Littelfuse
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Littelfuse, Inc.
8755 West Higgins Road, Suite 500
Chicago, IL 60631 USA
(773) 628-1000

May 24, 2023

LFPCN PG0163 – KLKD_CN Series from Suzhou China Manufacturing Range

Dear Valued Customer,

Littelfuse would like to notify you about the availability of our KLKD Series fuse range from our Suzhou Littelfuse OVS facility. This UL Listed products follow the same product series naming convention, however, they would be identified with a '-CN' suffix (KLKD_CN).

There will be no changes to product form, fit or function resulting from this transition. The advantages of this availability include a 50% shorter lead time and faster responses to design and project specifications, tests, order status, and sample requests as well as support from a regionally located team.

Form, fit, function, changes: None
Part number changes: Yes, as per attached documentation
Effective date: 1st June 2023
Replacement products: N/A
Last time buy: N/A

The Littelfuse Suzhou operation includes more than 5,000 square feet of manufacturing space with a workforce of more than 500 employees. Littelfuse has had a long and successful history in Suzhou since bringing manufacturing operations there in 1995.

This facility was recognized by the Association for Manufacturing Excellence (AME) with the 2017 AME Excellence Award for demonstrated continuous improvement, best practices, creativity and innovation, with certifications of ISO9000 and IATF 16949.

Manufacturing Address:
Suzhou Littelfuse OVS, (China)
China-Singapore Suzhou Industrial Park, 6 Xinghai Street, Suzhou, 215021, China

Please see the annex for package label changes and affected part number information.

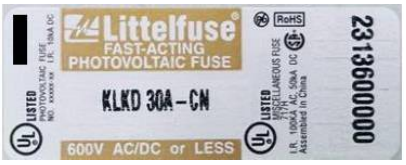
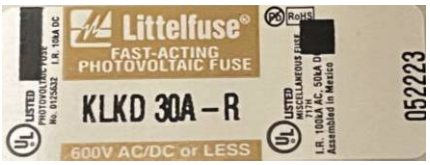
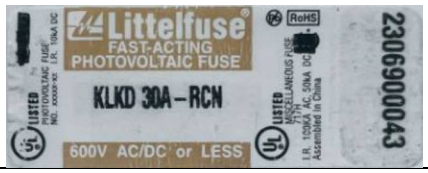
This notification is for your information and acknowledgement. If you have any questions, please contact your local Littelfuse customer or inside sales representative.

We highly value your business and look forward to assisting you whenever possible.

Sincerely,

Sakthidharan Krishnamoorthy
Product Manager
Industrial Business Unit
Littelfuse, Inc.
Office: +1 773-628-0719
Email: skrishnamoorthy@littelfuse.com

Annex: Example of Label Change

Mexico ID labels	**China ID labels**
KLKD030.T Fuse label	**KLKD030.TXCN Fuse label**
	
KLKD030.T Package label	**KLKD030.TXCN Package label**
	
KLKD030.H Fuse label	**KLKD030.HXCN Fuse label**
	
KLKD030.H Package label	**KLKD030.HXCN Package label**
	
KLKD030.HXR Fuse label	**KLKD030.HXRCN Fuse label**
	
KLKD030.HXR Package label	**KLKD030.HXRCN Package label**
	

Annex: Ordering Part Numbers

Mexico Manufactured Part Number	China Manufactured Part Number
KLKD015.T	KLKD015.TXCN
KLKD015.H	KLKD015.HXCN
KLKD020.T	KLKD020.TXCN
KLKD020.H	KLKD020.HXCN
KLKD025.T	KLKD025.TXCN
KLKD025.H	KLKD025.HXCN
KLKD030.T	KLKD030.TXCN
KLKD030.H	KLKD030.HXCN
KLKD015.HXR	KLKD015.HXRCN
KLKD020.HXR	KLKD020.HXRCN
KLKD025.HXR	KLKD025.HXRCN
KLKD030.HXR	KLKD030.HXRCN

Littelfuse®
Expertise Applied | Answers Delivered
8755 W. Higgins Road
Suite 500
Chicago, IL 60631

PRODUCT TEST REPORT

Document No.:	KLKD_CN - China
Issue Date:	4/27/2023
Revision:	0
Product Series:	KLKD_CN
Description:	Supplementary Fuse
Ratings:	15 - 30 A

Remarks:
This report represents the KLKD_CN series product manufactured in China. When KLKD _CN is referenced, it represents the ferrule and PCB mount versions. For fuse product performance and electrical characteristics, please refer to the KLKD_CN series datasheet on Littelfuse.com

This report has been prepared by the Engineering Group of Littelfuse, Inc. in Champaign, Illinois USA.

Fuses included within this report are manufactured to Underwriters Laboratories UL/CSA/ANCE 248 "Low-Voltage Fuses" Part 1, Part 14 and Part 19. UL 248-1 Standard is entitled "General Requirements". UL 248-14 Standard is entitled “Supplemental Fuses”. UL 248-19 is entitled "Photovoltaic Fuses".

In addition, the KLKD_CN series, 15 A through 25 A ratings, have been tested to meet the requirements of IEC 60269-6 and EN 60269-6. The EN 60269-6 standard is harmonized with IEC 60269-6. Therefore, for all references to IEC 60269-6 in this document, it can be assumed that EN 60269-6 also applies. PCB Mount options meet IEC60269-6 electrical requirements only.

Per general practice for some tests, only the highest ampere rating in each design break is tested to the applicable standard. It is assumed by the testing agency that these results also cover all ampere sub-ratings under the tested design break.

LuAnn Lange	Ray Zumbahlen
Prepared by:	Approved by:
Technical Support Technician	Product Design Engineer
Title:	Title:

1.0 VERIFICATION OF TEMPERATURE RISE AND CURRENT CARRYING CAPACITY:

Performed in accordance to UL 248-1 (8.2), UL 248-14 (8.2), and UL 248-19 (6.2).
Fuses shall carry 100% of rated current until temperature stabilization occurs.
Stabilization shall be considered to have occurred when no individual temperature rise reading of 4 consecutive readings taken at 5 min intervals exceeds the average reading of these 4 readings by more than 2ºC and no indication of increasing temperature rise is observed.

In addition to the requirements in Part 1: At the conclusion of the temperature rise test, the test current shall be increased without interruption to 1.1 In for a period of not less than 15 min. Temperature is not to be monitored during this time.

ACCEPTABLE CRITERIA:

A. Fuses shall carry current until temperature stabilization occurs and must not open during test.
B. Fuses do not exhibit charring or melting and shall be readily identifiable for replacement purpose.
C. The maximum temperature rise for contacts shall not exceed 75°C.

RESULT SUMMARY:

Ampere Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 30 A	PASS	PASS	PASS

2.0 VERIFICATION OF OVERLOAD OPERATION:

2.1 Performed in accordance to UL 248-1 (8.3) and UL 248-14 (8.3), and UL 248-19 (6.3).
Fuses are subjected to 1.35 In of their current ratings to validate that the fuse will open before damage occurs in a circuit due to a sustained overload condition. These opening times verify the fuses will operate as specified.

ACCEPTABLE CRITERIA:

A. Fuses shall clear circuit within 60 minutes maximum from the beginning of 1.35 I_n over-current.
B. Fuses do not exhibit charring or melting and shall be readily identifiable for replacement purpose.

2.2 Performed in accordance to UL 248-1 (8.3) and UL 248-14 (8.3), and UL 248-19 (6.3).
Fuses are subjected to 2.0 In of their current ratings to validate that the fuse will open before damage occurs in a circuit due to a sustained overload condition. These opening times verify the fuses will operate as specified.

ACCEPTABLE CRITERIA:

A. Fuses shall clear circuit withing 2 minutes maximum from the beginning of 2.0 I_n over-current.
B. Fuses do not exhibit charring or melting and shall be readily identifiable for replacement purpose.

RESULT SUMMARY:

	1.35 I_n		2.0 I_n	
Ampere Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria A (pass/fail)	Criteria B (pass/fail)
15 - 30 A	PASS	PASS	PASS	PASS

3.0 VERIFICATION OF OPERATION AT RATED VOLTAGE:

AC VOLTAGE:

3.1 MAXIMUM INTERRUPT RATING:

Performed in accordance to UL 248-1 (8.4) and UL 248-14 (8.4).
Fuses are subjected to their maximum interrupt rating at rated AC voltage to ensure the fuses safely operate and protect the circuit. The KLKD_CN maximum interrupt rating is 200 kA at rated AC voltage. Fuses were tested at 600V ac, power factor <= 0.2.

ACCEPTABLE CRITERIA:

A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

3.2 MAXIMUM ENERGY:

Performed in accordance to UL 248-1 (8.4).
Fuses are subjected to maximum energy tests at rated AC voltage. Current is to be adjusted such that the peak current at interruption is 70 – 100 percent of the peak value of the rms current.

ACCEPTABLE CRITERIA:

A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

RESULT SUMMARY:

	Maximum Interrupt Rating AC				Maximum Energy AC		
Ampere Rating	Max Interrupt Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 30 A	200 kA	PASS	PASS	PASS	PASS	PASS	PASS

3.3 THRESHOLD RATIO

Performed in accordance to UL 248-1 (8.4) and UL 248-14 (8.4).
Fuses are subjected to threshold tests at rated AC voltage. Current shall be equal to or less than the product of the fuse rating in A times the threshold ratio (TR).

ACCEPTABLE CRITERIA:

A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.
D. Fuses shall clear in the first half cycle after closing.

3.4 INTERMEIDATE CURRENT TEST 4a

Performed in accordance to UL 248-1 (8.4) and UL 248-14 (8.4).
Fuses are subjected to 100kA at rated AC voltage.

ACCEPTABLE CRITERIA:

A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

RESULT SUMMARY:

	Threshold Test AC				100kA Test AC		
Ampere Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)	Criteria D (pass/fail)	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 30 A	PASS	PASS	PASS	PASS	PASS	PASS	PASS

3.5 **INTERMEIDATE CURRENT TEST 4b -**

Performed in accordance to UL 248-1 (8.4) and UL 248-14 (8.4).
Fuses are subjected to 50kA at rated AC voltage.

ACCEPTABLE CRITERIA:
A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

3.6 **LOW CURRENT**

Performed in accordance to UL 248-1 (8.4) and UL 248-14 (8.4).
Fuses are subjected to 2.0 In at rated AC voltage.

ACCEPTABLE CRITERIA:
A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 60 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

RESULT SUMMARY:

	50kA Test AC			2.0 In Test AC		
Ampere Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 30 A	PASS	PASS	PASS	PASS	PASS	PASS

DC VOLTAGE:

3.7 **MAXIMUM INTERRUPT RATING:**

Performed in accordance to UL 248-1 (8.4) and UL 248-14 (8.4).

Fuses are subjected to their maximum interrupt rating at rated voltage to ensure the fuses safely operate and protect the circuit. KLKD_CN maximum interrupt rating is 50 kA at rated DC voltage. Fuses were tested at 600V dc, time constant >= 10ms.

ACCEPTABLE CRITERIA:

A. Fuses shall operate and permanently clear the circuit without damage.

B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.

C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

3.8 **MAXIMUM ENERGY:**

Performed in accordance to UL 248-1 **(**8.4**)** and UL 248-14 **(**8.4**)**.

Fuses are subjected to maximum energy tests at rated DC voltage. Peak current shall be between 0.6 and 0.8 of the available current.

ACCEPTABLE CRITERIA:

A. Fuses shall operate and permanently clear the circuit without damage.

B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.

C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

RESULT SUMMARY:

	Maximum Interrupt Rating DC UL 248-1, 248-14				**Maximum Energy DC**		
Ampere Rating	Max Interrupt Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 30 A	50 kA	PASS	PASS	PASS	PASS	PASS	PASS

3.9 LOW CURRENT TEST 5a

Performed in accordance to UL 248-1 **(**8.4**)** and UL 248-14 **(**8.4**)**.
Fuses are subjected to 9.0 In at rated DC voltage.

ACCEPTABLE CRITERIA:
A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 60 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

3.10 LOW CURRENT TEST 5c

Performed in accordance to UL 248-1 (8.4) and UL 248-14 (8.4).
Fuses are subjected to 2.0 In at rated DC voltage.

ACCEPTABLE CRITERIA:
A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 60 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

RESULT SUMMARY:

	9.0 In Test DC			2.0 In Test DC UL 248-1, 248-14		
Ampere Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 30 A	PASS	PASS	PASS	PASS	PASS	PASS

3.11 HGH CURRENT TEST

Performed in accordance to UL 248-19 (6.4).
Fuses are subjected to their maximum interrupt rating at rated voltage to ensure the fuses safely operate and protect the circuit. KLKD_CN maximum interrupt rating is 10 kA at rated DC voltage. Fuses were tested at 600V dc, the test circuit shall have an inductance of 100 µH (±10%).

ACCEPTABLE CRITERIA:
A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

3.12 LOW CURRENT TEST 5c -

Performed in accordance to UL 248-19 (6.4).
Fuses are subjected to 2.0 In at rated DC voltage. The test circuit shall have an inductance of 100 µH (±10%)

ACCEPTABLE CRITERIA:
A. Fuses shall operate and permanently clear the circuit without damage.
B. Fuses shall be capable of maintaining this condition for 30 seconds and shall not re-strike. If restrike is noted the recovery voltage shall be continued for 60 s past the time of restrike.
C. Fuses shall remain in one piece, without the loss of filler and be readily identifiable for replacement purposes.

RESULT SUMMARY:

	Maximum Interrupt Rating DC UL 248-19				2.0 In Test DC UL 248-19		
Ampere Rating	Max Interrupt Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 30 A	10 kA	PASS	PASS	PASS	PASS	PASS	PASS

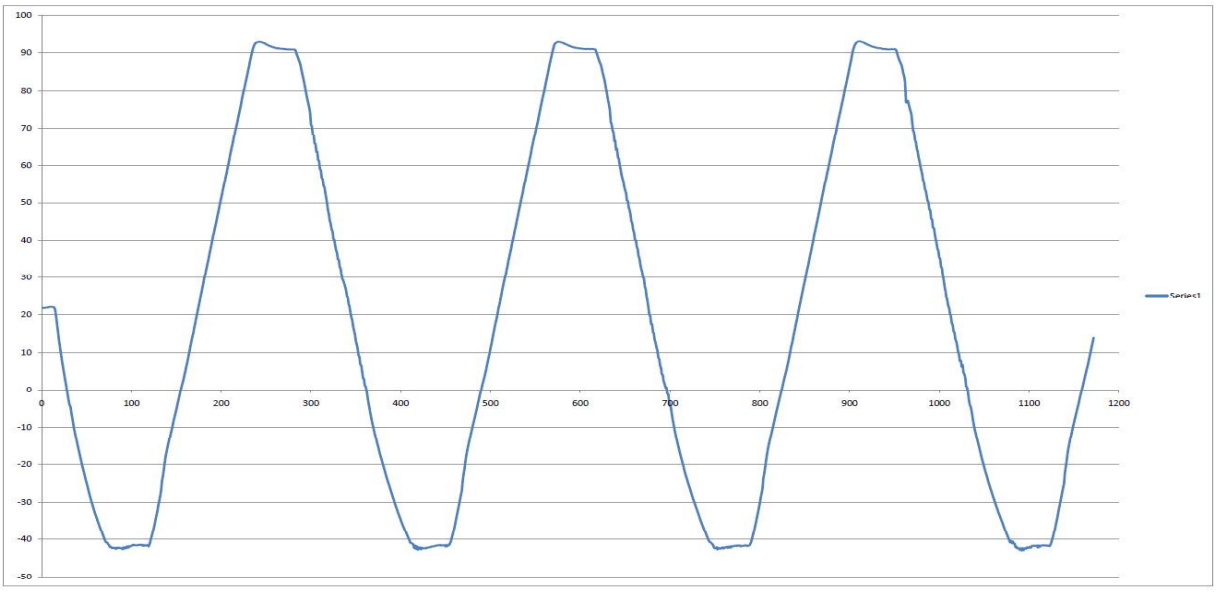
4.0 THERMALLY INDUCED DRIFT:

Performed in accordance to UL 248-19 (6.6.1).

Fuses are subjected to 50 cycles of heating and cooling. Each cycle consists of a minimum of 15 minutes below -40°C followed by a minimum of 15 minutes above +90°C. Once completed, the fuses are allowed to return to room temperature for a minimum of 3 hours then are subjected to Verification of Current Carrying Capacity (6.2), Verification of Overload Operation (6.3) and Verification of Operation at Rated Voltage (6.4) tests with the same pass/fail criteria. See plot below for a visual representation.

RESULT SUMMARY:

The results from this test were acceptable per UL.



5.0 TEMPERATURE EXTREMES:

Performed in accordance to UL 248-19 (6.6.2).

Fuses are conditioned at 50C for no less than 3 hours. Verification of Current Carrying Capacity (6.2) and Verification of Overload Operation at 135% (6.3) tests are repeated in this elevated environment with the same pass/fail criteria.

RESULT SUMMARY:

The results from this test were acceptable per UL standard.

6.0 CURRENT CYCLING

Performed in accordance to UL 248-19 (6.7).
The resistance is recorded for two fuse lots. One fuse lot is subjected to the thermal cycling test (6.6.1). The second lot is subjected to humidity conditioning at 25°C, 90-100% relative humidity for 5 days minimum (6.7.3). At the conclusion of the thermal cycling and humidity conditioning, both lots are subjected to 3000 cycles of the current cycle described in section 6.7.4.1. Fuse resistance is once again measured after current cycle testing.

ACCEPTABLE CRITERIA:
A. The resistance of each individual fuse does not differ from the initial measurements by more than
B. None of the samples exhibit cracking or crazing of the fuse body.

RESULT SUMMARY:

The results from this test were acceptable per UL standard.

7.0 DROP TEST

The initial fuse resistance is recorded. Fuses are dropped on the same end starting at a height of 6 inches. The fuse resistance is recorded after each drop. The height is increased in increments of 6 inches until a height of 36 inches is reached.

ACCEPTABLE CRITERIA:
A. The resistance of each individual fuse does not differ from the initial measurements by more than
B. The fuse shall not exhibit cracking of the fuse body or other damage that may prevent it from being

RESULT SUMMARY:

The results from this test were acceptable.

8.0 VERIFICATION OF TEMPERATURE RISE LIMITS AND POWER DISSIPATION

Performed in accordance to IEC 60269-6 (8.3)
Fuses are subjected to 0.7 I_n and 1.0 I_n of rated current until temperature stabilization occurs.

ACCEPTABLE CRITERIA:

A. Fuses shall carry current until temperature stabilization occurs and must not open during test.
B. Contacts not to exceed maximum temperature rise of 70°C.
C. Power dissipation not to exceed values set by manufacturer.

RESULT SUMMARY:

Ampere Rating	Criteria A (pass/fail)	Criteria B (pass/fail)	Criteria C (pass/fail)
15 - 25 A	PASS	PASS	PASS

9.0 VERIFICATION OF RATED CURRENT

Performed in accordance to IEC 60269-6 (8.4.3.2)
The fuse is subjected to 3000 repetitions of current cycling where one cycle is represented in figure below.

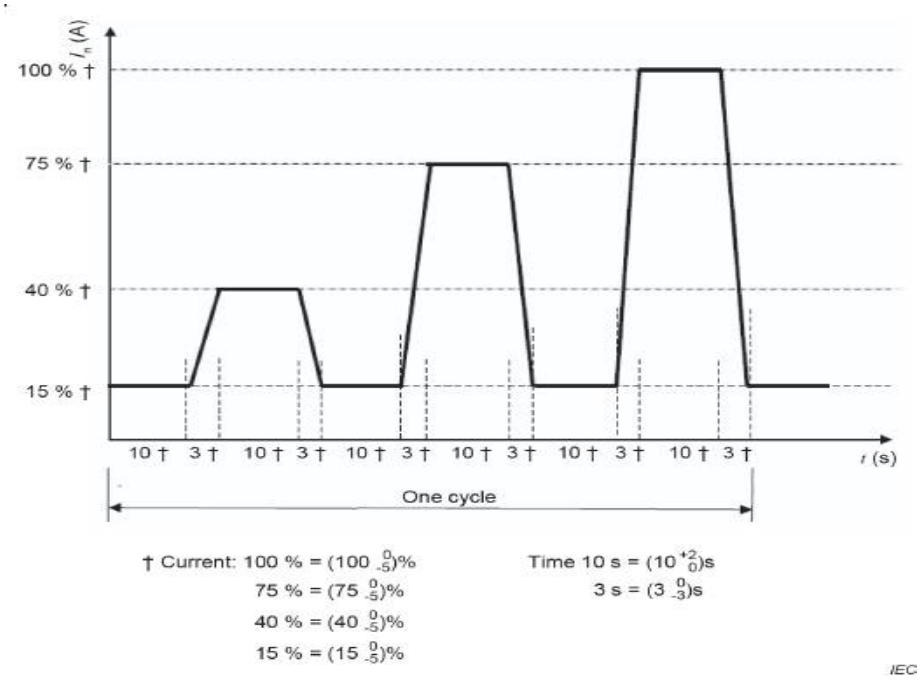


Figure 101 – Current of test cycling

ACCEPTABLE CRITERIA:

A. Fuse body shall not exhibit cracking or crazing.
B. Fuse resistance at room temperature shall not have changed by more that 10%.

RESULT SUMMARY:

Ampere Rating	Criteria A (pass/fail)	Criteria B (pass/fail)
15 - 25 A	PASS	PASS

10.0 VERIFICATION OF FREEDOM FROM UNACCEPTABLE LEVELS OF THERMALLY INDUCED DRIFT

Performed in accordance to IEC 60269-6 (8.11.2.4)
Fuses are subjected to temperature cycling consisting of 50 cycles of heating and cooling. Each cycle consisting of 15 minutes with fuse body maintained at -40°C (+/- 5°C) followed by 15 minutes of the fuse body maintained at 90°C (+/-5°C). Once cycling is complete, the fuses are returned to room temperature for a minimum of 3 hours then subjected "Verification of Conventional Non-Fusing and Fusing Test Current (8.4.3.1) and "Verification of Breaking Capacity" (8.5) with the same pass/fail criteria.

RESULT SUMMARY:

The results from these tests were acceptable.

11.0 VERIFICATION OF CONVENTIONAL NON-FUSING AND FUSING TEST CURRENT

11.1 Performed in accordance to IEC 60269-6 (8.4.3.1a)
Fuse is subjected to its conventional non-fusing current (1.05 I_n) for a time equal to the conventional time specified in table below.

ACCEPTABLE CRITERIA:
A. Fuses shall not open.

11.2 Performed in accordance to IEC 60269-6 (8.4.3.1b)
After the fuse is cooled down to ambient temperature, it is subjected to the conventional fusing current (1.35 I_n) . It shall operate within the conventional time as specified in the table below.

ACCEPTABLE CRITERIA:
A. Fuses shall open within the specified conventional time.
B. The fuse shall operate without external effects of damage.

RESULT SUMMARY:

	1.05 I_n		1.35 I_n		
Ampere Rating	Conventional Time (minutes)	Criteria A (pass/fail)	Conventional Time (minutes)	Criteria A (pass/fail)	Criteria B (pass/fail)
15 - 25 A	60	PASS	120	PASS	PASS

12.0 VERIFICATION OF BREAKING CAPACITY

12.1 RATED BREAKING CAPACITY

Performed in accordance to IEC 60269-6 (8.5.5.1 Test No. 1)
Fuses are subjected to their rated breaking capacity at rated voltage to ensure the fuses safely operate and protect the circuit. Fuses were tested at 600 V dc with a circuit time constant of 1-3 ms.

12.2 MAXIMUM ARC ENERGY

Performed in accordance to IEC 60269-6 (8.5.5.1 Test No. 2)
Fuses are subjected to a short circuit current that results in the maximum arc energy let through the fuse. Fuses were tested at 600 V dc with a circuit time constant of 1-3 ms.

12.3 OVERLOAD

Performed in accordance to IEC 60269-6 (8.5.5.1 Test No. 5)
Fuses are subjected to 2.0 In of the current rating. Fuses were tested at 600 V dc with a circuit time constant of ≤ 1 ms.

ACCEPTABLE CRITERIA:
A. Fuses shall be deemed not to comply with this standard if during the test one or more of the following failures occur:

- ignition of fuse link.
- mechanical damage to conventional test arrangement.
- mechanical damage to fuse.
- burning or melting of end caps.
- significant movement of end caps.

Note: thermal cracking which leaves the fuse-link in one piece is acceptable

RESULT SUMMARY:

		RATED BREAKING CAPACITY	MAXIMUM ARC ENERGY	OVERLOAD
		(Test No. 1)	(Test No. 2)	(Test No. 5)
Ampere Rating	Max Interrupt Rating	Criteria A (pass/fail)	Criteria A (pass/fail)	Criteria A (pass/fail)
15 - 25 A	10 kA	PASS	PASS	PASS

13.0 VERIFICATION OF FUNCTIONALITY AT TEMPERATURE EXTREMES

13.1 Performed in accordance to IEC 60269-6 (8.11.2.5a).
Fuses shall be subjected to a temperature of 50°C (+/-5°C) for no less than 3 hours or until temperature is stabilized. Then the fuse is subjected to its rated current (I_n) for a time equal to the conventional time specified in the table below.

ACCEPTABLE CRITERIA:
A. Fuses shall not open.

RESULT SUMMARY:

		1.0 I_n
Ampere Rating	Conventional Time (minutes)	Criteria A (pass/fail)
15 - 25 A	60	PASS

Supplemental (10 x 38) Fuses

KLKD_CN Series

600 V ac/dc • Fast Acting • 15–30 A

Description

The KLKD_CN series fast-acting 600 V ac/dc fuses are used in solar combiner boxes and in circuits with dc fault currents up to 50,000 A. These fuses are designed to meet both the UL and IEC photovoltaic fuse specifications and are available in standard and board-mount configurations. The KLKD_CN supplemental fuses also have high-interrupting and current-limiting capability. They are intended to supplement the primary branch-circuit fuse or breaker to provide backup overcurrent protection. The KLKD_CN fuses are non-indicating and may be used with an indicating fuse block or cover. These fuses are offered in a range of ampere ratings to match specific requirements in a variety of applications.

Features & Benefits

FEATURES	BENEFITS
10 x 38 mm size	Common dimensions used in a variety of applications
Fast-acting	Provides fast, reliable short-circuit response within the interrupting rating
Mounting options	Available in ferrule or PCB-mount configurations
POWR-GARD® technology	Ensures quality backup overcurrent protection
UL & IEC compliant	Serves a global market

Applications

- Solar combiner boxes
- Inverters
- Power supplies
- Desktop meters

Revised: 04/13/2023

Specifications

Voltage Rating	600 V ac / V dc
Ampere Range	15 – 30 A
Interrupting Ratings	Ac: 100 kA 200 kA Littelfuse self-certified Dc: 15 – 30: 10 kA (UL 248-19) 15 – 30: 50 kA (UL 248-14)
Applicable Standards	UL 248-14, UL 248-19, CSA, IEC 60269-6
Environmental	RoHS Compliant
Material	Body: Melamine Caps: Copper Alloy
Operating Temperature	See Derating Curve
Country of Origin	China

Certification & Compliance

UL	UL Listed (File E339112 and E10480)
IEC	15 – 25 A Self Certified (IEC 60269-6)
CSA	CSA Certified (File: LR29862)
CE	Declaration of Conformity: EU_DOC-KLKD_CN_230330_IEC; EU_DOC-KLKD CN_230330
RoHS	RoHS 2 Directive 2011/65/EU; Directive (EU) 2015/863

Accessories

Littelfuse LPSM dead-front series fuse holder (ferrule fuse)
Littelfuse L60030M open-face series fuse holder (ferrule fuse)

Ordering Information (Ferrule Version)

AMPERAGE RATING	CATALOG NUMBER	PRODUCT MARKING	PACKING QUANTITY	ORDERING NUMBER	UPC CODE	AGENCY APPROVALS	
						UL	CSA
15	KLKD015CN	KLKD 15A-CN	10	KLKD015.TXCN	07945831111	•	•
			100	KLKD015.HXCN	07945831112	•	•
20	KLKD020CN	KLKD 20A-CN	10	KLKD020.TXCN	07945831114	•	•
			100	KLKD020.HXCN	07945831115	•	•
25	KLKD025CN	KLKD 25A-CN	10	KLKD025.TXCN	07945831117	•	•
			100	KLKD025.HXCN	07945831118	•	•
30	KLKD030CN	KLKD 30A-CN	10	KLKD030.TXCN	07945831120	•	•
			100	KLKD030.HXCN	07945831121	•	•

Ordering Information (PCB Version)

AMPERAGE RATING	CATALOG NUMBER	PRODUCT MARKING	PACKING QUANTITY	ORDERING NUMBER	UPC CODE	AGENCY APPROVALS	
						UL	CSA
15	KLKD015RCN	KLKD 15A-RCN	100	KLKD015.HXRCN	07945831113	•	•
20	KLKD020RCN	KLKD 20A-RCN	100	KLKD020.HXRCN	07945831116	•	•

Supplemental (10 x 38) Fuses
KLKD_CN Series

Ordering Information (PCB Version)

AMPERAGE RATING	CATALOG NUMBER	PRODUCT MARKING	PACKING QUANTITY	ORDERING NUMBER	UPC CODE	AGENCY APPROVALS	
						UL	CSA
25	KLKD025RCN	KLKD 25A-RCN	100	KLKD025.HXRCN	07945831119	•	•
30	KLKD030RCN	KLKD 30A-RCN	100	KLKD030.HXRCN	07945831122	•	•

Electrical Specifications

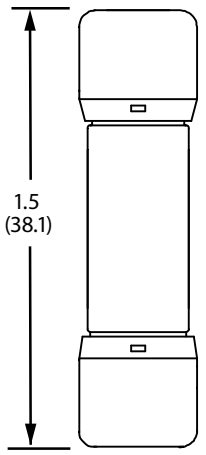
AMPERAGE RATING	CATALOG NUMBER		VOLTAGE RATING		INTERRUPTING RATING		NOM COLD RESISTANCE (OHMS)	WATTS LOSS AT 100 % RATED CURRENT (W)	WATTS LOSS AT 80 % RATED CURRENT (W)	AVERAGE MELTING I2T (A2S)	TOTAL CLEARING I2T (A2S) 20 KA @ 600 V DC	TOTAL CLEARING I2T (A2S) 100 KA @ 600 V DC
	FERRULE	PCB	AC	DC	AC	DC						
15	KLKD015CN	KLKD015RCN	600	600	200	50	0.007855	2.045	1.570	137.333	351.240	-
20	KLKD020CN	KLKD020RCN	600	600	200	50	0.0045	2.133	1.593	462.056	1151.185	2120.000
25	KLKD025CN	KLKD025RCN	600	600	200	50	0.003532	2.550	1.933	834.529	1744.033	2085.000
30	KLKD030CN	KLKD030RCN	600	600	200	50	0.002776	3.701	1.983	1409.000	2757.000	3220.000

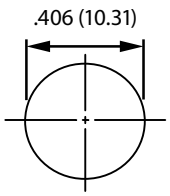
Electrical Specification - Agency Requirements

AMPERAGE RATING	OPENING TIME (MINUTES)			
	100 % OF AMPERE RATING PER UL	105 % OF AMPERE RATING PER IEC	135 % OF AMPERE RATING PER UL	200 % OF AMPERE RATING PER UL
15 – 30	Temperature Stabilization	60 min	60 max	4 max

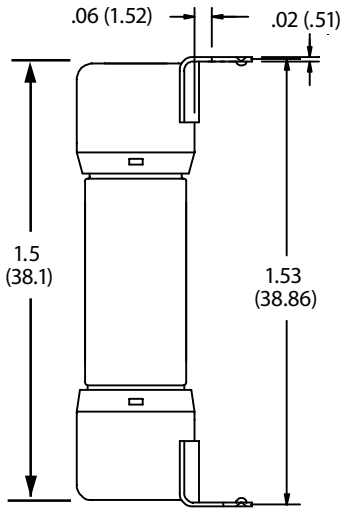
Dimensions Inches (mm)

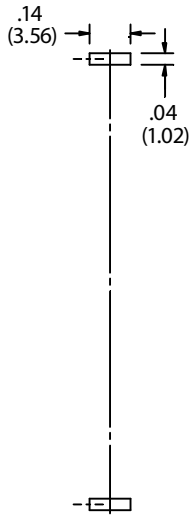
FERRULE VERSION



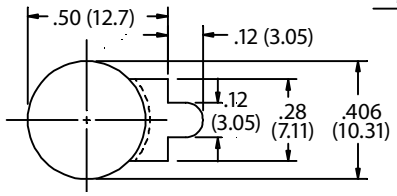


PCB VERSION





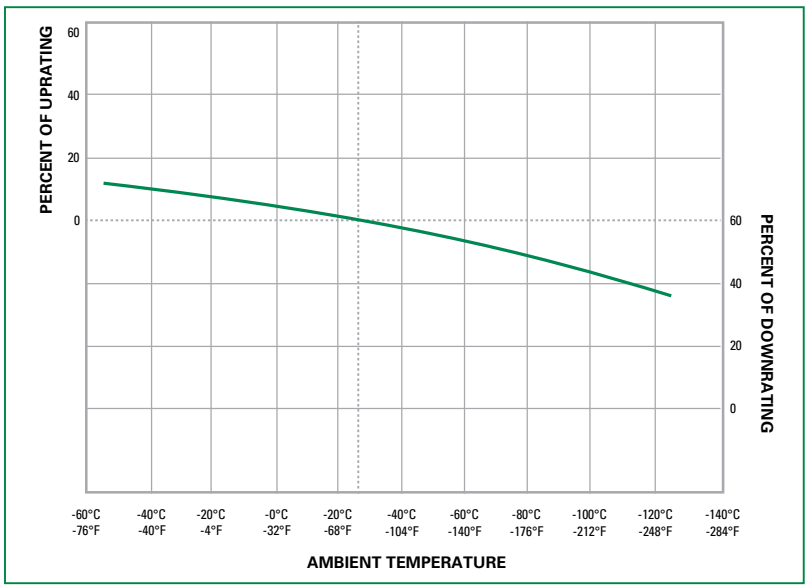
MOUNTING HOLE DETAIL



Revised: 04/13/2023

Temperature Derating Curve

Ambient temperature: temperature of air immediately surrounding fuse



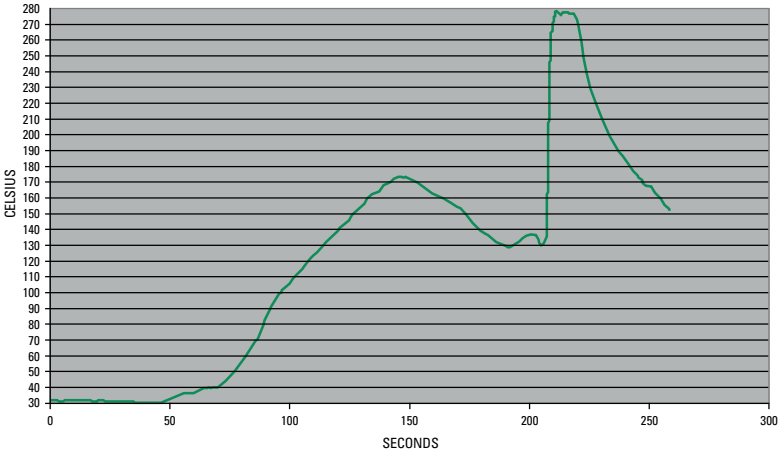
Current-Limiting Effects

SHORT CIRCUIT CURRENT*	APPARENT RMS SYMMETRICAL CURRENT FOR VARIOUS FUSE RATINGS	
	25 A	30 A
5,000	654	722
10,000	823	910
15,000	943	1042
20,000	1037	1147
25,000	1117	1235
30,000	1188	1313
35,000	1250	1382
40,000	1307	1445
50,000	1408	1556
60,000	1496	1654
80,000	1647	1820
100,000	1774	1961

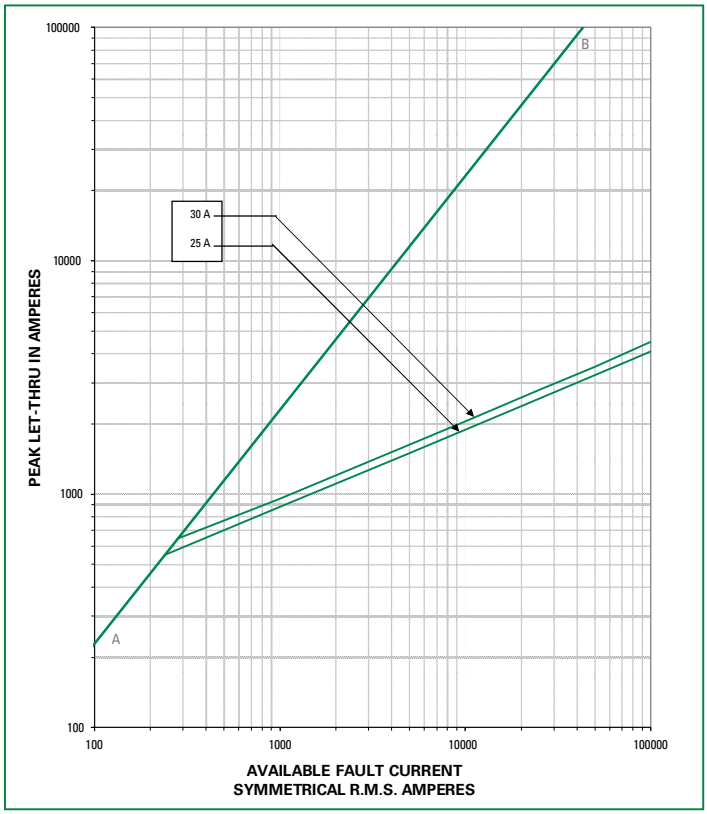
*Prospective RMS Symmetrical Amperes Short-Circuit Current

Recommended Process and Soldering Parameters

WAVE PARAMETER	LEAD FREE RECOMMENDATION
Preheat:	Typical Industry Recommendation
Temperature Minimum:	130 °C
Temperature Maximum:	—
Pre-heat Time	75 Seconds Maximum
Solder Pot Temperature	280 °C Maximum
Solder Dwell Time	270 °C for 8 Seconds Maximum
Complete Cycle Time	250 Seconds Maximum



Peak Let-Thru Curve



Time Current Curves