

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

| | |
|-------------|--------|
| $I_{F(AV)}$ | 15 A |
| V_{RRM} | 25 V |
| $T_j(max)$ | 150 °C |
| $V_F(max)$ | 0.35 V |

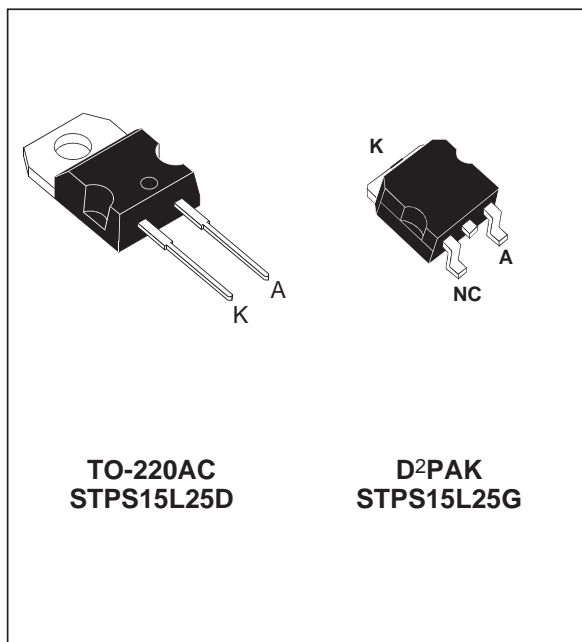
FEATURES

- 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
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Single Schottky rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters (V_{RMS}).

Packaged in TO-220AC or D²PAK, this device is especially intended for use as a Rectifier at the secondary of 3.3V SMPS and DC/DC units.



**TO-220AC
STPS15L25D**

**D²PAK
STPS15L25G**

ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | Value | Unit |
|--------------|--|--|------------------|
| V_{RRM} | Repetitive peak reverse voltage | 25 | V |
| $I_{F(RMS)}$ | RMS forward current | 30 | A |
| $I_{F(AV)}$ | Average forward current | $T_c = 145^\circ\text{C} \quad \delta = 0.5$ 15 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ms Sinusoidal}$ 250 | A |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2\mu\text{s square } F=1\text{kHz}$ 1 | A |
| I_{RSM} | Non repetitive peak reverse current | $t_p = 100\mu\text{s square}$ 4 | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1\mu\text{s } T_j = 25^\circ\text{C}$ 9000 | 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

STPS15L25D/G

THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|------------------|-------|------|
| $R_{th(j-c)}$ | Junction to case | 1 | °C/W |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameters | Test conditions | | Min. | Typ. | Max. | Unit |
|---------|-------------------------|---------------------------|--------------------|------|------|------|------|
| I_R * | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = V_{RRM}$ | | | 1.3 | mA |
| | | $T_j = 125^\circ\text{C}$ | | | 225 | 450 | mA |
| V_F * | Forward voltage drop | $T_j = 25^\circ\text{C}$ | $I_F = 15\text{A}$ | | | 0.46 | V |
| | | $T_j = 125^\circ\text{C}$ | $I_F = 15\text{A}$ | | 0.3 | 0.35 | |
| | | $T_j = 25^\circ\text{C}$ | $I_F = 30\text{A}$ | | | 0.56 | |
| | | $T_j = 125^\circ\text{C}$ | $I_F = 30\text{A}$ | | 0.41 | 0.46 | |

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

To evaluate the maximum conduction losses use the following equation :

$$P = 0.24 \times I_{F(AV)} + 0.0073 I_{F(RMS)}^2$$

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

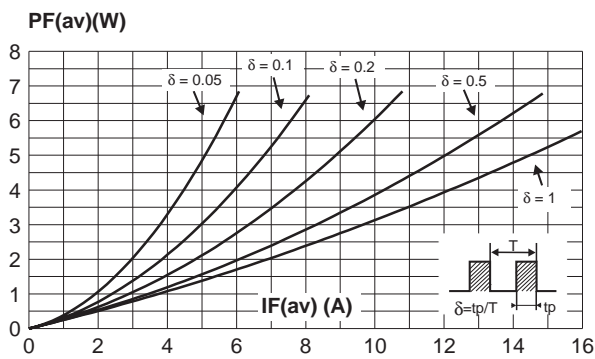


Fig. 3: Normalized avalanche power derating versus pulse duration.

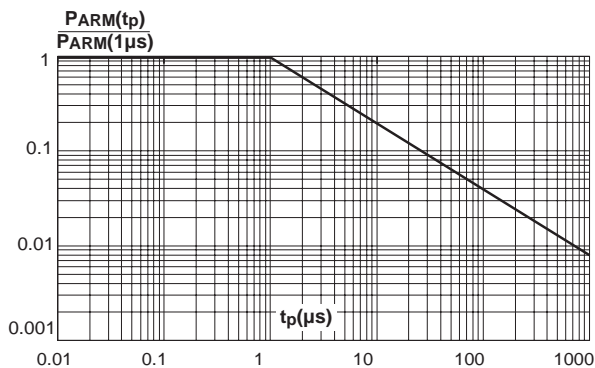


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

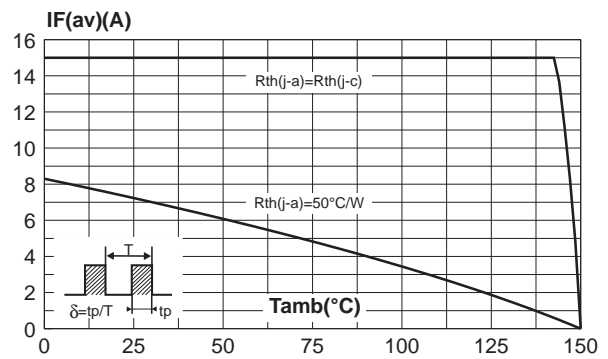


Fig. 4: Normalized avalanche power derating versus junction temperature.

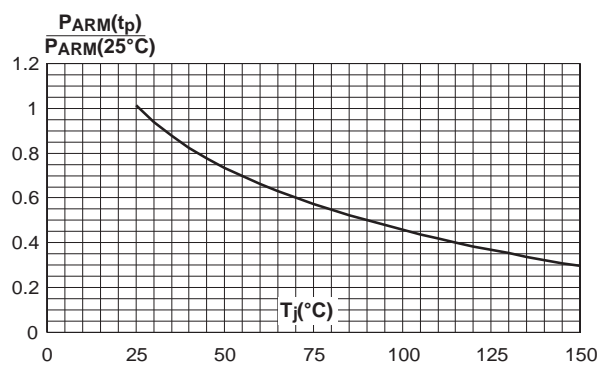


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

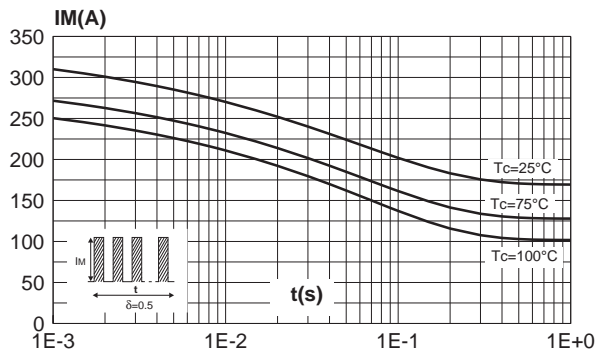


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

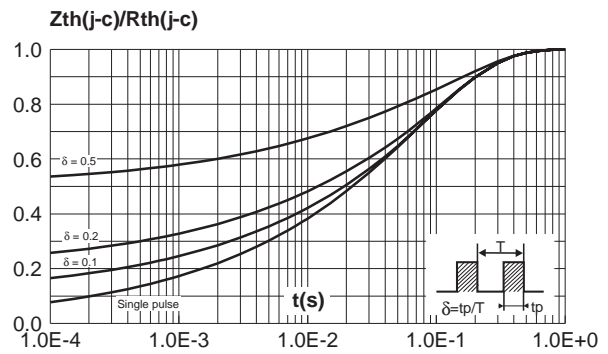


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

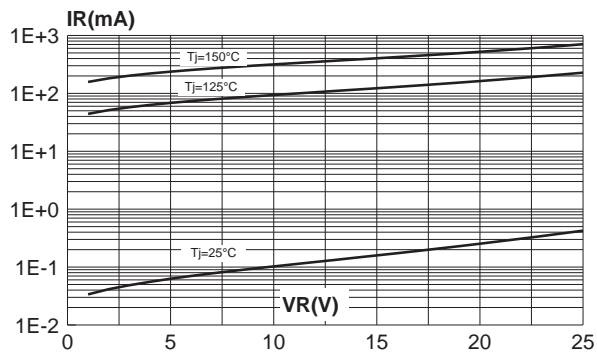


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

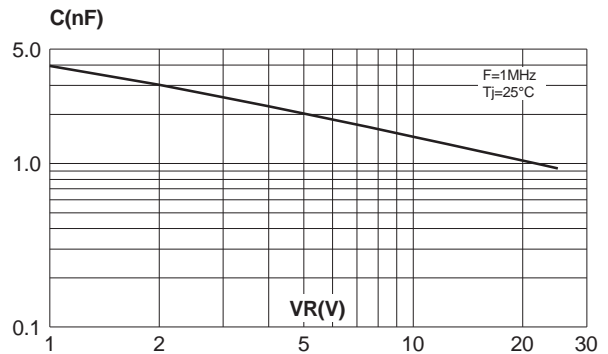


Fig. 9: Forward voltage drop versus forward current (maximum values).

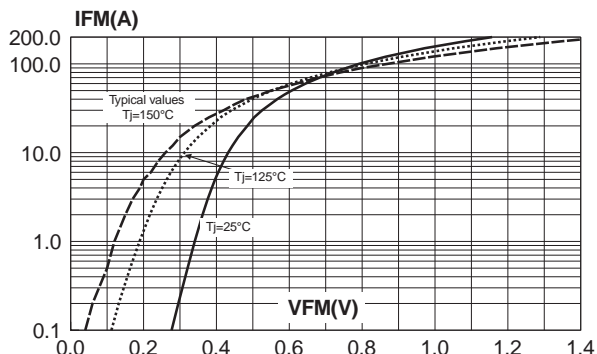
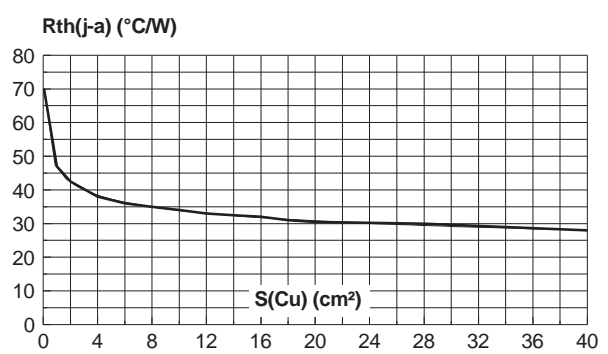
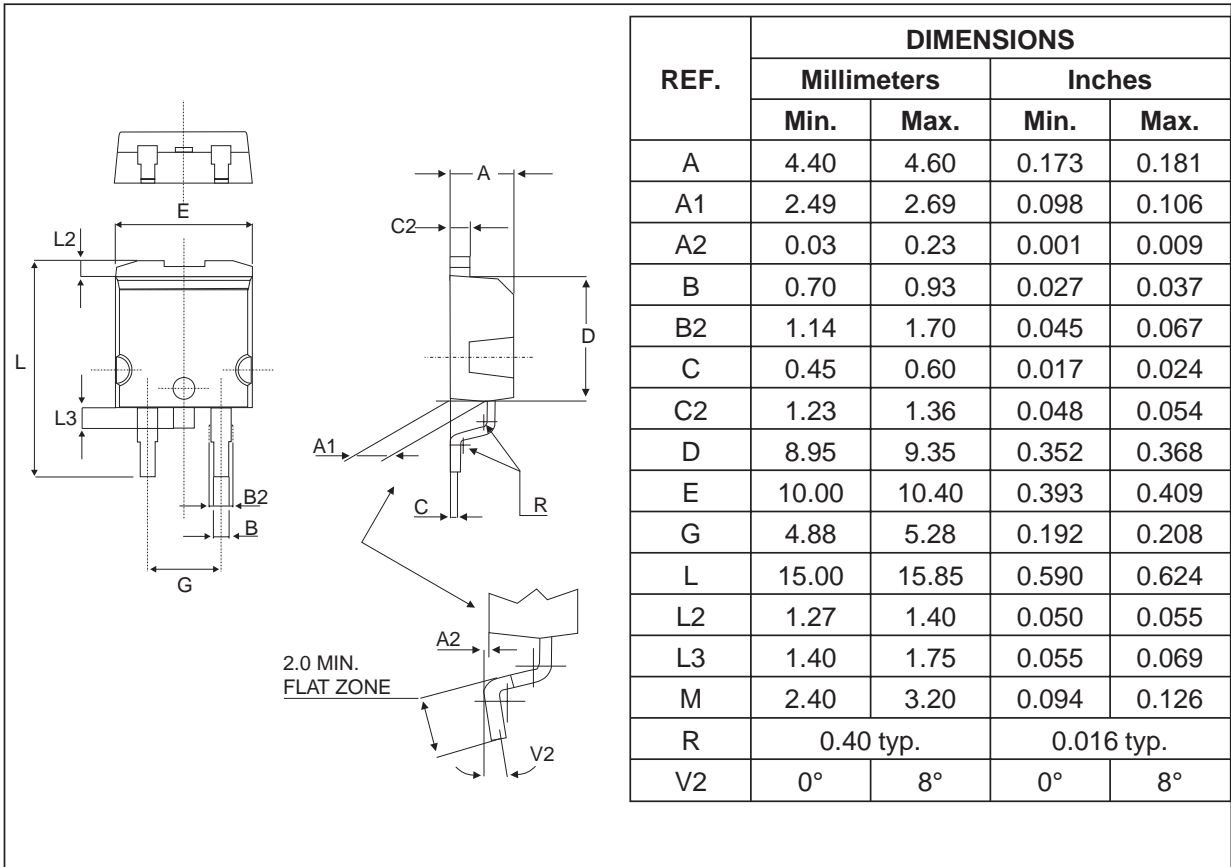


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness : 35 μm). (STPS15L25G only)

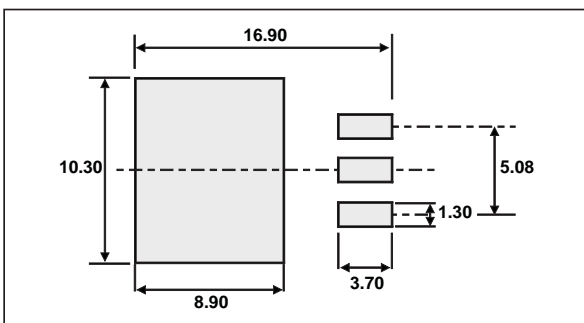


STPS15L25D/G

PACKAGE MECHANICAL DATA
D²PAK



FOOT PRINT DIMENSIONS (in millimeters)



• COOLING METHOD: BY CONDUCTION (METHOD C)

PACKAGE MECHANICAL DATA
 TO-220AC

| REF. | DIMENSIONS | | | |
|---------|-------------|-------|------------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| C | 1.23 | 1.32 | 0.048 | 0.051 |
| D | 2.40 | 2.72 | 0.094 | 0.107 |
| E | 0.49 | 0.70 | 0.019 | 0.027 |
| F | 0.61 | 0.88 | 0.024 | 0.034 |
| F1 | 1.14 | 1.70 | 0.044 | 0.066 |
| G | 4.95 | 5.15 | 0.194 | 0.202 |
| H2 | 10.00 | 10.40 | 0.393 | 0.409 |
| L2 | 16.40 typ. | | 0.645 typ. | |
| L4 | 13.00 | 14.00 | 0.511 | 0.551 |
| L5 | 2.65 | 2.95 | 0.104 | 0.116 |
| L6 | 15.25 | 15.75 | 0.600 | 0.620 |
| L7 | 6.20 | 6.60 | 0.244 | 0.259 |
| L9 | 3.50 | 3.93 | 0.137 | 0.154 |
| M | 2.6 typ. | | 0.102 typ. | |
| Diam. I | 3.75 | 3.85 | 0.147 | 0.151 |

- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.55 M.N
- MAXIMUM TORQUE VALUE : 0.70 M.N

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|------------|--------------------|--------|----------|---------------|
| STPS15L25D | STPS15L25D | TO-220AC | 1.86g | 50 | Tube |
| STPS15L25G | STPS15L25G | D ² PAK | 1.48g | 50 | Tube |
| STPS15L25G-TR | STPS15L25G | D ² PAK | 1.48g | 1000 | Tape & reel |

- EPOXY MEETS UL94,V0

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