chanhvinh.com

POWR-GARD® Fuse Datasheet

Littelfuse
Expertise Applied | Answers Delivered

SPF SERIES SOLAR FUSES

1000 VDC • 1-30 A



Specifications

Voltage Rating	1000 VDC
Amperage Rating	1, 2, 3, 3.5, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30
Max. Interrupting Rating	20 kA
Time Constant	≤ 2ms
Material	Body: Melamine Caps: Copper Alloy
Approvals	UL 2579 Listed (File: E339112) IEC 60269-6 (1-25 A) VDE Certified (No. 40033098)* see specifications on pg. 2 CSA Certified (File: 029862_0_000)
Environmental	RoHS Compliant
Country of Origin	Mexico

Description

The SPF 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 series is UL Listed to safely interrupt faulted circuits up to this demanding voltage level.

Littelfuse offers 14 ampere ratings to match specific requirements in a variety of applications.

Part Numbering System

0SPF xxxx H XR

Series

Amp Code
Refer to Amp Code Column in Electrical Specifications Table

Mounting Options
Blank = Ferrule
XR = PCB

Package Quantity
T = 10
H = 100

SERIES	AMP	PACKAGE QUANTITY	MOUNTING METHOD	CATALOG NUMBER	ORDERING NUMBER
SPF	2	10	FERRULE	SPF002	0SPF002.T
SPF	3.5	10	FERRULE	SPF03.5	0SPF03.5T
SPF	30	100	PCB TABS	SPF030R	0SPF030.HXR

Features/Benefits

- Meets UL, IEC and VDE photovoltaic standards
- UL 2579 Listed 1000 VDC maximum
- 1-30 A ratings available
- 20,000 A Interrupting Rating
- Both PCB mount and dead-front holder options available

Applications

- Inverters
- Combiner boxes
- Battery charge controllers

Recommended Fuse Holders

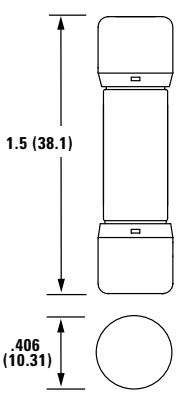
LPHV 1000 VDC POWR-Safe Series

Web Resources

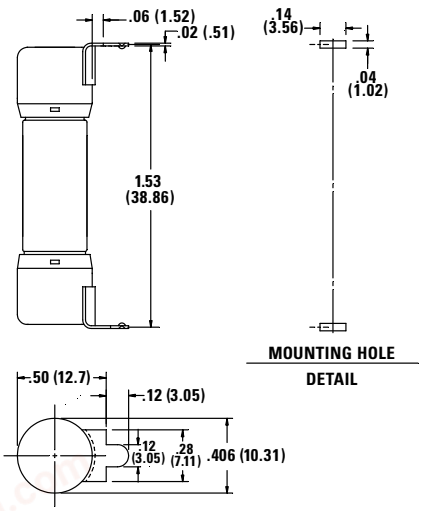
Downloadable CAD drawings and other technical information: **Littelfuse.com/spf**

Dimensions Inches (mm)

Ferrule Version



PCB Version



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.

© 2013 Littelfuse POWR-GARD® Products
Rev:4-D-052413

chanhvinh.com

SPF SERIES SOLAR FUSES

Electrical Specifications
Ferrule Version

AMPERAGE	AMP CODE	ORDERING NUMBER	UPC	VOLTAGE	INTERRUPTING RATING		NOM COLD RESISTANCE (ohm)	WATTS LOSS AT 100% RATED CURRENT (W)	WATTS LOSS AT 80% RATED CURRENT (W)	TOTAL CLEARING I^2t (A^2s) 10 kA	TOTAL CLEARING I^2t (A^2s) 20 kA	AGENCY APPROVALS		
				DC	AC	DC						UL	VDE	CSA
1	001.	0SPF001.T	07945816907	1000	–	20 kA	0.394	0.602	0.410	0.554	0.554	•		•
2	002.	0SPF002.T	07945816910	1000	–	20 kA	0.237	1.586	0.851	1.175	4.755	•	•	•
3	003.	0SPF003.T	07945816913	1000	–	20 kA	0.11	1.504	0.824	5.007	7.882	•	•	•
3.5	03.5	0SPF03.5T	07945880087	1000	–	20 kA	0.07787	1.365	0.778	11.297	11.297	•		•
4	004.	0SPF004.T	07945816916	1000	–	20 kA	0.06127	1.491	0.839	23.031	23.031	•	•	•
5	005.	0SPF005.T	07945816919	1000	–	20 kA	0.04086	1.465	0.859	42.600	42.600	•	•	•
6	006.	0SPF006.T	07945816922	1000	–	20 kA	0.0281	1.348	0.769	76.270	80.254	•	•	•
8	008.	0SPF008.T	07945816925	1000	–	20 kA	0.0178	1.610	0.914	193.323	198.960	•	•	•
10	010.	0SPF010.T	07945816928	1000	–	20 kA	0.0125	1.760	1.000	395.556	401.208	•	•	•
12	012.	0SPF012.T	07945816931	1000	–	20 kA	0.00993	1.965	1.109	599.198	641.940	•	•	•
15	015.	0SPF015.T	07945816934	1000	–	20 kA	0.00799	2.282	1.382	457.740	504.770	•	•	•
20	020.	0SPF020.T	07945816937	1000	–	20 kA	0.0045	2.810	1.574	1173.990	1312.850	•	•	•
25	025.	0SPF025.T	07945817595	1000	–	20 kA	0.00353	2.981	1.745	1937.430	2371.140	•	•	•
30	030.	0SPF030.T	07945817598	1000	–	20 kA	0.00284	3.923	2.125	2209.480	2678.750	•		•

Electrical Specifications
PCB Version

AMPERAGE	AMP CODE	ORDERING NUMBER	UPC	VOLTAGE	INTERRUPTING RATING		NOM COLD RESISTANCE (ohm)	WATTS LOSS AT 100% RATED CURRENT (W)	WATTS LOSS AT 80% RATED CURRENT (W)	TOTAL CLEARING I^2t (A^2s) 10 kA	TOTAL CLEARING I^2t (A^2s) 20 kA	AGENCY APPROVALS	
				DC	AC	DC						UL	CSA
1	001.	0SPF001.HXR	07945816909	1000	–	20 kA	0.394	0.602	0.410	0.554	0.554	•	•
2	002.	0SPF002.HXR	07945816912	1000	–	20 kA	0.237	1.586	0.851	1.175	4.755	•	•
3	003.	0SPF003.HXR	07945816915	1000	–	20 kA	0.11	1.504	0.824	5.007	7.882	•	•
3.5	03.5	0SPF03.5HXR	07945880089	1000	–	20kA	0.07787	1.365	0.778	11.297	11.297	•	•
4	004.	0SPF004.HXR	07945816918	1000	–	20 kA	0.06127	1.491	0.839	23.031	23.031	•	•
5	005.	0SPF005.HXR	07945816921	1000	–	20 kA	0.04086	1.465	0.859	42.600	42.600	•	•
6	006.	0SPF006.HXR	07945816924	1000	–	20 kA	0.0281	1.348	0.769	76.270	80.254	•	•
8	008.	0SPF008.HXR	07945816927	1000	–	20 kA	0.0178	1.610	0.914	193.323	198.960	•	•
10	010.	0SPF010.HXR	07945816930	1000	–	20 kA	0.0125	1.760	1.000	395.556	401.208	•	•
12	012.	0SPF012.HXR	07945816933	1000	–	20 kA	0.00993	1.965	1.109	599.198	641.940	•	•
15	015.	0SPF015.HXR	07945816936	1000	–	20 kA	0.00799	2.282	1.382	457.740	504.770	•	•
20	020.	0SPF020.HXR	07945817594	1000	–	20 kA	0.0045	2.810	1.574	1173.990	1312.850	•	•
25	025.	0SPF025.HXR	07945817597	1000	–	20 kA	0.00353	2.981	1.745	1937.430	2371.140	•	•
30	030.	0SPF030.HXR	07945817600	1000	–	20 kA	0.00284	3.923	2.125	2209.480	2678.750	•	•

© 2013 Littelfuse POWR-GARD® Products

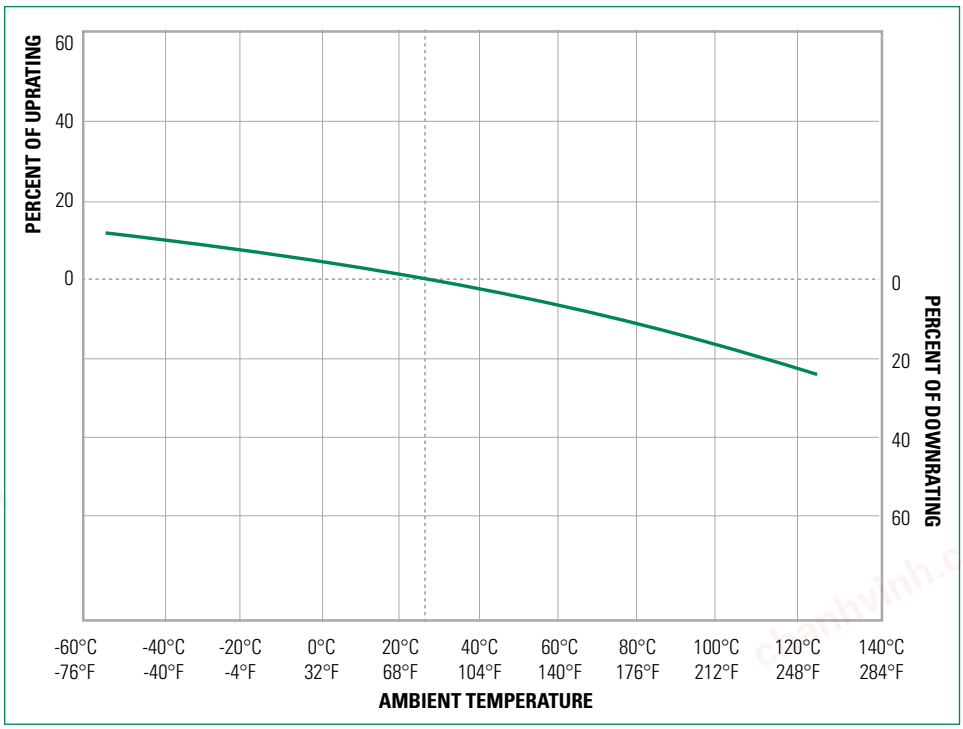
chanhvinh.com

SPF SERIES SOLAR FUSES

Electrical Specification – Agency Requirements

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

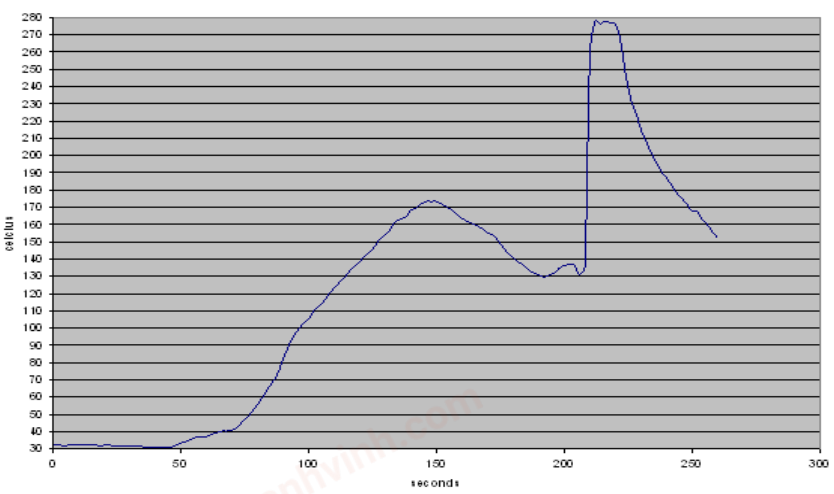
Temperature Derating Curve (Temperature of Air Immediately Surrounding Fuse)



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

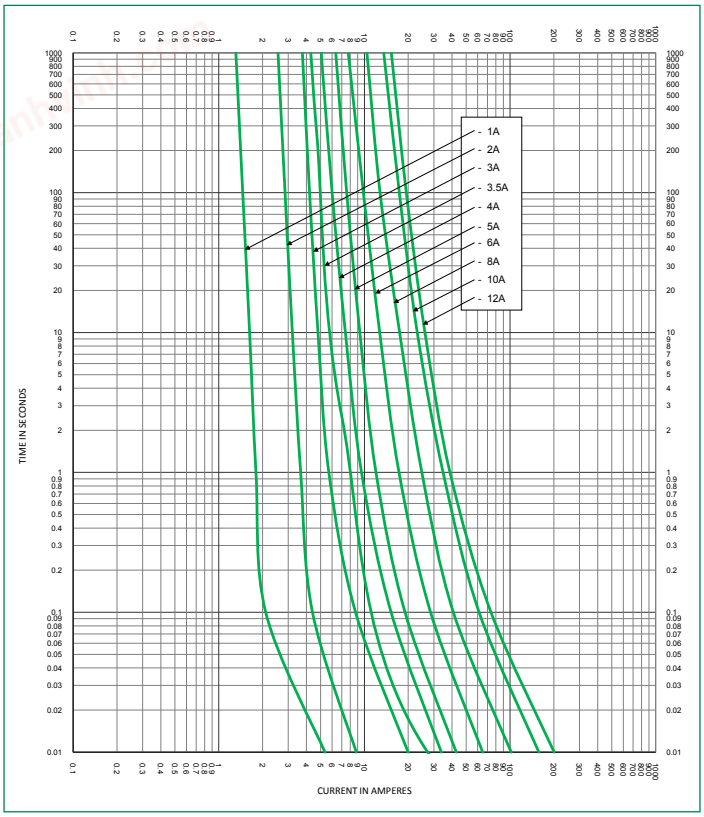


© 2013 Littelfuse POWR-GARD® Products

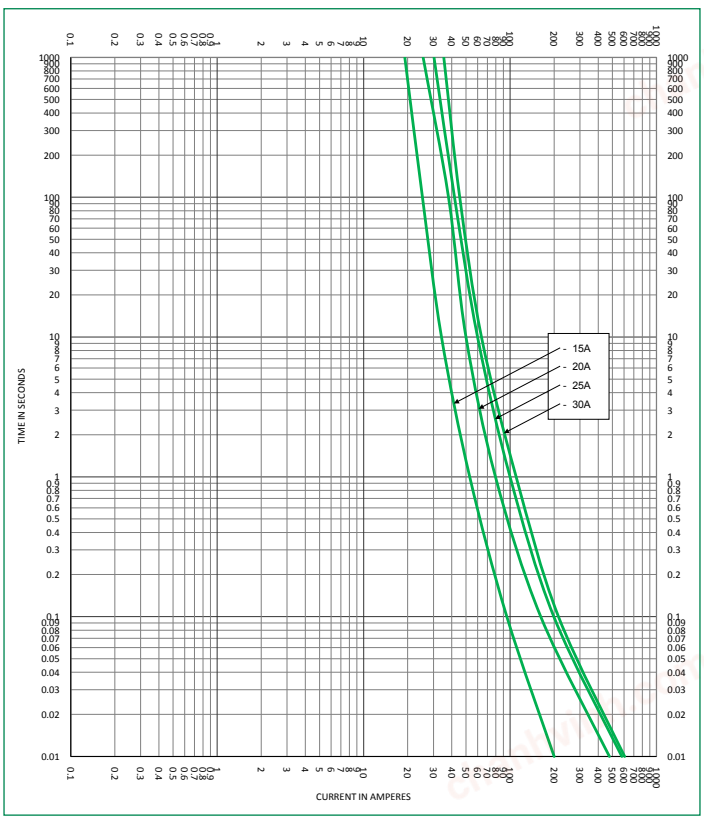
chanhvinh.com

SPF SERIES SOLAR FUSES

Time Current Curve (1-12 A)



Time Current Curve (15-30 A)



© 2013 Littelfuse POWR-GARD® Products