



STPS5L40

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_F(AV)$	5 A
V_{RRM}	40 V
$T_j(max)$	150°C
$V_F(max)$	0.44 V

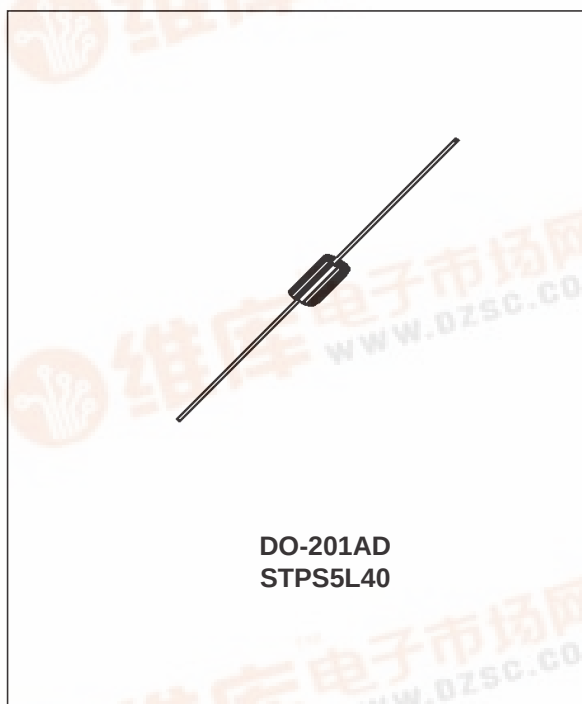
FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP FOR HIGHER EFFICIENCY.
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Axial Power Schottky rectifier suited for Switch Mode Power Supplies and high frequency inverters.

Packaged in DO-201AD, this device is intended for use in low voltage output for small battery chargers & consumer SMPS such as DVD and Set-Top-Box..



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		40	V
$I_F(RMS)$	RMS forward current		15	A
$I_F(AV)$	Average forward current	$T_I = 100^\circ\text{C} \quad \delta = 0.5$	5	A
I_{FSM}	Surge non repetitive forward current	Half wave, single phase $t_p = 10 \text{ ms}$	150	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1 \mu\text{s} \quad T_j = 25^\circ\text{C}$	2700	W
T_{stg}	Storage temperature range		- 65 to + 150	°C
T_j	Maximum operating junction temperature *		150	°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

STPS5L40

THERMAL PARAMETERS

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient		75	°C/W
$R_{th(j-l)}$	Junction to leads	Lead length = 10 mm	15	°C/W

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	mA
		$T_j = 100^\circ\text{C}$			8	25	
		$T_j = 125^\circ\text{C}$			25	75	
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5\text{ A}$		0.44	0.50	V
		$T_j = 100^\circ\text{C}$			0.40	0.46	
		$T_j = 125^\circ\text{C}$			0.38	0.44	

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

To evaluate the maximum conduction losses use the following equation:

$$P = 0.34 \times I_{F(AV)} + 0.028 \times I_F^2(RMS)$$

Fig. 1: Conduction losses versus average current.

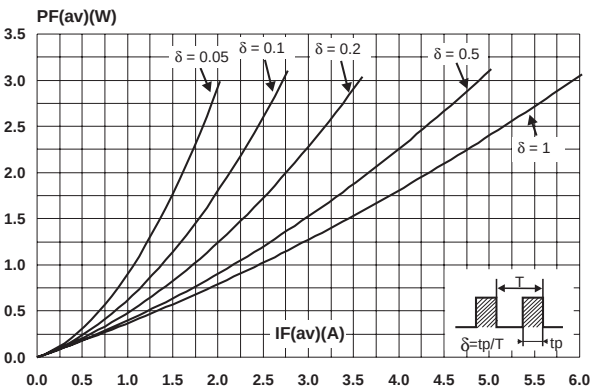


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

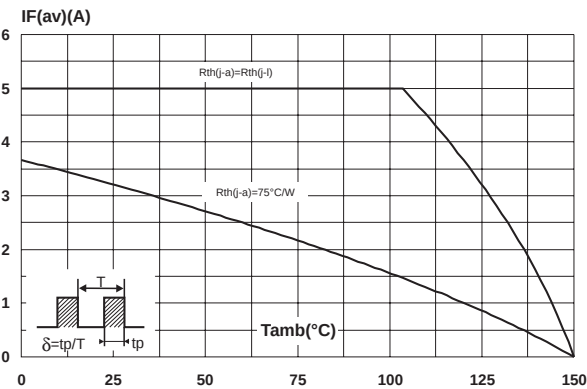


Fig. 3: Normalized avalanche power derating versus pulse duration.

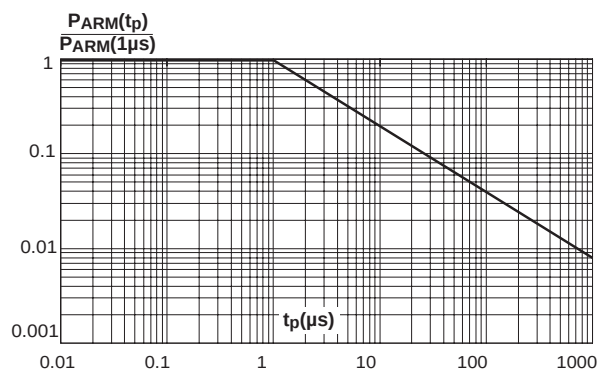


Fig. 4: Normalized avalanche power derating versus junction temperature.

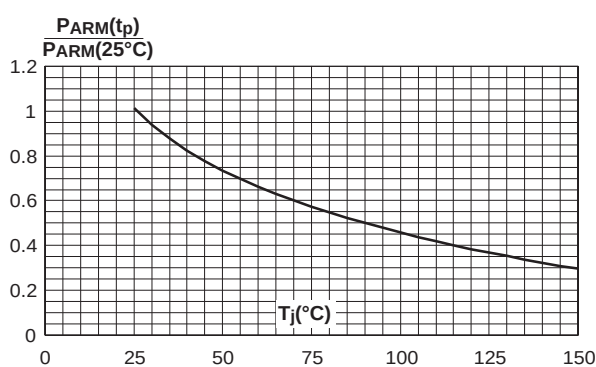


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

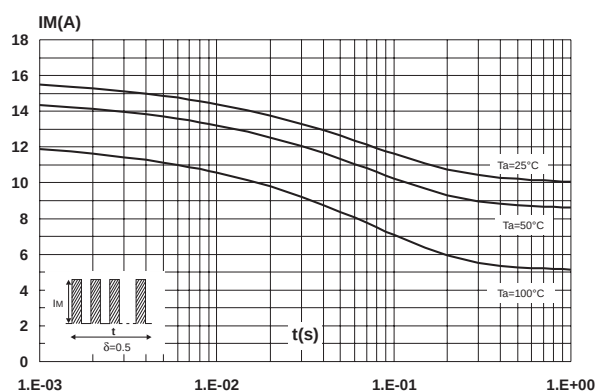


Fig. 6: Relative variation of thermal impedance junction to ambient versus pulse duration.

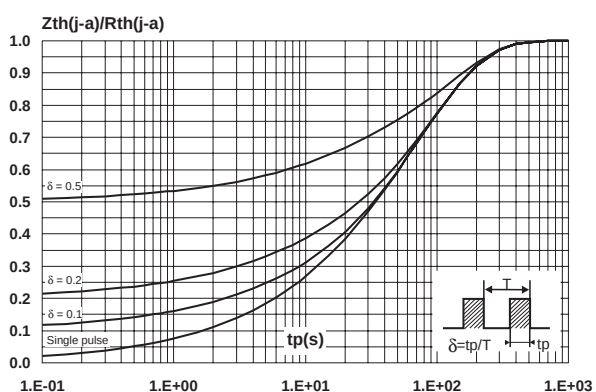


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

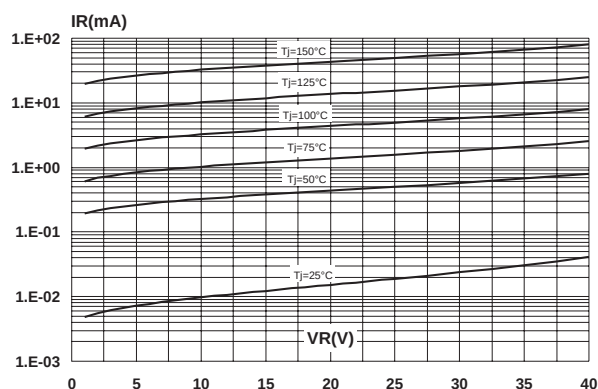


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

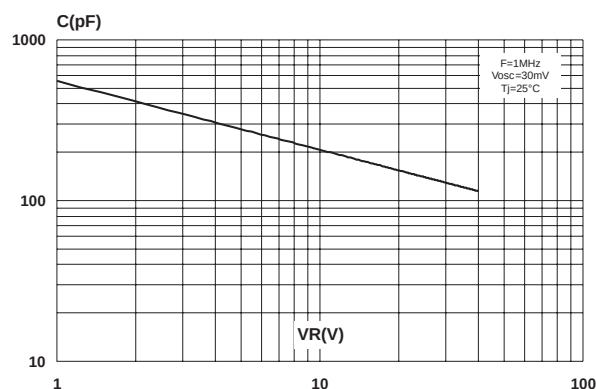


Fig. 9-1: Forward voltage drop versus forward current (low level).

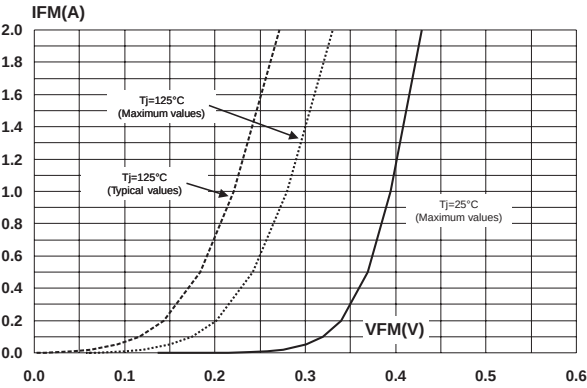


Fig. 9-2: Forward voltage drop versus forward current (high level).

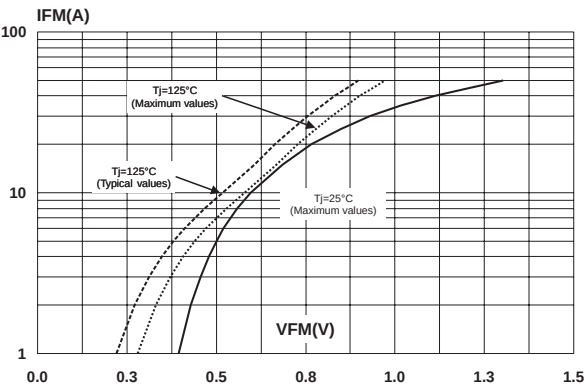


Fig. 10: Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, Cu = 35 μm).

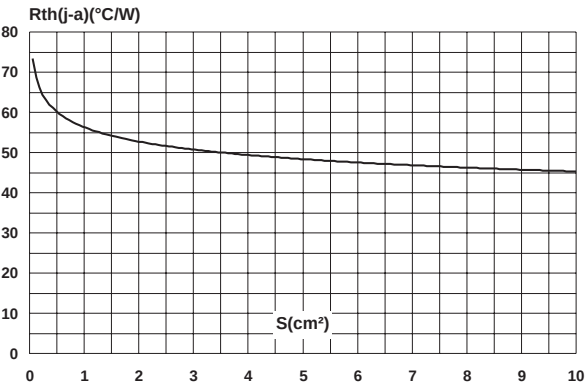
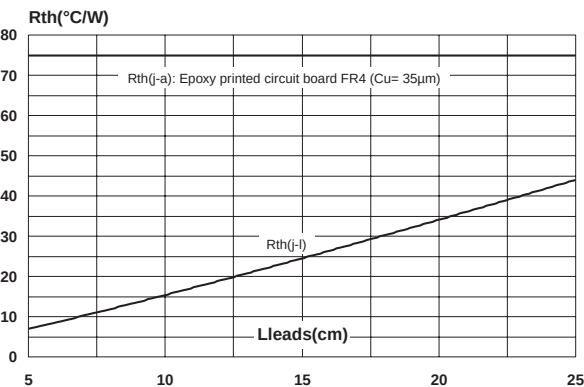
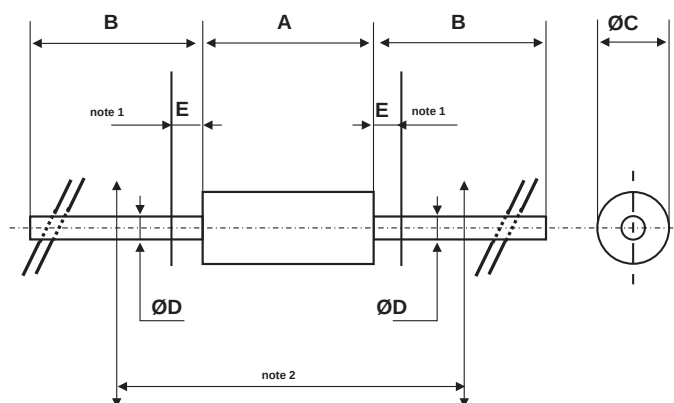


Fig. 11: Thermal resistances versus leads length.



PACKAGE MECHANICAL DATA

DO-201AD plastic



REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter Ø D is not controlled over zone E 2 - The minimum axial length within which the device may be placed with its leads bent at right angles is 0.59"(15 mm)
B	25.40		1.000		
Ø C		5.30		0.209	
Ø D		1.30		0.051	
E		1.25		0.049	

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS5L40	STPS5L40	DO-201AD	1.12g	600	Ammopack
STPS5L40RL	STPS5L40	DO-201AD	1.12g	1900	Tape and reel

- WHITE BAND INDICATES CATHODE
- EPOXY MEETS UL94,V0

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>