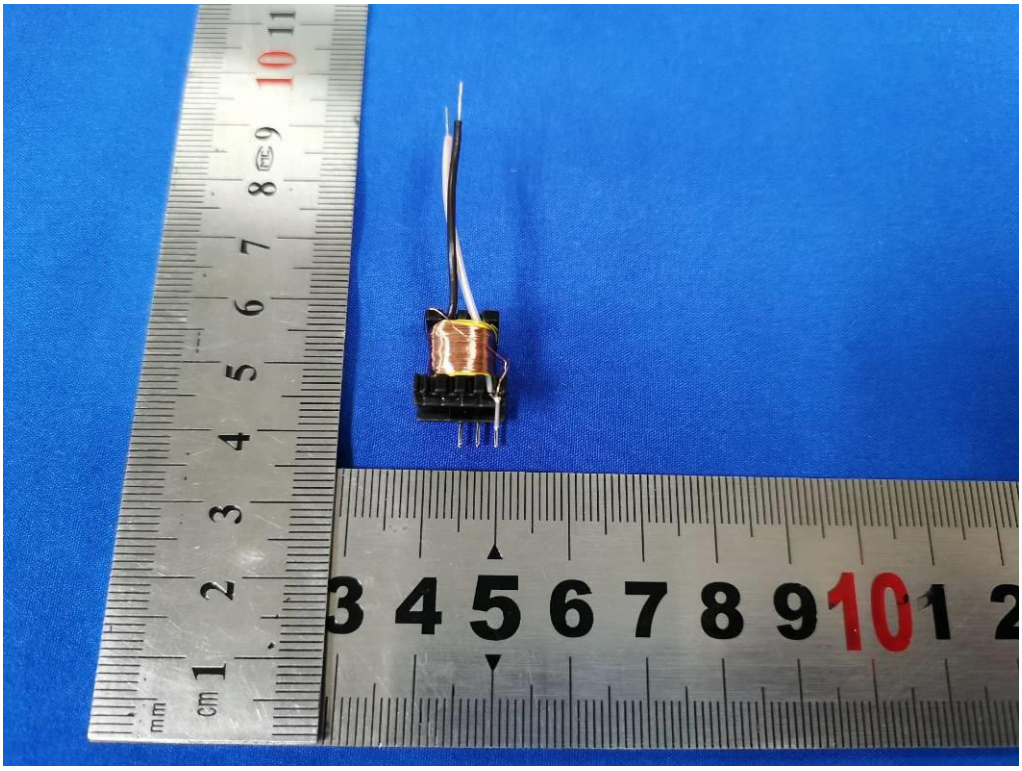


Figure 27. Transformer of model MINI-6-yyy

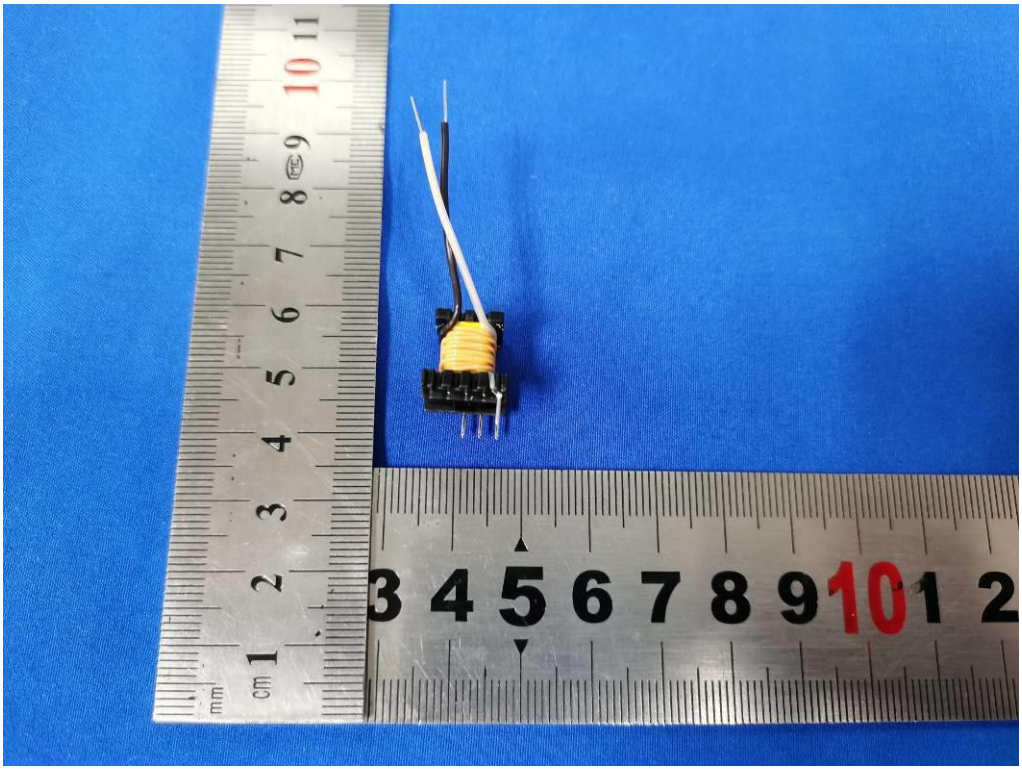


Figure 28. Transformer of model MINI-6-yyy

Product: LED Driver

Type Designation: See in main report

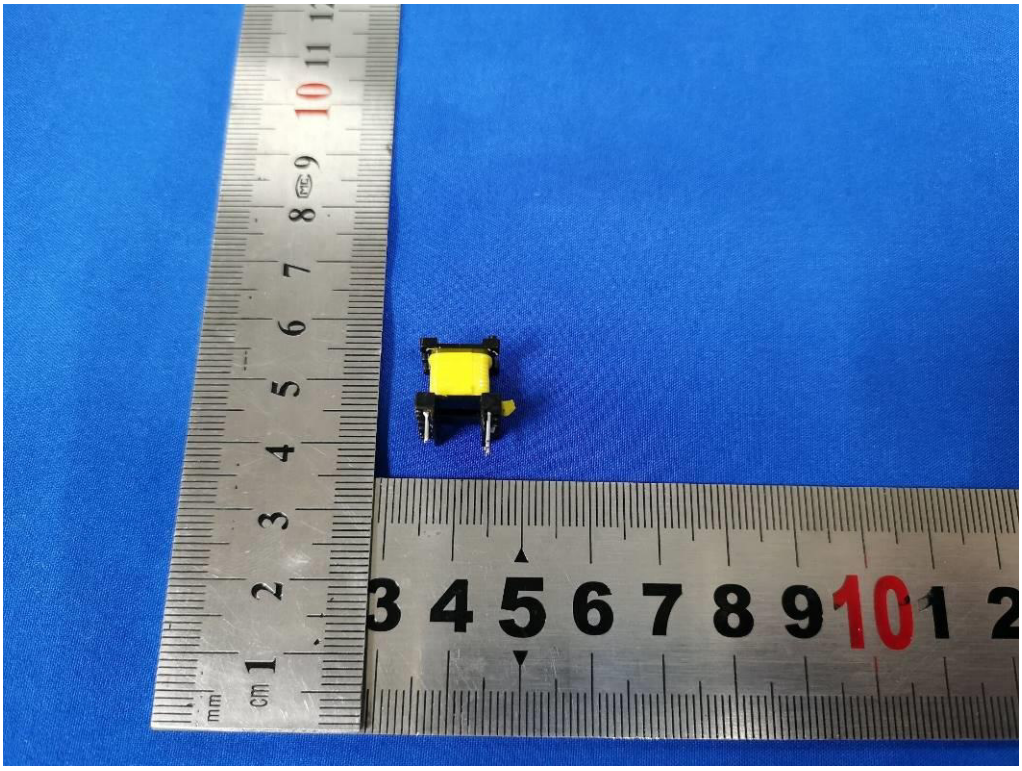


Figure 29. Transformer of model MINI-6-yyy

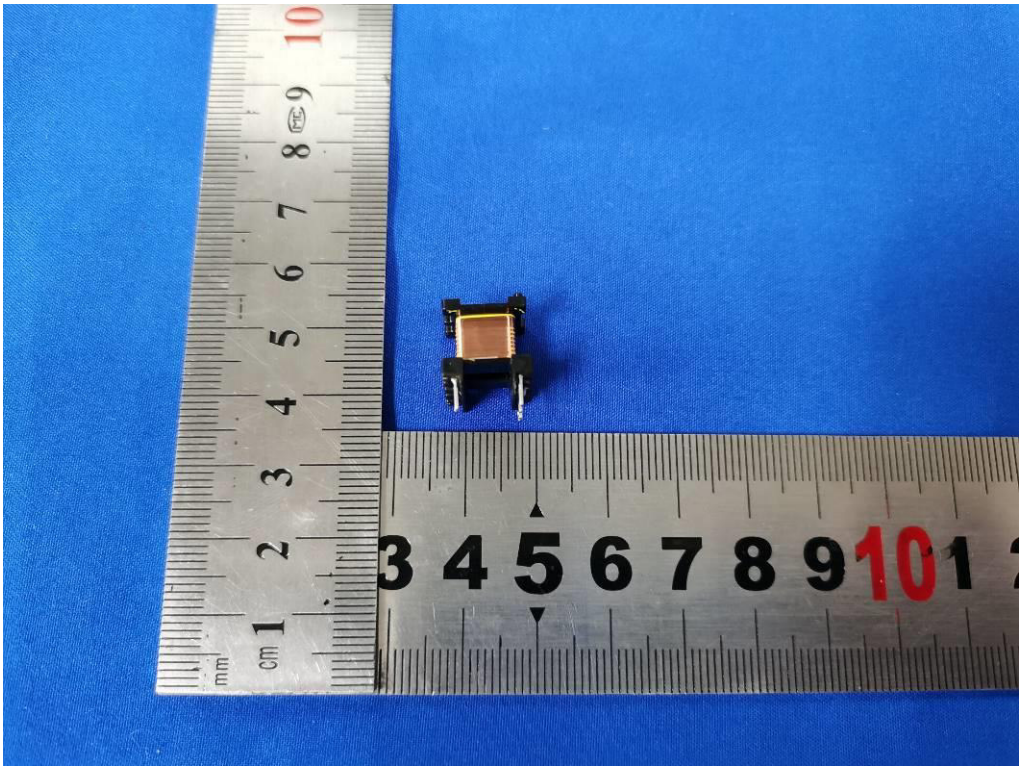


Figure 30. Transformer of model MINI-6-yyy

Product: LED Driver

Type Designation: See in main report

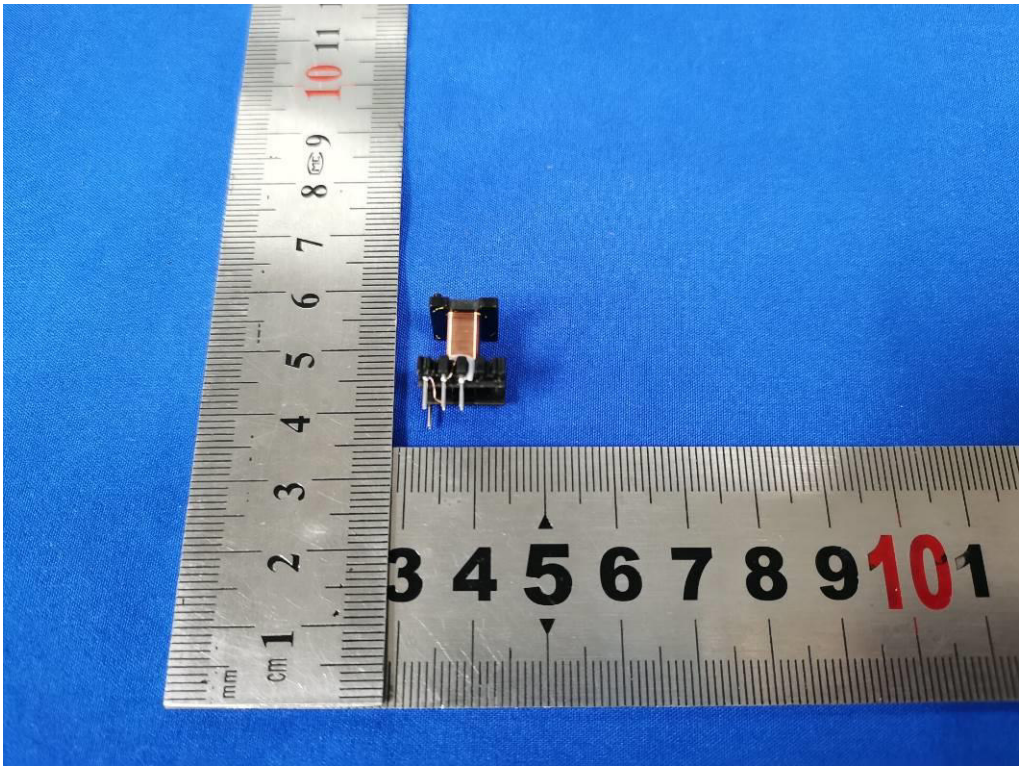


Figure 31. Transformer of model MINI-6-yyy

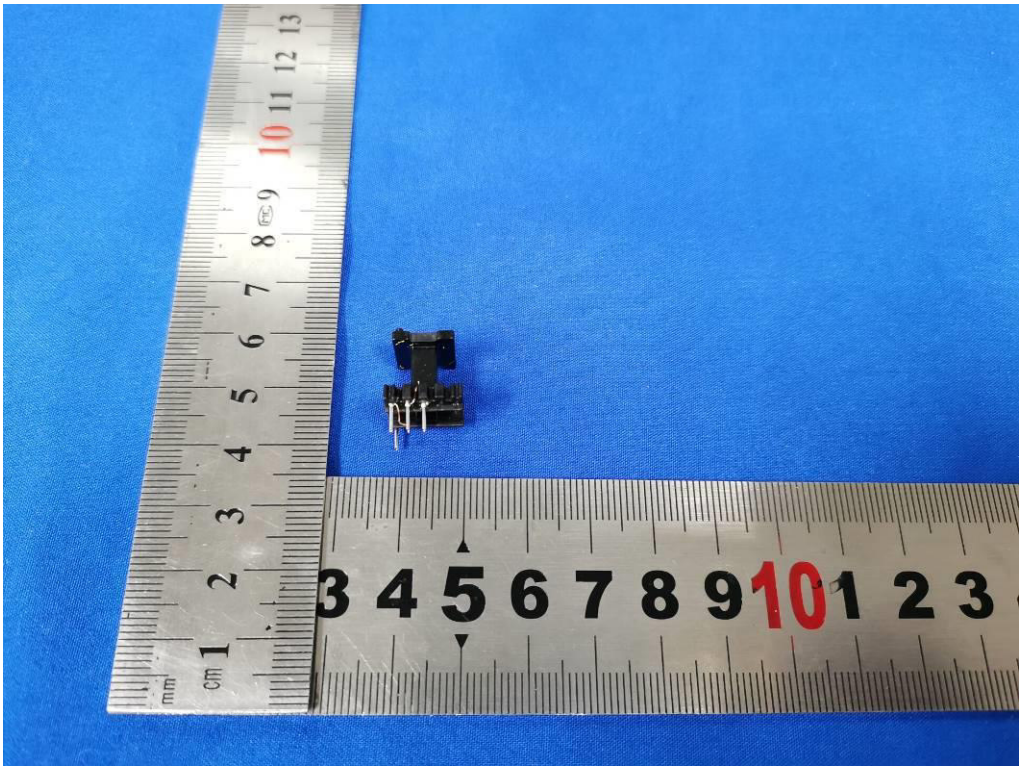


Figure 32. Transformer of model MINI-6-yyy

Product: LED Driver

Type Designation: See in main report

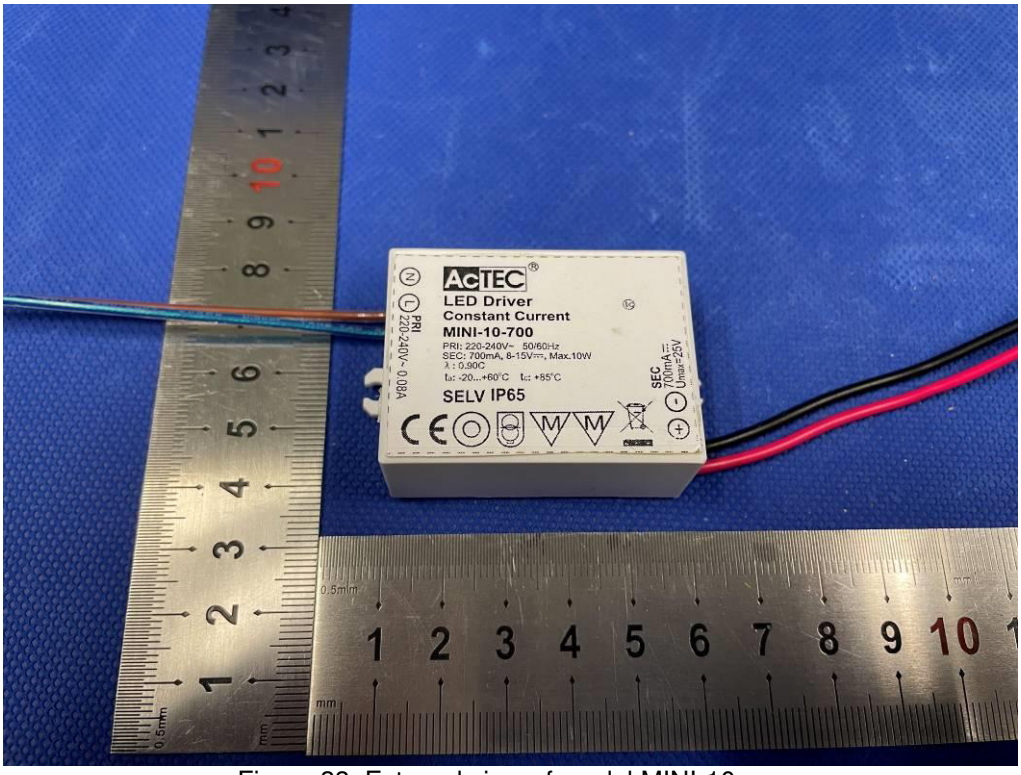


Figure 33. External view of model MINI-10-zzz

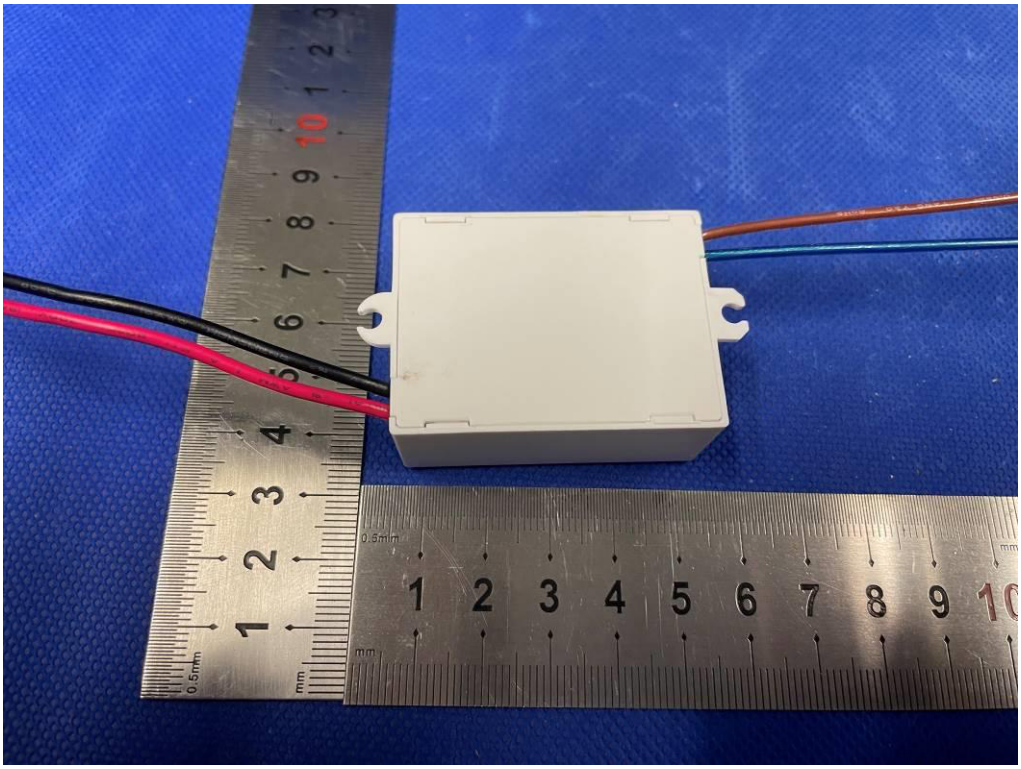


Figure 34. External view of model MINI-10-zzz

Product: LED Driver

Type Designation: See in main report

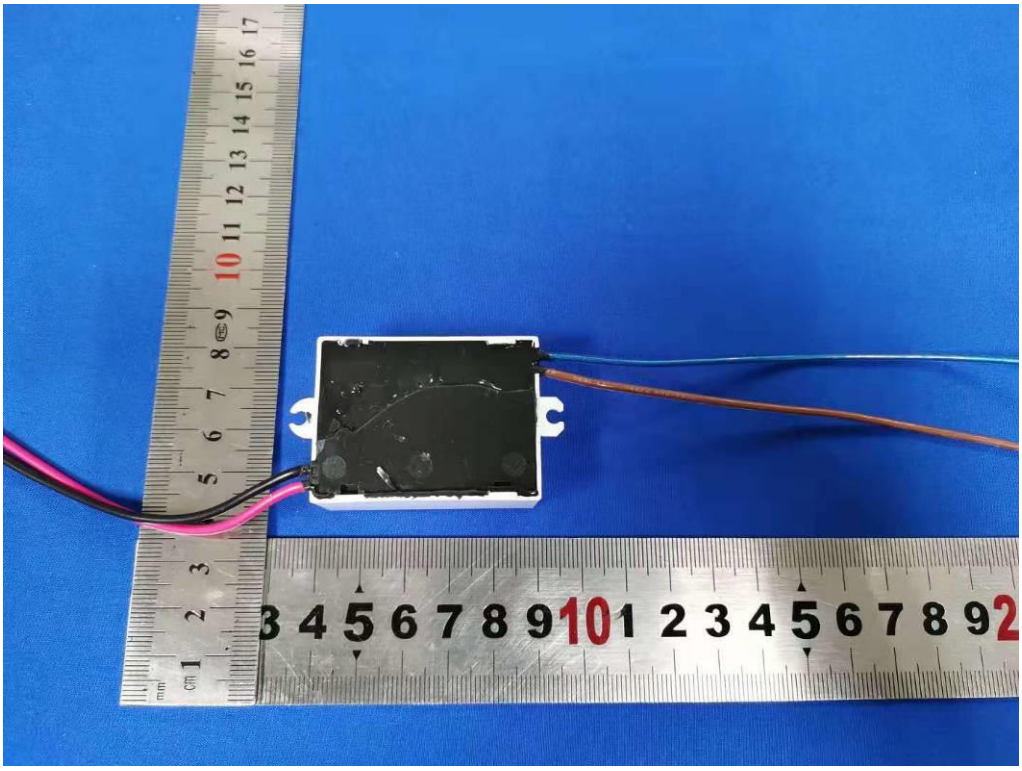


Figure 35. Internal view of model MINI-10-zzz

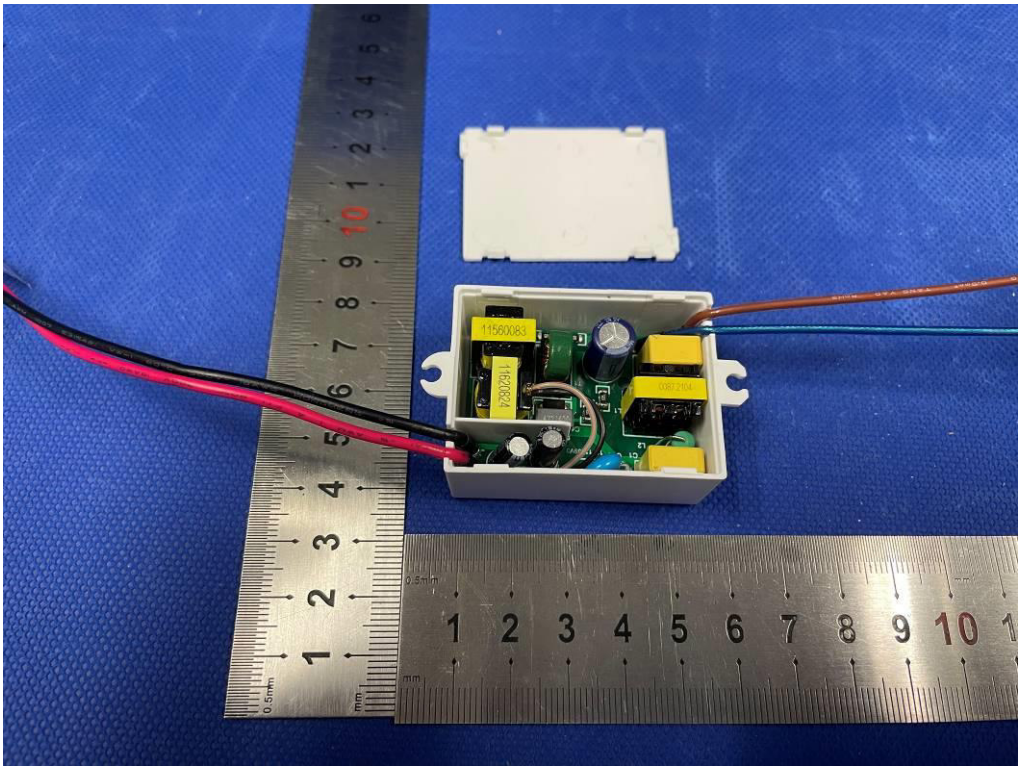


Figure 36. Internal view of model MINI-10-zzz after remove potting material

Product: LED Driver

Type Designation: See in main report

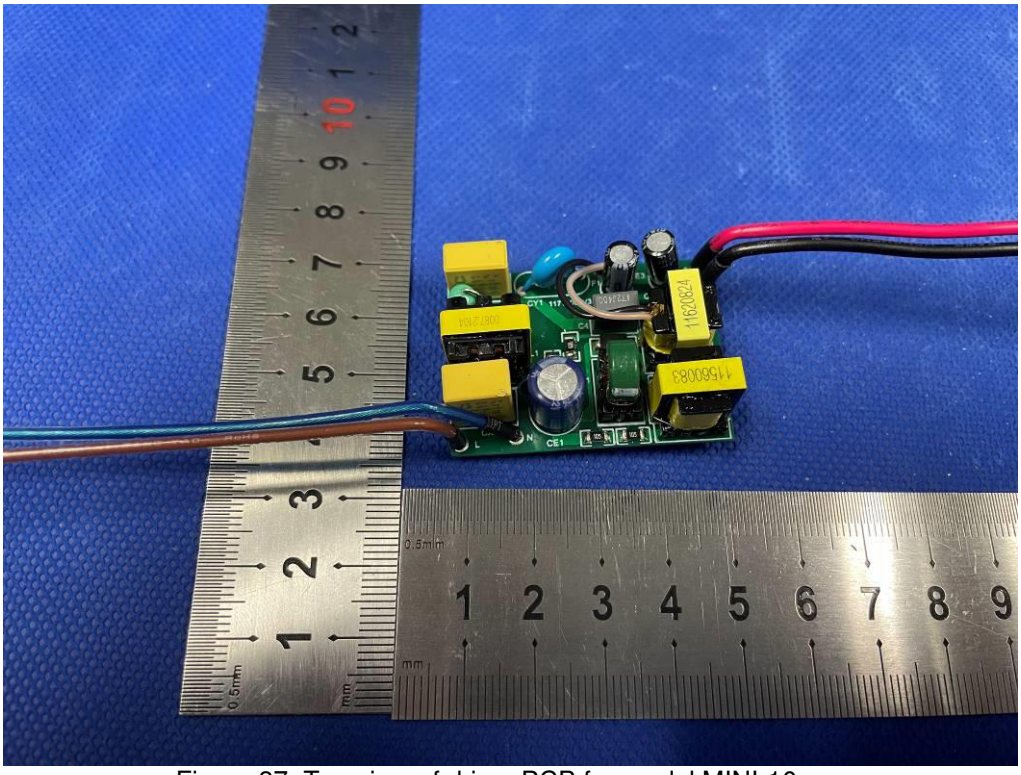


Figure 37. Top view of driver PCB for model MINI-10-zzz

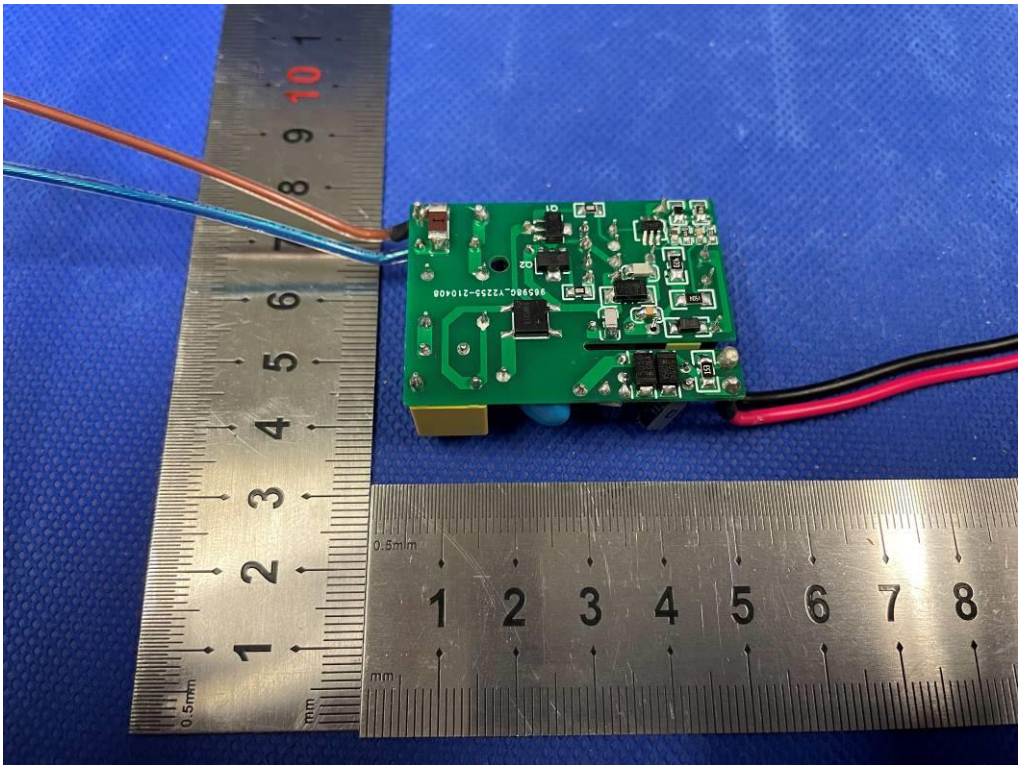


Figure 38. Bottom view of driver PCB for model MINI-10-zzz

Product: LED Driver

Type Designation: See in main report

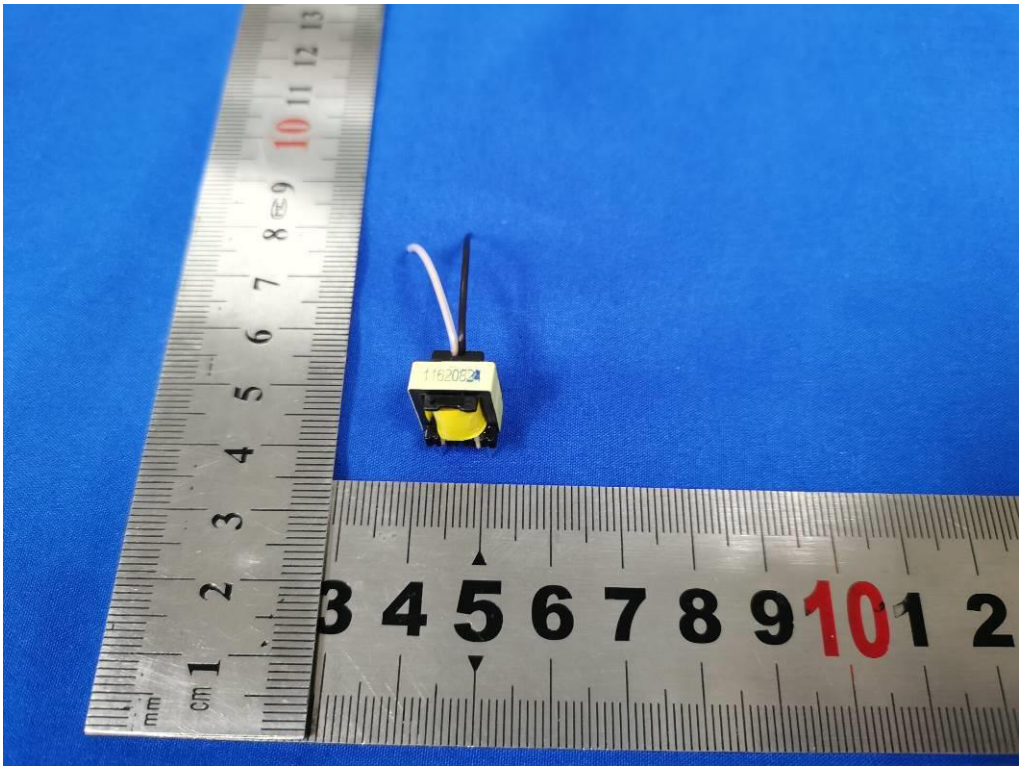


Figure 39. Transformer of model MINI-10-zzz

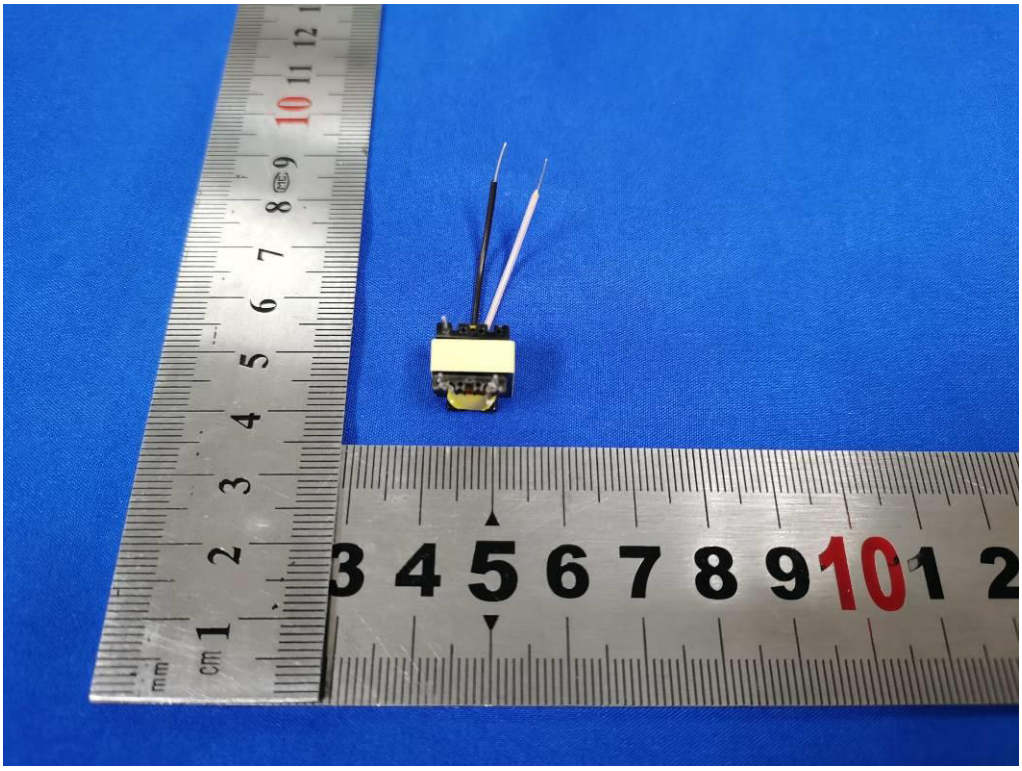


Figure 40. Transformer of model MINI-10-zzz

Product: LED Driver

Type Designation: See in main report

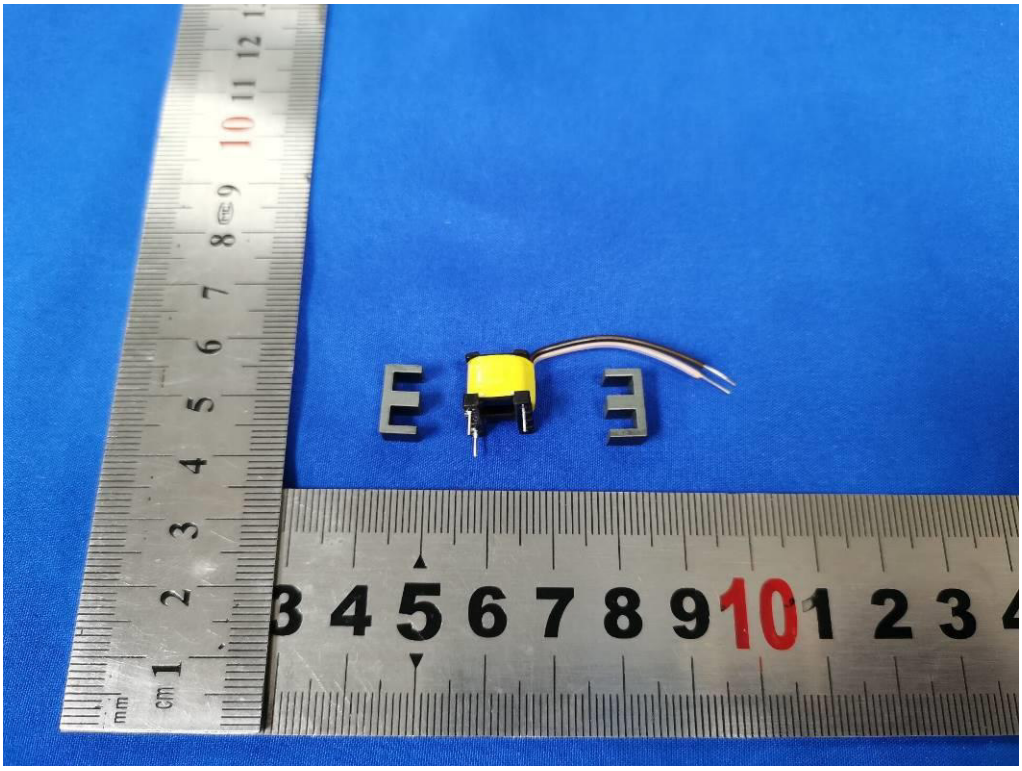


Figure 41. Transformer of model MINI-10-zzz

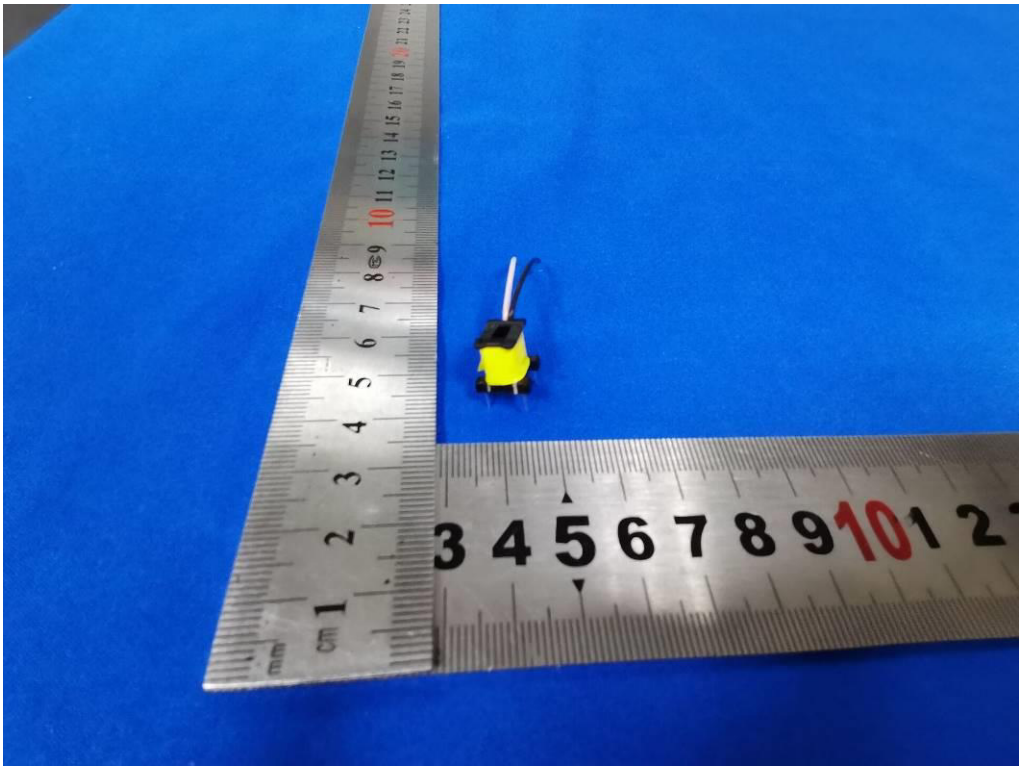


Figure 42. Transformer of model MINI-10-zzz

Product: LED Driver

Type Designation: See in main report

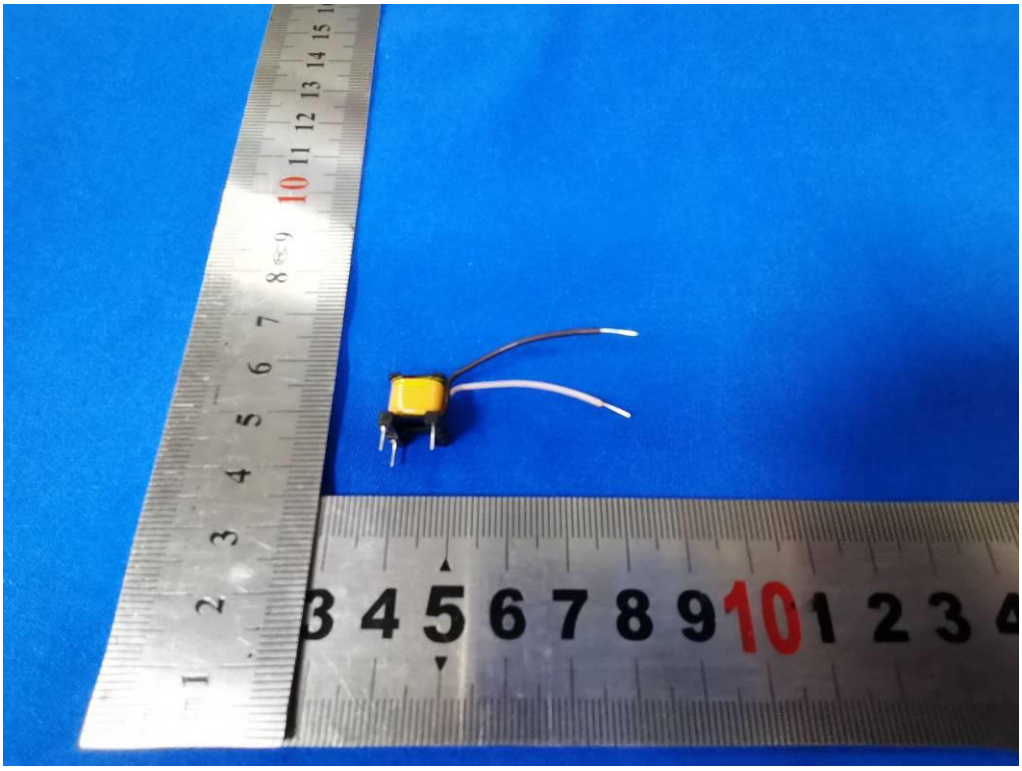


Figure 43. Transformer of model MINI-10-zzz

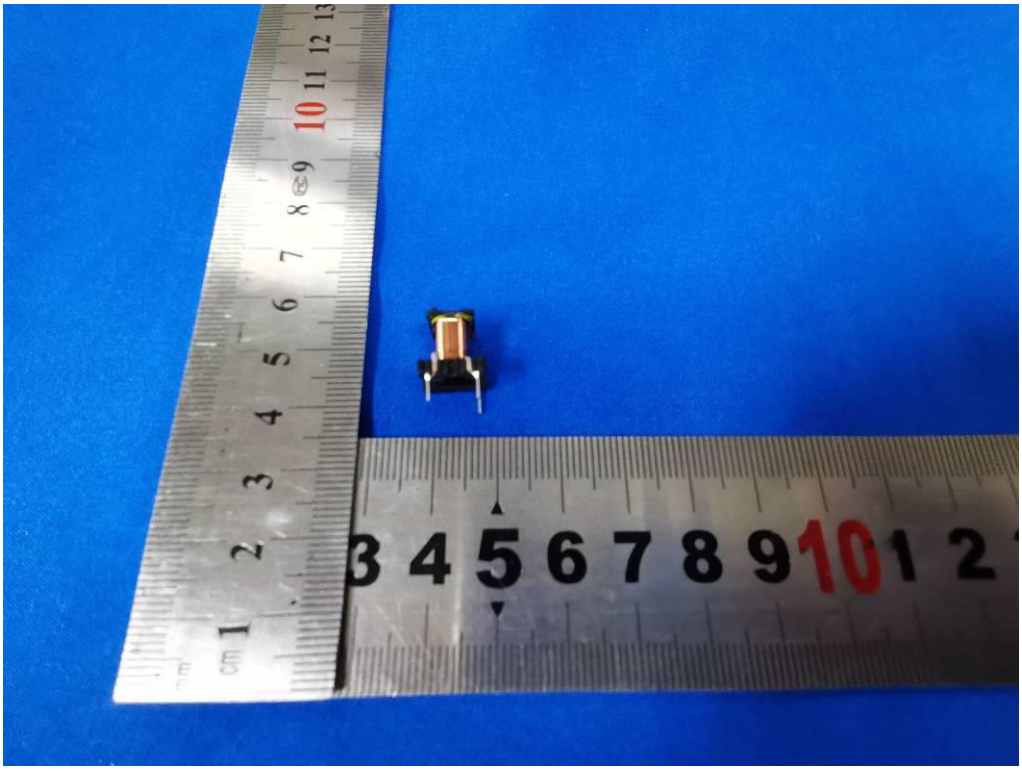


Figure 44. Transformer of model MINI-10-zzz

Product: LED Driver

Type Designation: See in main report

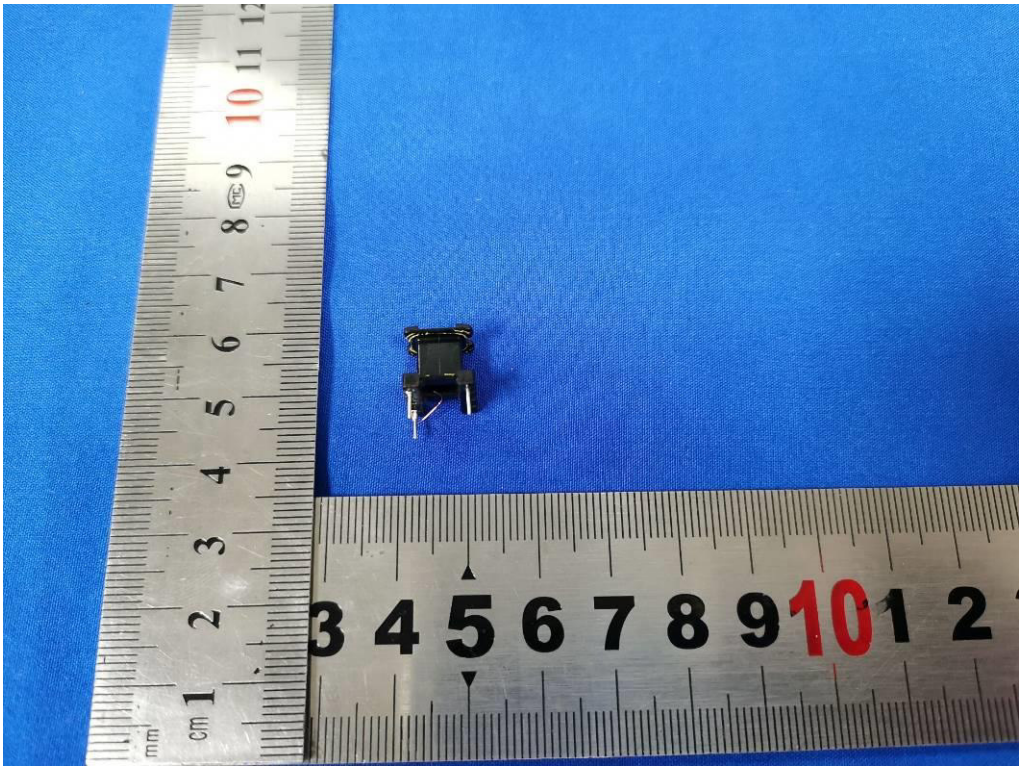


Figure 45. Transformer of model MINI-10-zzz