

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_F(AV)$	1 A
V_{RRM}	40 V
$V_F(max)$	0.5 V

FEATURES AND BENEFITS

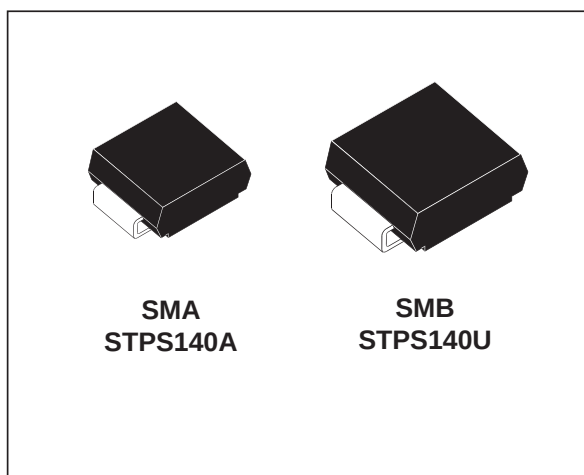
- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP
- SURFACE MOUNTED DEVICE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Single chip Schottky rectifier suited for Switchmode Power Supplies and high frequency DC to DC converters.

Packaged in SMA and SMB(*), this device is intended for surface mounting and used in low voltage, high frequency inverters, free wheeling and polarity protection applications.

(*) in accordance with DO214AA and DO21AC JEDEC



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			40	V
$I_{F(RMS)}$	RMS forward current			7	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	SMA	$T_L = 130^\circ\text{C}$	1	A
		SMB	$T_L = 135^\circ\text{C}$		
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal		60	A
I_{RRM}	Repetitive peak reverse current	$t_p = 2\text{ }\mu\text{s}$ $F = 1\text{ kHz}$		1	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100\text{ }\mu\text{s}$ square		1	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}$ $T_j = 25^\circ\text{C}$		900	W
T_{stg}	Storage temperature range			- 65 to + 150	$^\circ\text{C}$
T_j	Maximum junction temperature			150	
dV/dt	Critical rate of rise of reverse voltage			10000	V/ μs

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	$^{\circ}\text{C/W}$
		SMB	25	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = 40\text{V}$			12	μA
		$T_j = 100^{\circ}\text{C}$			0.25	2	mA
V_F^{**}	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 1\text{A}$			0.55	V
		$T_j = 125^{\circ}\text{C}$	$I_F = 1\text{A}$		0.43	0.5	
		$T_j = 25^{\circ}\text{C}$	$I_F = 2\text{A}$			0.65	
		$T_j = 125^{\circ}\text{C}$	$I_F = 2\text{A}$		0.53	0.6	

Pulse test : * $t_p = 5\text{ms}$, $\delta < 2\%$
** $t_p = 380\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :
 $P = 0.4 \times I_{F(AV)} + 0.10 \times I_F^2(RMS)$

Fig. 1: Average forward power dissipation versus average forward current.

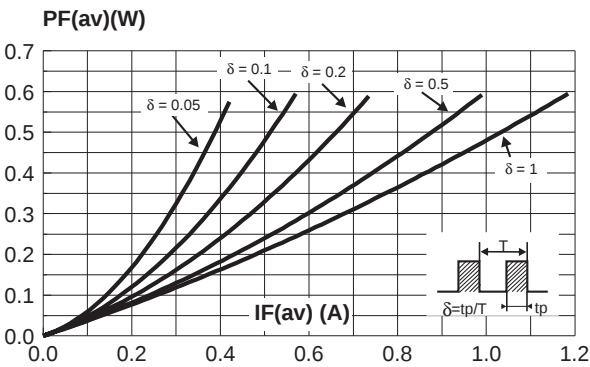


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$).

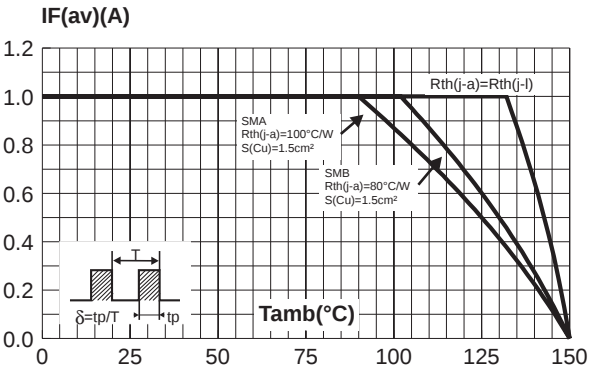


Fig. 3: Normalized avalanche power derating versus pulse duration.

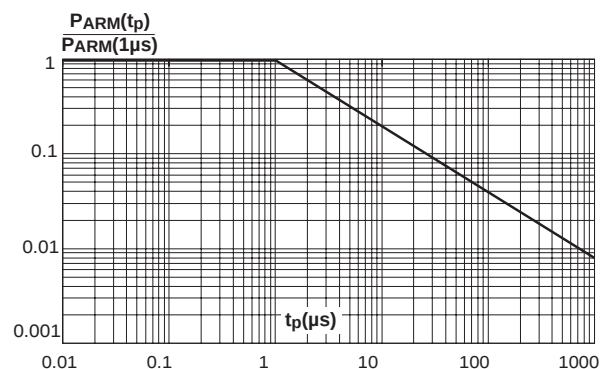


Fig. 4: Normalized avalanche power derating versus junction temperature.

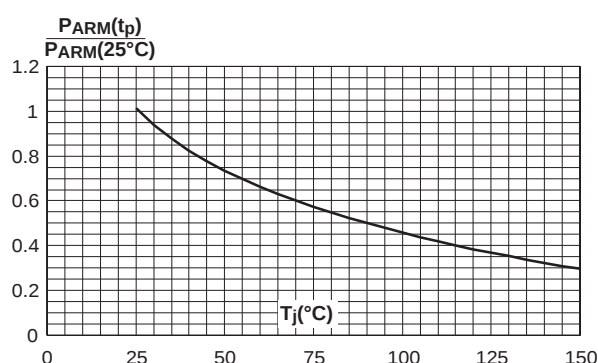


Fig. 5-1: Non repetitivesurge peak forward current versus overload duration (maximum values) (SMB).

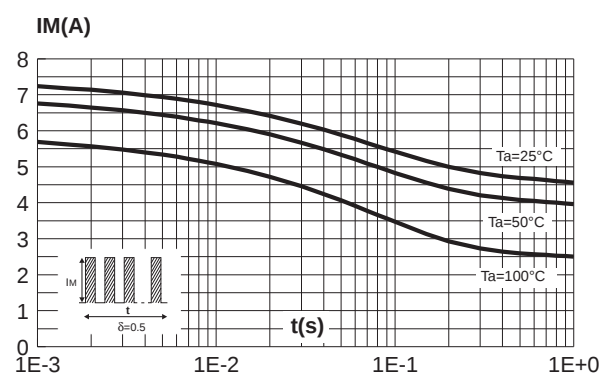


Fig. 5-2: Non repetitivesurge peak forward current versus overload duration (maximum values) (SMA).

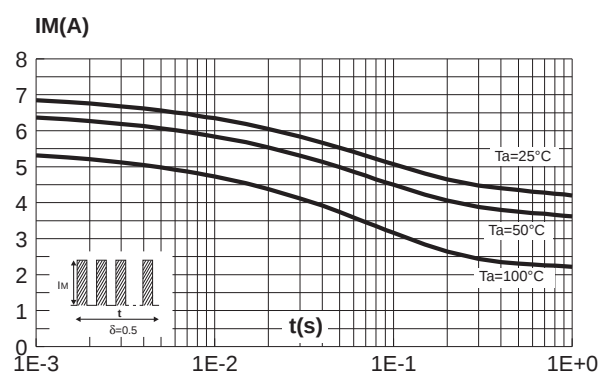


Fig. 6-1: Relative variation of thermal impedance junction to ambient versus pulse duration (SMB).

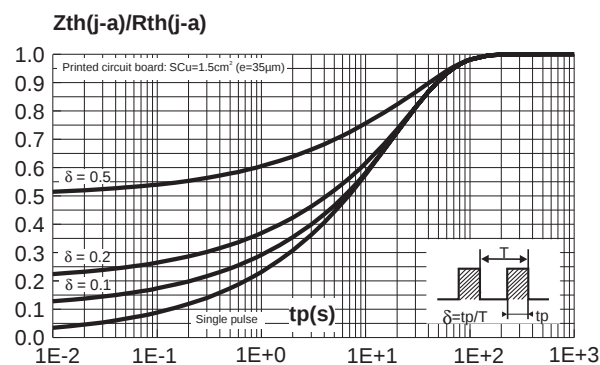


Fig. 6-2: Relative variation of thermal impedance junction to ambient versus pulse duration (SMA).

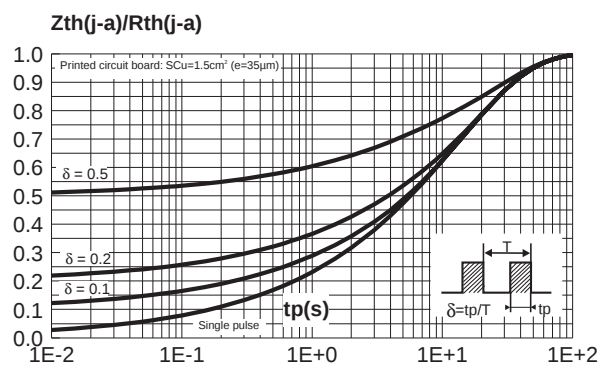


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

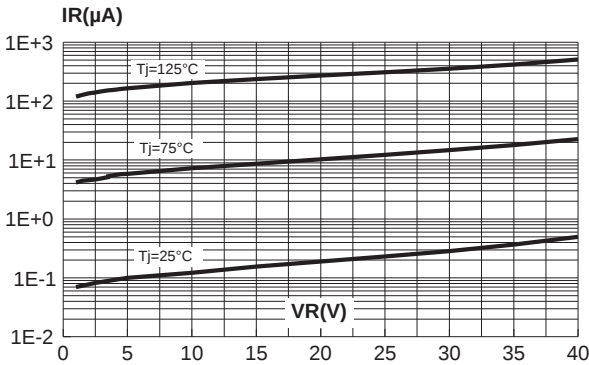


Fig. 8: Junction capacitance versus reverse voltage applied (typical values)

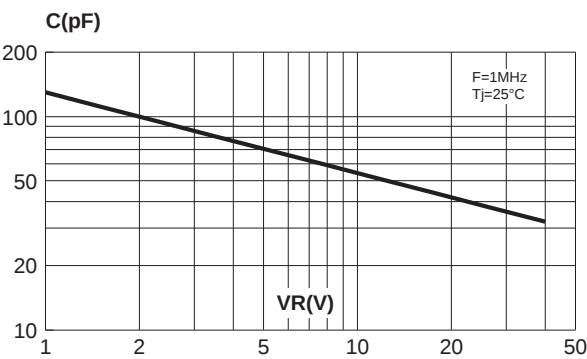


Fig. 9: Forward voltage drop versus forward current (maximum values).

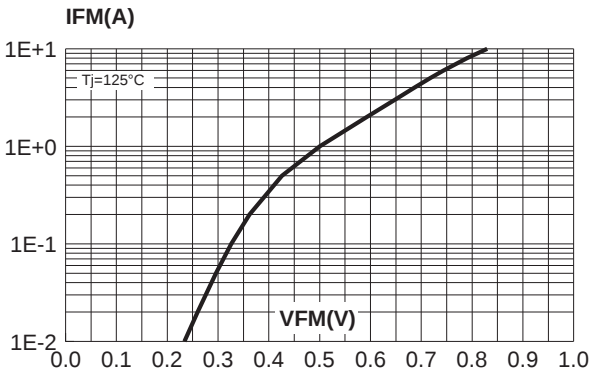


Fig. 10-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35 μm)(SMB).

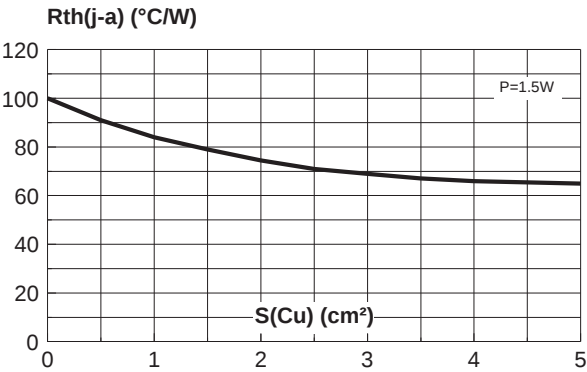
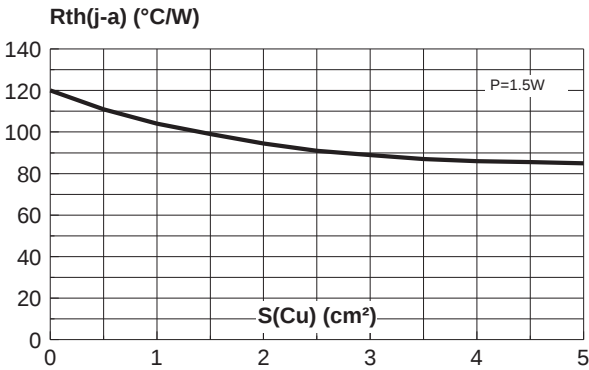


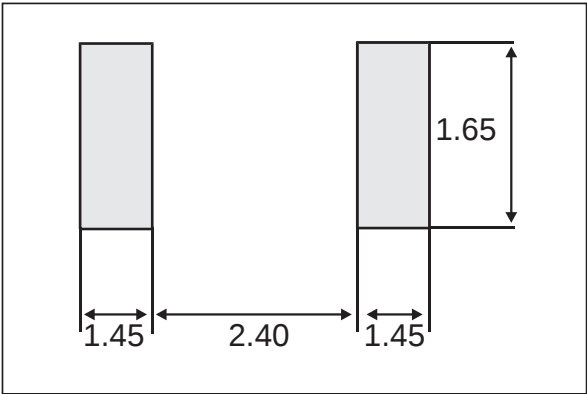
Fig. 10-2: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35 μm)(SMA).



PACKAGE MECHANICAL DATA
SMA

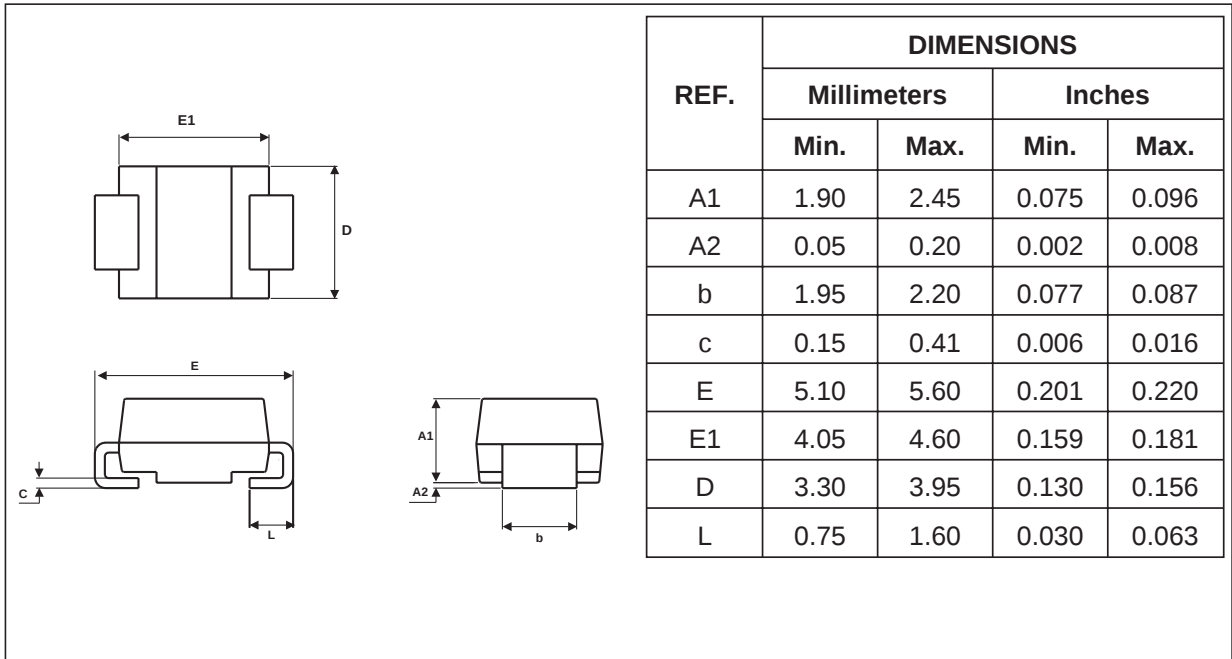
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

FOOT PRINT (in millimeters)



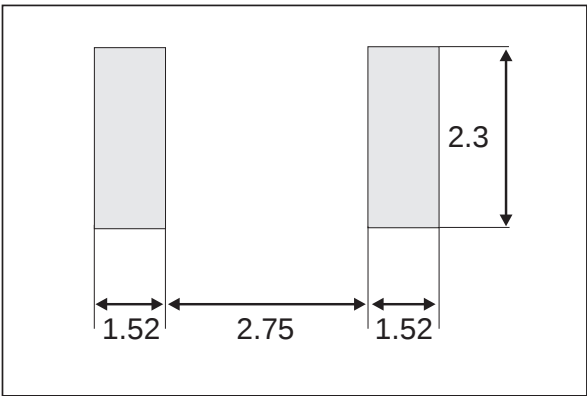
MARKING: S140

PACKAGE MECHANICAL DATA
SMB Plastic



FOOT PRINT (in millimeters)

. MARKING: G14



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
© 2003 STMicroelectronics - Printed in Italy - All rights reserved.
STMicroelectronics GROUP OF COMPANIES
Australia - Brazil - Canada - China - Finland - France - Germany
Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore
Spain - Sweden - Switzerland - United Kingdom - United States.
<http://www.st.com>