



# STPS140A/U

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>1 A</b>
<b>V<sub>RRM</sub></b>	<b>40 V</b>
<b>V<sub>F (max)</sub></b>	<b>0.5 V</b>

### FEATURES AND BENEFITS

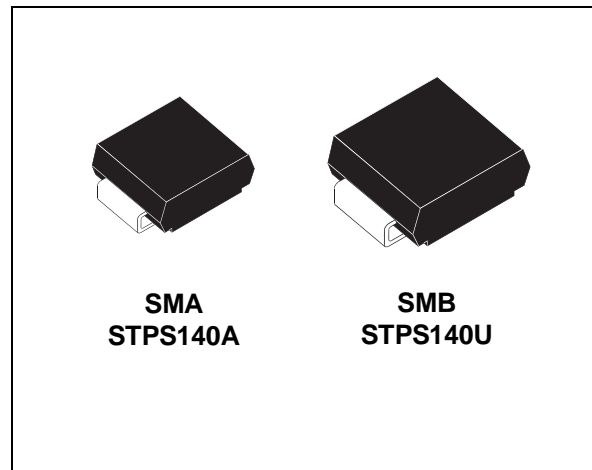
- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP
- SURFACE MOUNTED DEVICE

### DESCRIPTION

Single chip Schottky rectifier suited for Switch-mode 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 <sub>RRM</sub>	Repetitive peak reverse voltage		40	V	
I <sub>F(RMS)</sub>	RMS forward current		7	A	
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$	SMA	T <sub>L</sub> = 130°C	1	A
		SMB	T <sub>L</sub> = 135°C		
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms Sinusoidal	60	A	
I <sub>RRM</sub>	Repetitive peak reverse current	tp = 2 $\mu$ s F = 1kHz	1	A	
I <sub>RSM</sub>	Non repetitive peak reverse current	tp = 100 $\mu$ s square	1	A	
T <sub>stg</sub>	Storage temperature range		- 65 to + 150	°C	
T <sub>j</sub>	Maximum junction temperature		150		
dV/dt	Critical rate of rise of reverse voltage		10000	V/ $\mu$ s	

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## THERMAL RESISTANCES

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

## STATIC ELECTRICAL CHARACTERISTICS

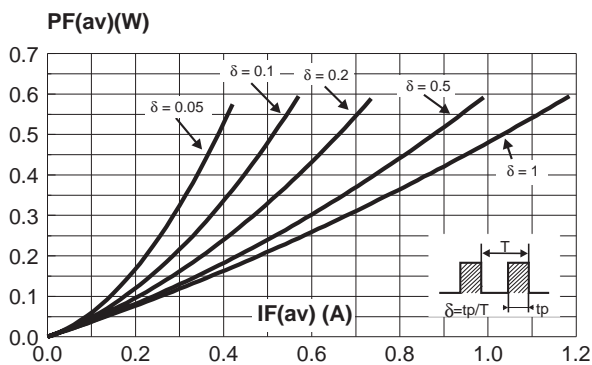
Symbol	Tests Conditions	Tests Conditions	Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = 40\text{V}$		12	$\mu\text{A}$
		$T_j = 100^\circ\text{C}$		0.25	2	mA
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$		0.55	V
		$T_j = 125^\circ\text{C}$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

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

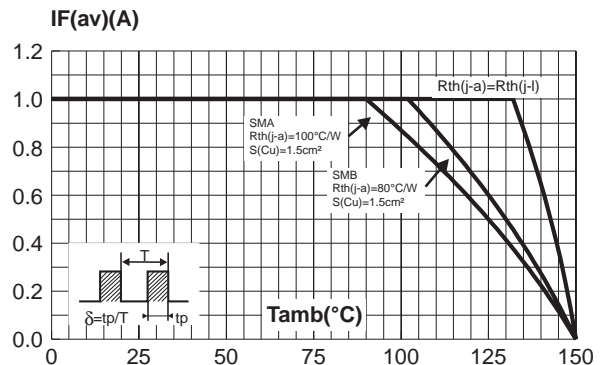
To evaluate the maximum conduction losses use the following equation :

$$P = 0.4 \times I_{F(AV)} + 0.10 \times I_F^2(RMS)$$

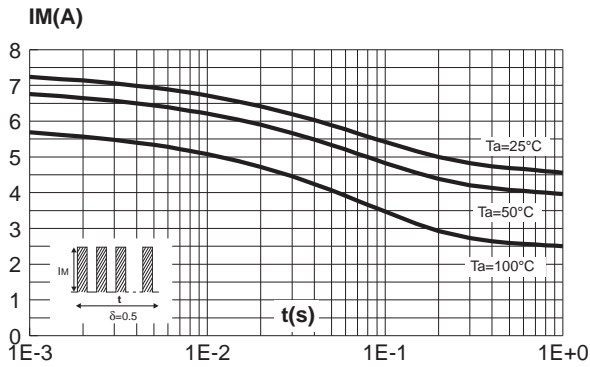
**Fig. 1:** Average forward power dissipation versus average forward current.



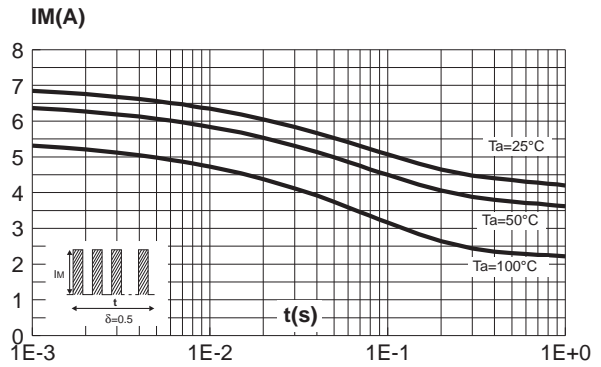
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ ).



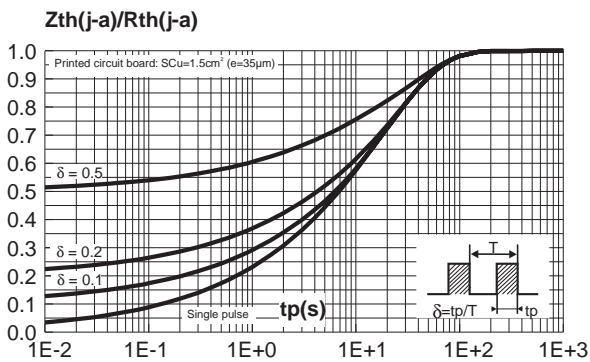
**Fig. 3-1:** Non repetivesurge peak forward current versus overload duration (maximum values) (SMB).



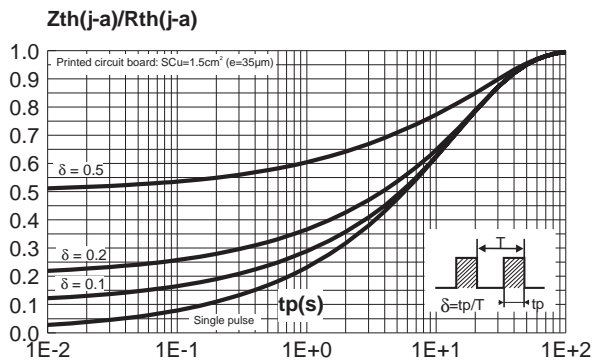
**Fig. 3-2:** Non repetivesurge peak forward current versus overload duration (maximum values) (SMA).



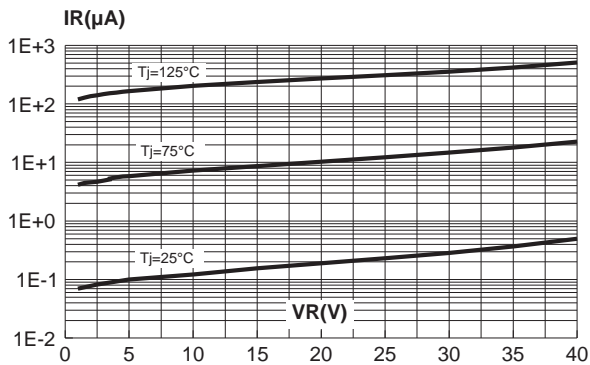
**Fig. 4-1:** Relative variation of thermal impedance junction to ambient versus pulse duration (SMB).



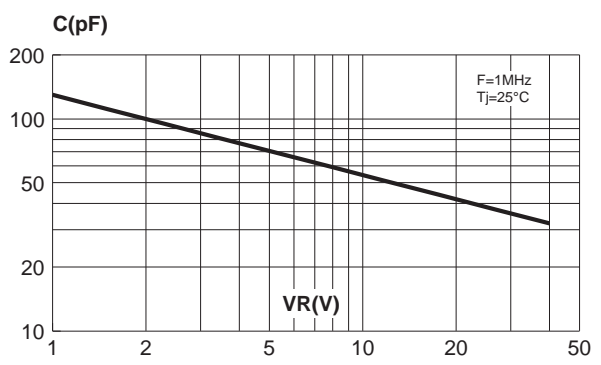
**Fig. 4-2:** Relative variation of thermal impedance junction to ambient versus pulse duration (SMA).



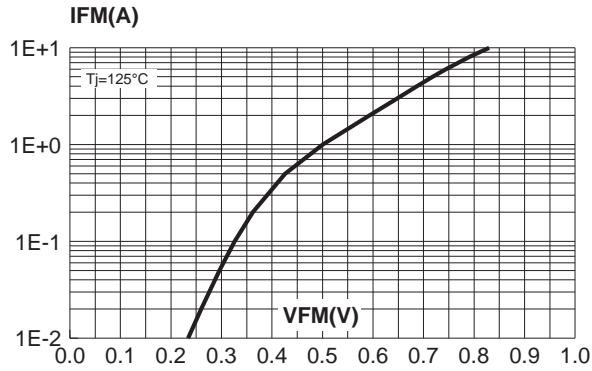
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values).



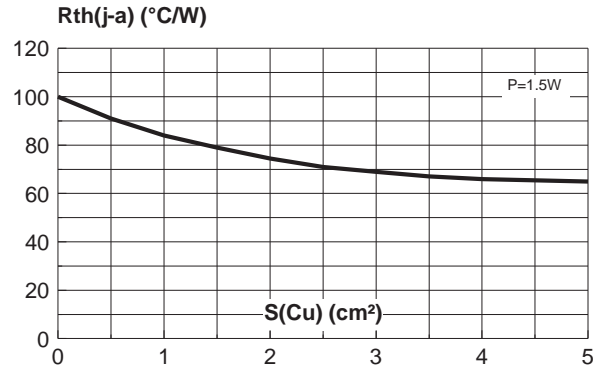
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values)



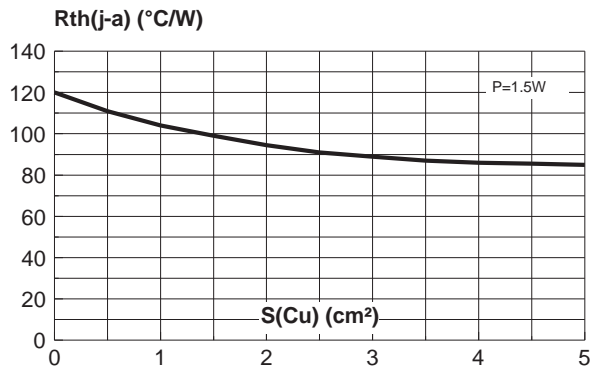
**Fig. 7:** Forward voltage drop versus forward current (maximum values).



**Fig. 8-1:** Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35 $\mu\text{m}$ )(SMB).



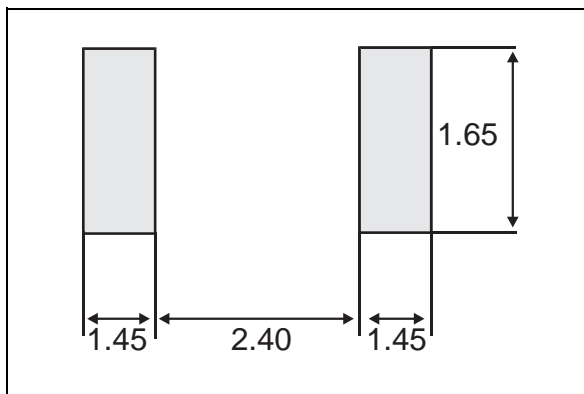
**Fig. 8-2:** Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35 $\mu\text{m}$ )(SMA).



**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

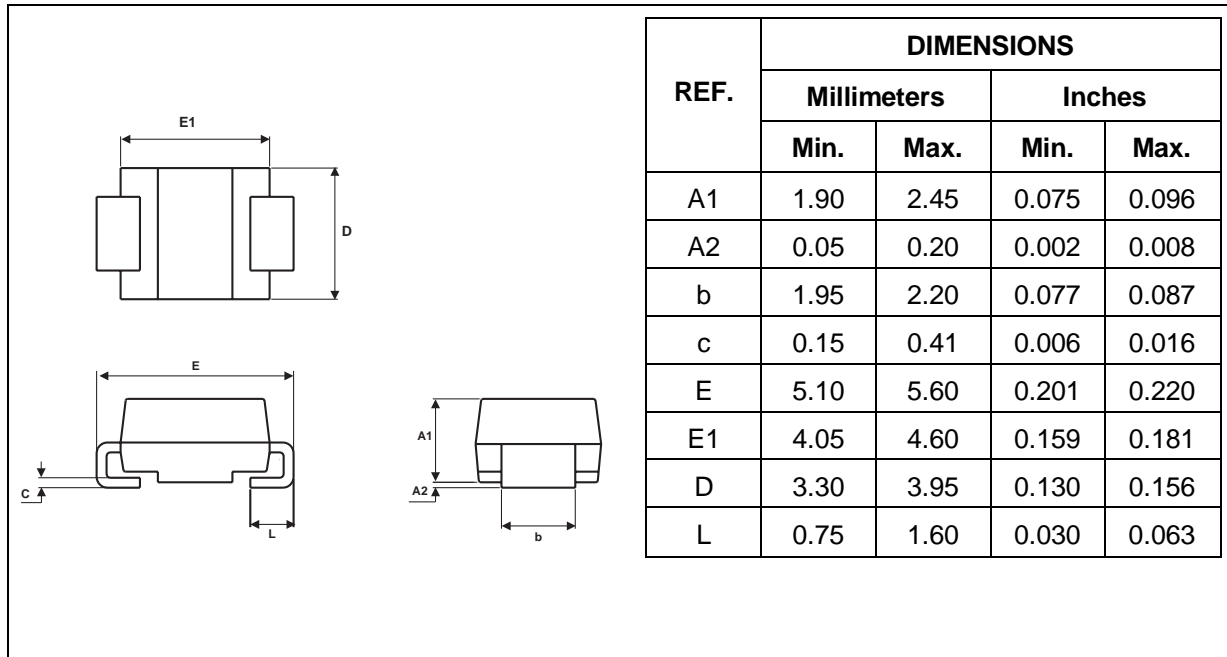
**FOOT PRINT (in millimeters)**



■ **Marking:** S140

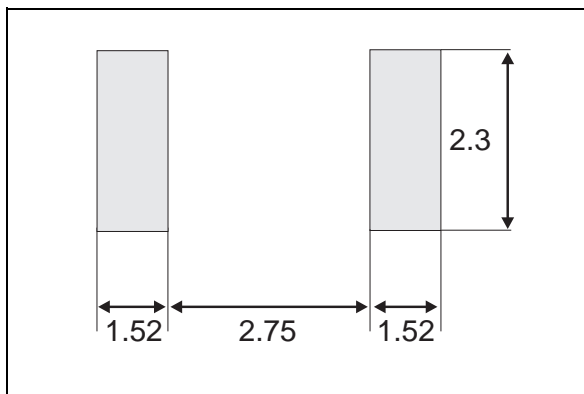
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## PACKAGE MECHANICAL DATA SMB Plastic



### FOOT PRINT (in millimeters)

### ■ Marking: G14



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