STPS140Z

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

I_F	1 A
V_{RRM}	40 V
V_F (max)	0.49 V
Tj (max)	150°C



SOD-123

FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING

DESCRIPTION

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

Packaged in SOD-123, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications. Due to the small size of the package this device fit GSM and PCMCIA requirements.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		40	V
I_F	Continuous forward current	T_{amb} = 60 °C	1	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	5.5	A
I_{RRM}	Repetitive peak reverse current	tp = 2 µs square F = 1kHz	0.5	A
I_{RSM}	Non repetitive peak reverse current	tp = 100µs square	1	A
T_{stg}	Storage temperature range		- 65 to + 150	°C
Tj	Maximum operating junction temperature *		150	
T_L	Maximum temperature for soldering during 10s		260	°C
dV/dt	Critical rate of rise of reverse voltage		10000	V/µs

* : $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th\ (j-a)}$	Junction to ambient *	175	°C/W

* with 50 mm^2 copper area (e=35µm)

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	Tj = 25°C	V_R = 5V			10	µA
		Tj = 25°C	V_R = 40V			40	µA
		Tj = 100°C			1.5	5	mA
V_F **	Forward voltage drop	Tj = 25°C	I_F = 1 A			0.55	V
		Tj = 100°C			0.45	0.51	

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

To evaluate the maximum conduction losses use the following equation :
$P = 0.2 \times I_{F(AV)} + 0.3 \times I_F{}^2{}_{(RMS)}$ at Tj = 150°C

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

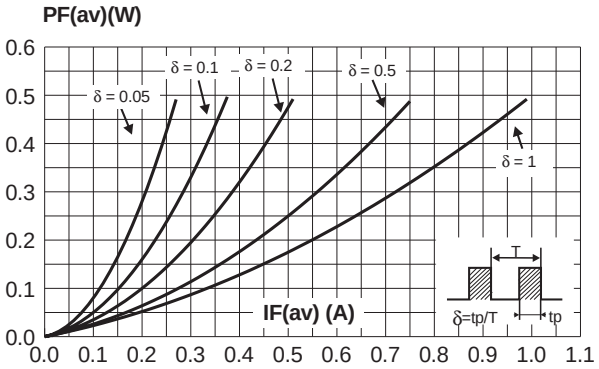


Fig. 2: Average forward current versus ambient temperature (δ=1).

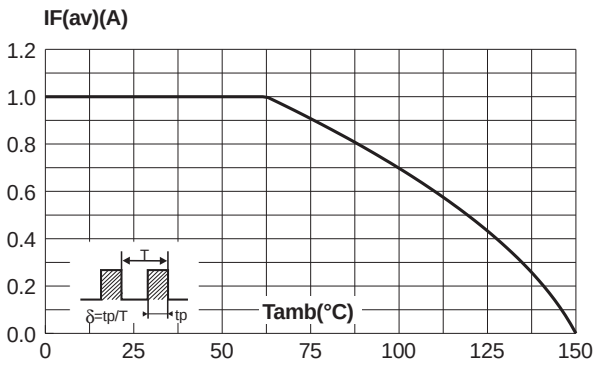


Fig. 3: Non repetive surge peak forward current versus overload duration (maximum values).

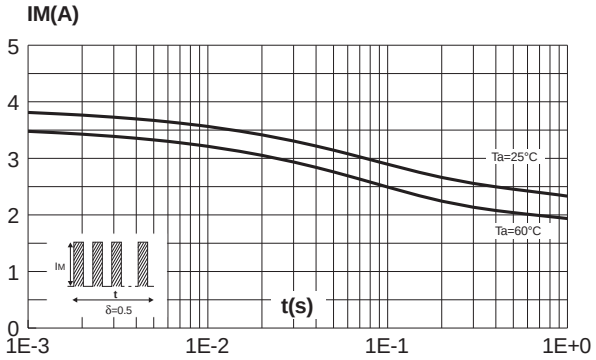


Fig. 4: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board FR4 with recommended pad layout).

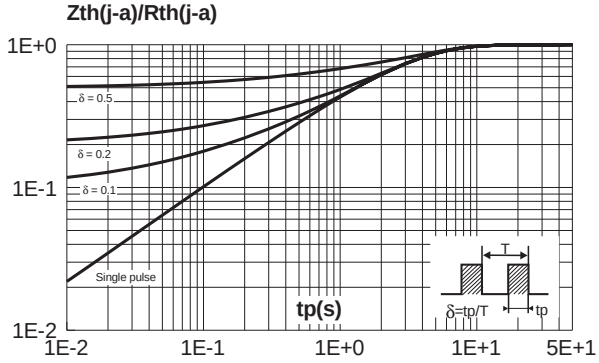


Fig. 5: Reverse leakage current versus reverse voltage applied (typical value).

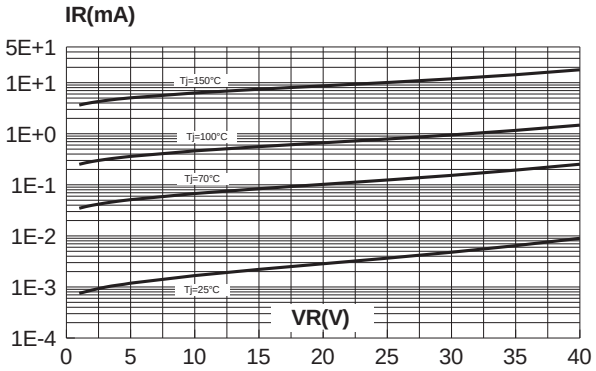


Fig. 6: Reverse leakage current versus junction temperature (typical value).

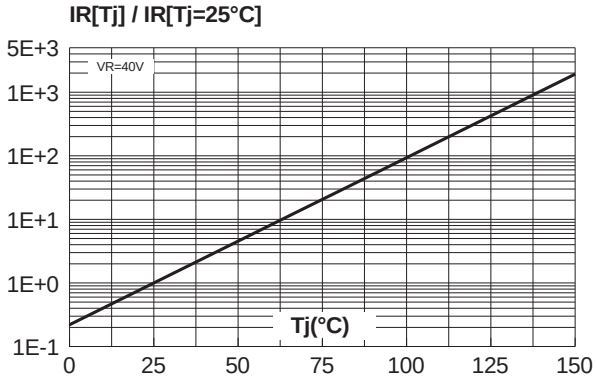


Fig. 7: Junction capacitance versus reverse voltage applied (typical value).

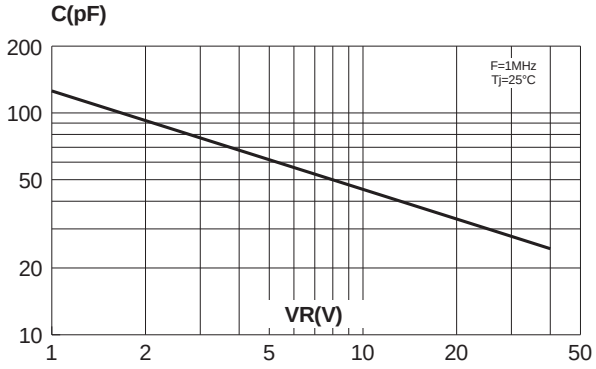


Fig. 8-1: Forward voltage drop versus forward current (high level, maximum values).

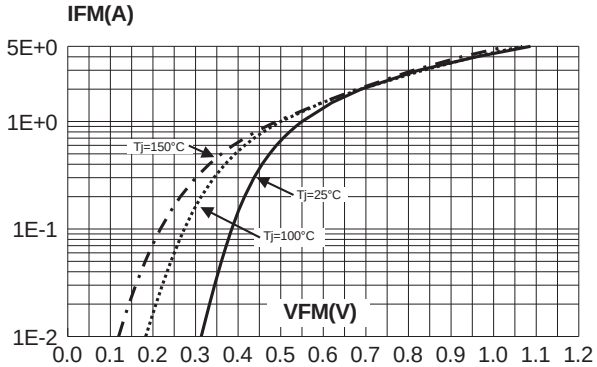


Fig. 8-2: Forward voltage drop versus forward current (low level, maximum values).

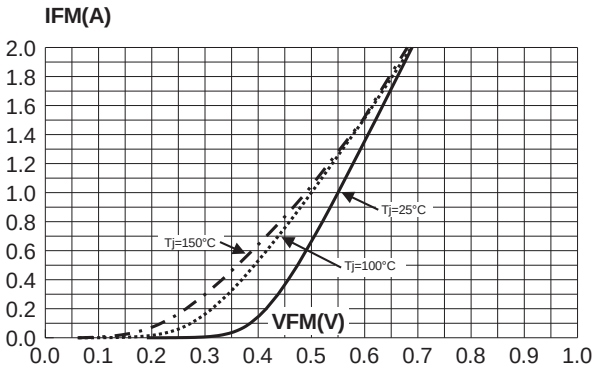
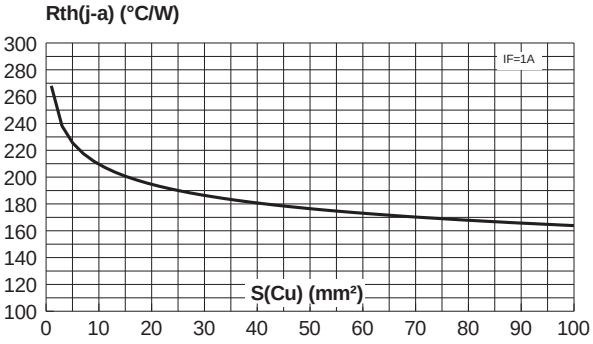
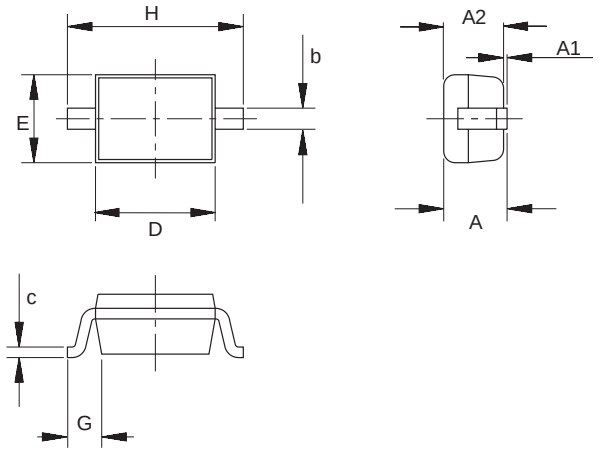


Fig. 9: Thermal resistance junction to ambient versus copper surface (epoxy printed circuit board FR4, copper thickness: 35µm).



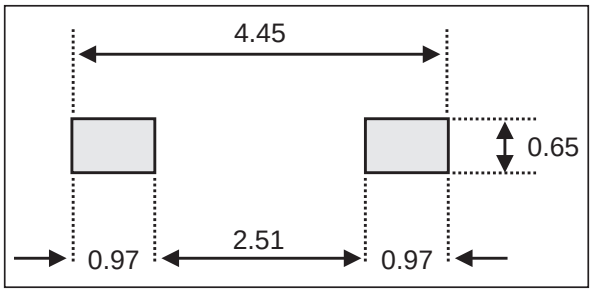
PACKAGE MECHANICAL DATA

SOD-123 Plastic



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.45		0.057
A1	0	0.1	0	0.004
A2	0.85	1.35	0.033	0.053
b	0.55 Typ.		0.022 Typ.	
c	0.15 Typ.		0.039 Typ.	
D	2.55	2.85	0.1	0.112
E	1.4	1.7	0.055	0.067
G	0.25		0.01	
H	3.55	3.95	0.14	0.156

FOOTPRINT (in millimeters)



MARKING

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS140Z	Z54	SOD-123	0.01 g	3000	Tape & reel

- Epoxy meets UL94, V0
- Band indicates cathode

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

© 2002 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