

POWR-GARD® Fuse Datasheet

SPF_CN Series Solar Fuses

1000 V dc • 1–30 A



Description

The SPF_CN Solar Protection Fuse series has been specifically designed for the protection of photovoltaic (PV) systems. This family of midget-style fuses (10 x 38 mm) can safely protect PV modules and conductors from reverse-overcurrent conditions.

As PV systems have grown in size, so have the corresponding voltage requirements. This increase in system voltage has typically been intended to minimize power loss associated with long conductor runs. Standard circuit protection devices are not designed to completely protect photovoltaic panels. However, the SPF_CN series is UL Listed to safely interrupt faulted circuits up to this demanding voltage level.

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

Features/Benefits

- Full range, fast-acting fuse helps eliminate common low-overload faults
- Prevents power generation losses due to nuisance tripping from changes in temperature
- PCB mount and dead-front holder options available

Applications

- Inverters
- Combiner boxes
- Battery charge controllers

Recommended Accessories

Fuse Holder: LPHV 1000 V dc POWR-Safe series

Fuse Clips: 125004/125005

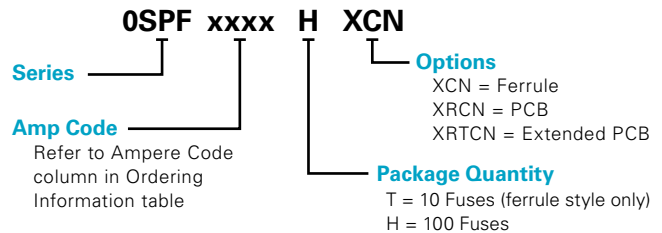
Web Resources

Download technical documents: Littelfuse.com/Solar

Specifications

Voltage Rating	1000 V dc
Amperage Rating	1, 2, 3, 3.5, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30
Max. Interrupting Rating	20 kA: 1 A–20 A 50 kA: 25 A–30 A
Time Constant	≤ 2 ms
Material	Body: melamine Caps: copper alloy
Approvals	UL listed US-CA (File: E339112) TUV (Cert: J 50494849)
Applicable Standards	UL 248-1, 248-19 IEC 60269-6
Environmental	RoHS Compliant REACH
Country of Origin	China

Part Numbering System



Look for this logo to indicate products that are used in solar applications. Visit our website Littelfuse.com/solar for the latest updates on approvals, certifications, and new products.

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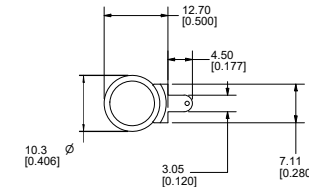
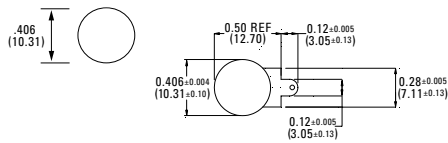
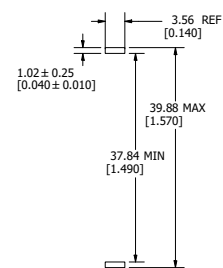
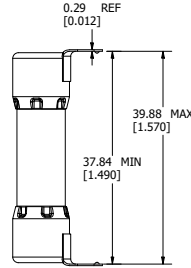
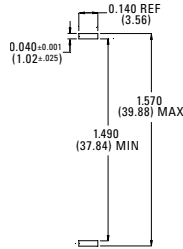
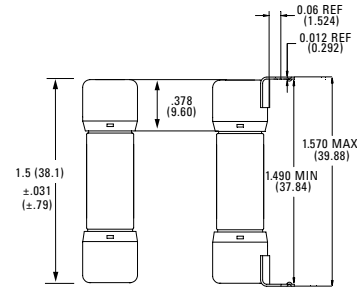
SPF_CN Series Solar Fuses

Dimensions Inches (Millimeters)

Ferrule Version

PCB Version

Extended PCB Version



Ordering Information

Ferrule Version

SERIES	AMPERAGE	AMPERE CODE	CATALOG NUMBER	PRODUCT MARKING	PACKING QUANTITY	ORDERING PART NUMBER	UPC CODE
SPF	1	001.	SPF001CN	SPF 1A-CN	10	OSPF001.TXCN	07945826521
					100	OSPF001.HXCN	07945826535
SPF	2	002.	SPF002CN	SPF 2A-CN	10	OSPF002.TXCN	07945826522
					100	OSPF002.HXCN	07945826536
SPF	3	003.	SPF003CN	SPF 3A-CN	10	OSPF003.TXCN	07945826523
					100	OSPF003.HXCN	07945826537
SPF	3.5	03.5	SPF03.5CN	SPF 3-½A-CN	10	OSPF03.5TXCN	07945826524
					100	OSPF03.5HXCN	07945826538
SPF	4	004.	SPF004CN	SPF 4A-CN	10	OSPF004.TXCN	07945826525
					100	OSPF004.HXCN	07945826539
SPF	5	005.	SPF005CN	SPF 5A-CN	10	OSPF005.TXCN	07945826526
					100	OSPF005.HXCN	07945826540
SPF	6	006.	SPF006CN	SPF 6A-CN	10	OSPF006.TXCN	07945826527
					100	OSPF006.HXCN	07945826541
SPF	8	008.	SPF008CN	SPF 8A-CN	10	OSPF008.TXCN	07945826528
					100	OSPF008.HXCN	07945826542
SPF	10	010.	SPF010CN	SPF 10A-CN	10	OSPF010.TXCN	07945826529
					100	OSPF010.HXCN	07945826543
SPF	12	012.	SPF012CN	SPF 12A-CN	10	OSPF012.TXCN	07945826530
					100	OSPF012.HXCN	07945826544
SPF	15	015.	SPF015CN	SPF 15A-CN	10	OSPF015.TXCN	07945826531
					100	OSPF015.HXCN	07945826545
SPF	20	020.	SPF020CN	SPF 20A-CN	10	OSPF020.TXCN	07945826532
					100	OSPF020.HXCN	07945826546
SPF	25	025.	SPF025CN	SPF 25A-CN	10	OSPF025.TXCN	07945826533
					100	OSPF025.HXCN	07945826547
SPF	30	030.	SPF030CN	SPF 30A-CN	10	OSPF030.TXCN	07945826534
					100	OSPF030.HXCN	07945826548

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Ordering Information

PCB and Extended PCB Versions

SERIES	AMPERAGE	AMPERE CODE	CATALOG NUMBER	PRODUCT MARKING	PACKING QUANTITY	ORDERING PART NUMBER	UPC CODE
SPF	1	001.	SPF001RCN	SPF 1A-RCN	100	OSPF001.HXRCN	07945827736
SPF	2	002.	SPF002RCN	SPF 2A-RCN	100	OSPF002.HXRCN	07945827737
SPF	3	003.	SPF003RCN	SPF 3A-RCN	100	OSPF003.HXRCN	07945827738
SPF	3	003.	SPF003RTCN	SPF 3A-RTCN	100	OSPF003.HXRTCN	07945865983
SPF	3.5	03.5	SPF03.5RCN	SPF 3-½A-RCN	100	OSPF03.5.HXRCN	07945827739
SPF	4	004.	SPF004RCN	SPF 4A-RCN	100	OSPF004.HXRCN	07945827740
SPF	5	005.	SPF005RCN	SPF 5A-RCN	100	OSPF005.HXRCN	07945827741
SPF	6	006.	SPF006RCN	SPF 6A-RCN	100	OSPF006.HXRCN	07945827742
SPF	8	008.	SPF008RCN	SPF 8A-RCN	100	OSPF008.HXRCN	07945827743
SPF	10	010.	SPF010RCN	SPF 10A-RCN	100	OSPF010.HXRCN	07945827744
SPF	12	012.	SPF012RCN	SPF 12A-RCN	100	OSPF012.HXRCN	07945827745
SPF	15	015.	SPF015RCN	SPF 15A-RCN	100	OSPF015.HXRCN	07945827746
SPF	20	020.	SPF020RCN	SPF 20A-RCN	100	OSPF020.HXRCN	07945827747
SPF	25	025.	SPF025RCN	SPF 25A-RCN	100	OSPF025.HXRCN	07945827748
SPF	30	030.	SPF030RCN	SPF 30A-RCN	100	OSPF030.HXRCN	07945827749
SPF	30	030.	SPF030RTCN	SPF 30A-RTCN	100	OSPF030.HXRTCN	07945831409

Electrical Specifications

AMPERAGE	AMPERE CODE	CATALOG NUMBER (FERRULE)	CATALOG NUMBER (PCB)	CATALOG NUMBER (EXTENDED PCB)	VOLTAGE		NOM COLD RESISTANCE (ohm)	WATTS LOSS AT 100 % RATED CURRENT (W)	WATTS LOSS AT 80 % RATED CURRENT (W)	TOTAL CLEARING I ² t (A ² s) 20 kA	TOTAL CLEARING I ² t (A ² s) 50 kA	AGENCY APPROVALS	
					DC	DC						UL	TUV
1	001.	SPF001CN	SPF001RCN	—	1000	20	0.394	0.60	0.41	0.6	—	•	•
2	002.	SPF002CN	SPF002RCN	—	1000	20	0.154	1.59	0.85	4.8	—	•	•
3	003.	SPF003CN	SPF003RCN	SPF003RTCN	1000	20	0.110	1.50	0.82	7.9	—	•	•
3.5	03.5	SPF03.5CN	SPF03.5RCN	—	1000	20	0.078	1.37	0.78	11	—	•	•
4	004.	SPF004CN	SPF004RCN	—	1000	20	0.061	1.49	0.84	23	—	•	•
5	005.	SPF005CN	SPF005RCN	—	1000	20	0.041	1.47	0.86	43	—	•	•
6	006.	SPF006CN	SPF006RCN	—	1000	20	0.028	1.35	0.77	80	—	•	•
8	008.	SPF008CN	SPF008RCN	—	1000	20	0.018	1.61	0.91	199	—	•	•
10	010.	SPF010CN	SPF010RCN	—	1000	20	0.013	1.76	1.00	401	—	•	•
12	012.	SPF012CN	SPF012RCN	—	1000	20	0.010	1.97	1.11	642	—	•	•
15	015.	SPF015CN	SPF015RCN	—	1000	20	0.008	2.28	1.38	505	—	•	•
20	020.	SPF020CN	SPF020RCN	—	1000	20	0.005	2.81	1.57	1313	—	•	•
25	025.	SPF025CN	SPF025RCN	—	1000	50	0.004	3.33	1.88	2141	2433	•	•
30	030.	SPF030CN	SPF030RCN	SPF030RTCN	1000	50	0.003	3.85	2.15	3290	3810	•	•

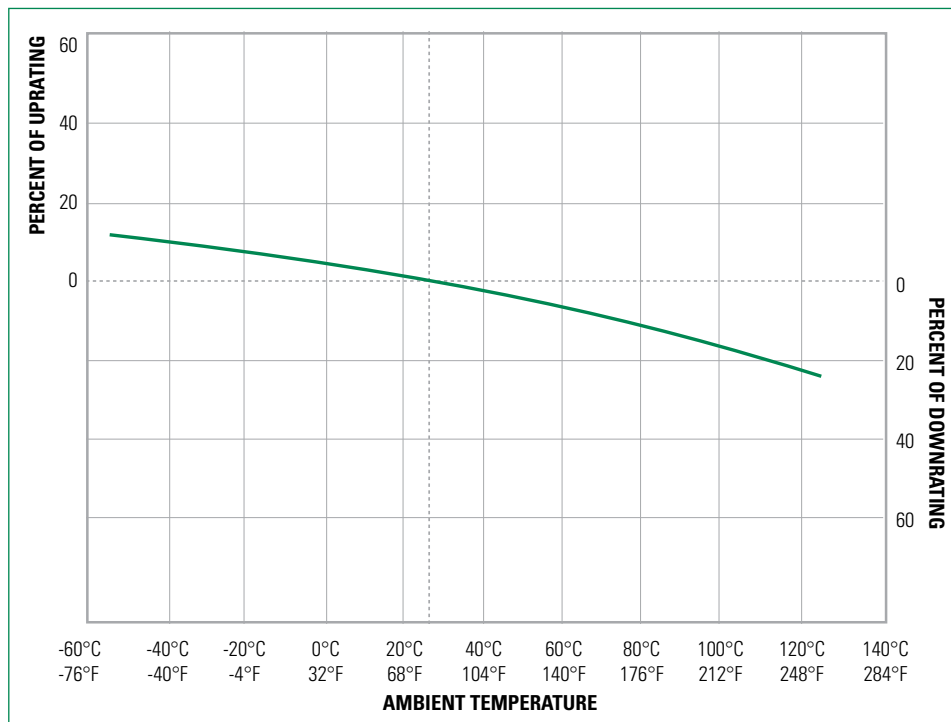
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Electrical Specification – Agency Requirements

AMPERAGE RATING	OPENING TIME (MINUTES)				
	100 % of Amperage Rating per UL	113 % of Amperage Rating per IEC	135 % of Amperage Rating per UL	145 % of Amperage Rating per IEC	200 % of Amperage Rating per UL
1–30	Temperature Stabilization	60 Min	60 Max	60 Max	4 Max

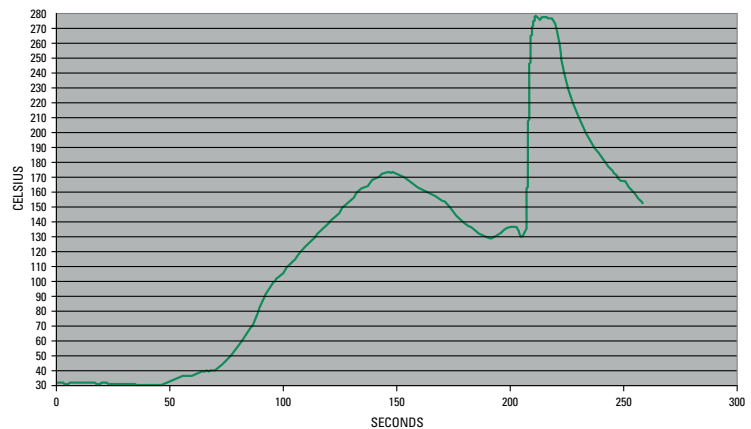
Temperature Derating Curve (temperature of air immediately surrounding fuse)



Recommended Process 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

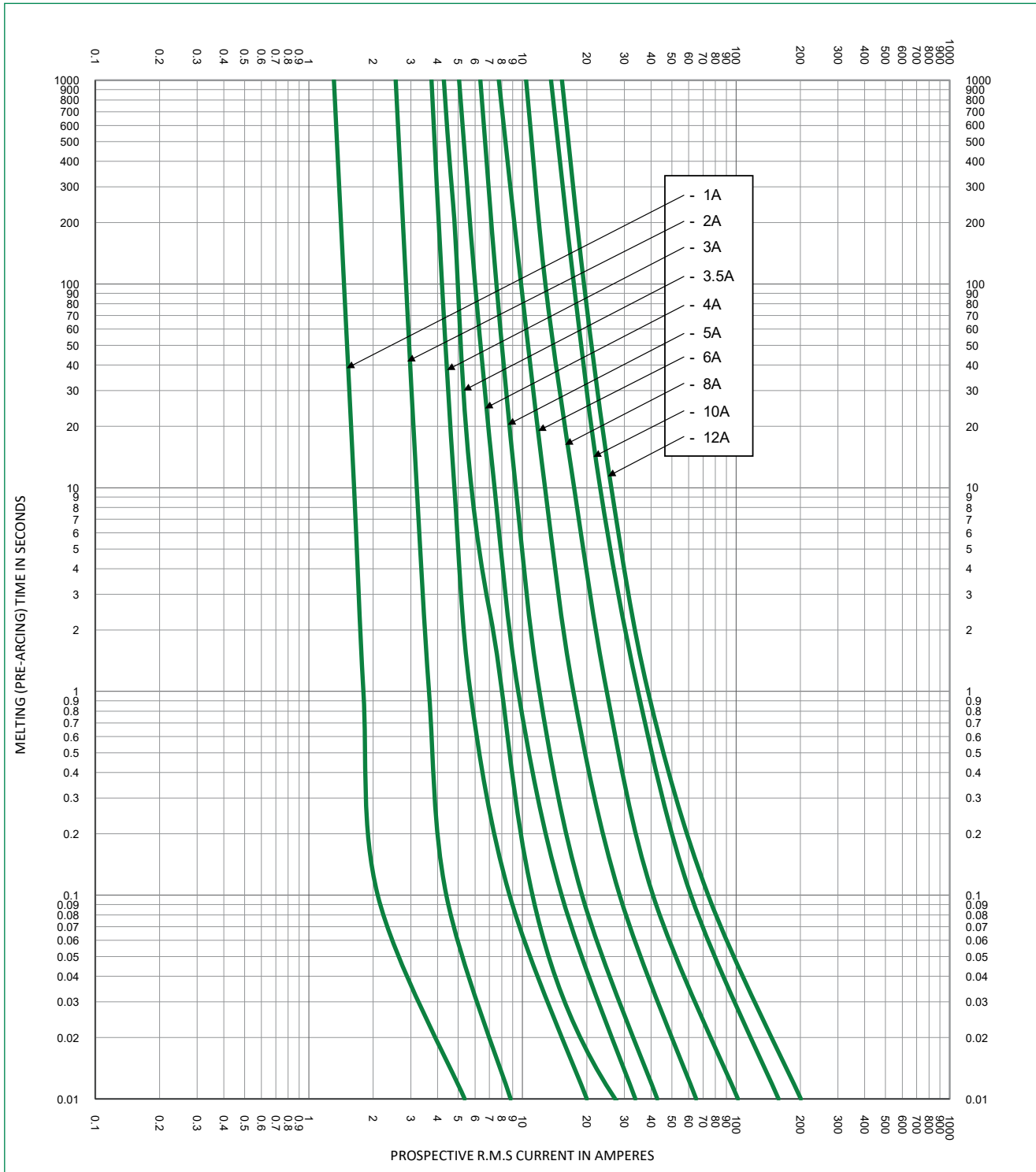
Soldering Parameters



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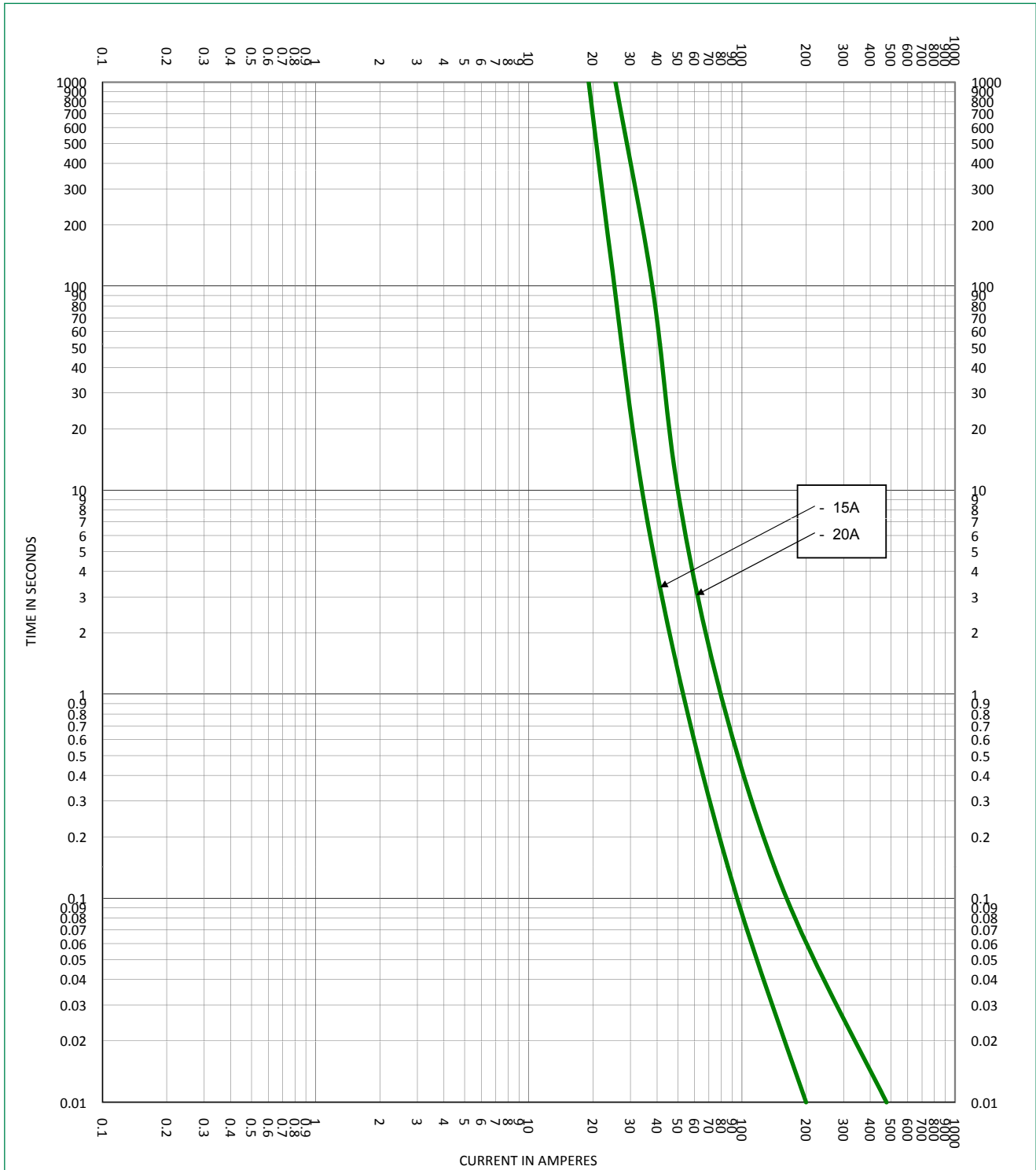
Time Current Curve (1–12 A)



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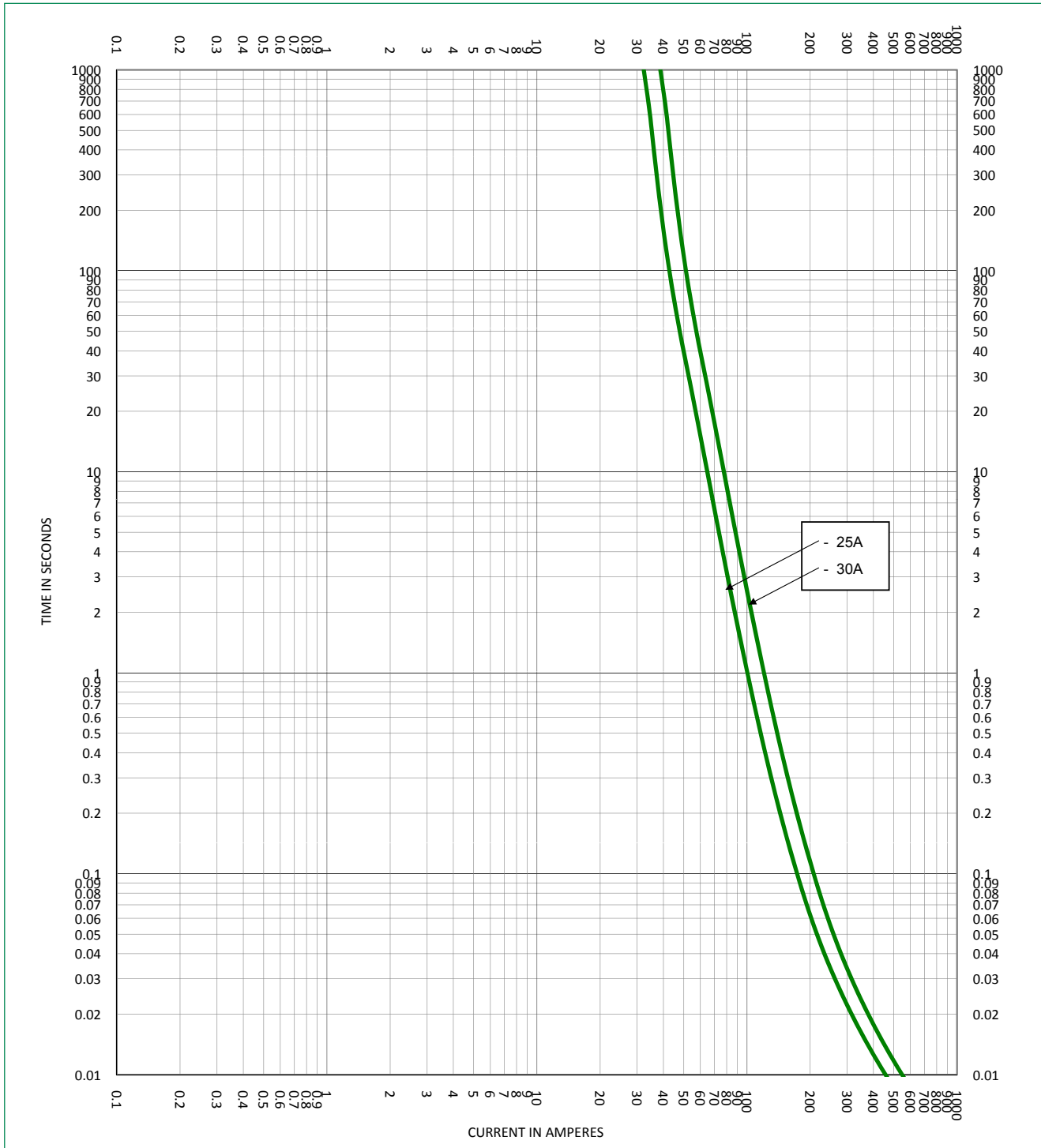
Time Current Curve (15–20 A)



POWR-GARD® Fuse Datasheet

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Time Current Curve (25–30 A)



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