



# STPS15L25D/G

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

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

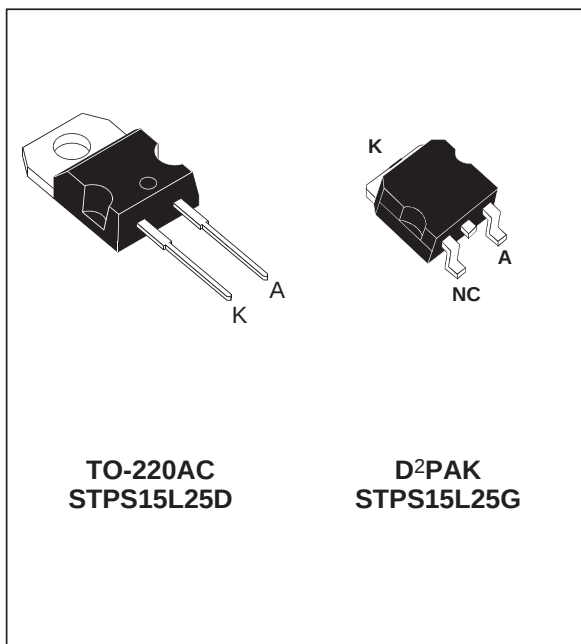
### FEATURES

- 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 D<sup>2</sup>PAK, this device is especially intended for use as a Rectifier at the secondary of 3.3V SMPS and DC/DC units.



TO-220AC  
STPS15L25D

D<sup>2</sup>PAK  
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/ $\mu\text{s}$ |

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j - a)}$  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     | $^{\circ}\text{C/W}$ |

## STATIC ELECTRICAL CHARACTERISTICS

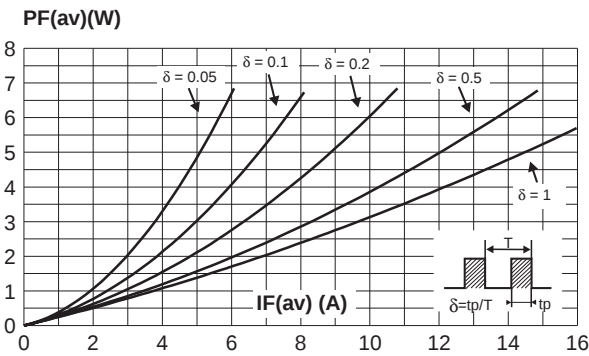
| Symbol  | Parameters              | Test conditions             | Min.               | Typ. | Max. | Unit |
|---------|-------------------------|-----------------------------|--------------------|------|------|------|
| $I_R$ * | Reverse leakage current | $T_j = 25^{\circ}\text{C}$  | $V_R = V_{RRM}$    |      | 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 : \*  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$

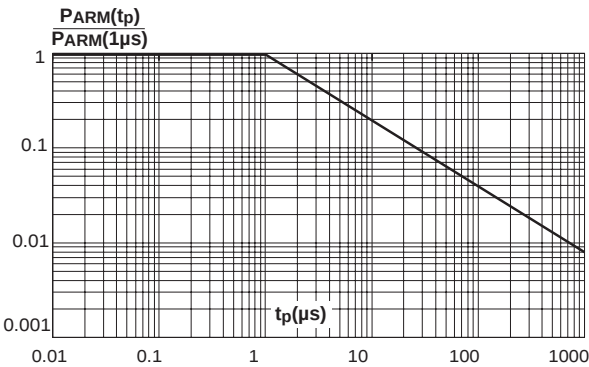
To evaluate the maximum conduction losses use the following equation :

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

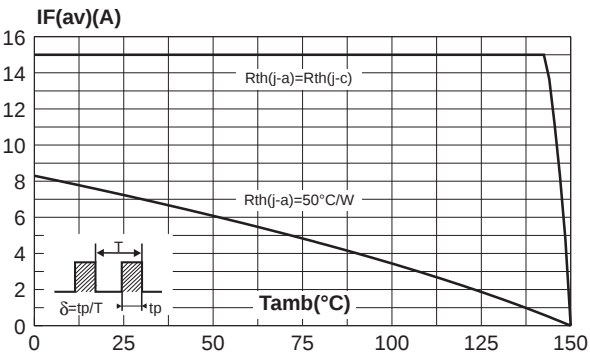
**Fig. 1:** Average forward power dissipation versus average forward current.



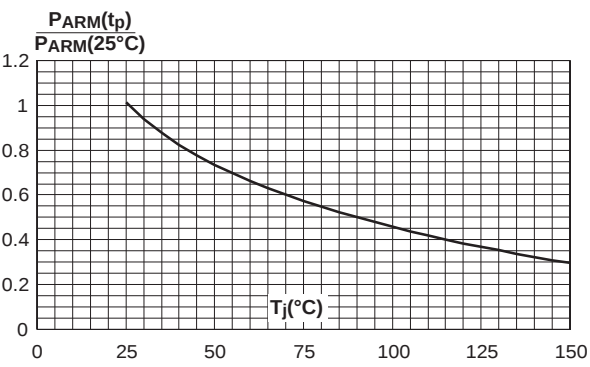
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



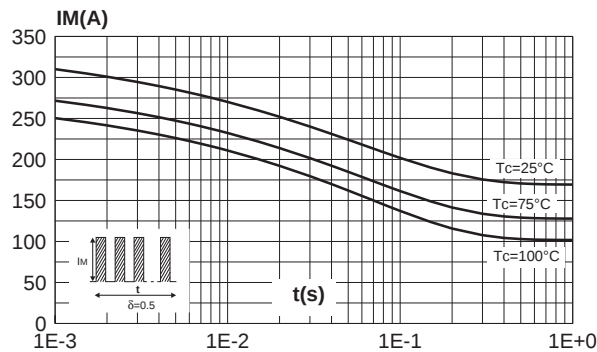
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ).



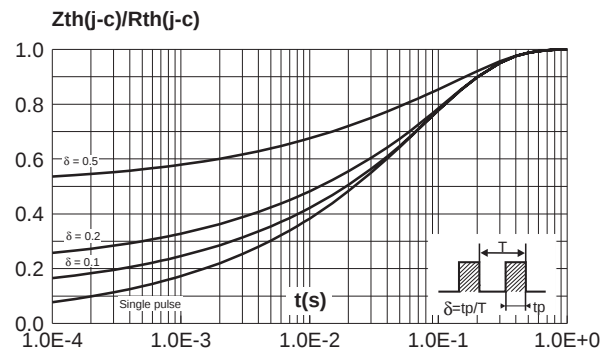
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



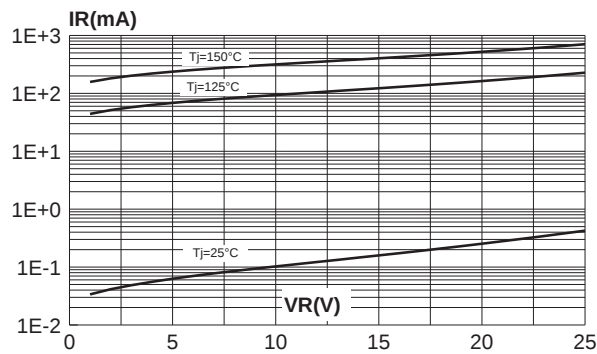
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).



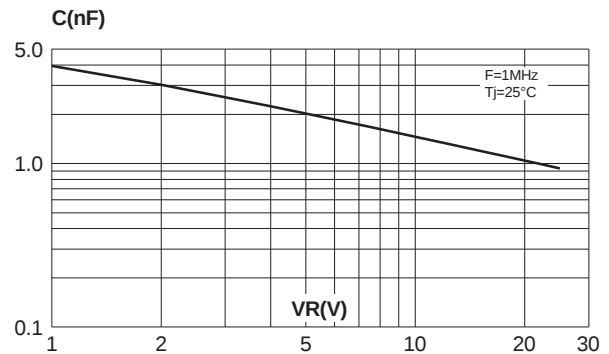
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



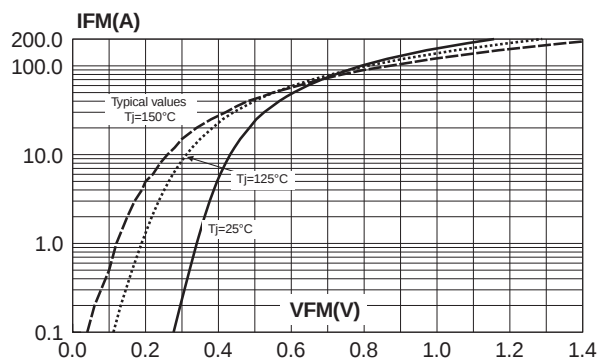
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).



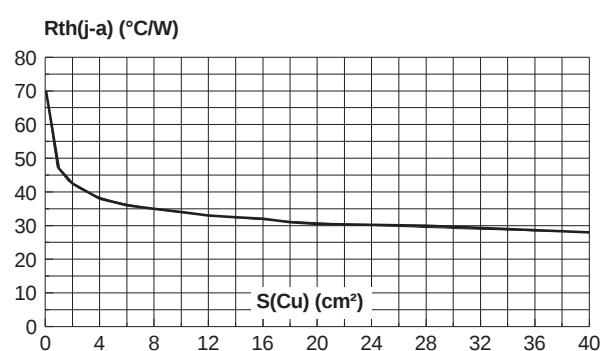
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).



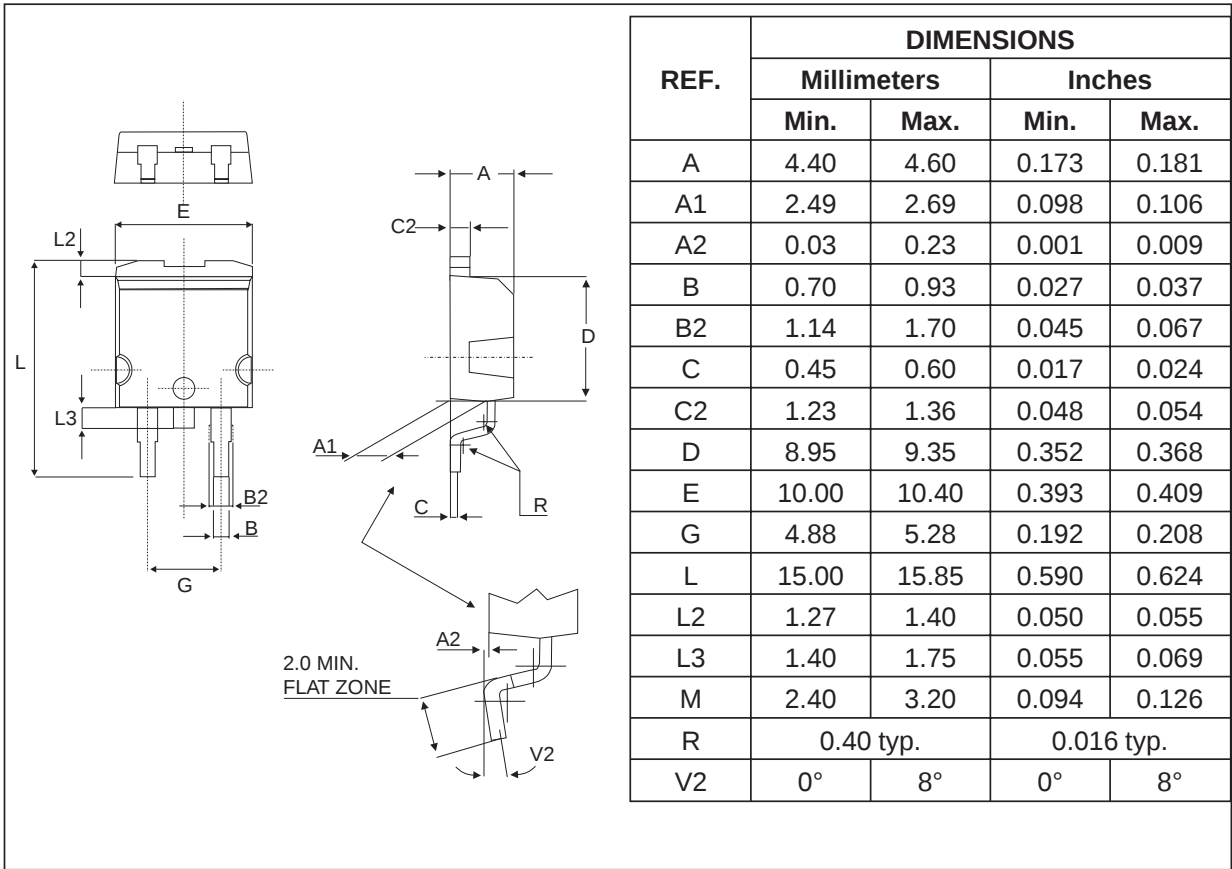
**Fig. 9:** Forward voltage drop versus forward current (maximum values).



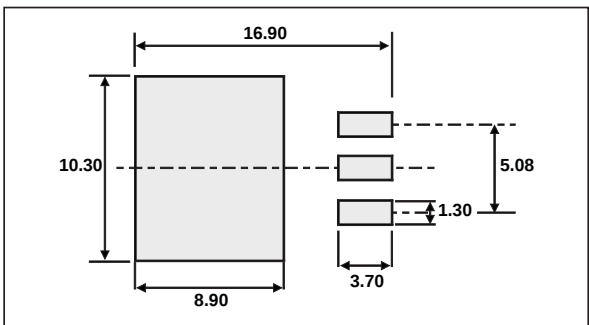
**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness : 35  $\mu\text{m}$ ). (STPS15L25G only)



PACKAGE MECHANICAL DATA  
D<sup>2</sup>PAK



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 <sup>2</sup> PAK | 1.48g  | 50       | Tube          |
| STPS15L25G-TR | STPS15L25G | D <sup>2</sup> PAK | 1.48g  | 1000     | Tape & reel   |

- EPOXY MEETS UL94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2003 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany  
 Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore  
 Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>

