# STPS5L40

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

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

**DO-201AD**
**STPS5L40**

### 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 | Tl = 100°C $\delta$ = 0.5 | 5 | A |
| $I_{FSM}$ | Surge non repetitive forward current | Half wave, single phase tp = 10 ms | 150 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | tp = 1µs Tj = 25°C | 2700 | W |
| $T_{stg}$ | Storage temperature range | | - 65 to + 150 | °C |
| Tj | Maximum operating junction temperature * | | 150 | °C |
| dV/dt | Critical rate of rise of reverse voltage (rated $V_R$, Tj = 25°C) | | 10000 | V/µs |

* : $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

## 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 | Tj = 25°C | $V_R = V_{RRM}$ | | | 0.2 | mA |
| | | Tj = 100°C | | | 8 | 25 | |
| | | Tj = 125°C | | | 25 | 75 | |
| $V_F$ * | Forward voltage drop | Tj = 25°C | $I_F$ = 5 A | | 0.44 | 0.50 | V |
| | | Tj = 100°C | | | 0.40 | 0.46 | |
| | | Tj = 125°C | | | 0.38 | 0.44 | |

Pulse test : * tp = 380 µs, δ < 2%

To evaluate the maximum conduction losses use the following equation:

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

**Fig. 1:** Conduction losses versus average current.

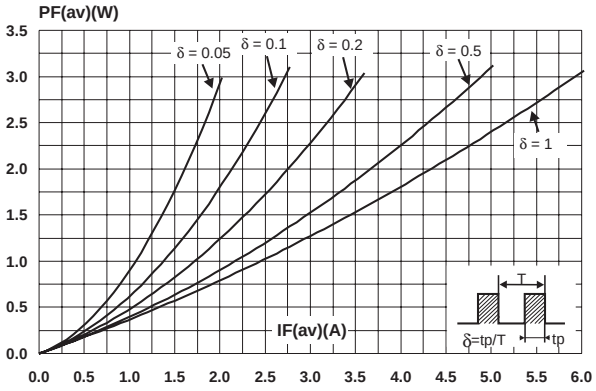



**Fig. 2:** Average forward current versus ambient temperature (δ = 0.5).

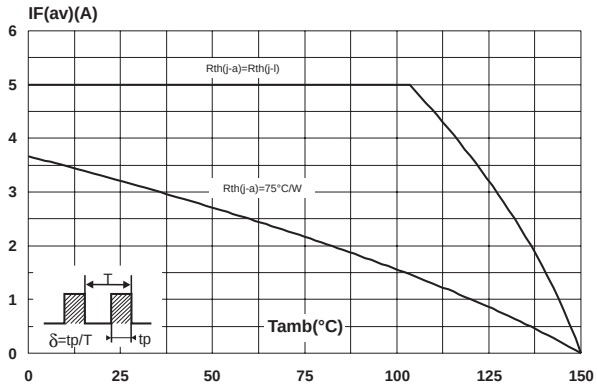


**Fig. 3:** Normalized avalanche power derating versus pulse duration.

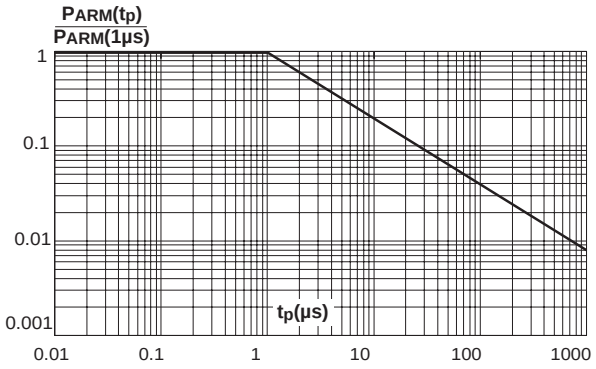



**Fig. 4:** Normalized avalanche power derating versus junction temperature.

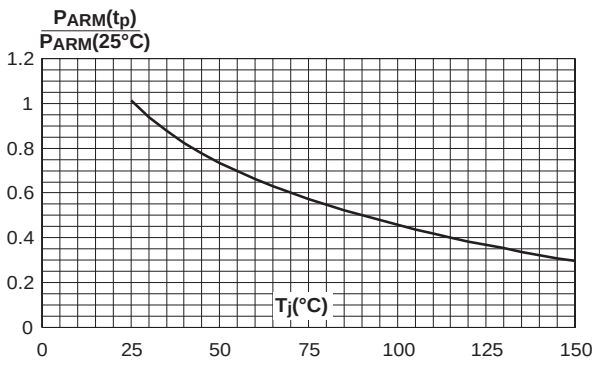



**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).

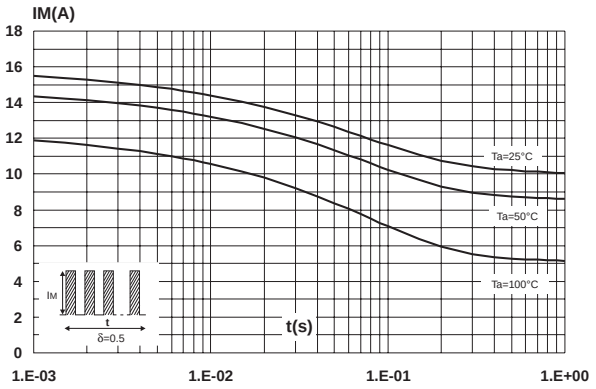



**Fig. 6:** Relative variation of thermal impedance junction to ambient versus pulse duration.

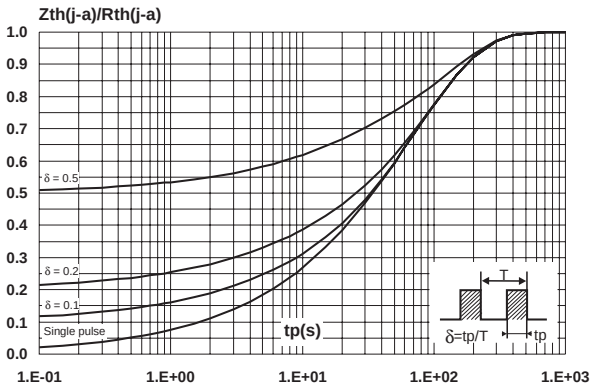



**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).

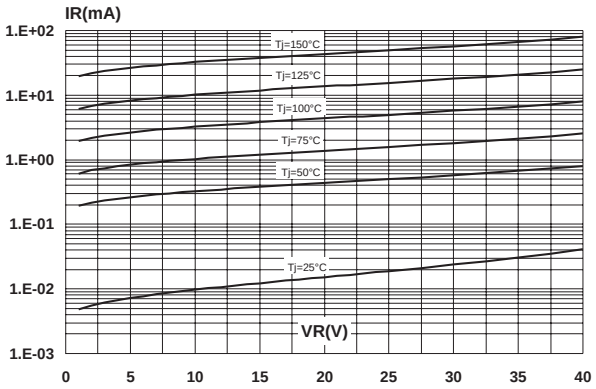



**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).

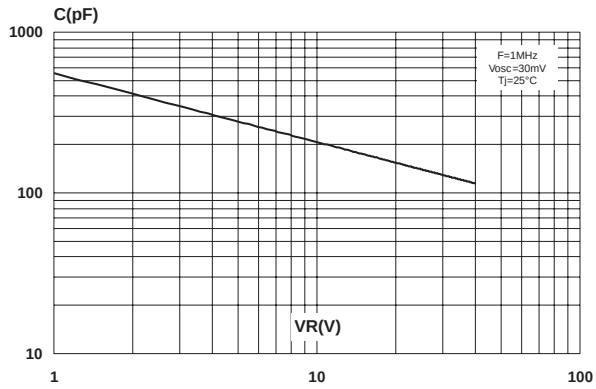


**Fig. 9-1:** Forward voltage drop versus forward current (low level).

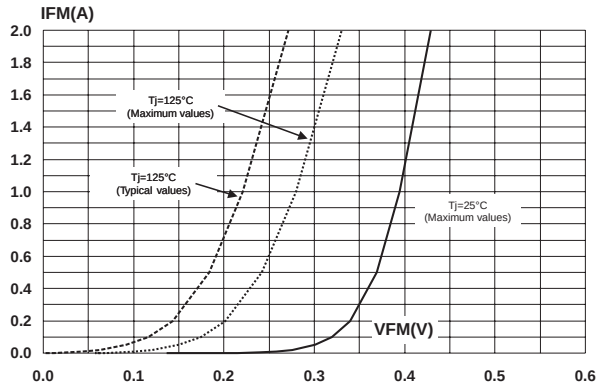



**Fig. 9-2:** Forward voltage drop versus forward current (high level).

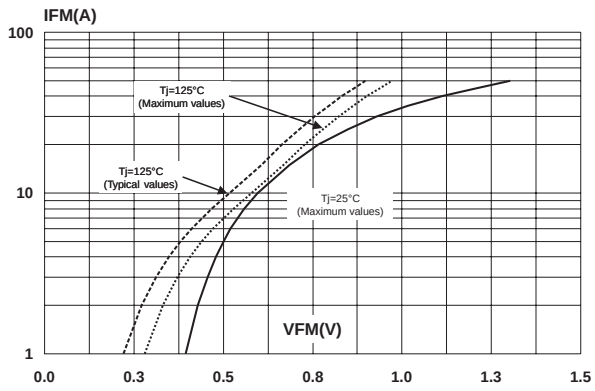



**Fig. 10:** Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, Cu = 35µm).

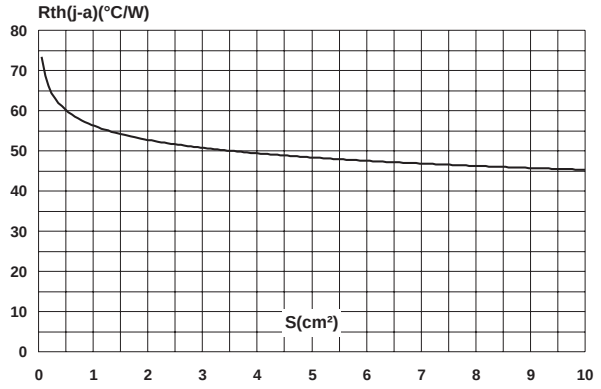
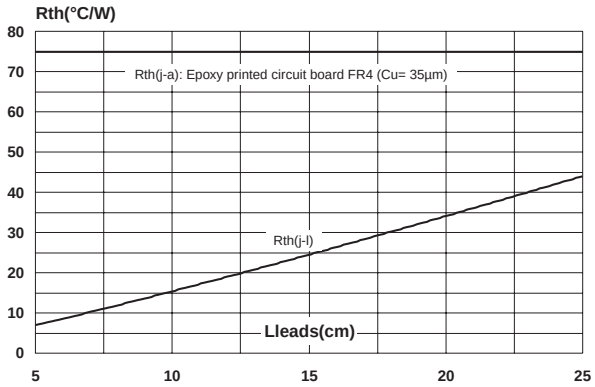
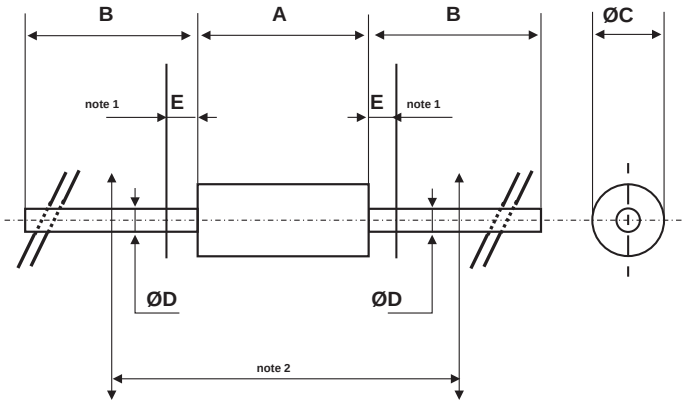



**Fig. 11:** Thermal resistances versus leads length.



## PACKAGE MECHANICAL DATA

DO-201AD plastic




| REF. | DIMENSIONS | | | | NOTES |
|---|---|---|---|---|---|
| | Millimeters | | Inches | | |
| | Min. | Max. | Min. | Max. | |
| A | | 9.50 | | 0.374 | 1 - The lead diameter ∅ D is not controlled over zone E<br><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 | | |
| ∅ C | | 5.30 | | 0.209 | |
| ∅ 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