

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

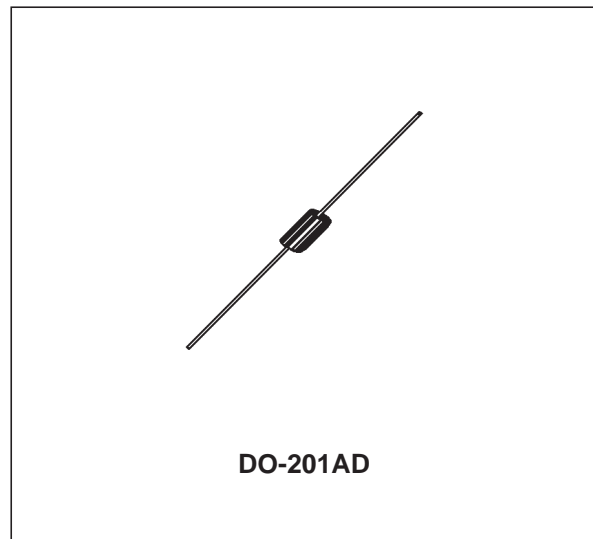
| | |
|----------------------------|----------------|
| I_{F(AV)} | 3 A |
| V_{RRM} | 40 V |
| T_j | 150°C |
| V_F (max) | 0.475 V |

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 | 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).

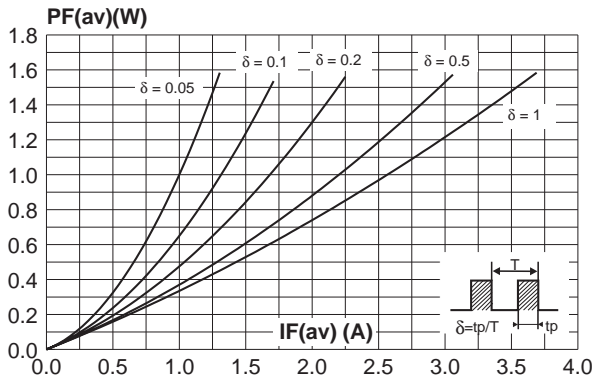


Fig. 3: Normalized avalanche power derating versus pulse duration.

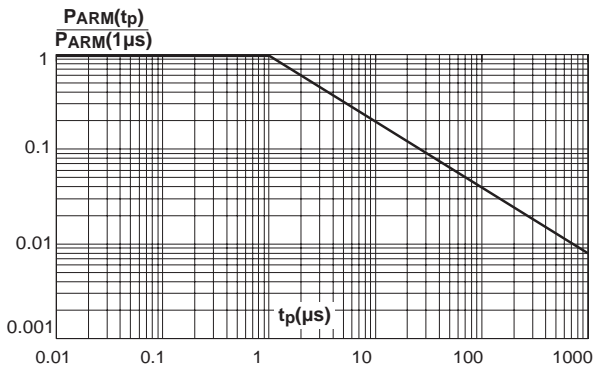


Fig. 2: Average forward power dissipation versus average forward current (1N5822).

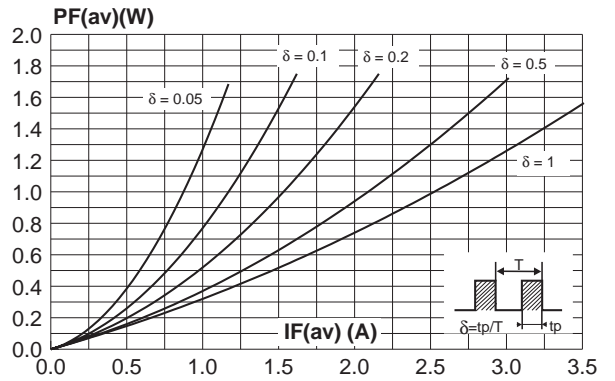


Fig. 4: Normalized avalanche power derating versus junction temperature.

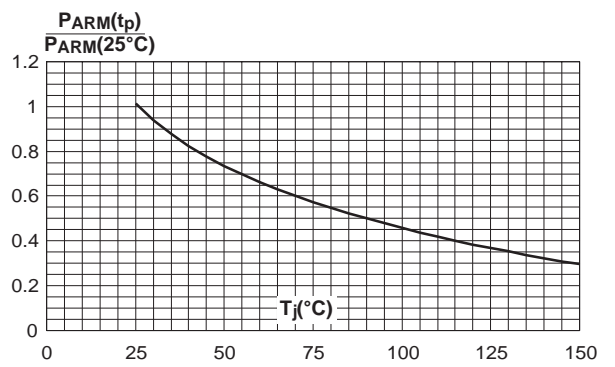


Fig. 5-1: Average forward current versus ambient temperature ($\delta=0.5$) (1N5820/1N5821).

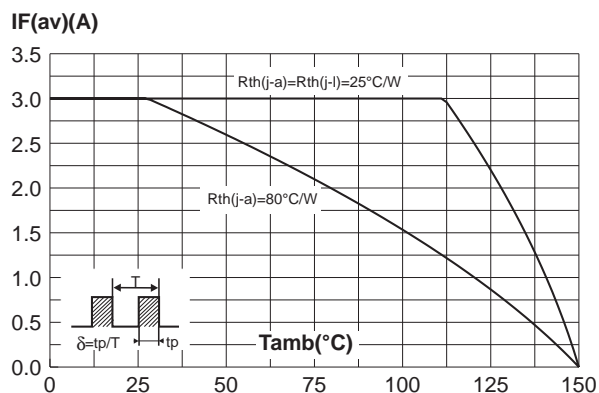


Fig. 5-2: Average forward current versus ambient temperature ($\delta=0.5$) (1N5822).

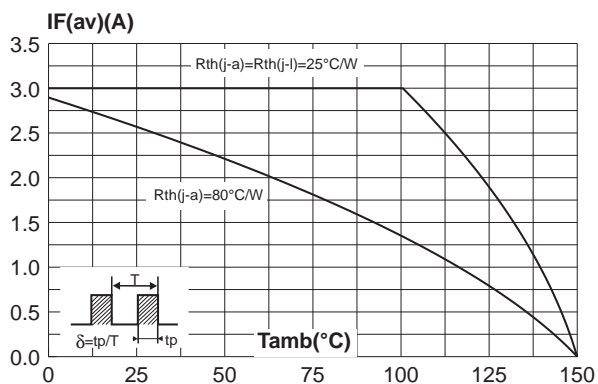


Fig. 6-1: Non repetitive surge peak forward current versus overload duration (maximum values) (1N5820/1N5821).

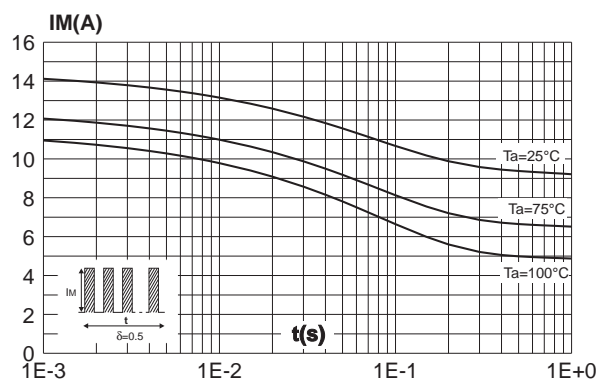


Fig. 6-2: Non repetitive surge peak forward current versus overload duration (maximum values) (1N5822).

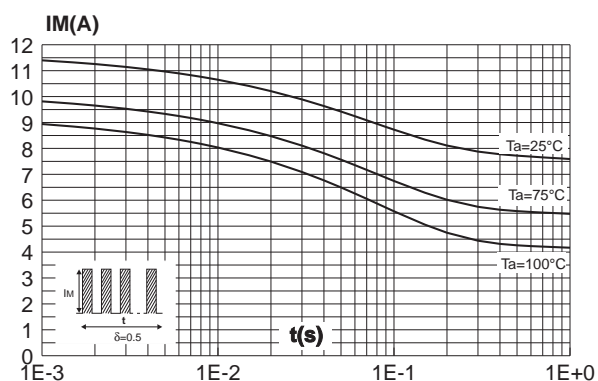


Fig. 7: Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board, $e(\text{Cu})=35\text{mm}$, recommended pad layout).

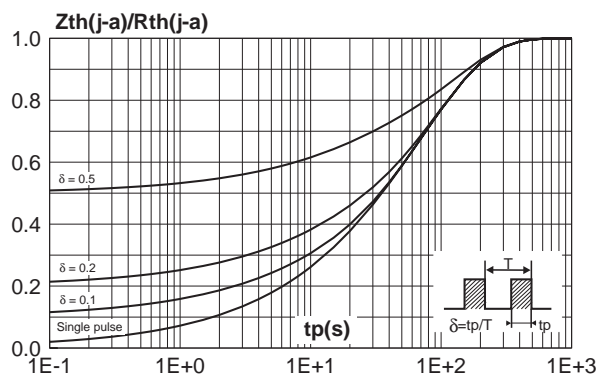


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

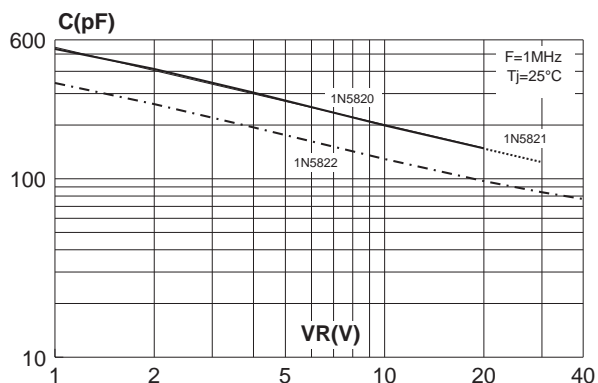


Fig. 9-1: Reverse leakage current versus reverse voltage applied (typical values) (1N5820/1N5821).

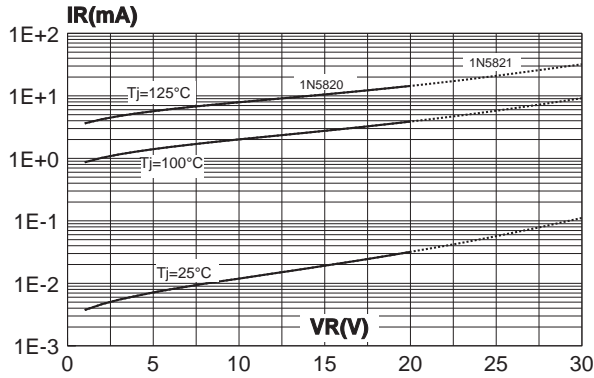


Fig. 9-2: Reverse leakage current versus reverse voltage applied (typical values) (1N5822).

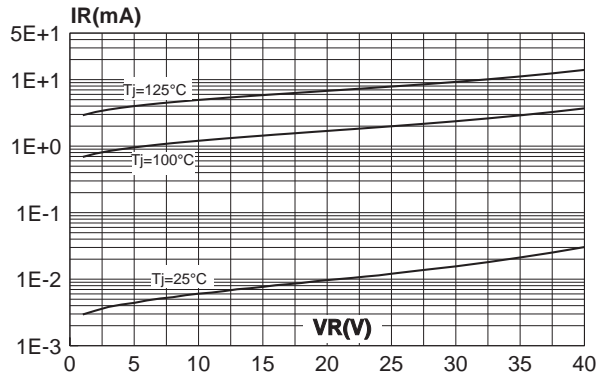


Fig. 10-1: Forward voltage drop versus forward current (typical values) (1N5820/1N5821).

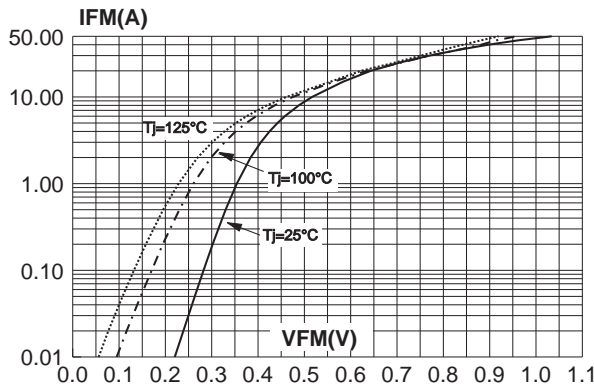


Fig. 10-2: Forward voltage drop versus forward current (typical values) (1N5822).

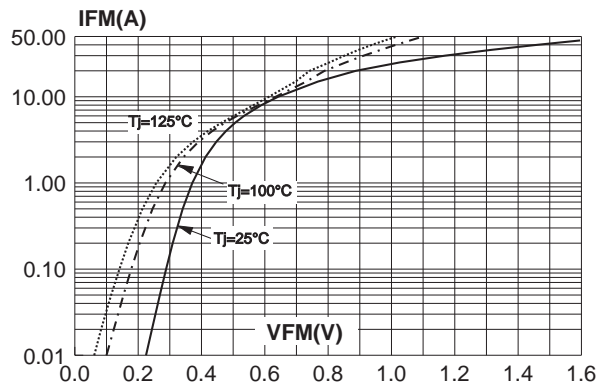
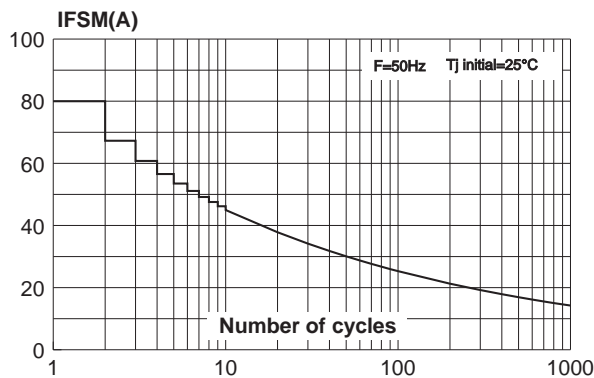
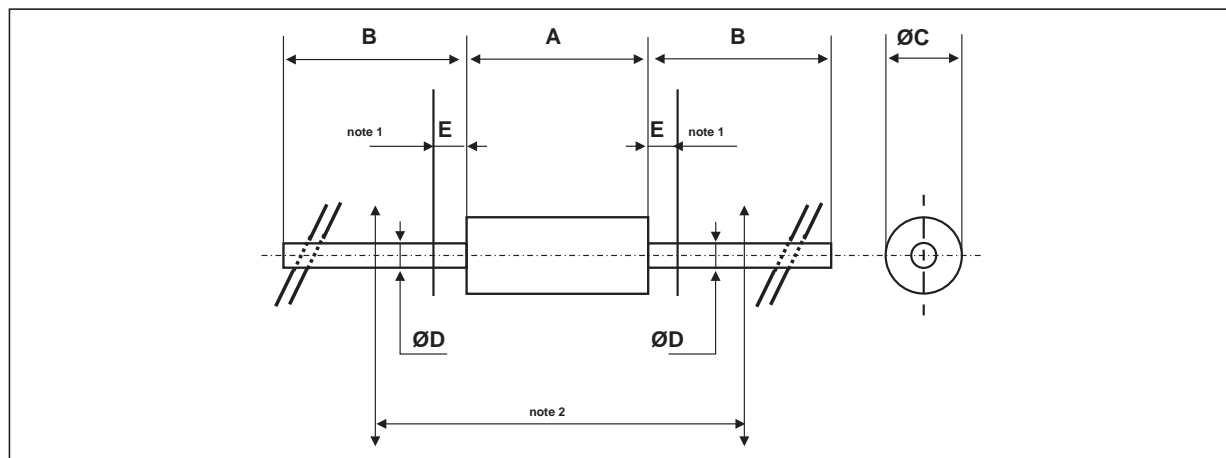


Fig. 11: Non repetitive surge peak forward current versus number of cycles.



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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- Техническая поддержка проекта;
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