

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	3 A
$V_{RRM}$	40 V
$T_j$	150°C
$V_F(\text{max})$	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
$I_{F(\text{RMS})}$	RMS forward current	10			A
$I_{F(AV)}$	Average forward current	$T_L = 100^\circ\text{C}$	$\delta = 0.5$	3	A
		$T_L = 110^\circ\text{C}$	$\delta = 0.5$	3	A
$I_{FSM}$	Surge non repetitive forward current	$tp = 10 \mu\text{s}$	Sinusoidal	80	A
$P_{ARM}$	Repetitive peak avalanche power	$tp = 1\mu\text{s}$	$T_j = 25^\circ\text{C}$	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/ $\mu\text{s}$

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j - a)}$  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	°C/W
$R_{th} (j-l)$	Junction to lead	Lead length = 10 mm	25	°C/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

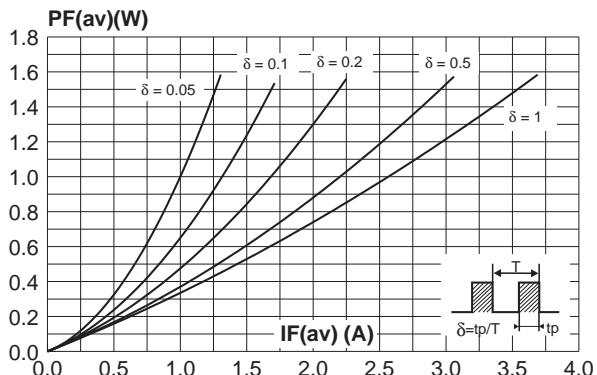
Pulse test : \*  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equations :

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

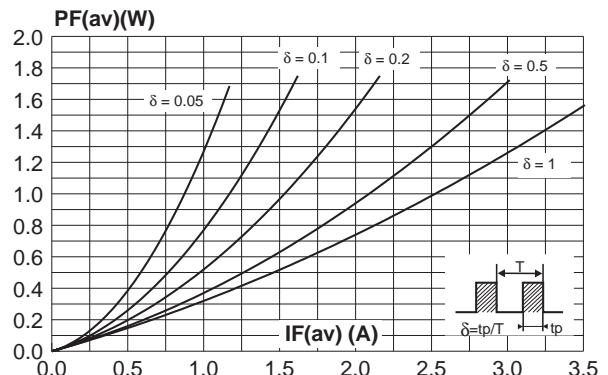
$$P = 0.33 \times I_{F(AV)} + 0.060 I_{F}^2(\text{RMS}) \text{ for 1N5822}$$

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

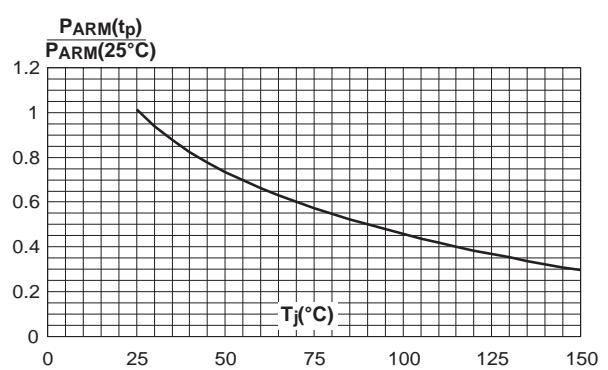
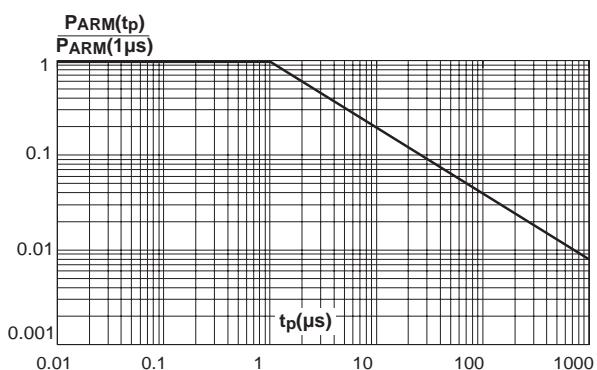


**Fig. 3:** Normalized avalanche power derating versus pulse duration.

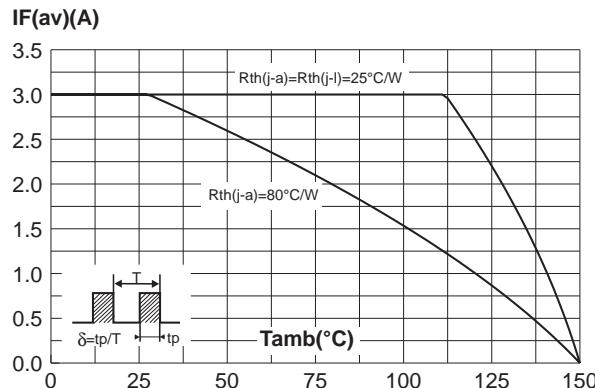
**Fig. 2:** Average forward power dissipation versus average forward current (1N5822).



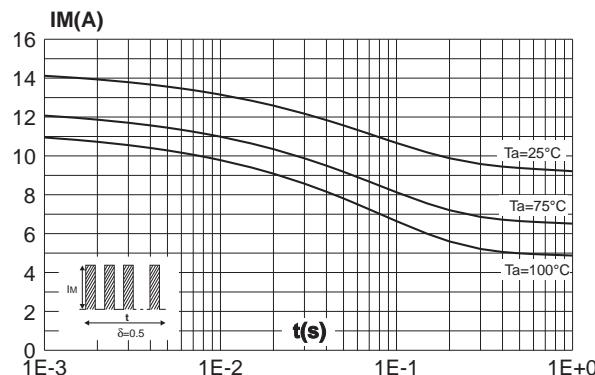
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



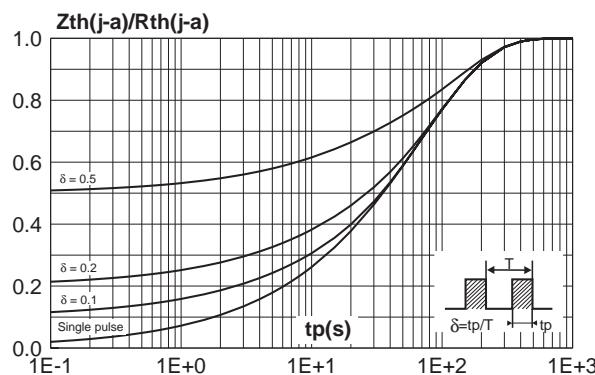
**Fig. 5-1:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5820/1N5821).



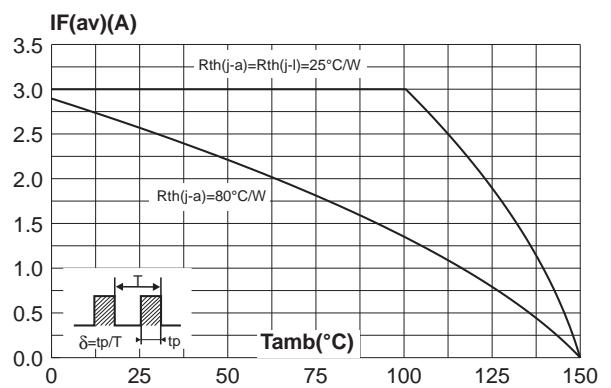
**Fig. 6-1:** Non repetitive surge peak forward current versus overload duration (maximum values) (1N5820/1N5821).



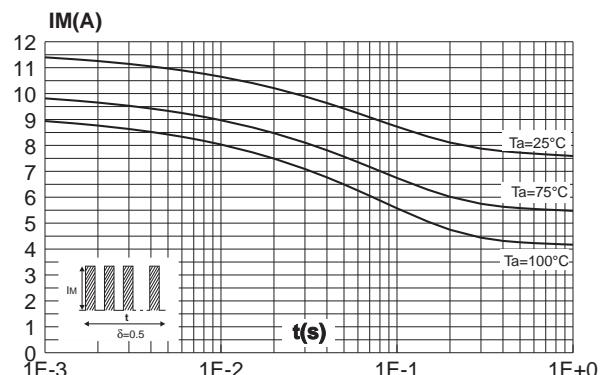
**Fig. 7:** Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board,  $e(Cu)=35\text{mm}$ , recommended pad layout).



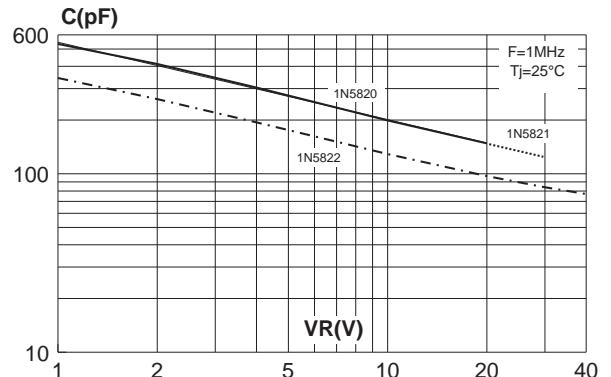
**Fig. 5-2:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5822).



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

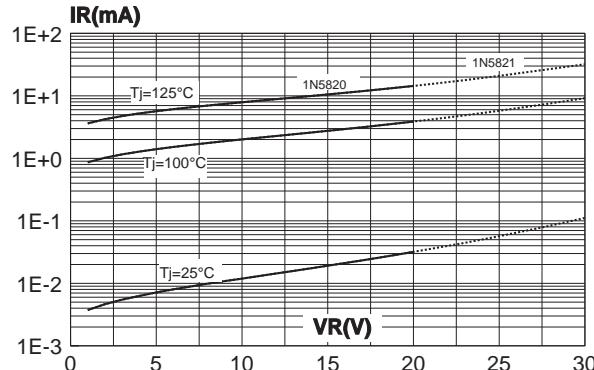


**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).

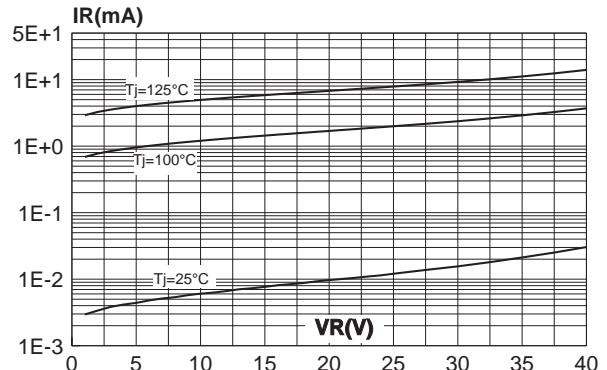


## 1N582x

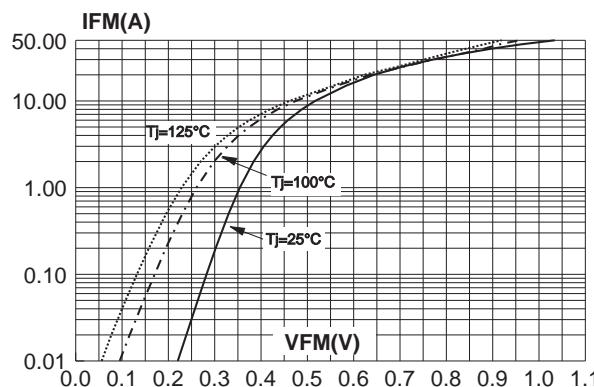
**Fig. 9-1:** Reverse leakage current versus reverse voltage applied (typical values) (1N5820/1N5821).



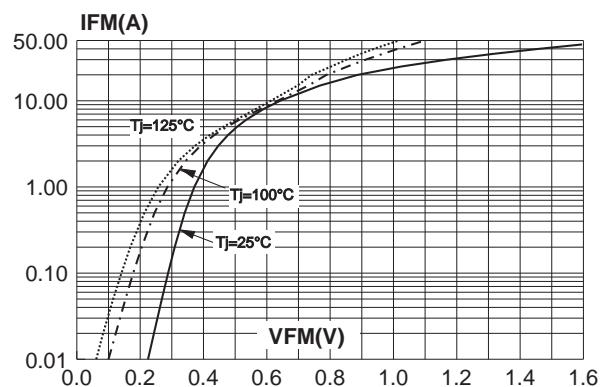
**Fig. 9-2:** Reverse leakage current versus reverse voltage applied (typical values) (1N5822).



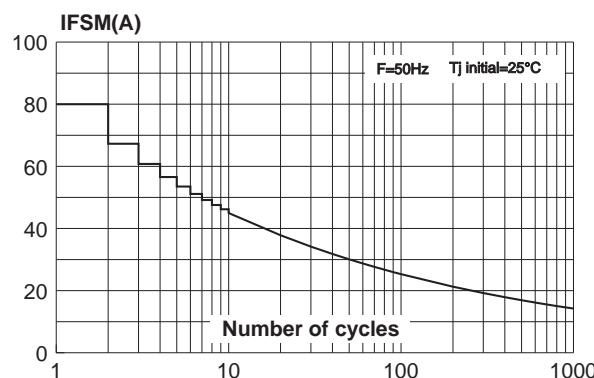
**Fig. 10-1:** Forward voltage drop versus forward current (typical values) (1N5820/1N5821).



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

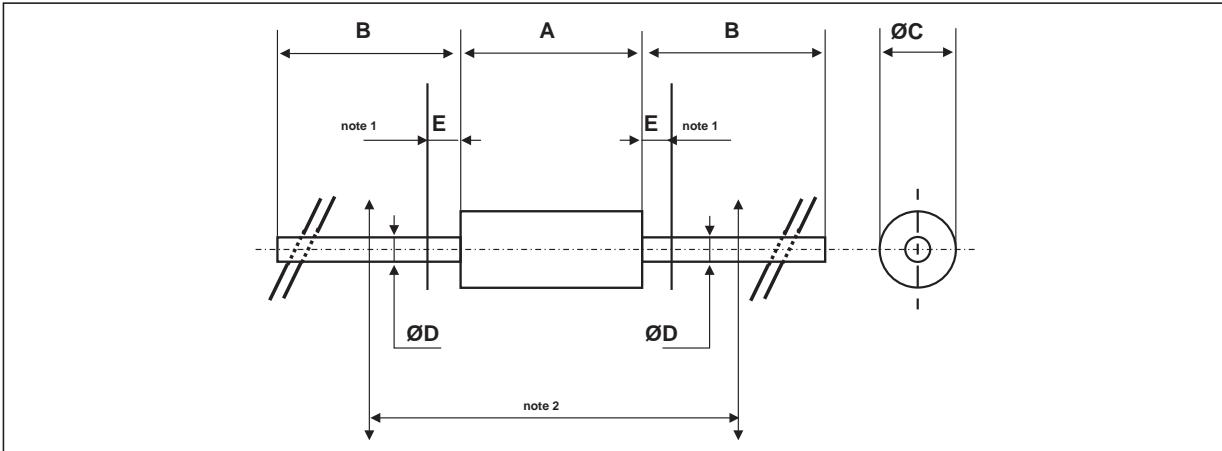


**Fig. 11:** Non repetitive surge peak forward current versus number of cycles.



## PACKAGE MECHANICAL DATA

DO-201AD plastic



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

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