



## Schottky Barrier Photovoltaic Bypass Diode

HALOGEN  
**FREE**

### DESCRIPTION

The SFDS1045Le3 is a single Schottky rectifier assembled in a thin flexible package. The device is designed specifically for use as a photovoltaic bypass diode for solar panels. Its low 0.81 mm (0.032 inch) height allows it to be assembled under the glass of the panel, if desired. Customized configurations are available for high volume applications.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- Low forward voltage drop.
- Ultra low profile package height.
- Very low thermal resistance package.
- Light weight package with flexible copper leads for surface mount soldering or welding.
- RoHS compliant (2002/95/EC) and halogen free (IEC 61249-2-21).
- Tested to applicable IEC 61215 Edition 2.0 requirements.

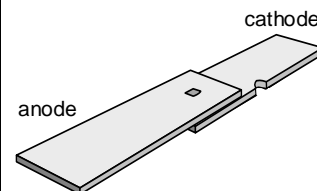
### APPLICATIONS / BENEFITS

- $I_O$  rating of 10 amps.
- $V_{RRM}$  rating of 45 volts.
- $T_{J(MAX)}$  rating of 200 °C.
- $V_{F(MAX)}$  rating of 0.46 volts at 10A @ 25 °C.

### MAXIMUM RATINGS @ 25 °C unless otherwise specified

Parameters/Test Conditions	Symbol	Value	Unit
Junction (Reverse blocking) and Storage Temperature	$T_{J(R)}$ and $T_{STG}$	-55 to +150	°C/W
Junction (Forward conducting) Temperature	$T_{J(F)}$	-55 to +200	°C/W
Thermal Resistance Junction-to-Lead	$R_{\theta JL}^{(1)}$	16	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}^{(1)}$	4	°C/W
Peak Repetitive Reverse Voltage	$V_{RRM}$	45	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_R$		
RMS Reverse Voltage	$V_{R(RMS)}$	32	V
Average Rectified Forward Output Current ( $T_C = 135^\circ\text{C}$ )	$I_O$	10 <sup>(2)</sup>	A
Repetitive peak forward current ( $f > 15\text{ Hz}$ )	$I_{FRM}$	65	A
Non repetitive peak forward surge current (8.3 ms single half sine wave)	$I_{FSM}$	450	A
Non repetitive peak reverse surge current (100 kHz square wave, $T_C = 135^\circ\text{C}$ )	$I_{RSM}$	2.0	A

**Notes:** 1. Measured with heat sinks at 3/8" from die edge.  
2. In free air mounted on standard PV interconnect ribbon 6 mil (0.152 mm) thick, 200 mil (5.8 mm) wide, 6" (150 mm) long soldered to each terminal (not connected to body of device).



**Flex Diode**

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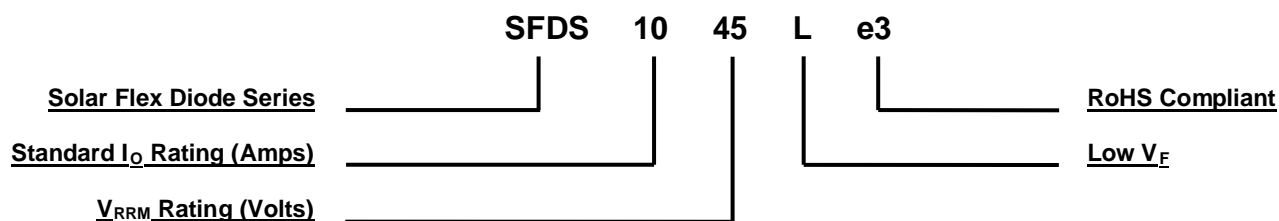
#### Website:

[www.microsemi.com](http://www.microsemi.com)

### MECHANICAL and PACKAGING

- **TERMINALS:** Ni/Sn plating - fully RoHS compliant.
- **LEAD PULL STRENGTH:** Min 10 lb/f (44.4 N). *A standard (no lead bend) device has one lead secured and the other is pulled outwards along the axis and in the same plane as the device. All devices can meet the minimum value with no damage to the device.*
- **LEAD EXTENSION:** Max 0.039 inch (1 mm). *The leads may need to expand or contract during the solar module assembly process or during normal temperature variations (daytime to nighttime) in standard operation.*
- **MARKING:** Manufacturer, package type, part number and date code.
- **POLARITY:** Cathode lead is notched.
- **DELIVERY option:** Blister tray with a base quantity of 80 pieces.
- **WEIGHT:** 0.53 grams (approximate).
- See [Package Dimensions](#) on last page.

### PART NOMENCLATURE



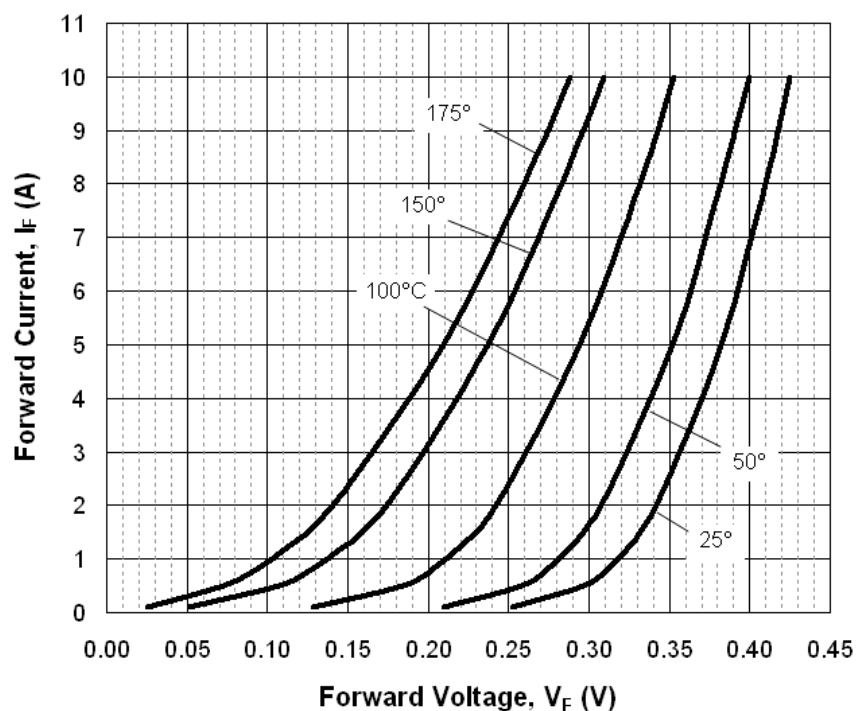
### SYMBOLS & DEFINITIONS

Symbol	Definition
$I_R$	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
$V_F$	Forward Voltage: The forward voltage the device will exhibit at a specified current (typically shown as maximum value).

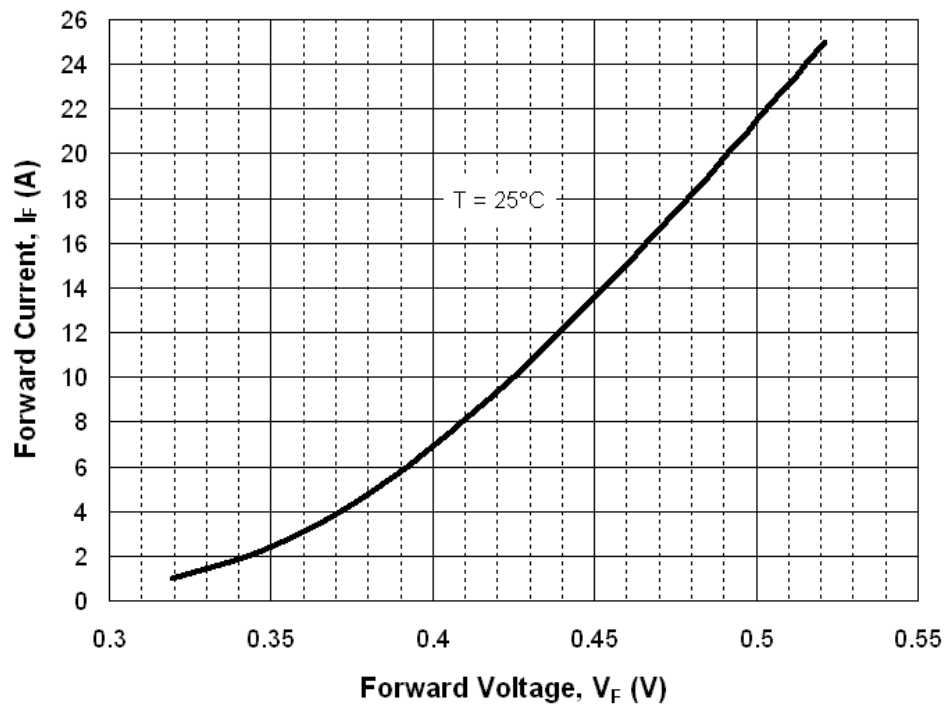
**ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Test Conditions		Typ	max	Units
$V_F^{(1)}$	Maximum forward voltage	$T_J = 25\text{ }^{\circ}\text{C}$	$I_F = 0.1\text{ A}$	0.25	0.27	V
			$I_F = 8.0\text{ A}$	0.41	0.42	
			$I_F = 10.0\text{ A}$	0.42	0.46	
		$T_J = 100\text{ }^{\circ}\text{C}$	$I_F = 10.0\text{ A}$	0.36	0.38	
$I_R^{(1)}$	Maximum instantaneous reverse current	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = 45\text{ V}$	0.12	0.15	mA

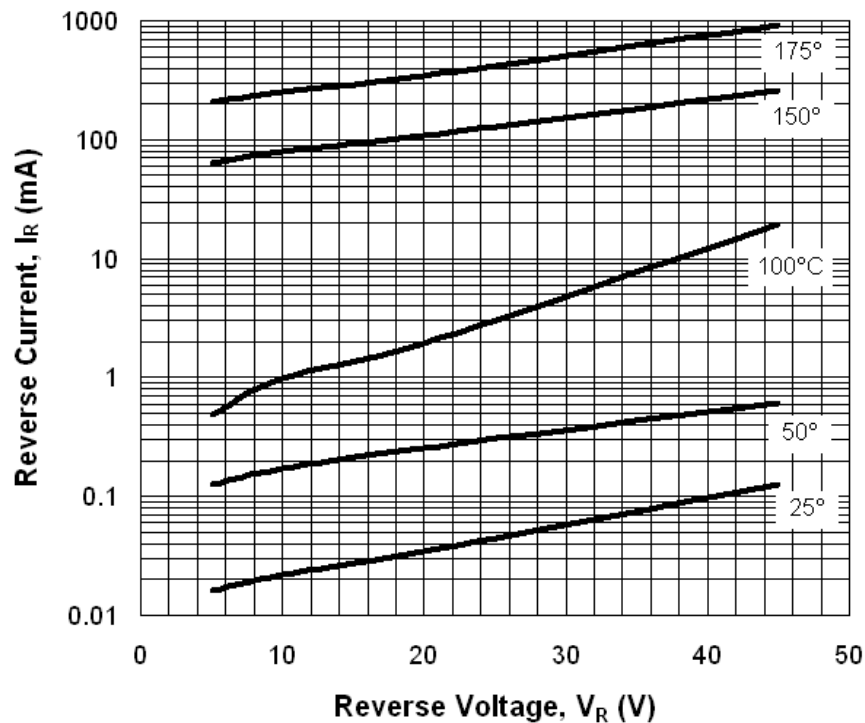
**NOTES:** 1. Measured with a test pulse of 380  $\mu\text{s}$  to minimize self-heating effect.

**GRAPHS**


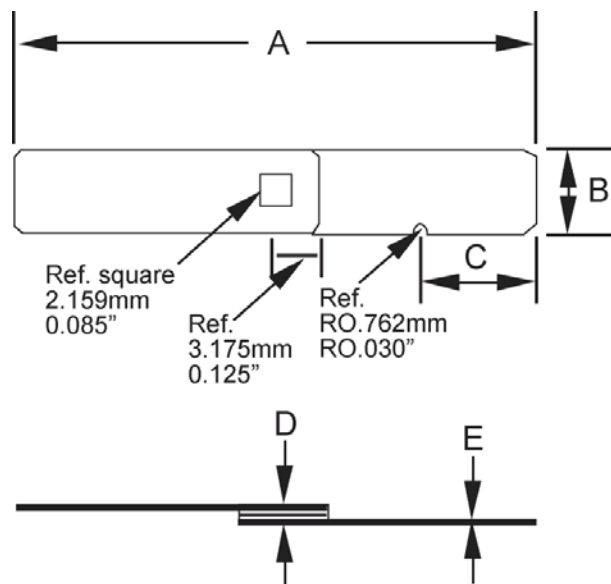
**FIGURE 1**  
Typical Forward Current vs. Forward Voltage

**GRAPHS**


**FIGURE 2**  
Typical Forward Current vs. Forward Voltage



**FIGURE 3**  
Typical Reverse Current vs. Reverse Voltage

**PACKAGE DIMENSIONS**


Ltr	Dimensions	
	Inches	Millimeters
<b>A</b>	1.000 +/- 0.050	25.40 +/- 1.27
<b>B</b>	0.250 +/- 0.005	6.35 +/- 0.13
<b>C</b>	0.1875 +/- 0.010	4.762 +/- 0.254
<b>D</b>	0.032 +/- 0.004	0.81 +/- 0.10
<b>E</b>	0.008 +/- 0.002	0.20 +/- 0.05