

POWER SCHOTTKY RECTIFIER

Table 1: Main Product Characteristics

$I_{F(AV)}$	1 A
V_{RRM}	150 V
$T_j(\text{max})$	175°C
$V_F(\text{max})$	0.67 V

FEATURES AND BENEFITS

- Negligible switching losses
- Low forward voltage drop for higher efficiency and extended battery life
- Low thermal resistance
- Surface mount miniature package
- Avalanche capability specified

DESCRIPTION

150V Power Schottky rectifier are suited for switch Mode Power Supplies on up to 24V rails and high frequency converters.

Packaged in SMA and Axial, this device is intended for use in consumer and computer applications like TV, STB, PC and DVD where low drop forward voltage is required to reduce power dissipation.

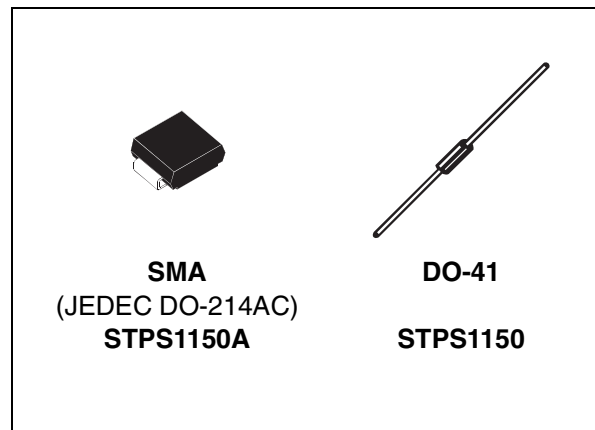


Table 2: Order Codes

Part Number	Marking
STPS1150A	1150
STPS1150	STPS1150
STPS1150RL	STPS1150

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter	Value	Unit	
V_{RRM}	Repetitive peak reverse voltage	150	V	
$I_{F(RMS)}$	RMS forward voltage	15	A	
$I_{F(AV)}$	Average forward current	SMA $T_L = 160^\circ\text{C} \quad \delta = 0.5$	1	A
		DO-41 $T_L = 150^\circ\text{C} \quad \delta = 0.5$		
I_{FSM}	Surge non repetitive forward current	SMA	50	A
		DO-41		
	Half wave, single phase, 50Hz	75		
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s} \quad T_j = 25^\circ\text{C}$	1500	W
T_{stg}	Storage temperature range	-65 to + 150		°C
T_j	Maximum operating junction temperature *	175		°C
dV/dt	Critical rate of rise of reverse voltage (rated V_R , $T_j = 25^\circ\text{C}$)	10000		V/ μs

* : $\frac{dP_{tot}}{dT_j} > \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

Table 4: Thermal Resistance

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	20	$^{\circ}\text{C}/\text{W}$
		Lead length = 10 mm DO-41	30	

Table 5: Static Electrical Characteristics

Symbol	Parameter	Tests conditions	Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$	0.2	1	μA
		$T_j = 125^{\circ}\text{C}$		0.2	1	mA
V_F^*	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 1\text{A}$	0.78	0.82	V
		$T_j = 125^{\circ}\text{C}$		0.62	0.67	
		$T_j = 25^{\circ}\text{C}$	$I_F = 2\text{A}$	0.85	0.89	
		$T_j = 125^{\circ}\text{C}$		0.69	0.75	

Pulse test: * $t_p = 380 \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.59 \times I_{F(AV)} + 0.08 I_{F(RMS)}^2$

Figure 1: Average forward power dissipation versus average forward current

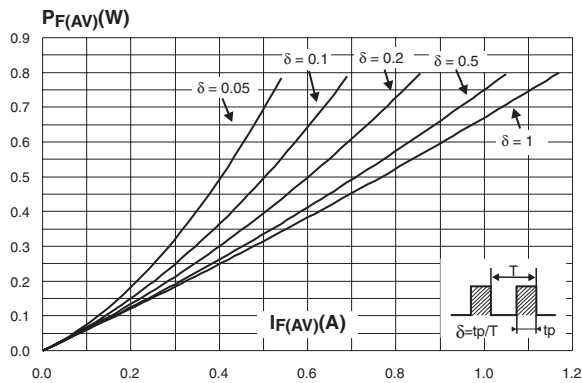


Figure 2: Average forward current versus ambient temperature (delta = 0.5)

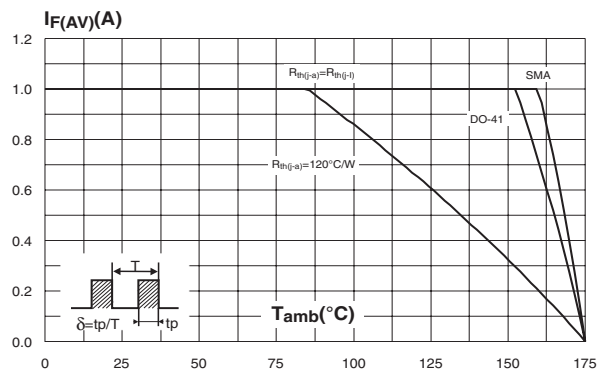


Figure 3: Normalized avalanche power derating versus pulse duration

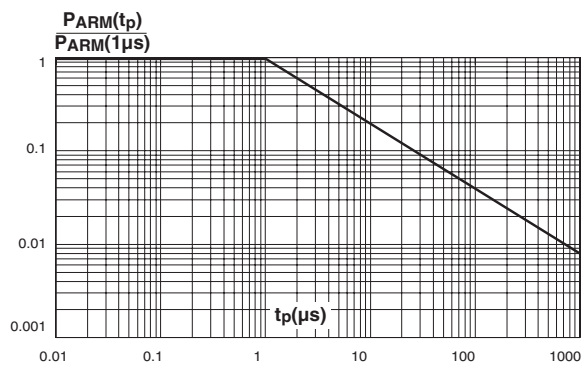


Figure 4: Normalized avalanche power derating versus junction temperature

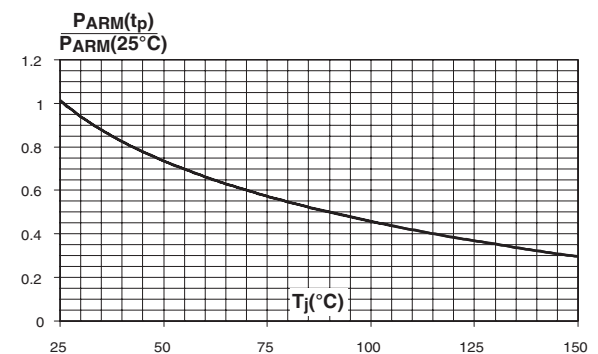


Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values) (SMA)

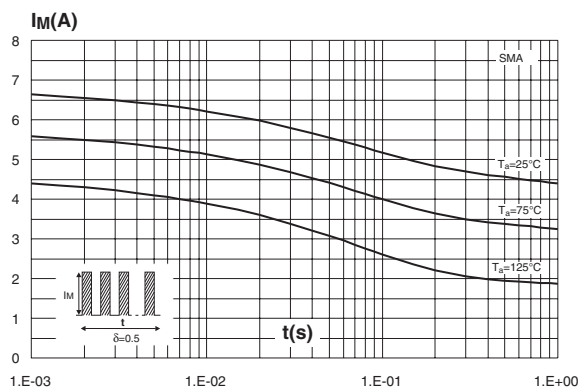


Figure 6: Non repetitive surge peak forward current versus overload duration (maximum values) (DO-41)

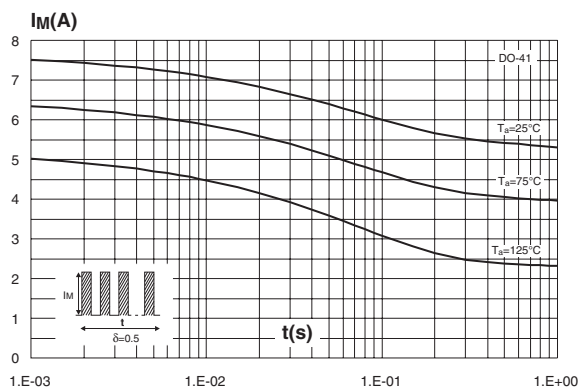


Figure 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, e(Cu)=35µm, recommended pad layout) (SMA)

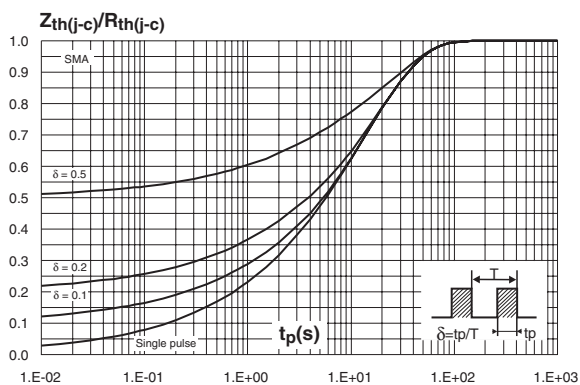


Figure 8: Relative variation of thermal impedance junction to ambient versus pulse duration (DO-41)

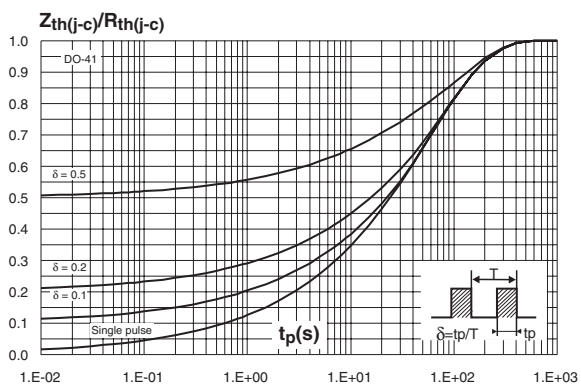


Figure 9: Reverse leakage current versus reverse voltage applied (typical values)

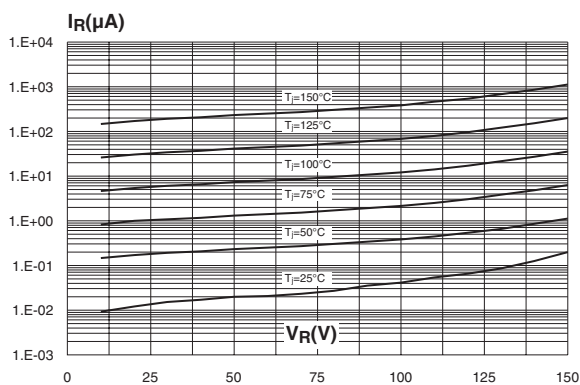


Figure 10: Junction capacitance versus reverse voltage applied (typical values)

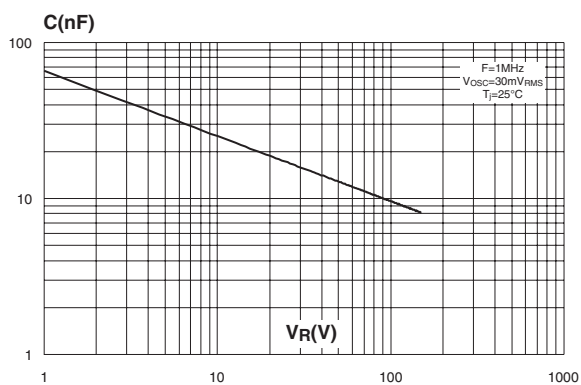


Figure 11: Forward voltage drop versus forward current (maximum values, high level)

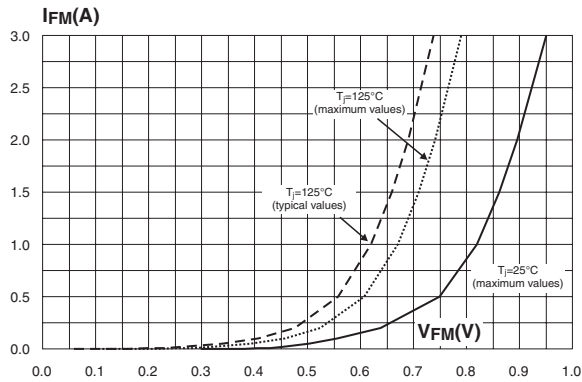


Figure 12: Forward voltage drop versus forward current (maximum values, low level)

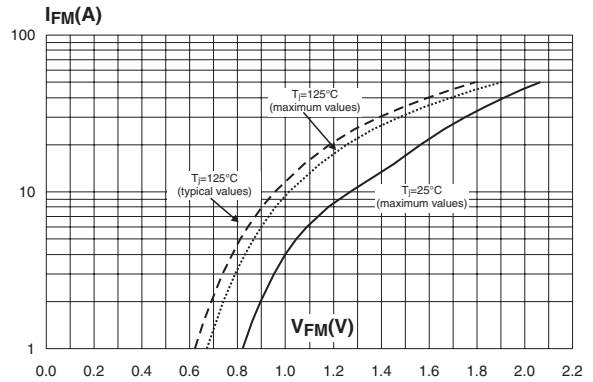


Figure 13: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm) (SMA)

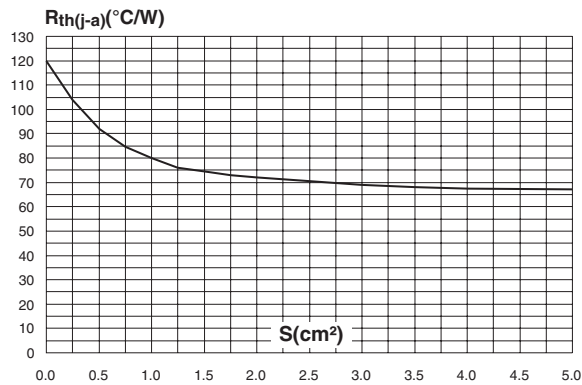


Figure 14: Thermal resistance versus lead length (DO-41)

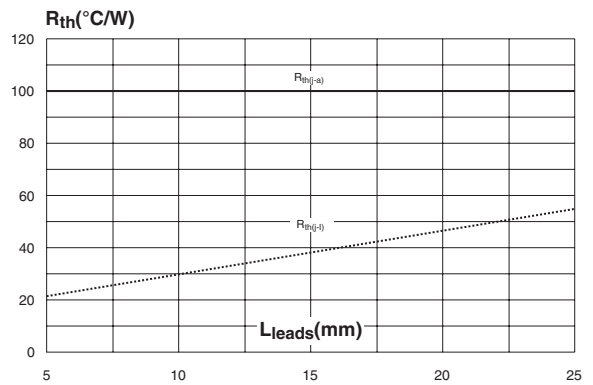


Figure 15: SMA Package Mechanical Data

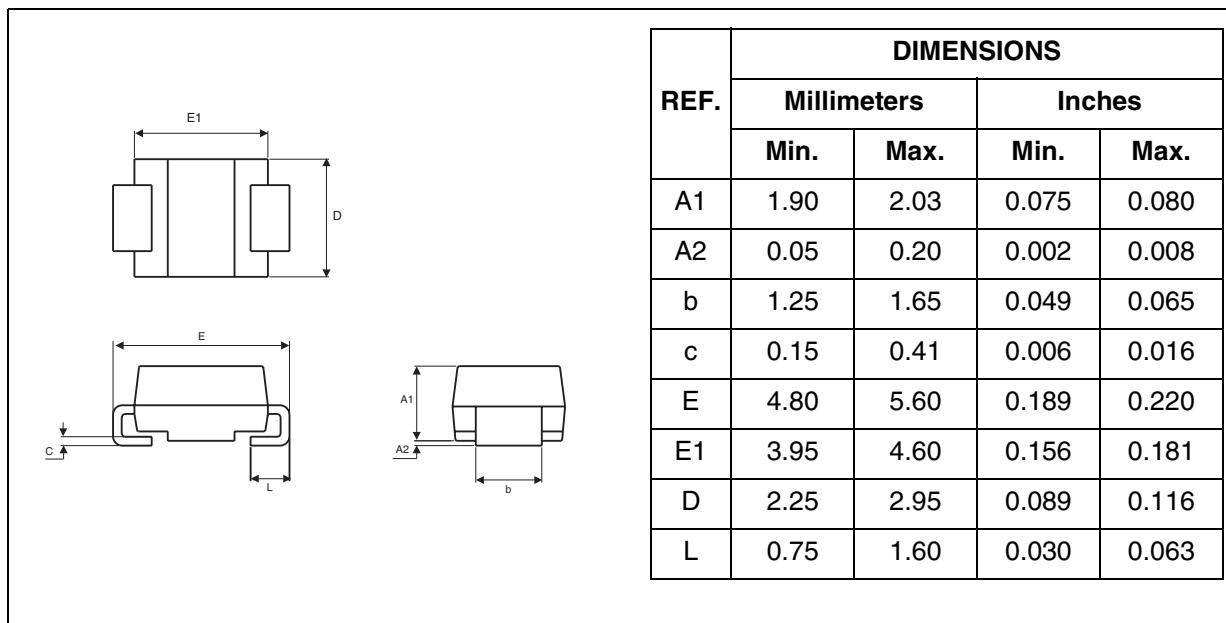
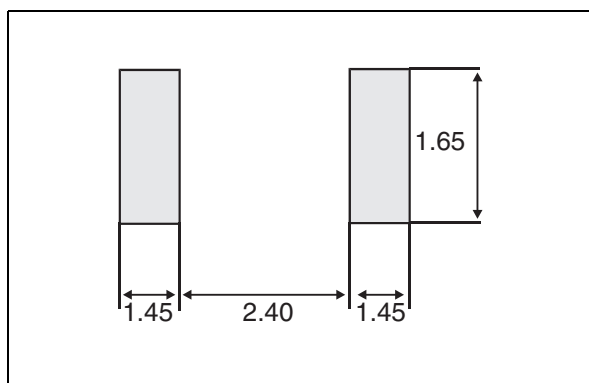
Figure 16: SMA Foot Print Dimensions
(in millimeters)

Figure 17: DO-41 Package Mechanical Data

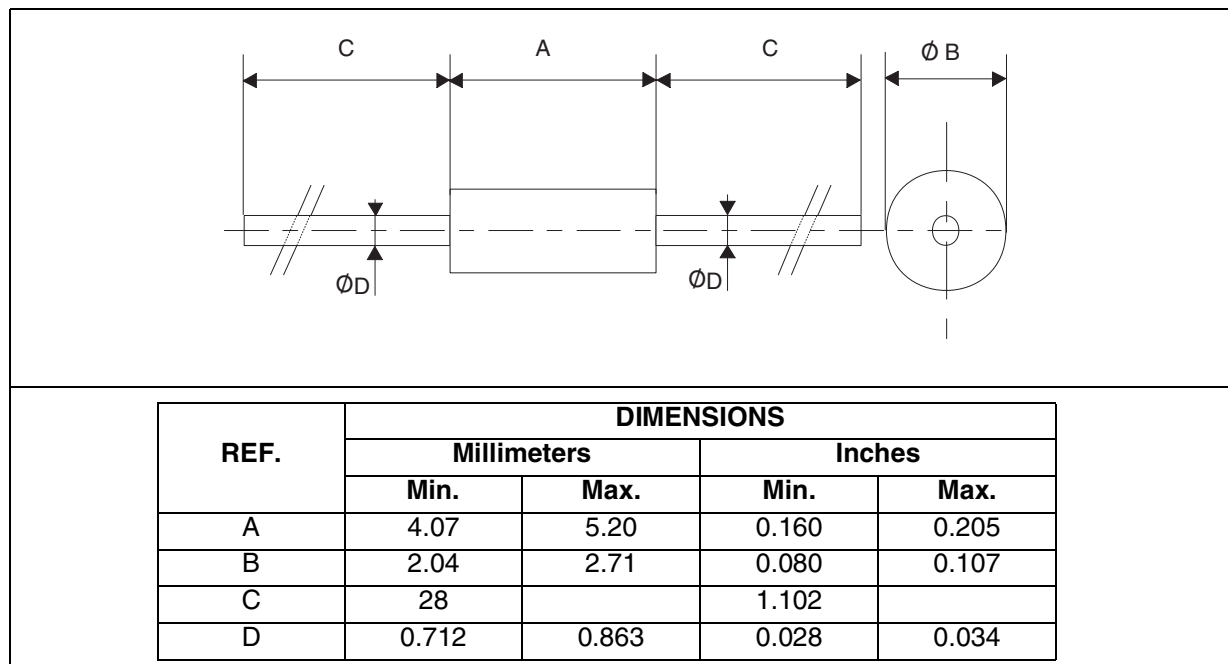


Table 6: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS1150A	1150	SMA	0.068 g	5000	Tape & reel
STPS1150	STPS1150	DO-41	0.34 g	2000	Ammopack
STPS1150RL	STPS1150	DO-41	0.34 g	5000	Tape & reel

- Band indicates cathode
- Epoxy meets UL94, V0

Table 7: Revision History

Date	Revision	Description of Changes
Jul-2003	2A	Last update.
Aug-2004	3	SMA package dimensions update. Reference A1 max. changed from 2.70mm (0.106inc.) to 2.03mm (0.080).

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
All other names are the property of their respective owners

© 2004 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America
www.st.com