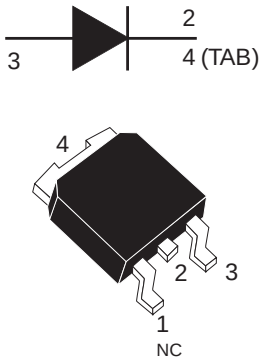
# STPS5L25B

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

| | |
|---|---|
| $I_{F(AV)}$ | 5 A |
| $V_{RRM}$ | 25 V |
| Tj (max) | 150°C |
| $V_F$ (max) | 0.35 V |




**DPAK**

### FEATURES AND BENEFITS

- VERY LOW FORWARD VOLTAGE DROP FOR LESS POWER DISSIPATION AND REDUCED HEATSINK
- OPTIMIZED CONDUCTION/REVERSE LOSSES TRADE-OFF WHICH MEANS THE HIGHEST EFFICIENCY IN THE APPLICATIONS
- HIGH POWER SURFACE MOUNT MINIATURE PACKAGE
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

Single Schottky rectifier suited to Switched Mode Power Supplies and high frequency DC to DC converters.

This device is especially intended for use as a Rectifier at the secondary of 3.3V SMPS units.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | 25 | V |
| $I_{F(RMS)}$ | RMS forward current | | 7 | A |
| $I_{F(AV)}$ | Average forward current | Tc = 145°C $\delta$ = 0.5 | 5 | A |
| $I_{FSM}$ | Surge non repetitive forward current | tp = 10 ms Sinusoidal | 75 | A |
| $I_{RRM}$ | Repetitive peak reverse current | tp=2 µs square F=1kHz | 1 | A |
| $I_{RSM}$ | Non repetitive peak reverse current | tp = 100 µs square | 2 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | tp = 1µs Tj = 25°C | 3000 | 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 | | 10000 | V/µs |

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

## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case | 2.5 | °C/W |

## STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Tests Conditions | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ * | Reverse leakage current | Tj = 25°C | $V_R = V_{RRM}$ | | | 350 | µA |
| | | Tj = 125°C | | | 55 | 115 | mA |
| $V_F$ * | Forward voltage drop | Tj = 25°C | $I_F$ = 5 A | | | 0.47 | V |
| | | Tj = 125°C | $I_F$ = 5 A | | 0.31 | 0.35 | |
| | | Tj = 25°C | $I_F$ = 10 A | | | 0.59 | |
| | | Tj = 125°C | $I_F$ = 10 A | | 0.41 | 0.50 | |

Pulse test : * tp = 380 µs, δ < 2%

**Fig. 1:** Average forward power dissipation versus average forward current.

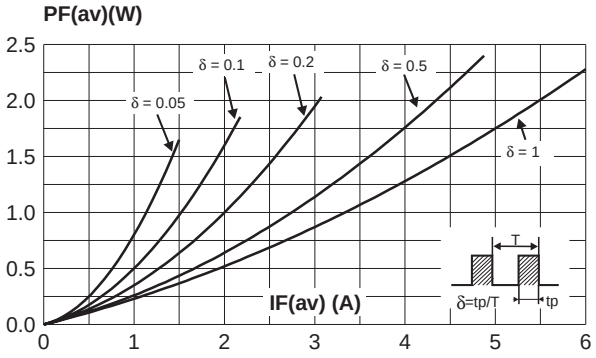



**Fig. 2:** Average forward current versus ambient temperature (δ=0.5).

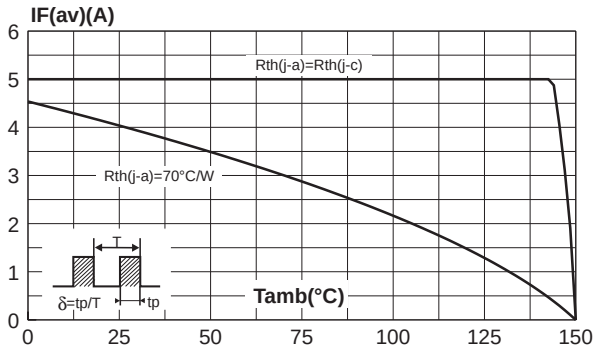



**Fig. 3:** Normalized avalanche power derating versus pulse duration.

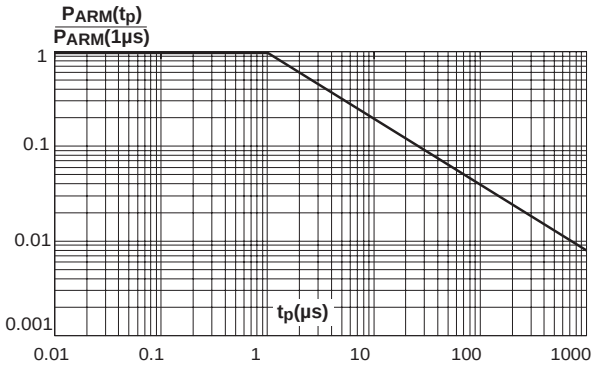



**Fig. 4:** Normalized avalanche power derating versus junction temperature.

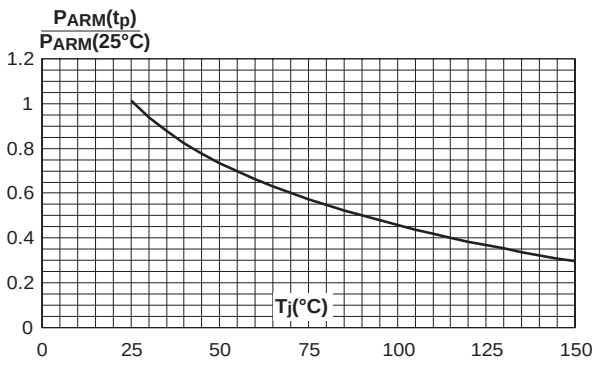


**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).

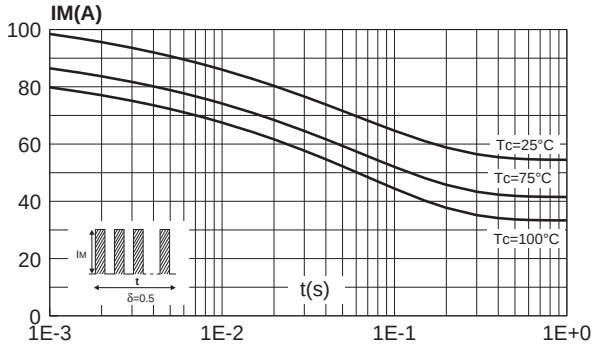



**Fig. 5:** Relative variation of thermal impedance junction to case versus pulse duration.

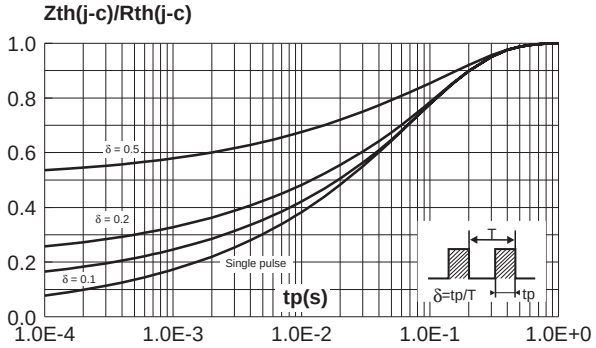



**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).

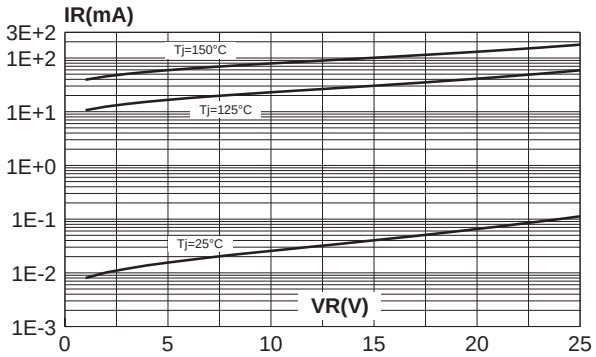



**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).

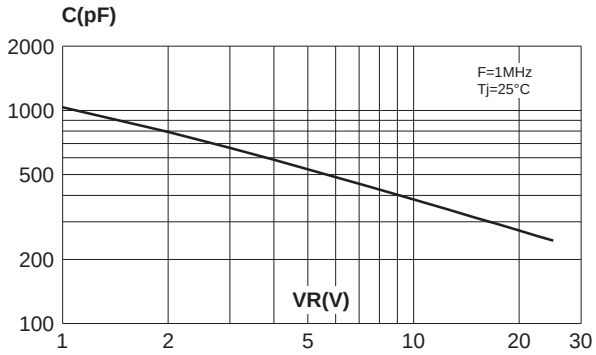



**Fig. 9:** Forward voltage drop versus forward current (maximum values).

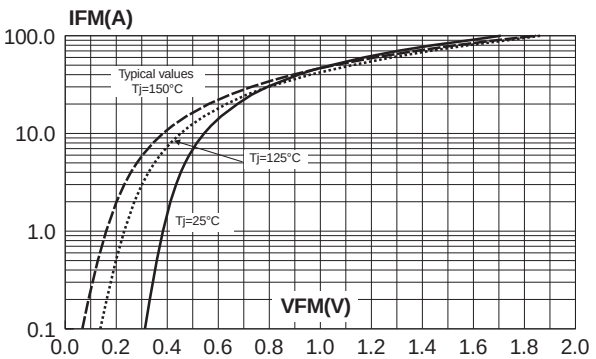
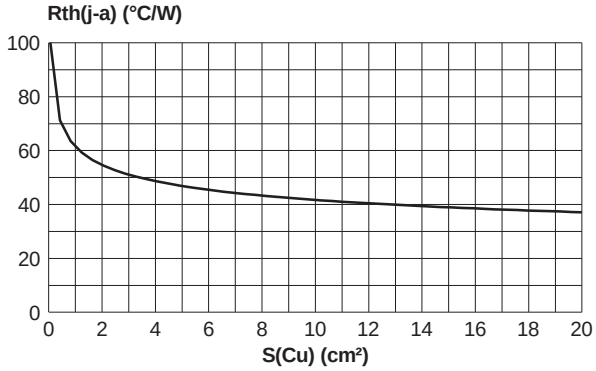
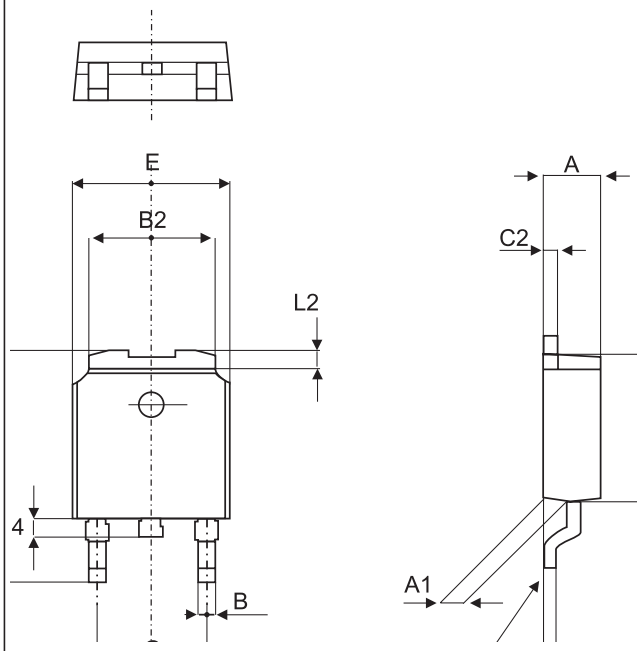



**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm).



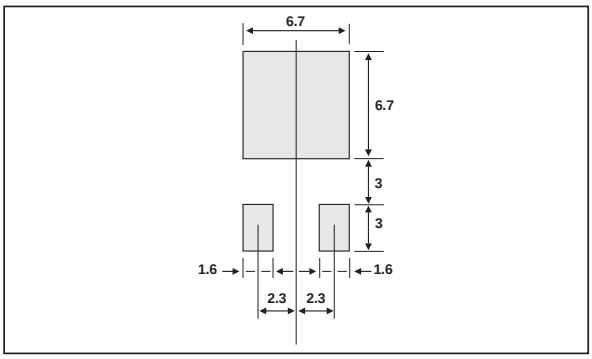
## PACKAGE MECHANICAL DATA

DPAK




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max | Min. | Max. |
| A | 2.20 | 2.40 | 0.086 | 0.094 |
| A1 | 0.90 | 1.10 | 0.035 | 0.043 |
| A2 | 0.03 | 0.23 | 0.001 | 0.009 |
| B | 0.64 | 0.90 | 0.025 | 0.035 |
| B2 | 5.20 | 5.40 | 0.204 | 0.212 |
| C | 0.45 | 0.60 | 0.017 | 0.023 |
| C2 | 0.48 | 0.60 | 0.018 | 0.023 |
| D | 6.00 | 6.20 | 0.236 | 0.244 |
| E | 6.40 | 6.60 | 0.251 | 0.259 |
| G | 4.40 | 4.60 | 0.173 | 0.181 |
| H | 9.35 | 10.10 | 0.368 | 0.397 |
| L2 | 0.80 typ. | | 0.031 typ. | |
| L4 | 0.60 | 1.00 | 0.023 | 0.039 |
| V2 | 0° | 8° | 0° | 8° |

**FOOT PRINT DIMENSIONS** (in millimeters)




| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS5L25B | STPS5L25B | DPAK | 0.30g | 75 | Tube |
| STPS15LB-TR | STPS5L25B | DPAK | 0.30g | 2500 | Tape & reel |

- Epoxy meets UL94,V0