

Photovoltaic Solar Cell Protection Schottky Plastic Rectifier

High Barrier Technology for Improved High Temperature Performance

This datasheet reflects specifications of product in actual application.



P600

FEATURES

- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency operation
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in solar cell junction box as a bypass diode for protection, using DC forward current without reverse bias.

MECHANICAL DATA

Case: P600, molded epoxy over passivated junction Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	45 V
I_{FSM}	300 A
V_F at $I_F = 15$ A	0.46 V
T_{OP} max.	175 °C
T_J max. (DC forward current)	200 °C
Package	P600
Diode variation	Single die

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	SB15H45	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}^{(1)}$	15	A
	$I_{F(AV)}^{(2)}$	7	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	300	A
Operating junction and storage temperature range	T_{OP}, T_{STG}	- 55 to + 175	°C
Junction temperature in DC forward current without reverse bias, $t \leq 1$ h (fig. 1)	$T_J^{(3)}$	≤ 200	°C

Notes

- (1) With heatsink, $T_L = 25$ °C
- (2) Without heatsink, free air
- (3) Meets the requirements of IEC 61215 ed. 2 bypass diode thermal test

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.48	-	V
	$I_F = 7.5\text{ A}$			0.50	-	
	$I_F = 15\text{ A}$			0.56	0.64	
	$I_F = 5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.35	-	
	$I_F = 7.5\text{ A}$			0.39	-	
	$I_F = 15\text{ A}$			0.46	0.54	
Reverse current	$V_R = 45\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	10	300	μA
		$T_A = 125\text{ }^\circ\text{C}$		8	20	mA
Typical junction capacitance	4.0 V, 1 MHz	C_J	1020	-	pF	

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: 10 ms pulse width

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	SB15H45	UNIT
Thermal resistance	$R_{\theta JA}^{(1)}$	66	$^\circ\text{C/W}$
	$R_{\theta JL}^{(1)}$	14	
Typical thermal resistance	$R_{\theta JL}^{(2)}$	3.5	$^\circ\text{C/W}$

Notes

- (1) Without heatsink, free air
 (2) $T_A = 75\text{ }^\circ\text{C}$, $T_L = 125\text{ }^\circ\text{C}$, $T_J = 175\text{ }^\circ\text{C}$, infinite mass at 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SB15H45-E3/54	1.756	54	800	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

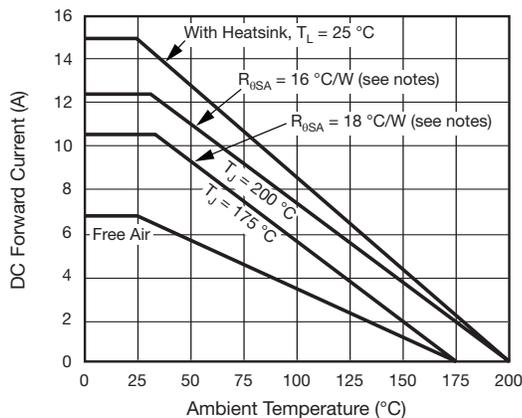


Fig. 1 - Forward Current Derating Curve

Notes

- Mounted on junction box
- Using DC forward current
- Junction box SA (sink to ambient)
- Assumes $R_{\theta LS}$ (lead to sink) of 5 $^\circ\text{C/W}$
- Thermal resistance $R_{\theta SA}$ (sink to ambient):

$$R_{\theta SA} = \frac{(T_J - T_A)}{P_D} - (R_{\theta JL} + R_{\theta LS})$$

- P_D : Power dissipation $P_D = V_F \times I_F$

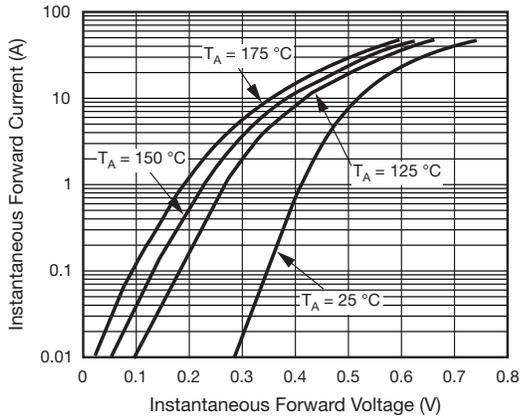


Fig. 2 - Typical Instantaneous Forward Characteristics

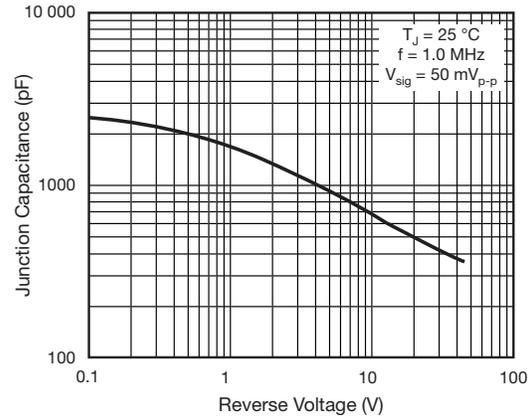


Fig. 4 - Typical Junction Capacitance

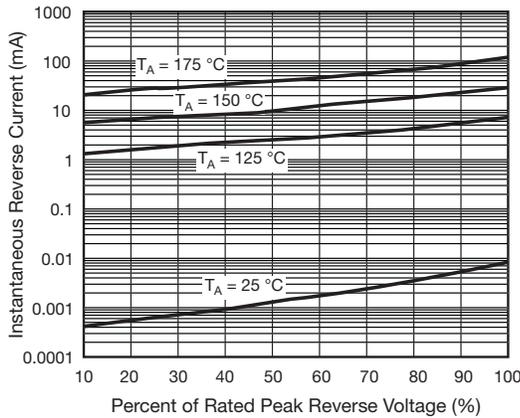
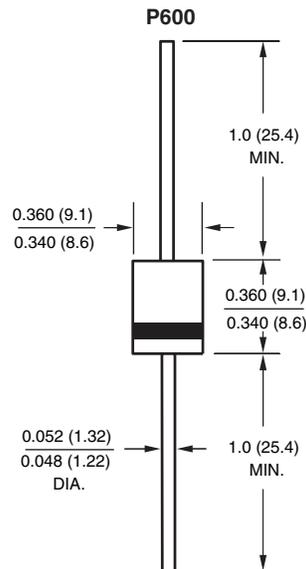


Fig. 3 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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