

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

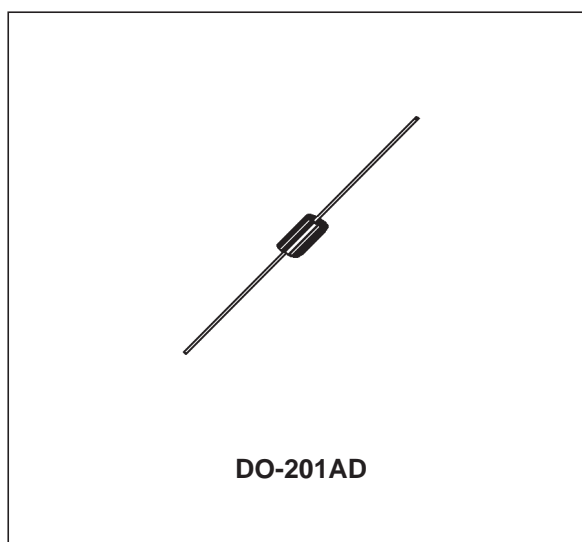
<b>I<sub>F(AV)</sub></b>	<b>3 A</b>
<b>V<sub>RRM</sub></b>	<b>40 V</b>
<b>T<sub>j</sub></b>	<b>150°C</b>
<b>V<sub>F</sub> (max)</b>	<b>0.475 V</b>

### 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 <sub>RRM</sub>	Repetitive peak reverse voltage	20	30	40	V
I <sub>F(RMS)</sub>	RMS forward current	10			A
I <sub>F(AV)</sub>	Average forward current	T <sub>L</sub> = 100°C δ = 0.5		3	A
		T <sub>L</sub> = 110°C δ = 0.5		3	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms Sinusoidal		80	A
P <sub>ARM</sub>	Repetitive peak avalanche power	tp = 1μs T <sub>j</sub> = 25°C		1700	W
T <sub>stg</sub>	Storage temperature range	- 65 to + 150			°C
T <sub>j</sub>	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	$^{\circ}\text{C}/\text{W}$
$R_{th(j-l)}$	Junction to lead	Lead length = 10 mm	25	$^{\circ}\text{C}/\text{W}$

## STATIC ELECTRICAL CHARACTERISTICS

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

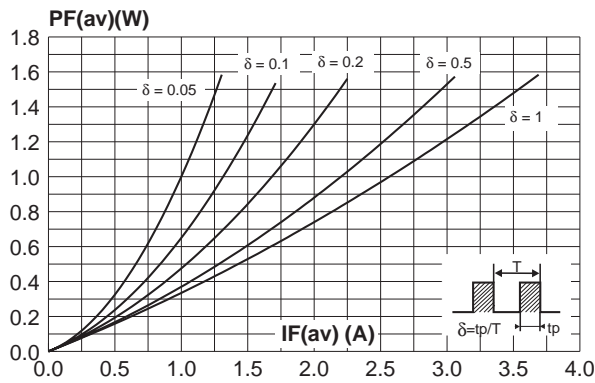
Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equations :

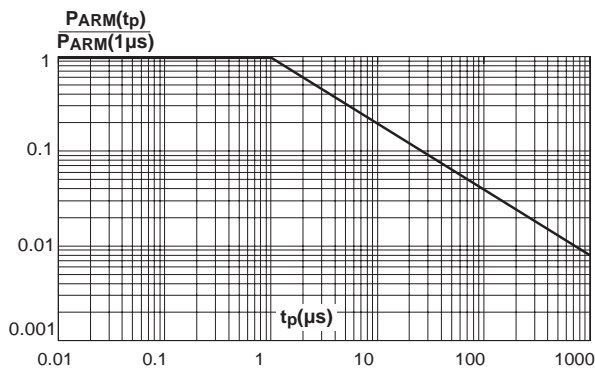
$$P = 0.33 \times I_{F(AV)} + 0.035 I_{F(RMS)}^2 \text{ for } 1N5820 / 1N5821$$

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

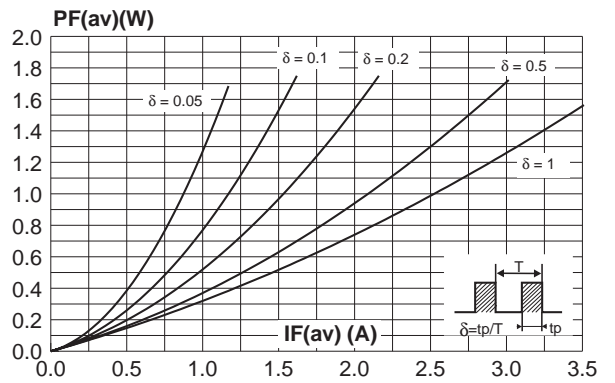
**Fig. 1:** Average forward power dissipation versus average forward current (1N5820/1N5821).



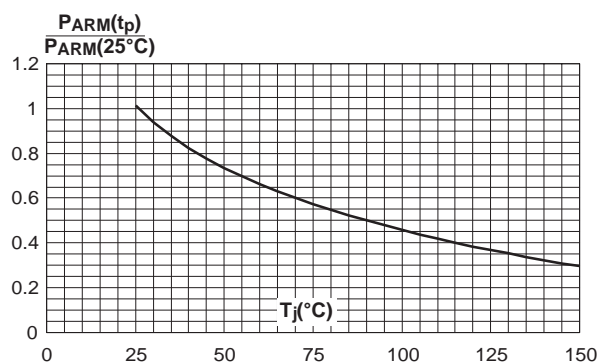
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



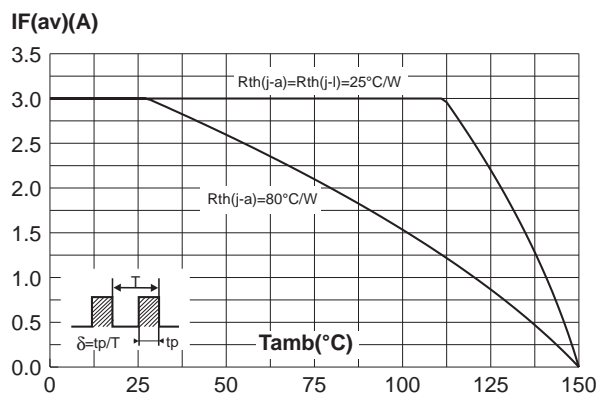
**Fig. 2:** Average forward power dissipation versus average forward current (1N5822).



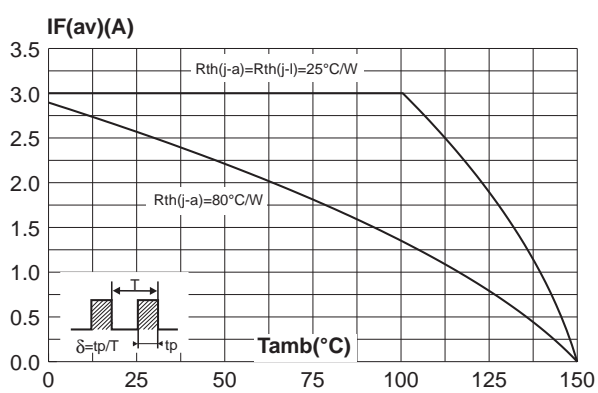
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



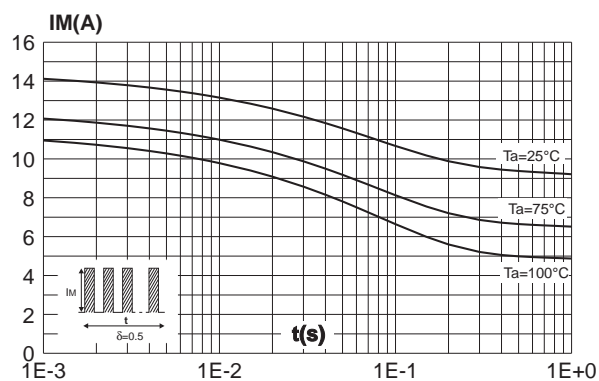
**Fig. 5-1:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5820/1N5821).



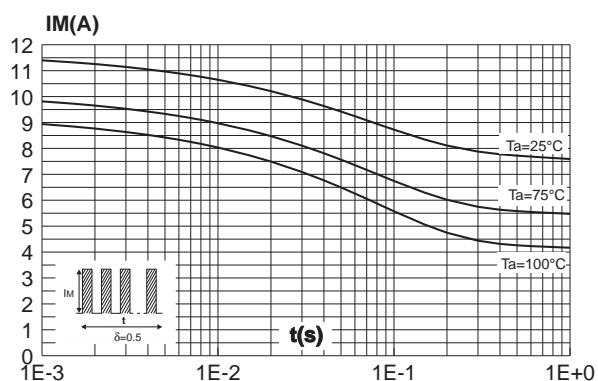
**Fig. 5-2:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5822).



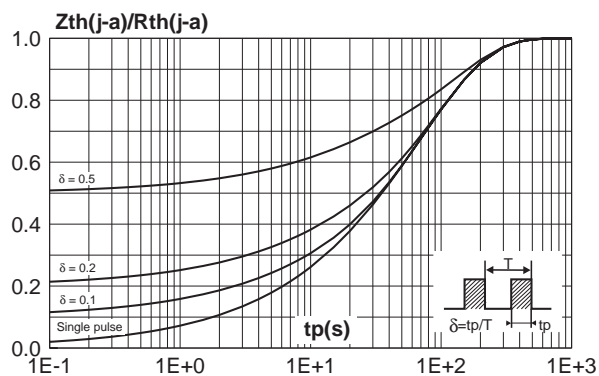
**Fig. 6-1:** Non repetitive surge peak forward current versus overload duration (maximum values) (1N5820/1N5821).



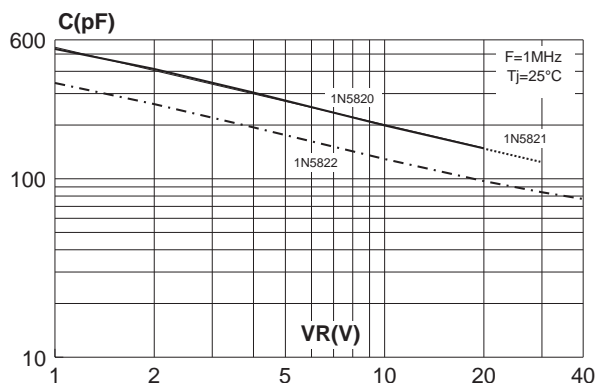
**Fig. 6-2:** Non repetitive surge peak forward current versus overload duration (maximum values) (1N5822).



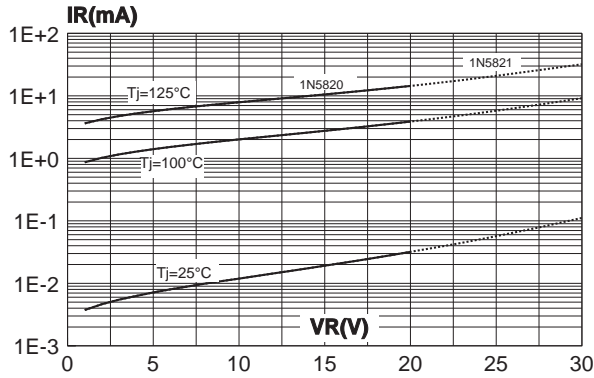
**Fig. 7:** Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board,  $e(\text{Cu})=35\text{mm}$ , recommended pad layout).



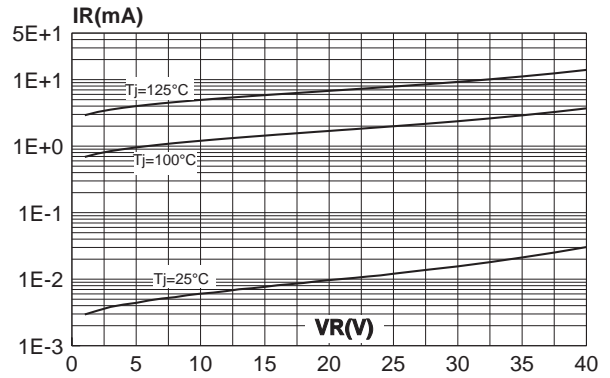
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).



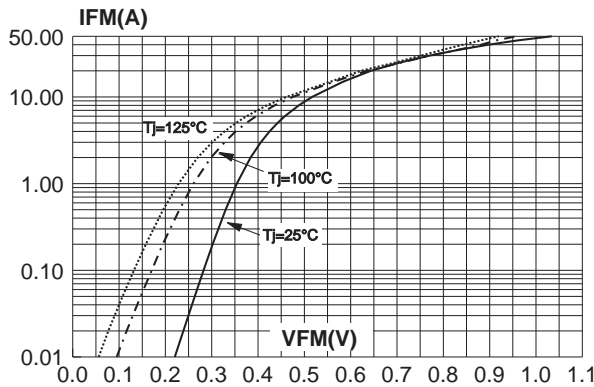
**Fig. 9-1:** Reverse leakage current versus reverse voltage applied (typical values) (1N5820/1N5821).



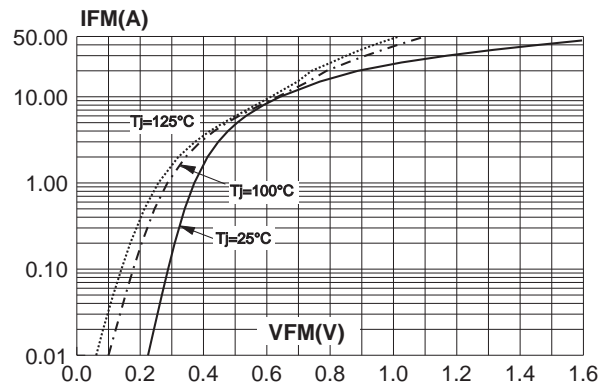
**Fig. 9-2:** Reverse leakage current versus reverse voltage applied (typical values) (1N5822).



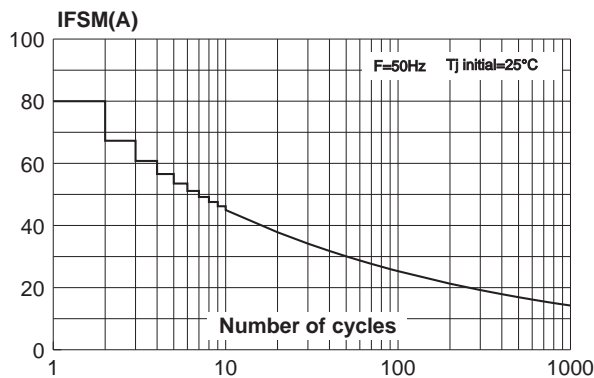
**Fig. 10-1:** Forward voltage drop versus forward current (typical values) (1N5820/1N5821).



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

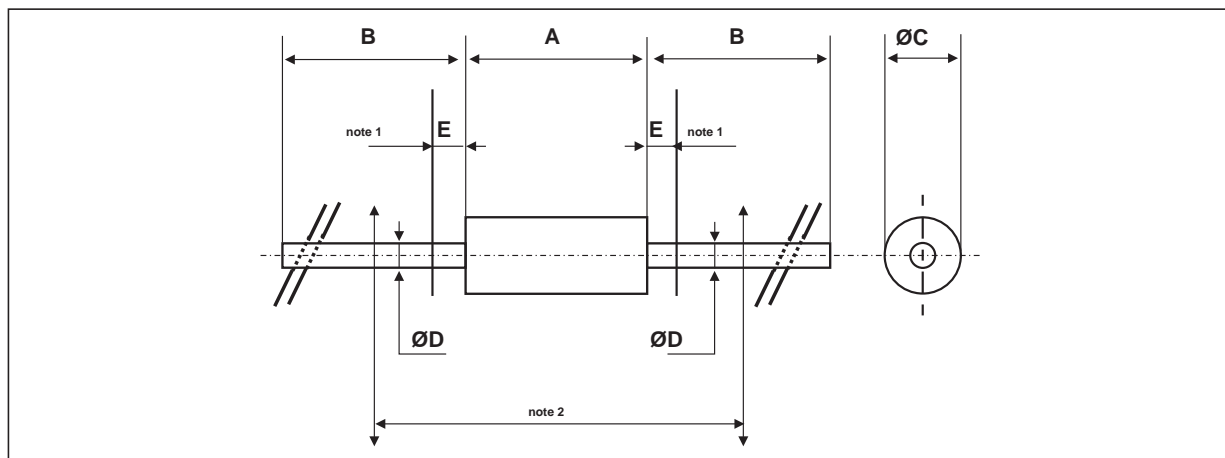


**Fig. 11:** Non repetitive surge peak forward current versus number of cycles.



**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

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