



POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

| | |
|-------------|--------|
| $I_{F(AV)}$ | 5 A |
| V_{RRM} | 40 V |
| $T_j(max)$ | 150°C |
| $V_F(max)$ | 0.44 V |

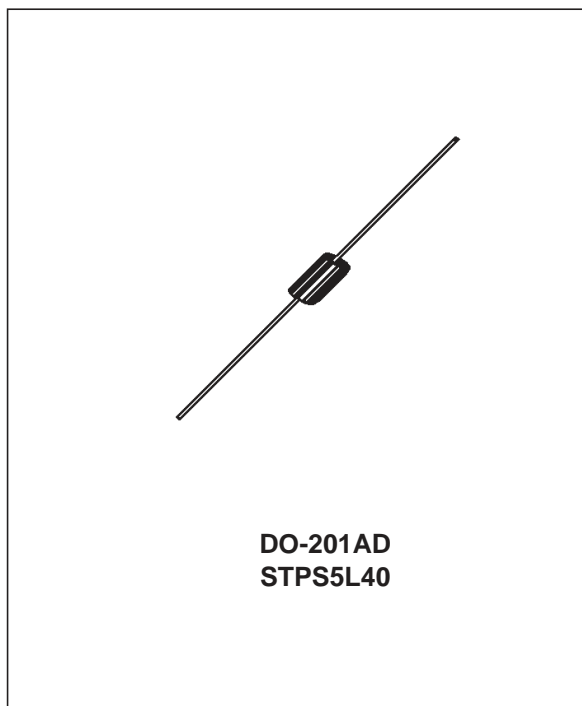
FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP FOR HIGHER EFFICIENCY.
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Axial Power Schottky rectifier suited for Switch Mode Power Supplies and high frequency inverters.

Packaged in DO-201AD, this device is intended for use in low voltage output for small battery chargers & consumer SMPS such as DVD and Set-Top-Box..



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | Value | Unit |
|--------------|--|---------------|------------------|
| V_{RRM} | Repetitive peak reverse voltage | 40 | V |
| $I_{F(RMS)}$ | RMS forward current | 15 | A |
| $I_{F(AV)}$ | Average forward current | 5 | A |
| I_{FSM} | Surge non repetitive forward current | 150 | A |
| P_{ARM} | Repetitive peak avalanche power | 2700 | 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 (rated V_R , $T_j = 25^\circ\text{C}$) | 10000 | V/ μs |

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

STPS5L40

THERMAL PARAMETERS

| Symbol | Parameter | | Value | Unit |
|---------------|---------------------|---------------------|-------|------|
| $R_{th(j-a)}$ | Junction to ambient | | 75 | °C/W |
| $R_{th(j-l)}$ | Junction to leads | Lead length = 10 mm | 15 | °C/W |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|---------|-------------------------|---------------------------|--------------------|------|------|------|------|
| I_R^* | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = V_{RRM}$ | | | 0.2 | mA |
| | | $T_j = 100^\circ\text{C}$ | | | 8 | 25 | |
| | | $T_j = 125^\circ\text{C}$ | | | 25 | 75 | |
| V_F^* | Forward voltage drop | $T_j = 25^\circ\text{C}$ | $I_F = 5\text{ A}$ | | 0.44 | 0.50 | V |
| | | $T_j = 100^\circ\text{C}$ | | | 0.40 | 0.46 | |
| | | $T_j = 125^\circ\text{C}$ | | | 0.38 | 0.44 | |

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

To evaluate the maximum conduction losses use the following equation:

$$P = 0.34 \times I_{F(AV)} + 0.028 \times I_{F(RMS)}^2$$

Fig. 1: Conduction losses versus average current.

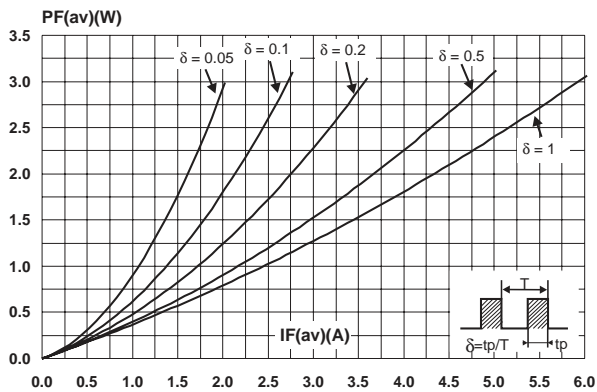


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

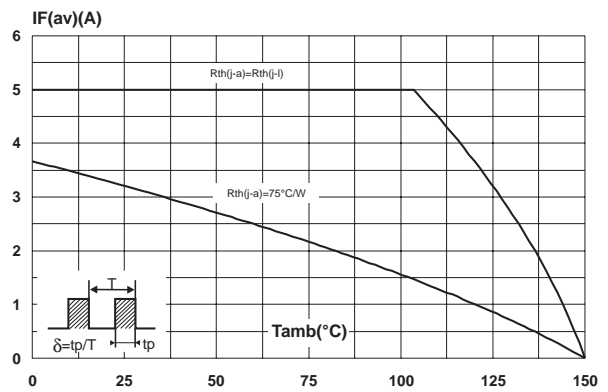


Fig. 3: Normalized avalanche power derating versus pulse duration.

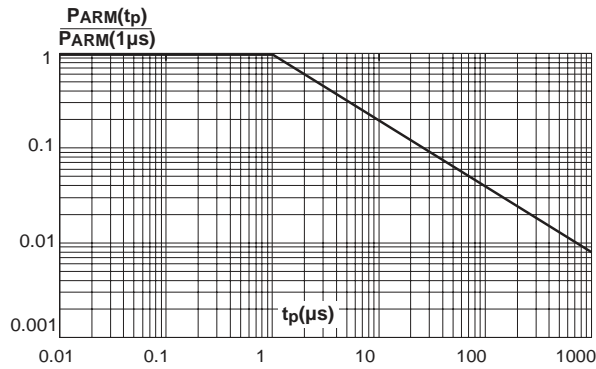


Fig. 4: Normalized avalanche power derating versus junction temperature.

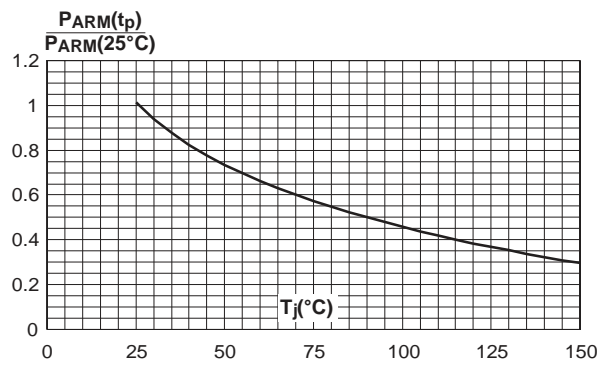


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

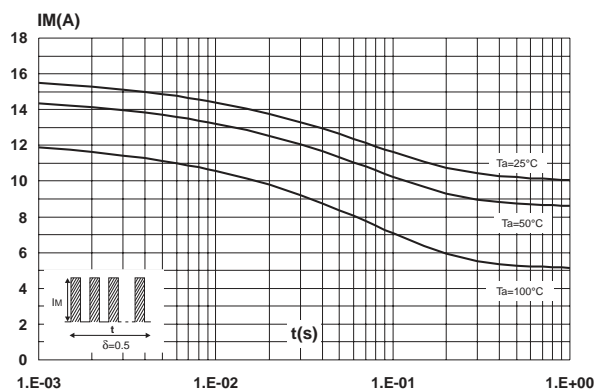


Fig. 6: Relative variation of thermal impedance junction to ambient versus pulse duration.

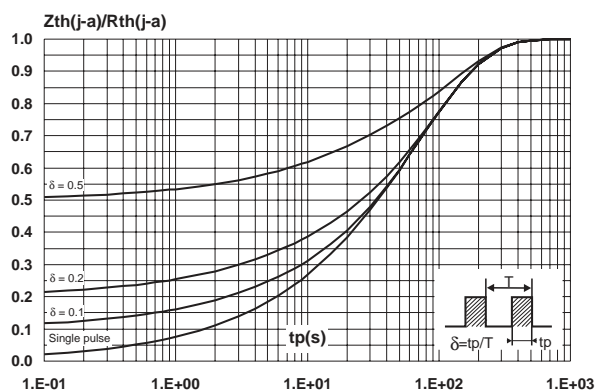


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

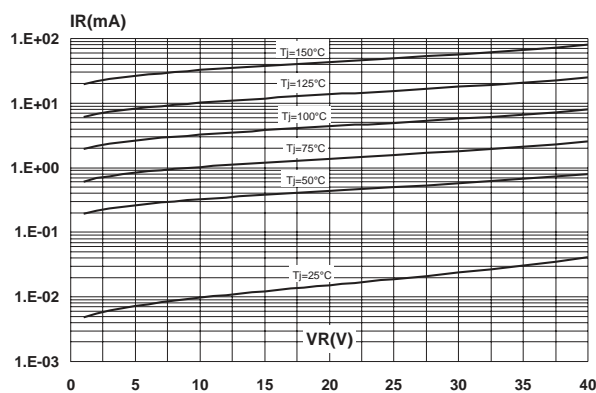


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

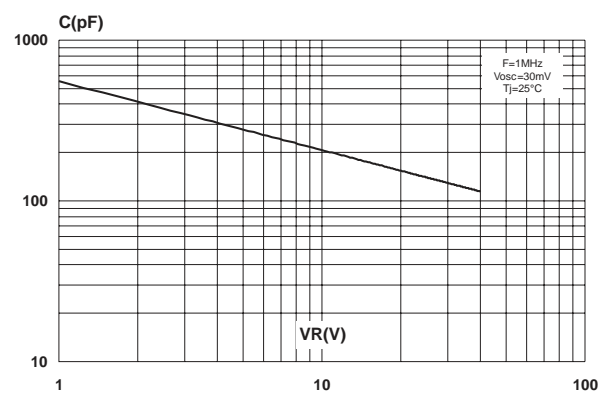


Fig. 9-1: Forward voltage drop versus forward current (low level).

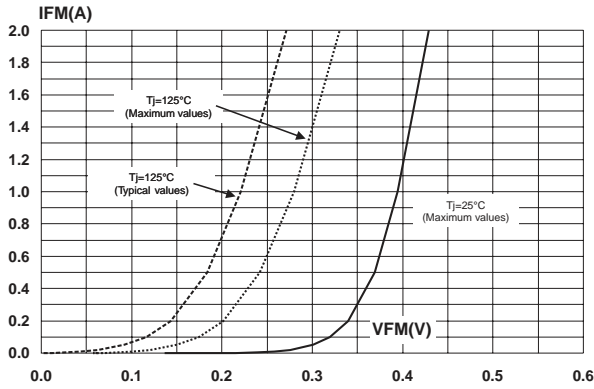


Fig. 9-2: Forward voltage drop versus forward current (high level).

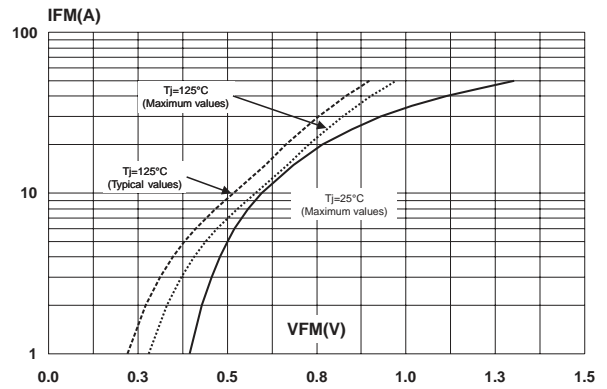


Fig. 10: Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, Cu = 35 μm).

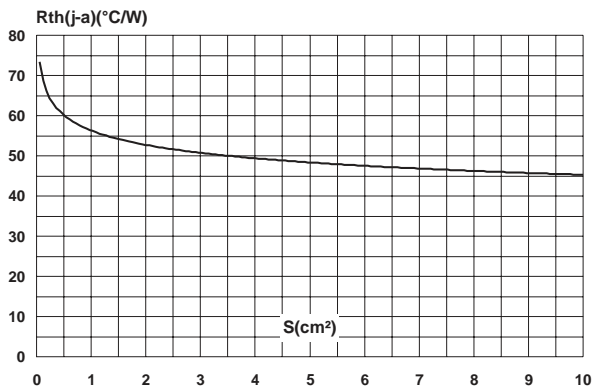
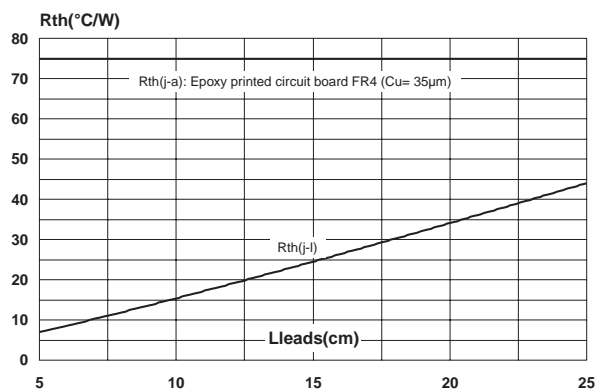
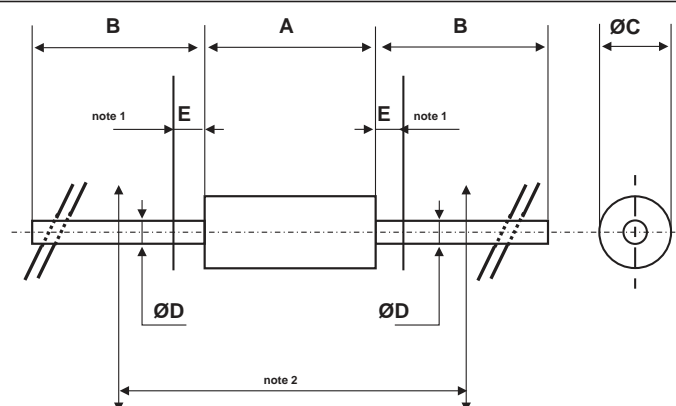


Fig. 11: Thermal resistances versus leads length.



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 |
|---------------|----------|----------|--------|----------|---------------|
| STPS5L40 | STPS5L40 | DO-201AD | 1.12g | 600 | Ammopack |
| STPS5L40RL | STPS5L40 | DO-201AD | 1.12g | 1900 | Tape and reel |

- WHITE BAND INDICATES CATHODE
- EPOXY MEETS UL94,V0

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