

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

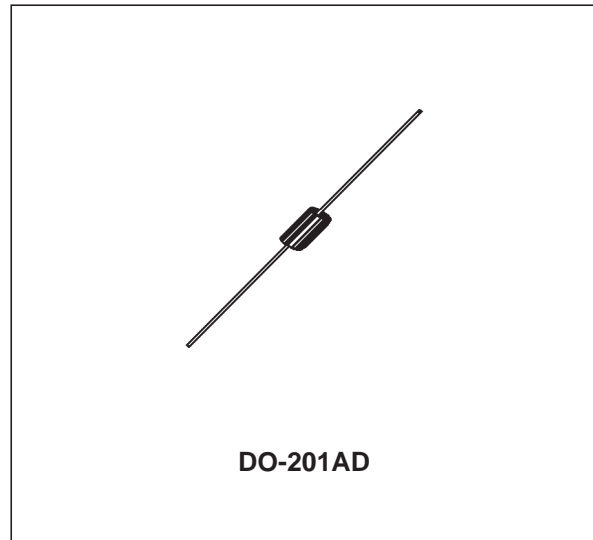
|                           |                |
|---------------------------|----------------|
| <b>I<sub>F(AV)</sub></b>  | <b>3 A</b>     |
| <b>V<sub>RRM</sub></b>    | <b>40 V</b>    |
| <b>T<sub>j</sub></b>      | <b>150°C</b>   |
| <b>V<sub>F(max)</sub></b> | <b>0.475 V</b> |

### 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             | 3      |        | A    |
| I <sub>FSM</sub>    | Surge non repetitive forward current     | tp = 10 ms<br>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    | $^{\circ}C/W$ |
| $R_{th(j-l)}$ | 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    |

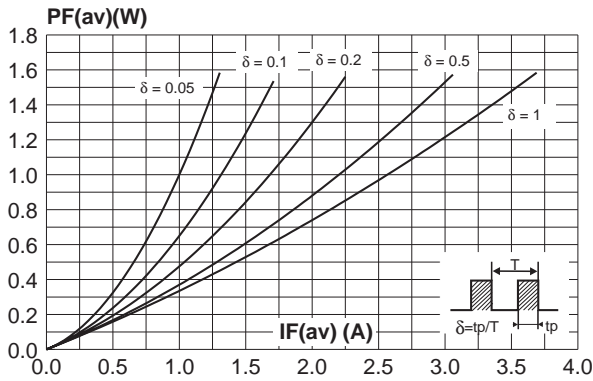
Pulse test : \*  $t_p = 380 \mu s$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equations :

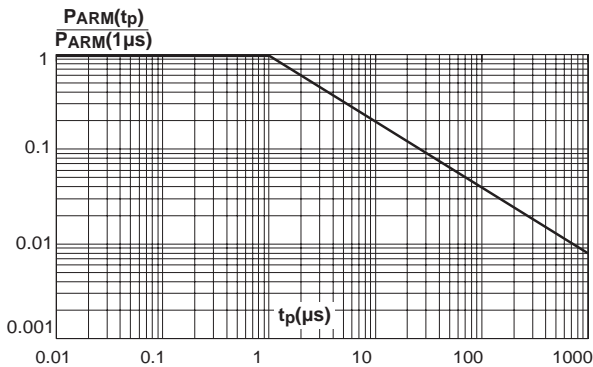
$$P = 0.33 \times I_{F(AV)} + 0.035 I_{F(RMS)}^2 \text{ for } 1N5820 / 1N5821$$

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

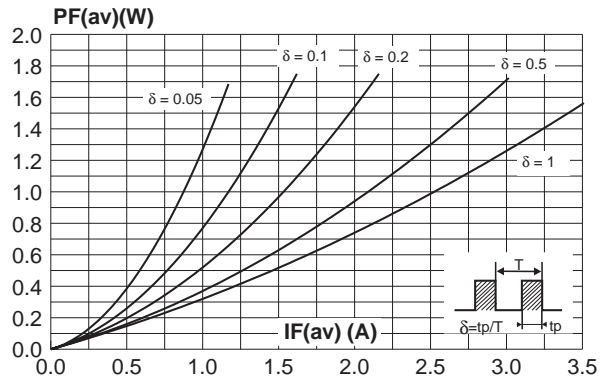
**Fig. 1:** Average forward power dissipation versus average forward current (1N5820/1N5821).



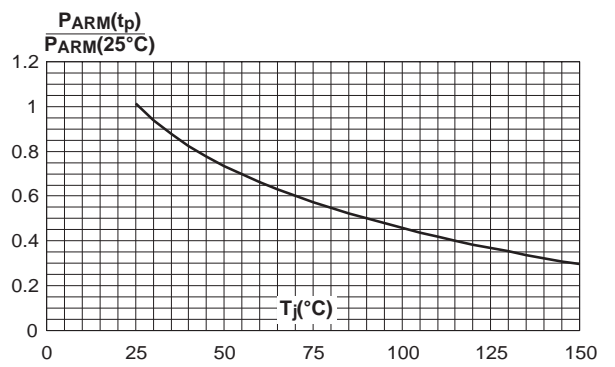
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



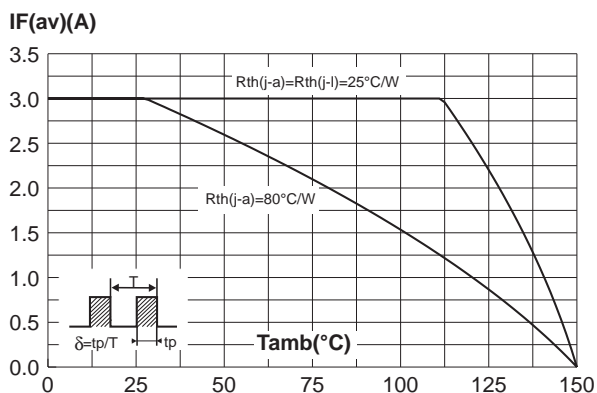
**Fig. 2:** Average forward power dissipation versus average forward current (1N5822).



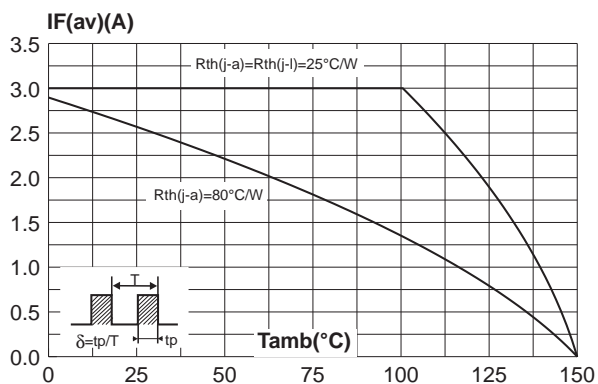
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



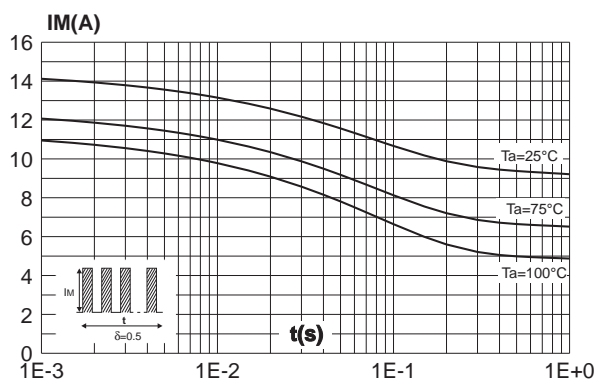
**Fig. 5-1:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5820/1N5821).



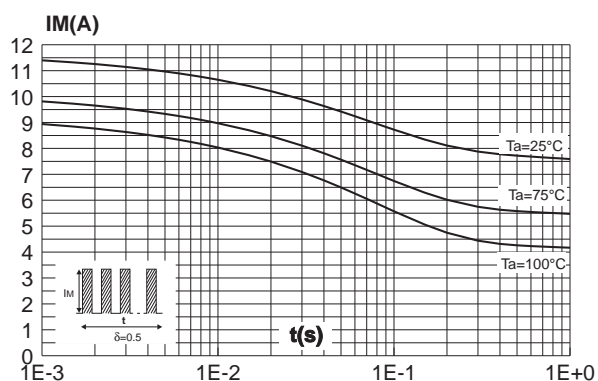
**Fig. 5-2:** Average forward current versus ambient temperature ( $\delta=0.5$ ) (1N5822).



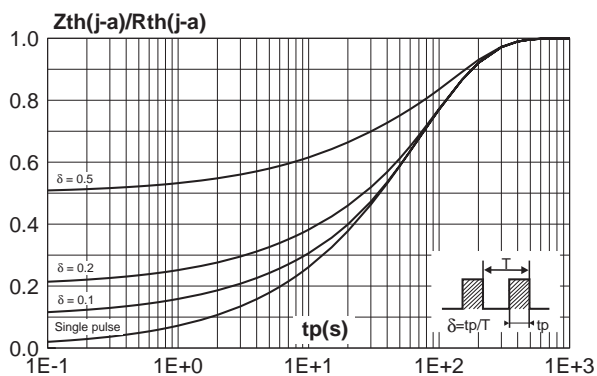
**Fig. 6-1:** Non repetitive surge peak forward current versus overload duration (maximum values) (1N5820/1N5821).



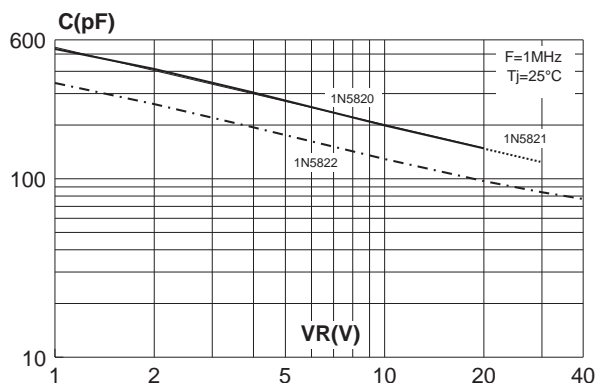
**Fig. 6-2:** Non repetitive surge peak forward current versus overload duration (maximum values) (1N5822).



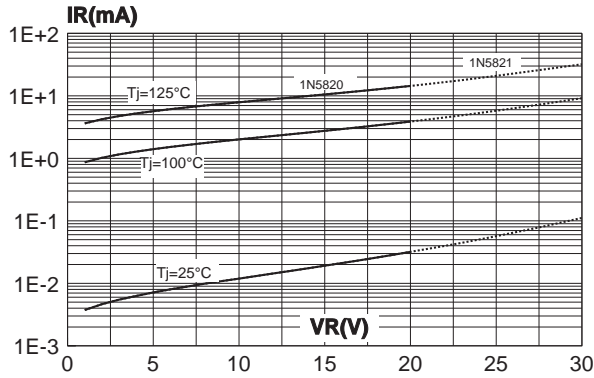
**Fig. 7:** Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board,  $e(\text{Cu})=35\text{mm}$ , recommended pad layout).



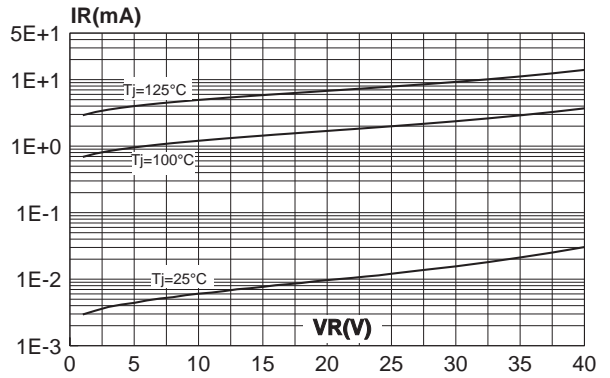
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).



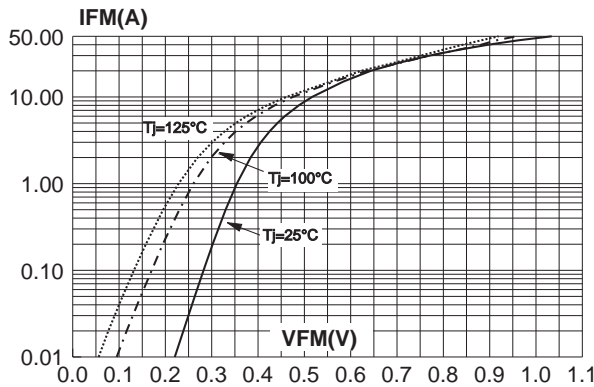
**Fig. 9-1:** Reverse leakage current versus reverse voltage applied (typical values) (1N5820/1N5821).



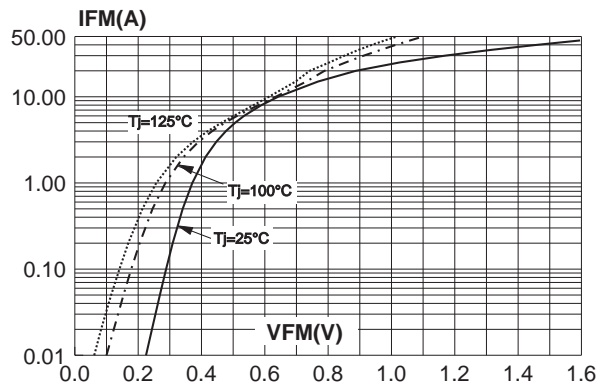
**Fig. 9-2:** Reverse leakage current versus reverse voltage applied (typical values) (1N5822).



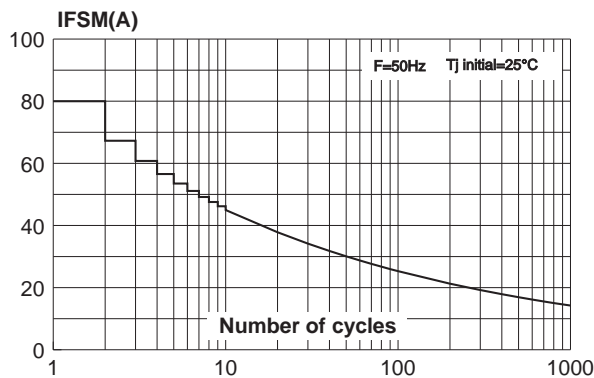
**Fig. 10-1:** Forward voltage drop versus forward current (typical values) (1N5820/1N5821).



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

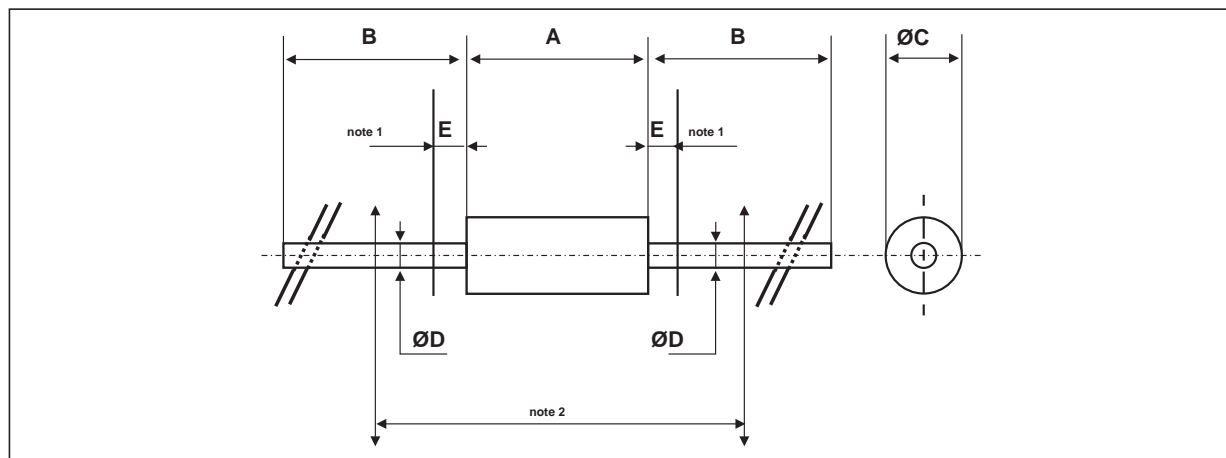


**Fig. 11:** Non repetitive surge peak forward current versus number of cycles.



## 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<br>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<br>cathode ring | DO-201AD | 1.12g  | 600      | Ammopack      |
| 1N582xRL      | Part number<br>cathode ring | DO-201AD | 1.12g  | 1900     | Tape & reel   |

• EPOXY MEETS UL94,V0

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