

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

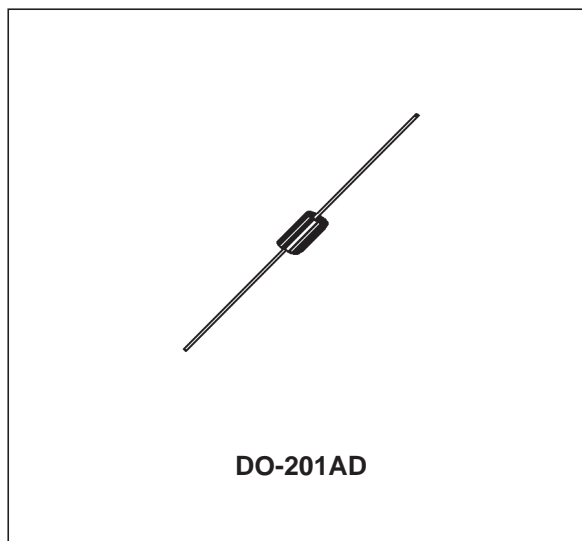
I_{F(AV)}	3 A
V_{RRM}	40 V
T_j	150°C
V_F (max)	0.475 V

FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Axial Power Schottky rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters. Packaged in DO-201AD these devices are intended for use in low voltage, high frequency inverters, free wheeling, polarity protection and small battery chargers.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value			Unit
			1N5820	1N5821	1N5822	
V _{RRM}	Repetitive peak reverse voltage		20	30	40	V
I _{F(RMS)}	RMS forward current		10			A
I _{F(AV)}	Average forward current	T _L = 100°C δ = 0.5			3	A
		T _L = 110°C δ = 0.5	3	3		A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	80			A
P _{ARM}	Repetitive peak avalanche power	tp = 1μs T _j = 25°C	1700			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		10000			V/μs

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j-a)}$ thermal runaway condition for a diode on its own heatsink

1N582x

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient	Lead length = 10 mm	80	$^{\circ}C/W$
$R_{th(j-l)}$	Junction to lead	Lead length = 10 mm	25	$^{\circ}C/W$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests Conditions		1N5820	1N5821	1N5822	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}C$	$V_R = V_{RRM}$	2	2	2	mA
		$T_j = 100^{\circ}C$		20	20	20	mA
V_F^*	Forward voltage drop	$T_j = 25^{\circ}C$	$I_F = 3 A$	0.475	0.5	0.525	V
		$T_j = 25^{\circ}C$	$I_F = 9.4 A$	0.85	0.9	0.95	V

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

To evaluate the conduction losses use the following equations :

$$P = 0.33 \times I_{F(AV)} + 0.035 I_{F(RMS)}^2 \text{ for } 1N5820 / 1N5821$$

$$P = 0.33 \times I_{F(AV)} + 0.060 I_{F(RMS)}^2 \text{ for } 1N5822$$

Fig. 1: Average forward power dissipation versus average forward current (1N5820/1N5821).

Fig. 2: Average forward power dissipation versus average forward current (1N5822).

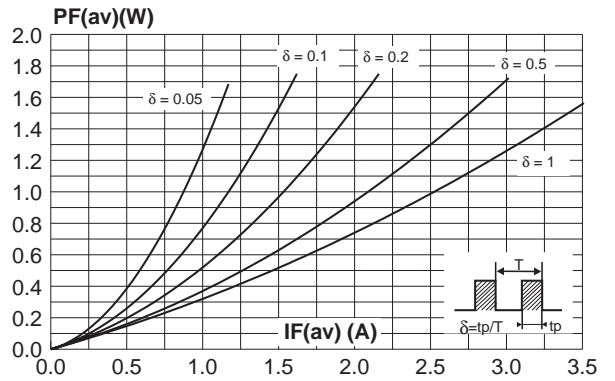
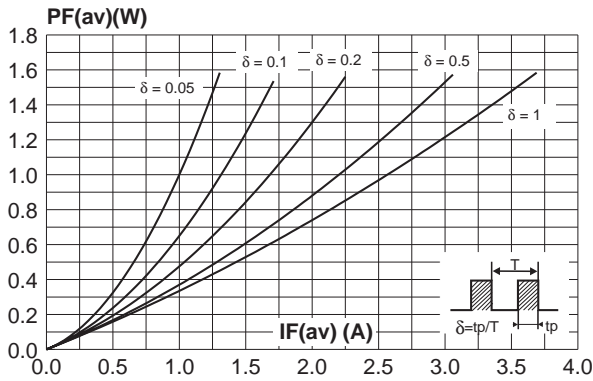


Fig. 3: Normalized avalanche power derating versus pulse duration.

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

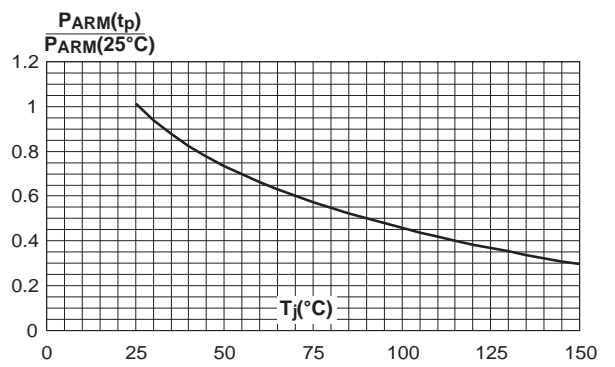
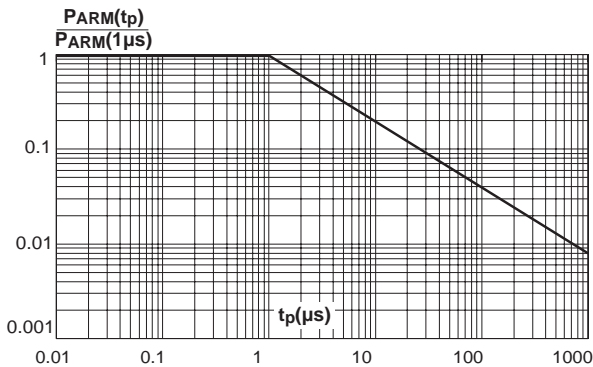


Fig. 5-1: Average forward current versus ambient temperature ($\delta=0.5$) (1N5820/1N5821).

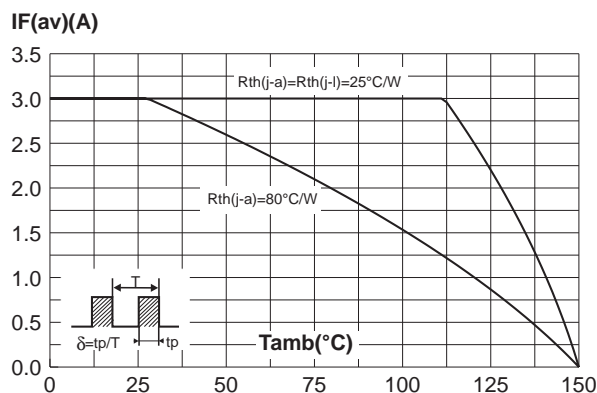


Fig. 5-2: Average forward current versus ambient temperature ($\delta=0.5$) (1N5822).

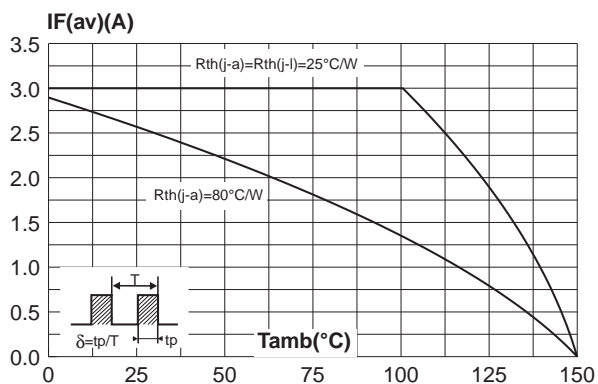


Fig. 6-1: Non repetitive surge peak forward current versus overload duration (maximum values) (1N5820/1N5821).

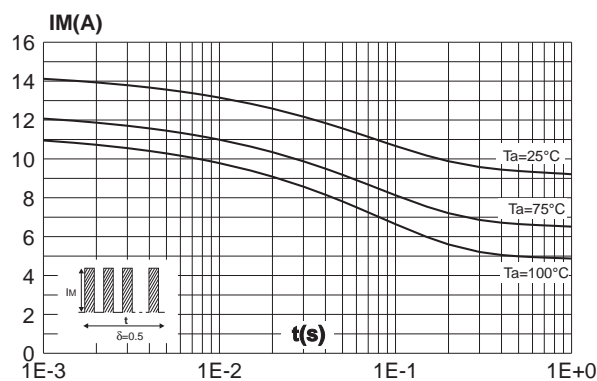


Fig. 6-2: Non repetitive surge peak forward current versus overload duration (maximum values) (1N5822).

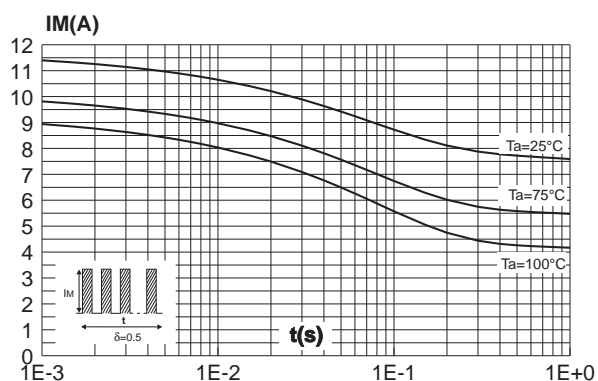


Fig. 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, $e(\text{Cu})=35\text{mm}$, recommended pad layout).

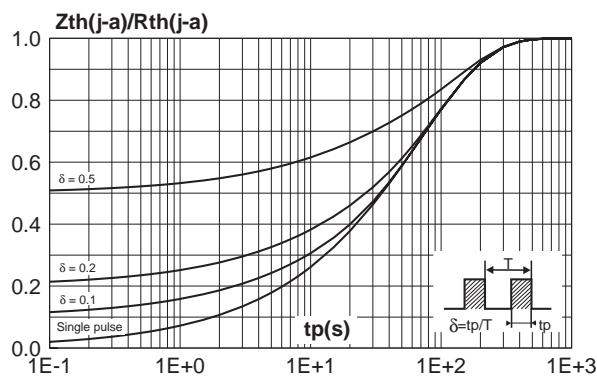


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

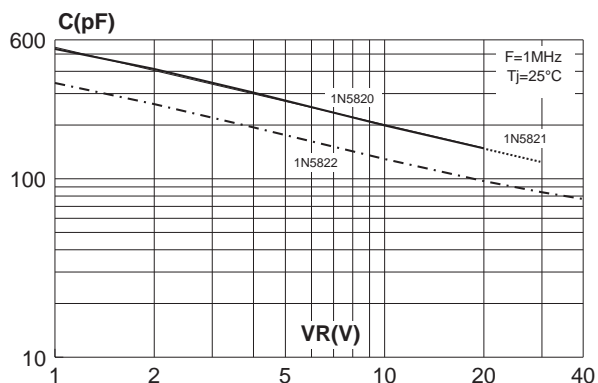


Fig. 9-1: Reverse leakage current versus reverse voltage applied (typical values) (1N5820/1N5821).

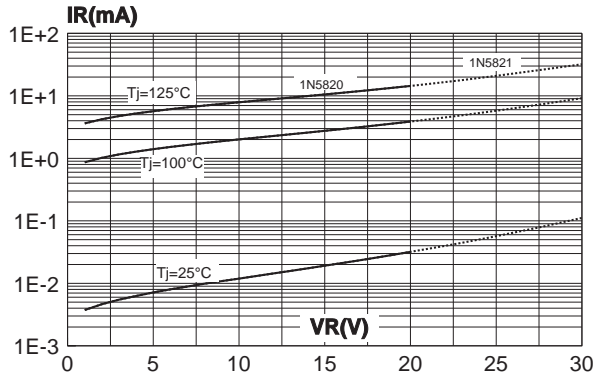


Fig. 9-2: Reverse leakage current versus reverse voltage applied (typical values) (1N5822).

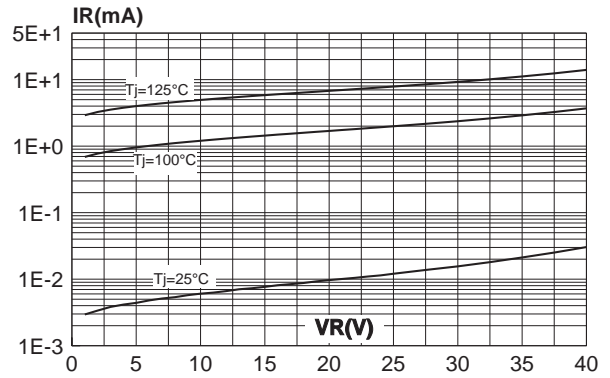


Fig. 10-1: Forward voltage drop versus forward current (typical values) (1N5820/1N5821).

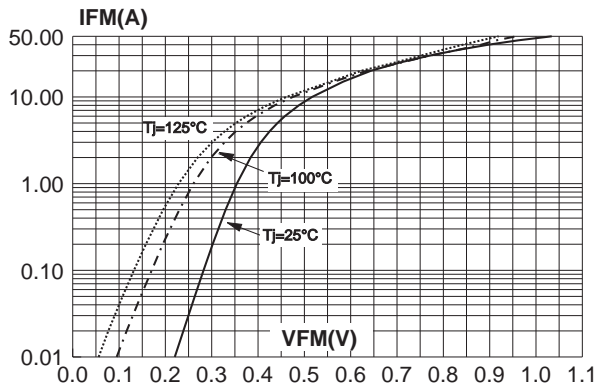


Fig. 10-2: Forward voltage drop versus forward current (typical values) (1N5822).

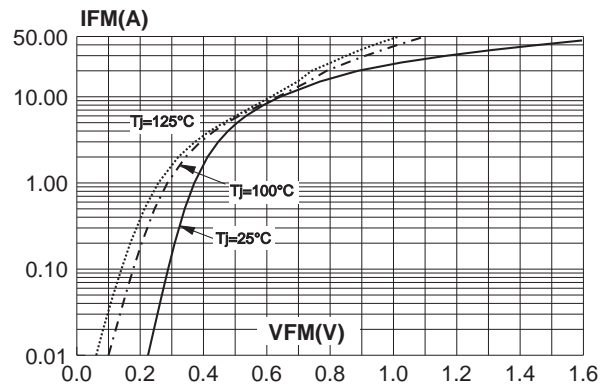
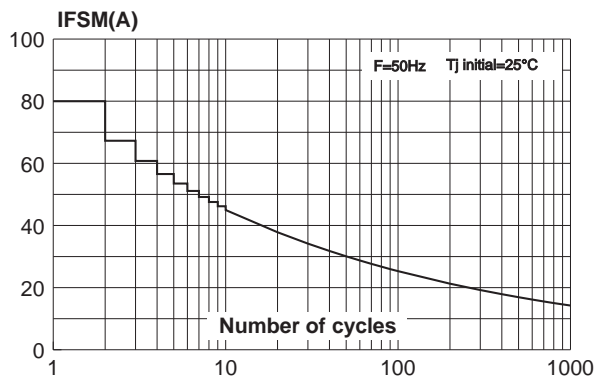
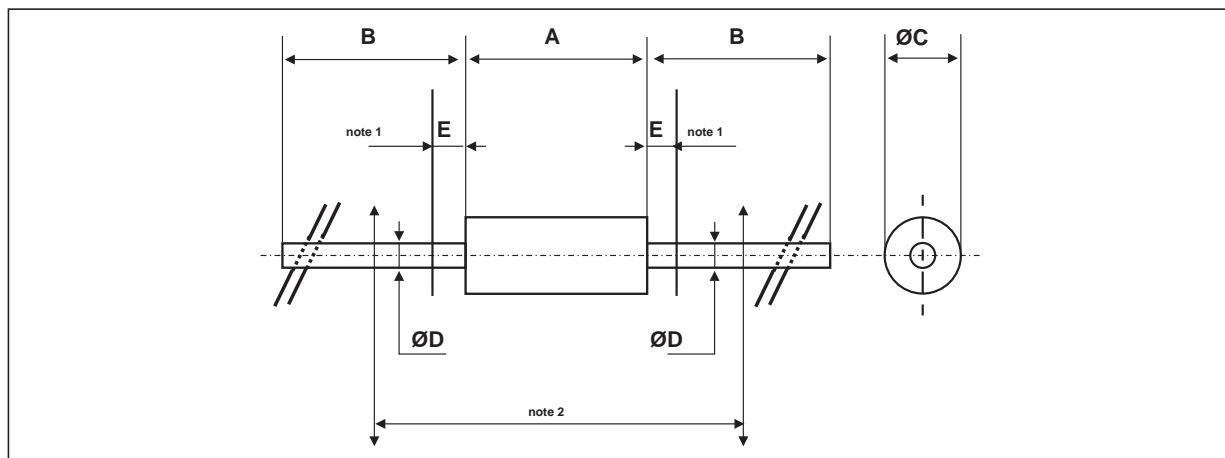


Fig. 11: Non repetitive surge peak forward current versus number of cycles.



PACKAGE MECHANICAL DATA

DO-201AD plastic



REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter $\varnothing D$ 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		
$\varnothing C$		5.30		0.209	
$\varnothing D$		1.30		0.051	
E		1.25		0.049	

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
1N582x	Part number cathode ring	DO-201AD	1.12g	600	Ammopack
1N582xRL	Part number cathode ring	DO-201AD	1.12g	1900	Tape & reel

• 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>