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STPS140A/U

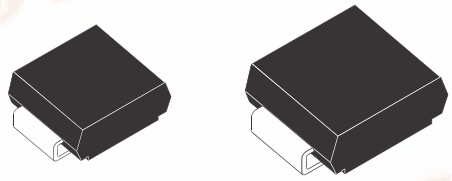
POWER SCHOTTKY RECTIFIER

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



SMA
STPS140A

SMB
STPS140U

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 DO214AAand 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	$T_L = 130°C$	1	A
		SMB	$T_L = 135°C$		
I_{FSM}	Surge non repetitive forward current		tp = 10 ms Sinusoidal	60	A
I_{RRM}	Repetitive peak reverse current		tp = 2 µs F = 1kHz	1	A
I_{RSM}	Non repetitive peak reverse current		tp = 100 µs square	1	A
P_{ARM}	Repetitive peak avalanche power		tp = 1µs Tj = 25°C	900	W
T_{stg}	Storage temperature range			- 65 to + 150	°C
Tj	Maximum junction temperature			150	
dV/dt	Critical rate of rise of reverse voltage			10000	V/µs

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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	Tj = 25°C	V_R = 40V			12	µA
		Tj = 100°C			0.25	2	mA
V_F **	Forward voltage drop	Tj = 25°C	I_F = 1 A			0.55	V
		Tj = 125°C	I_F = 1 A		0.43	0.5	
		Tj = 25°C	I_F = 2 A			0.65	
		Tj = 125°C	I_F = 2 A		0.53	0.6	

Pulse test : * tp = 5 ms, δ < 2 %
** tp = 380 µs, δ < 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.

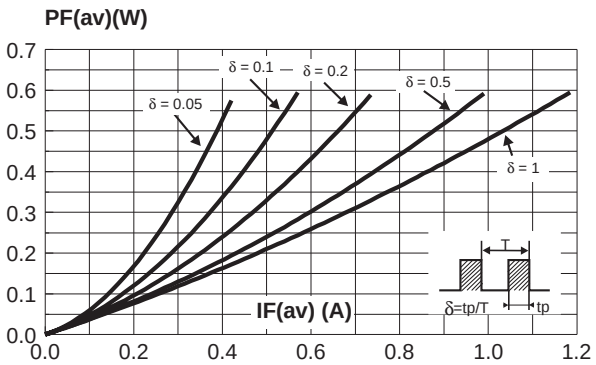


Fig. 2: Average forward current versus ambient temperature (δ=0.5).

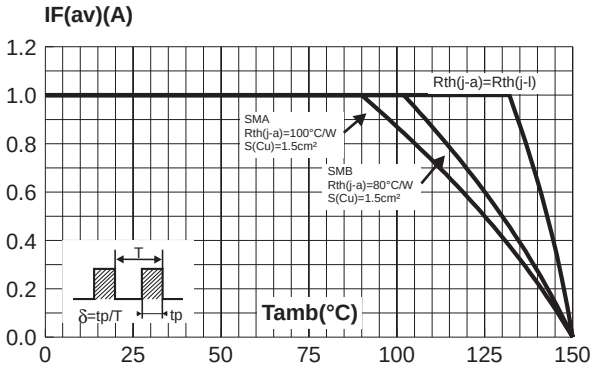


Fig. 3: Normalized avalanche power derating versus pulse duration.

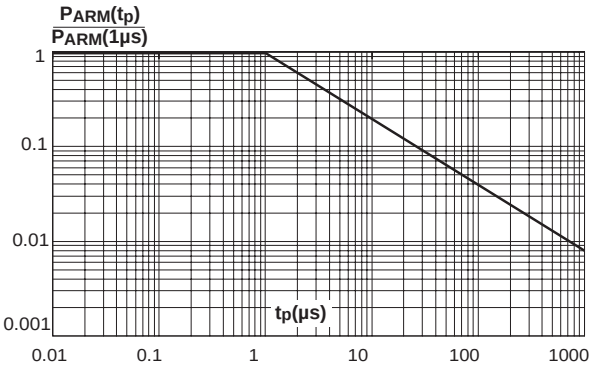


Fig. 4: Normalized avalanche power derating versus junction temperature.

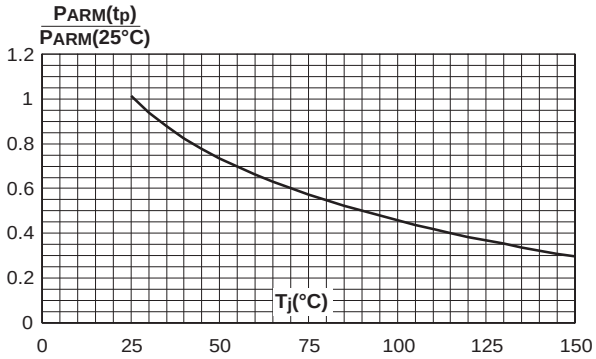


Fig. 5-1: Non repetivesurge peak forward current versus overload duration (maximum values) (SMB).

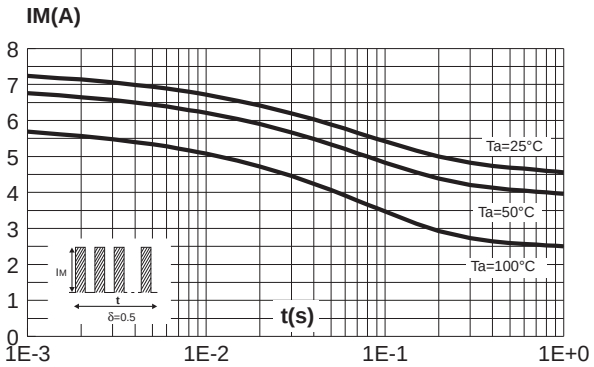


Fig. 5-2: Non repetivesurge peak forward current versus overload duration (maximum values) (SMA).

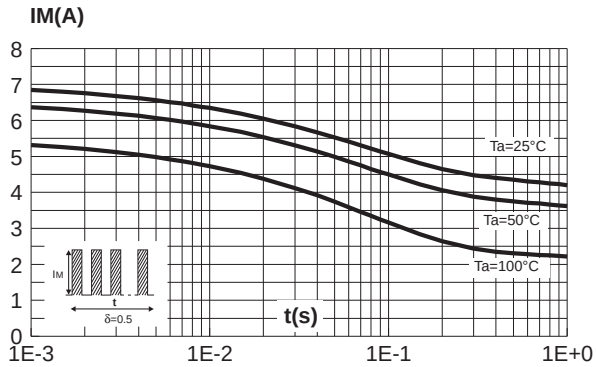


Fig. 6-1: Relative variation of thermal impedance junction to ambient versus pulse duration (SMB).

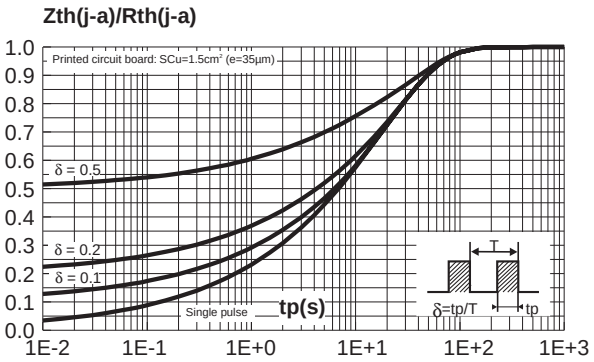


Fig. 6-2: Relative variation of thermal impedance junction to ambient versus pulse duration (SMA).

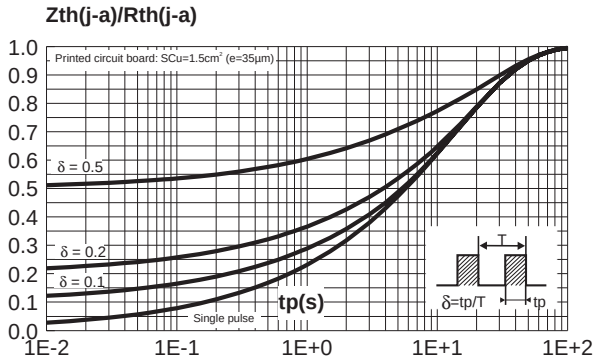


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

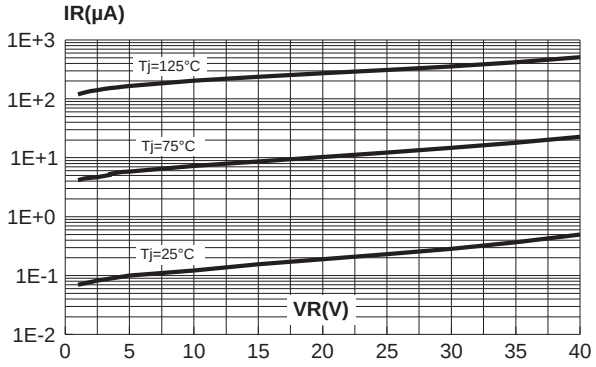


Fig. 8: Junction capacitance versus reverse voltage applied (typical values)

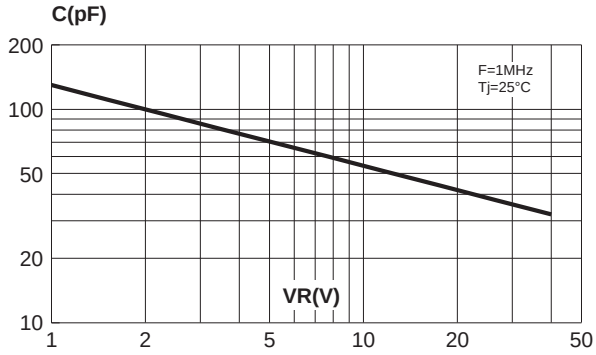


Fig. 9: Forward voltage drop versus forward current (maximum values).

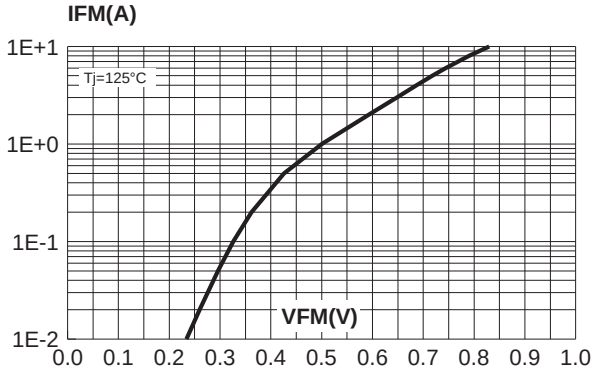


Fig. 10-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35µm)(SMB).

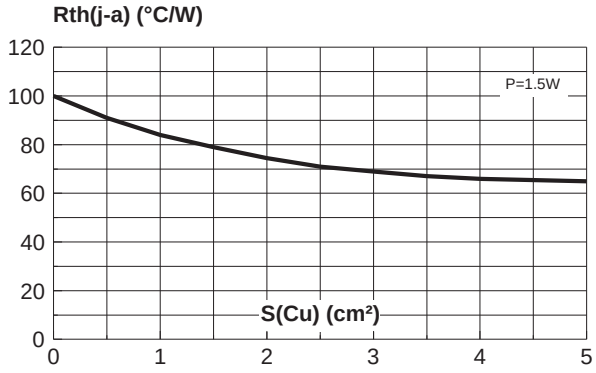
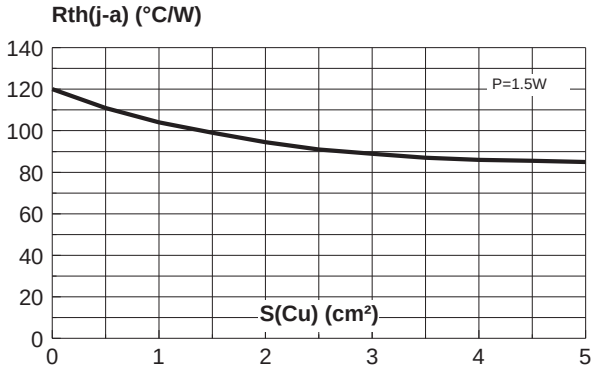
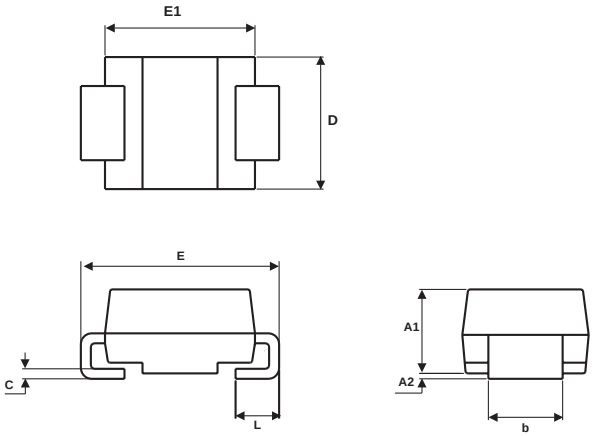


Fig. 10-2: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35µm)(SMA).

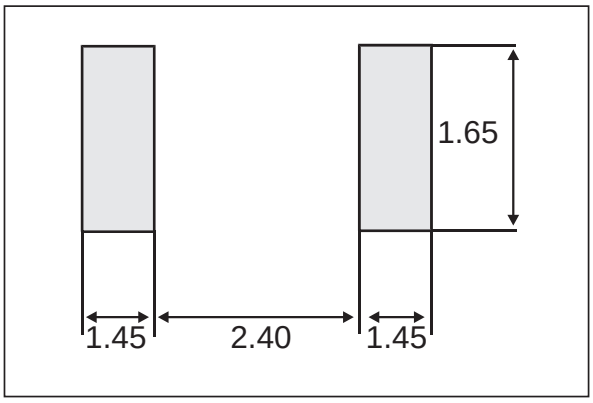


PACKAGE MECHANICAL DATA
SMA



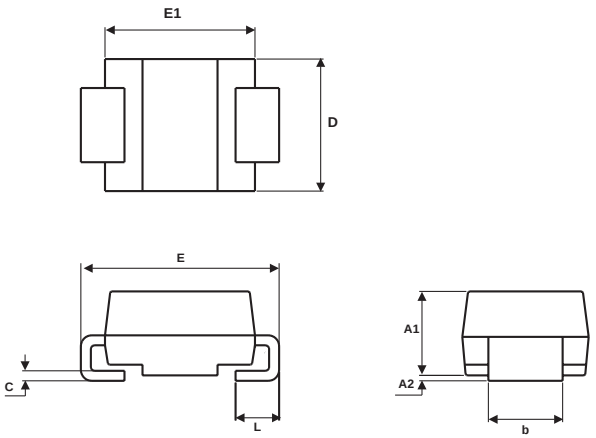
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.70	0.075	0.106
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

FOOT PRINT (in millimeters)



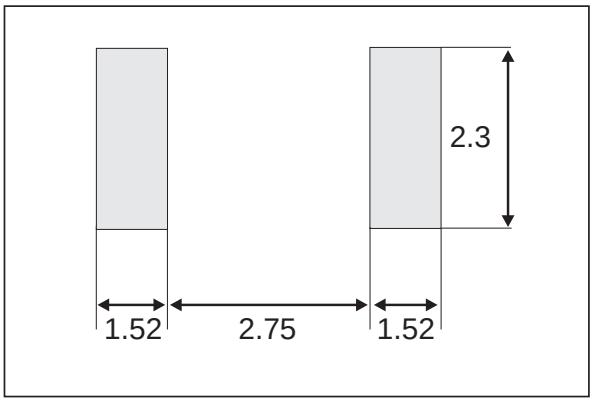
- **MARKING:** S140

PACKAGE MECHANICAL DATA
SMB Plastic



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.41	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.60	0.030	0.063

FOOT PRINT (in millimeters)



- **MARKING:** G14

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