

# KLKD SERIES 10x38 mm FUSES

600 VAC/600 VDC • Fast Acting



## Description

The KLKD fuse series is fast-acting with a high DC voltage rating. This family of Midget style fuses (10 x 38 mm) is used in solar combiner boxes and in circuits with DC fault currents up to 50,000 amperes. KLKD fuses are available in standard and board-mount configurations.

In addition, the KLKD series has been designed to meet both the UL and IEC photovoltaic fuse standards.

Littelfuse offers a wide range of ampere ratings to match specific requirements in a variety of applications.

## Features/Benefits

- Designed to UL and IEC photovoltaic specifications
- 1/10-30 A ratings available
- 50 kA DC Voltage Interrupting Rating (1/10-30 A)
- Both standard and board-mount configurations available
- 1-5 A meets UL1741 GFDI requirements

## Recommended Fuseholders

- LPSM Series
- L60030M Series
- L60030MPCB Board Mount Holder

## Applications

- Combiner boxes
- Inverters
- Power supplies
- Desktop meters
- 600 V circuit protection



Look for this logo to indicate products that are used in solar applications. Visit our website [www.littelfuse.com/solar](http://www.littelfuse.com/solar) for the latest updates on approvals, certifications, codes and standards.

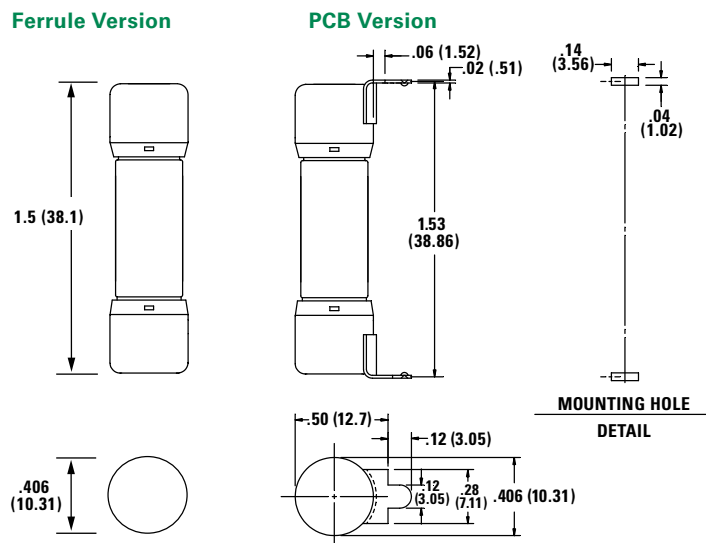
## Specifications

<b>Voltage Rating:</b>	600 VAC/VDC
<b>Amperage Rating:</b>	1/10, 1/8, 2/10, 1/4, 3/10, 1/2, 3/4, 1, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 25, 30
<b>Interrupting Ratings:</b>	AC: 100 kA DC: 1/10-30: 10 kA (UL 2579) 1/10-30: 50 kA (UL 248-14)
<b>Material:</b>	Body: Melamine Caps: Copper Alloy
<b>Operating Temperature:</b>	See Rerating Curve
<b>Approvals:</b>	1/10-30 A UL 2579 Listed (File No. E339112) 2-25 A IEC 60269-6 (VDE Approved to Certifications No. 40033094) UL 248-14 Listed (File No. E10480) CSA Certified (File No. LR29862) (1/10-30 A Ferrule Style Only) CE Certified
<b>Environmental:</b>	RoHS Compliant
<b>Country of Origin:</b>	Mexico

## Ordering Examples

AMPERAGE	PART NUMBER	ORDERING NUMBER
1/8	KLKD.125	KLKD.125T
1	KLKD001	KLKD001.T
2	KLKD002	KLKD002.T
8	KLKD008	KLKD008.T
30 (WITH PCB TABS)	KLKD030R	KLKD030.HXR

## Dimensions in inches (mm)



## Web Resources

Downloadable CAD drawings and other technical information:  
[www.littelfuse.com/klkd](http://www.littelfuse.com/klkd)

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## Ordering Information – Ferrule Version

PART NUMBER	ORDERING NUMBER	AMPERAGE	UPC	AGENCY APPROVALS			
				UL	VDE	CSA	CE
KLKD 1/10	KLKD.100T	1/10	07945810189	•		•	•
KLKD 1/8	KLKD.125T	1/8	07945810190	•		•	•
KLKD 2/10	KLKD.200T	2/10	07945810191	•		•	•
KLKD 1/4	KLKD.250T	1/4	07945810192	•		•	•
KLKD 3/10	KLKD.300T	3/10	07945810193	•		•	•
KLKD 1/2	KLKD.500T	1/2	07945810194	•		•	•
KLKD 3/4	KLKD.750T	3/4	07945810195	•		•	•
KLKD 1	KLKD001.T	1	07945810196	•		•	•
KLKD 1 1/2	KLKD01.5T	1 1/2	07945810197	•		•	•
KLKD 2	KLKD002.T	2	07945810198	•	•	•	•
KLKD 2 1/2	KLKD02.5T	2 1/2	07945810199	•	•	•	•
KLKD 3	KLKD003.T	3	07945810200	•	•	•	•
KLKD 3 1/2	KLKD03.5T	3 1/2	07945810214	•	•	•	•
KLKD 4	KLKD004.T	4	07945810201	•	•	•	•
KLKD 5	KLKD005.T	5	07945810202	•	•	•	•
KLKD 6	KLKD006.T	6	07945810203	•	•	•	•
KLKD 7	KLKD007.T	7	07945810204	•	•	•	•
KLKD 8	KLKD008.T	8	07945810205	•	•	•	•
KLKD 9	KLKD009.T	9	07945810215	•	•	•	•
KLKD 10	KLKD010.T	10	07945810206	•	•	•	•
KLKD 12	KLKD012.T	12	07945810207	•	•	•	•
KLKD 15	KLKD015.T	15	07945810208	•	•	•	•
KLKD 20	KLKD020.T	20	07945810209	•	•	•	•
KLKD 25	KLKD025.T	25	07945810210	•	•	•	•
KLKD 30	KLKD030.T	30	07945810211	•		•	•

## Ordering Information – PCB Version

PART NUMBER	ORDERING NUMBER	AMPERAGE	UPC	AGENCY APPROVALS	
				UL	CE
KLKD 1/10-R	KLKD.100HXR	1/10	07945814857	•	•
KLKD 1/2-R	KLKD.500HXR	1/2	07945814858	•	•
KLKD 1-R	KLKD001.HXR	1	07945812133	•	•
KLKD 2-R	KLKD002.HXR	2	07945894349	•	•
KLKD 3-R	KLKD003.HXR	3	07945818991	•	•
KLKD 4-R	KLKD004.HXR	4	07945811495	•	•
KLKD 5-R	KLKD005.HXR	5	07945814859	•	•
KLKD 6-R	KLKD006.HXR	6	07945894350	•	•
KLKD 8-R	KLKD008.HXR	8	07945894351	•	•
KLKD 10-R	KLKD010.HXR	10	07945814860	•	•
KLKD 12-R	KLKD012.HXR	12	07945894352	•	•
KLKD 15-R	KLKD015.HXR	15	07945894353	•	•
KLKD 20-R	KLKD020.HXR	20	07945894354	•	•
KLKD 25-R	KLKD025.HXR	25	07945894355	•	•
KLKD 30-R	KLKD030.HXR	30	07945894356	•	•

## Current-Limiting Effects

SHORT CIRCUIT CURRENT*	APPARENT RMS SYMMETRICAL CURRENT FOR VARIOUS FUSE RATINGS			
	1 1/2 A	12 A	25 A	30 A
5,000	240	292	654	722
10,000	303	367	823	910
15,000	347	420	943	1042
20,000	381	463	1037	1147
25,000	411	498	1117	1235
30,000	437	530	1188	1313
35,000	460	558	1250	1382
40,000	481	583	1307	1445
50,000	518	628	1408	1556
60,000	550	667	1496	1654
80,000	605	735	1647	1820
100,000	652	791	1774	1961

\*Prospective RMS Symmetrical Amperes Short-Circuit Current

## Fuse Weight

AMPERAGE	UNIT WEIGHT
1/10 – 1 1/2 A	.013 lb / 5.90 g
2 – 30 A	.017 lb / 7.71 g

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## Opening Characteristics 10 x 38 mm Solar Fuses

PART NUMBER	AMPERAGE	DC / AC VOLTAGE	INTERRUPTING RATING (kA)		AVERAGE PEAK ARC VOLTAGE *	AVERAGE CLEARING TIME *	TOTAL CLEARING I <sup>2</sup> T (A <sup>2</sup> SEC) 20 kA *	TOTAL CLEARING I <sup>2</sup> T (A <sup>2</sup> SEC) 100 kA
			AC	DC				
KLKD 1/10	0.1	600	100	50	754.32	0.000047	0.019	–
KLKD 1/8	0.125	600	100	50	811.56	0.000050	0.010	–
KLKD 2/10	0.2	600	100	50	834.19	0.000073	0.032	–
KLKD 1/4	0.25	600	100	50	–	–	–	–
KLKD 3/10	0.3	600	100	50	862.46	0.000101	0.067	–
KLKD ½	0.5	600	100	50	961.38	0.000141	0.197	–
KLKD ¾	0.75	600	100	50	1675.55	0.000170	0.753	–
KLKD 1	1	600	100	50	1422.41	0.000247	1.827	0.008
KLKD 1 1/2	1.5	600	100	50	1256.92	0.000828	13.956	280
KLKD 2	2	600	100	50	2867.96	0.000291	3.919	0.012
KLKD 2 1/2	2.5	600	100	50	2820.44	0.000387	8.877	–
KLKD 3	3	600	100	50	2521.83	0.000449	14.835	–
KLKD 3 1/2	3.5	600	100	50	2762.89	0.000471	21.048	–
KLKD 4	4	600	100	50	2498.89	0.000507	30.76	0.019
KLKD 5	5	600	100	50	2397.30	0.000607	56.514	0.024
KLKD 6	6	600	100	50	2558.28	0.000735	96.824	0.035
KLKD 7	7	600	100	50	2433.04	0.000898	168.578	0.087
KLKD 8	8	600	100	50	2499.40	0.000945	210.595	0.656
KLKD 9	9	600	100	50	2191.16	0.000992	266.633	–
KLKD 10	10	600	100	50	2296.23	0.001200	454.628	211.667
KLKD 12	12	600	100	50	2114.97	0.001455	744.775	440
KLKD 15	15	600	100	50	1428.37	0.001721	351.24	–
KLKD 20	20	600	100	50	1436.40	0.006144	1151.185	2120
KLKD 25	25	600	100	50	1701.60	0.002085	1744.033	2085
KLKD 30	30	600	100	50	1353.76	0.002924	2021.801	3220

\*Test Circuit: 600 VDC / 20 kA

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## Performance Characteristics 10 x 38 mm Solar Fuses

PART NUMBER	AMPERAGE	NOM COLD RESISTANCE (Ohm)	AVERAGE MELT TIME *	AVERAGE MELTING I <sup>2</sup> T *	WATTS LOSS AT 100% RATED CURRENT (W)	WATTS LOSS AT 80% RATED CURRENT (W)
KLKD 1/10	0.1	85.5	–	–	0.780	0.505
KLKD 1/8	0.125	65	–	–	0.975	0.659
KLKD 2/10	0.2	30.9	–	–	1.213	0.773
KLKD 1/4	0.25	22	–	–	1.364	0.870
KLKD 3/10	0.3	16.2	–	–	1.519	0.960
KLKD ½	0.5	8.16	–	–	1.961	1.237
KLKD ¾	0.75	0.402	0.000063	0.234	0.361	0.199
KLKD 1	1	0.252	0.000094	0.678	0.388	0.273
KLKD 1 1/2	1.5	0.134	0.000153	2.890	0.409	0.229
KLKD 2	2	0.124	0.000145	2.379	0.823	0.606
KLKD 2 1/2	2.5	0.0989	0.000186	5.142	0.912	0.618
KLKD 3	3	0.0773	0.000211	7.821	0.957	0.654
KLKD 3 1/2	3.5	0.0613	0.000249	12.417	1.12	0.826
KLKD 4	4	0.0511	0.000284	18.945	1.367	0.891
KLKD 5	5	0.0363	0.000347	34.163	1.4	0.938
KLKD 6	6	0.0261	0.000423	62.951	1.516	0.998
KLKD 7	7	0.0205	0.000505	105.143	1.577	1.066
KLKD 8	8	0.0194	0.000541	130.266	1.824	1.205
KLKD 9	9	0.0166	0.000587	164.221	2.208	1.428
KLKD 10	10	0.0128	0.000701	278.390	1.893	1.3
KLKD 12	12	0.0103	0.000822	445.010	2.296	1.584
KLKD 15	15	0.00782	0.000544	137.333	2.045	1.57
KLKD 20	20	0.0045	0.000826	462.056	2.133	1.593
KLKD 25	25	0.003532	0.001007	834.529	2.55	1.933
KLKD 30	30	0.002776	0.000819	452.465	2.99	2.16

\*Test Circuit: 600 VDC / 20 kA

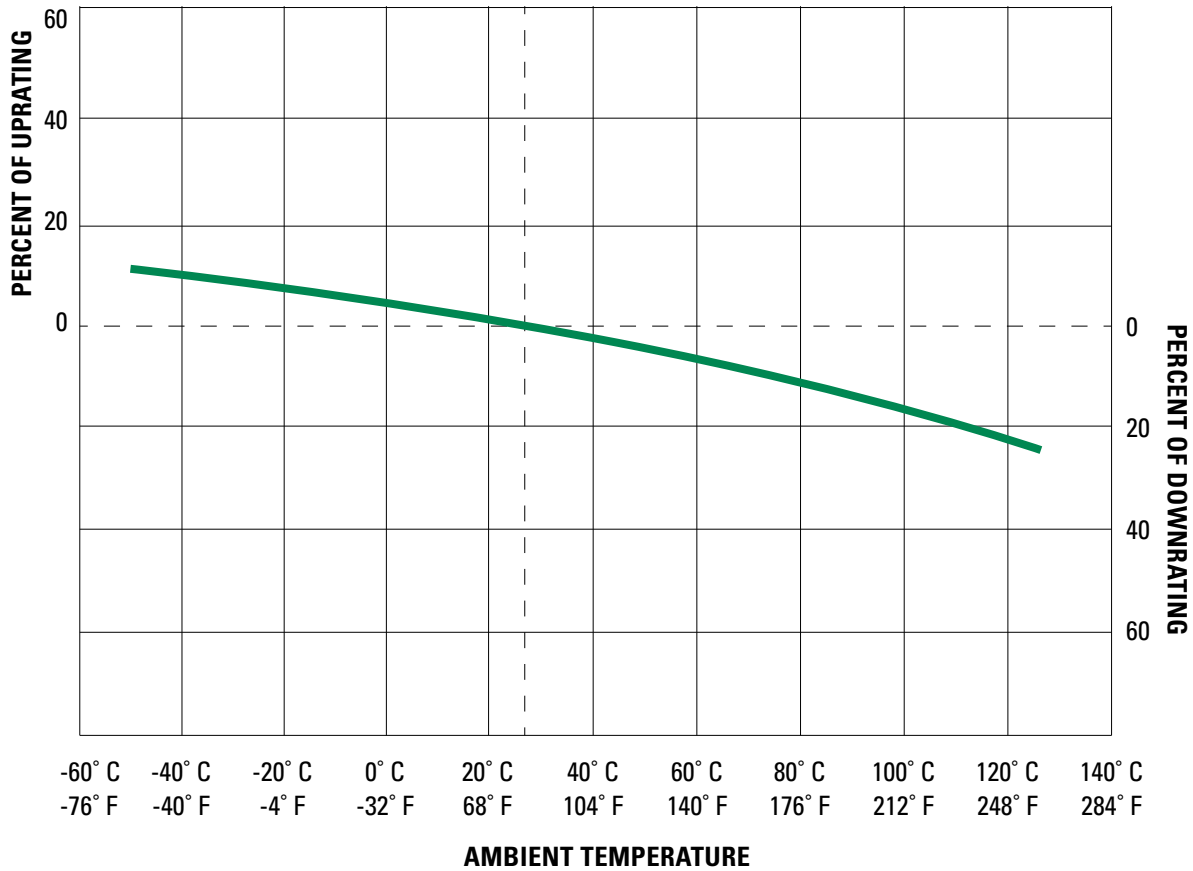
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## Electrical Characteristics for Series

% OF AMPERAGE	AMPERAGE	OPEN NG TIME (MINUTES)	PER
100%	30 A and below	60 Min	UL
113%	1-30 A	60 Min	IEC
135%	1-30 A	60 Max	UL
145%	1-30 A	60 Max	IEC
200%	1-30 A	4 Max	UL

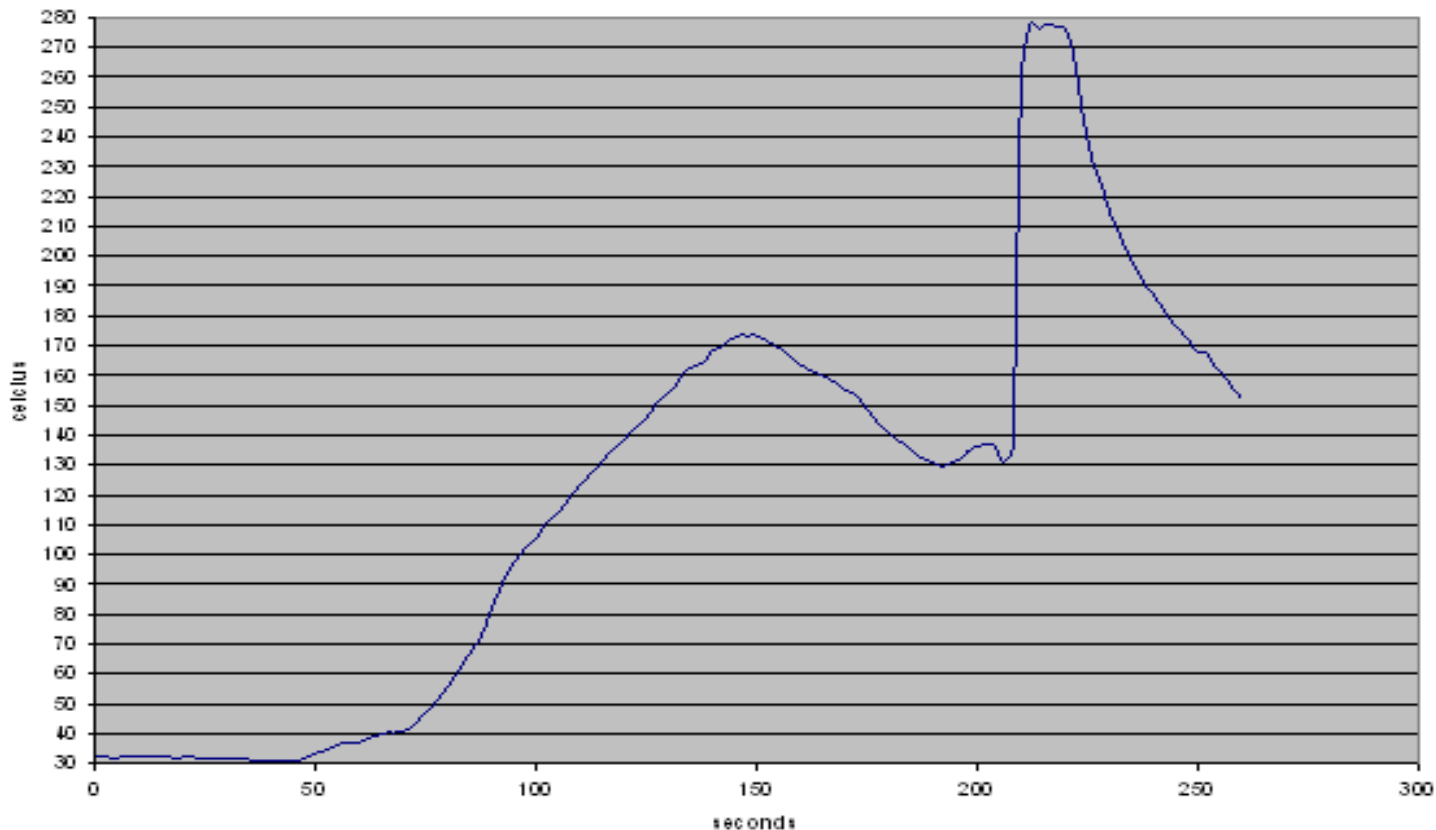
## Temperature Derating Curve



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## Soldering Parameters



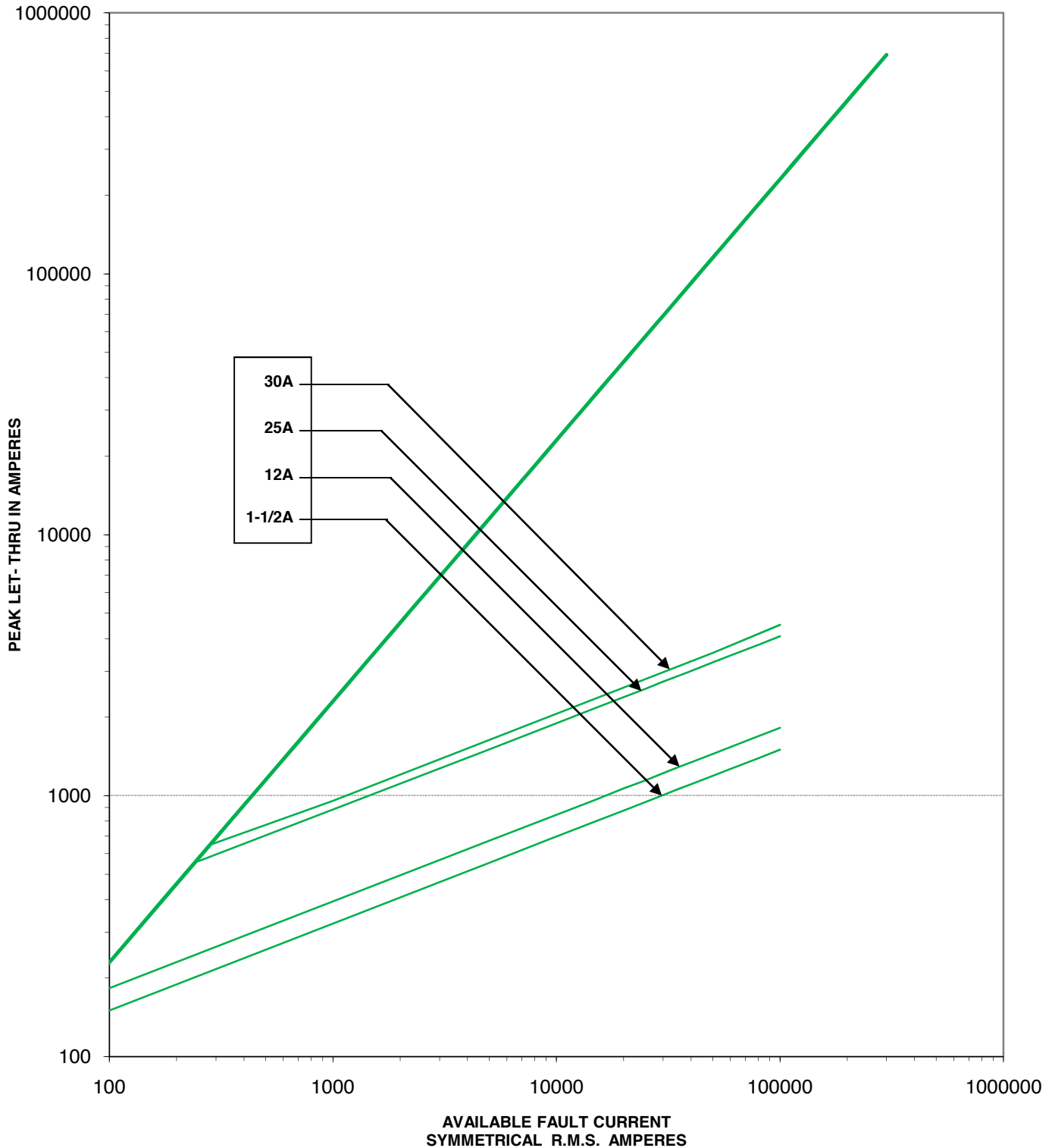
## Recommended Process Parameters

WAVE PARAMETER	LEAD FREE RECOMMENDATION
PREHEAT:	(Typical Industry Recommendation)
TEMPERATURE MINIMUM:	130° C
PRE-HEAT TIME	75 Seconds Maximum
SOLDER POT TEMPERATURE	280° C Maximum
SOLDER DWELL TIME	278° C for 8 Seconds Maximum
COMPLETE CYCLE TIME	250 Seconds Maximum

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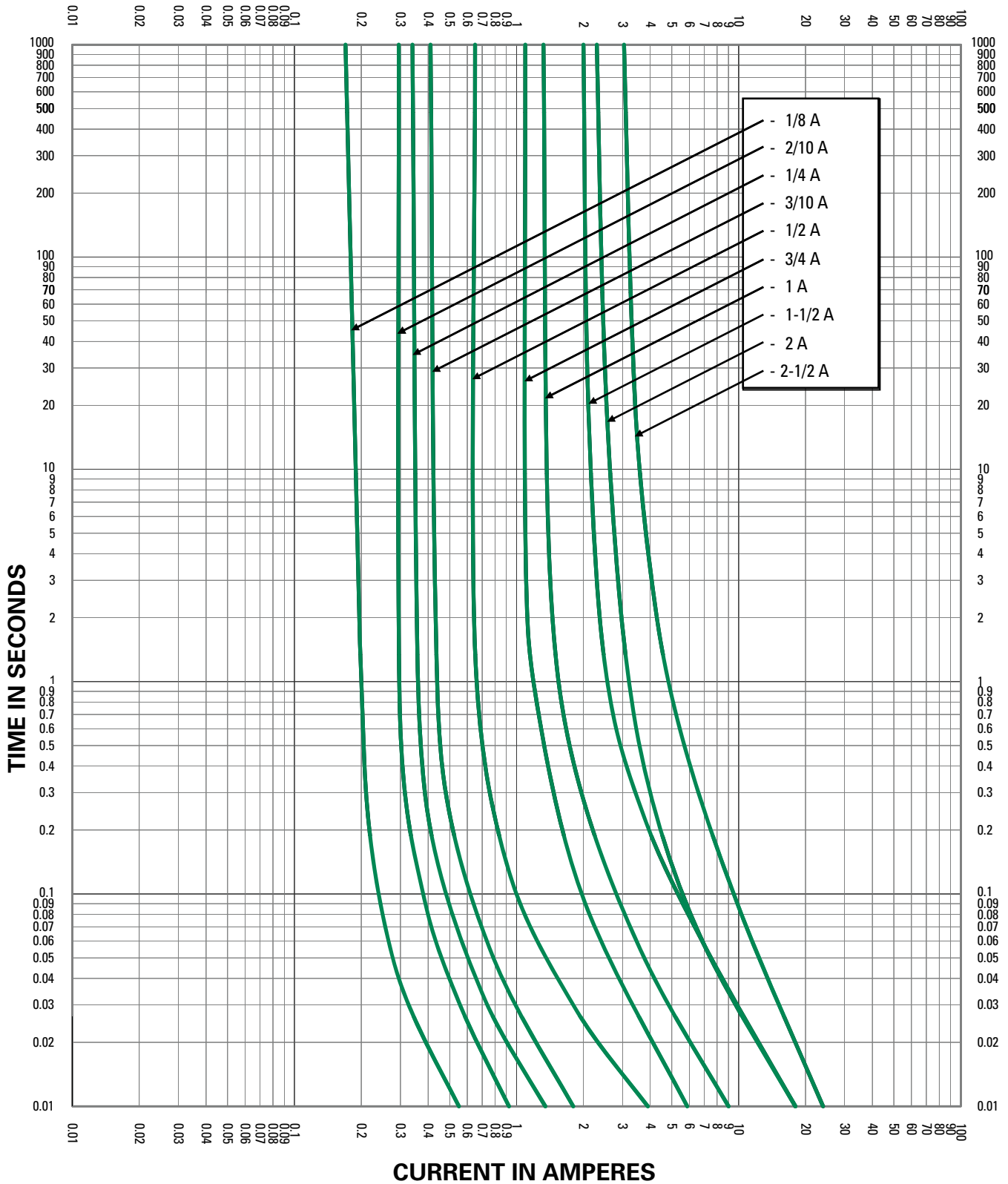
## Peak Let-Thru Curve



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## Time Current Curve

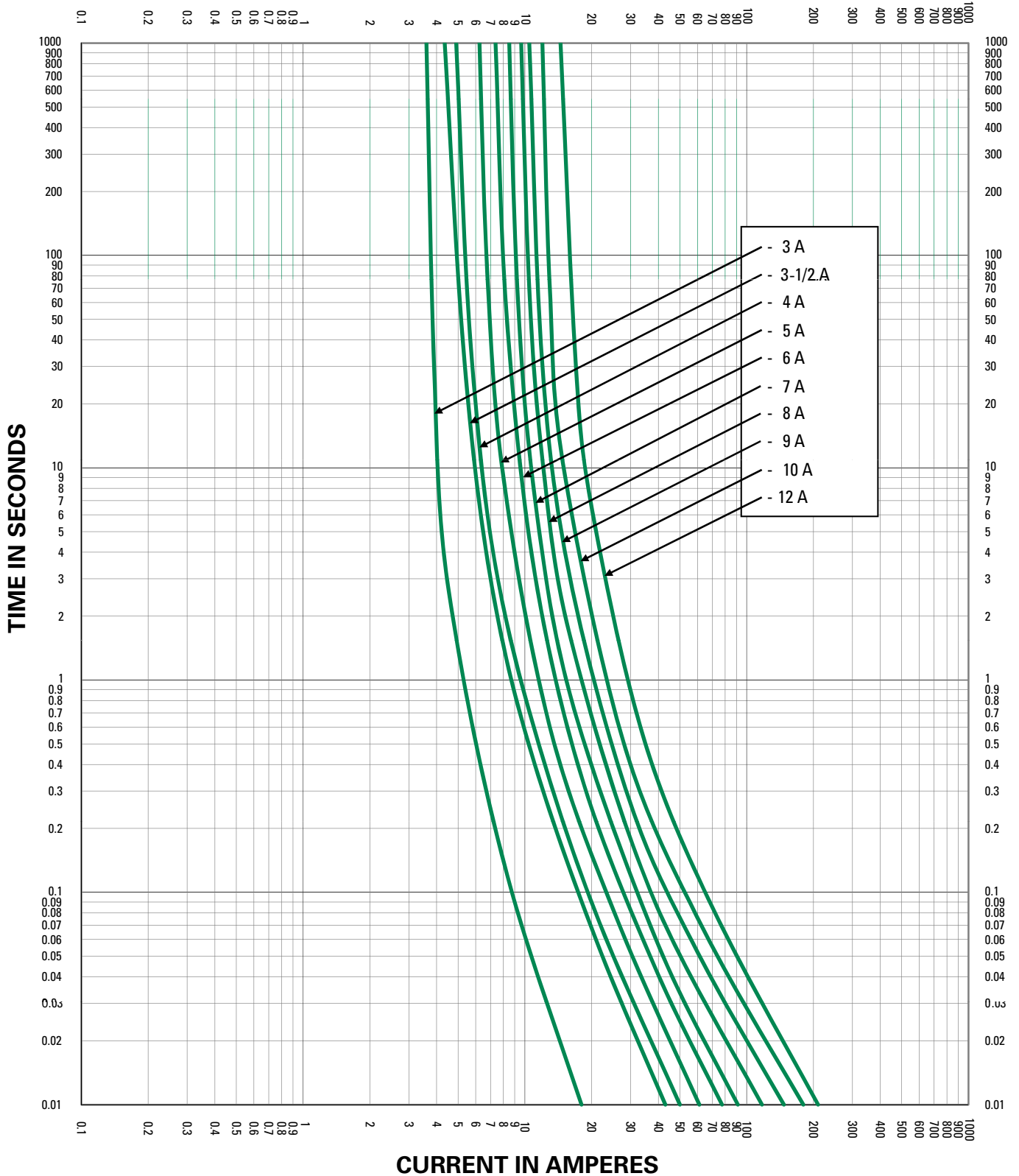




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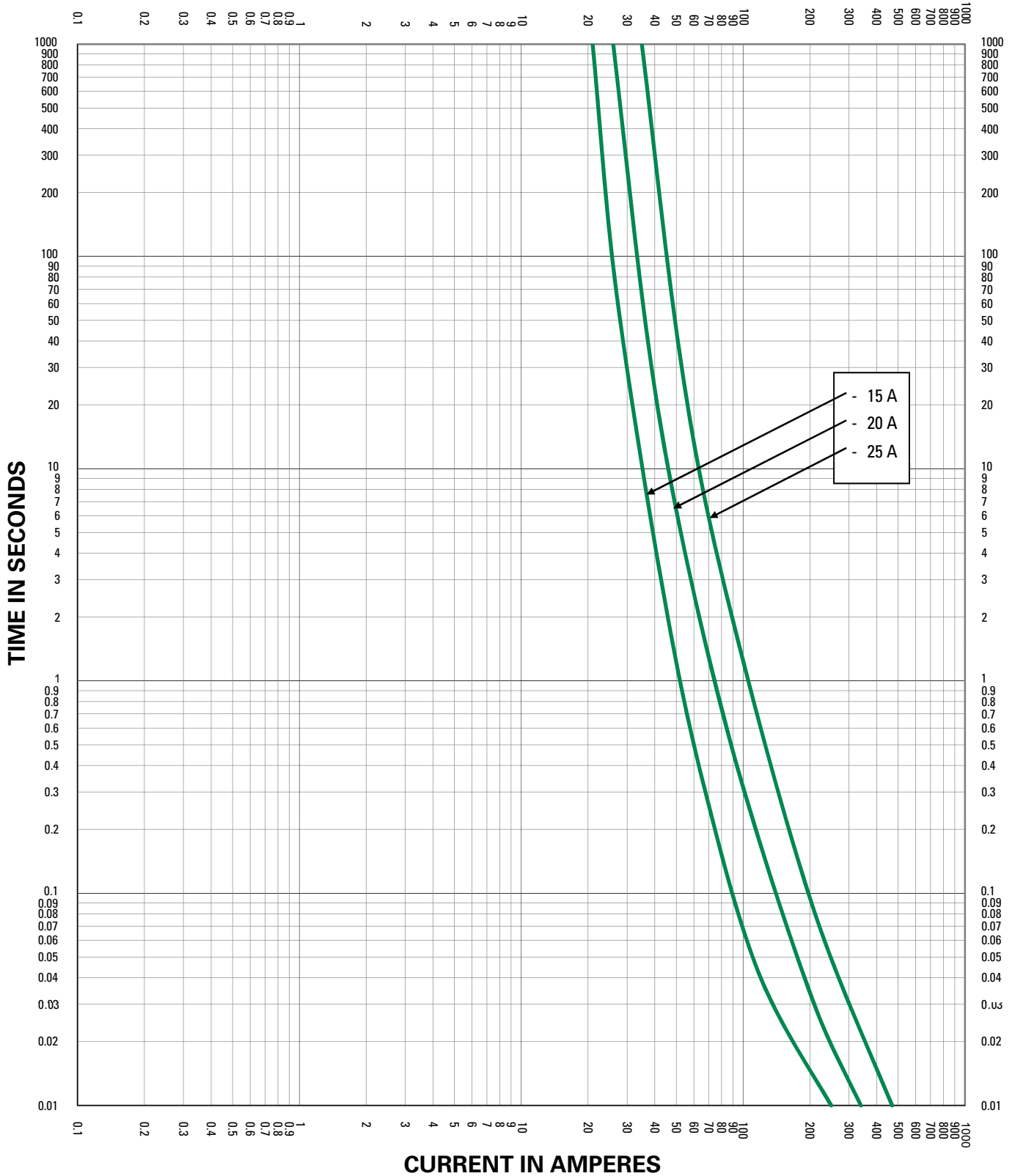
## Time Current Curve



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## Time Current Curve



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## Time Current Curve

