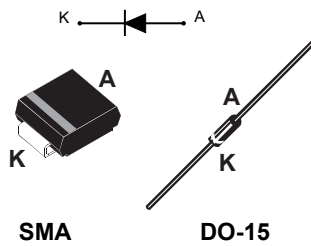


## 150 V power Schottky rectifier



## Features

- Negligible switching losses
- Low forward voltage drop for higher efficiency and extended battery life
- Low thermal resistance
- Surface mount miniature package
- Avalanche capability specified
- ECOPACK<sup>®</sup>2 compliant

## Applications

- Switching diode
- SMPS
- DC/DC converter
- Telecom power

## Description

This 150 V power Schottky rectifier is ideal for switch mode power supplies on up to 24 V rails and high frequency converters.

Packaged in SMA and axial, the [STPS2150](#) is optimized for use in consumer and computer applications where low drop forward voltage is required to reduce power dissipation.

| Product status link      |        |
|--------------------------|--------|
| <a href="#">STPS2150</a> |        |
| Product status link      |        |
| Symbol                   | Values |
| $I_{F(AV)}$              | 2 A    |
| $V_{RRM}$                | 150 V  |
| $T_j(max.)$              | 175 °C |
| $V_{F(typ.)}$            | 0.62 V |

# 1 Characteristics

**Table 1. Absolute ratings (limiting values, at 25 °C, unless otherwise specified)**

| Symbol       | Parameter   |  | Value        | Unit |
|--------------|---|--|--------------|------|
| $V_{RRM}$    | Repetitive peak reverse voltage                       |  | 150          | V    |
| $I_{F(RMS)}$ | Forward rms current                                   |  | 30           | A    |
| $I_{F(AV)}$  | Average forward current $\delta = 0.5$ , square wave  | SMA $T_L = 145\text{ °C}$                          | 2            | A    |
|              |   | DO-15 $T_L = 130\text{ °C}$                        |              |      |
| $I_{FSM}$    | Surge non repetitive forward current                  | SMA $t_p = 10\text{ ms sinusoidal}$                | 75           | A    |
|              |   | DO-15  | 150          |      |
| $P_{ARM}$    | Repetitive peak avalanche power                       | $t_p = 10\text{ }\mu\text{s}, T_j = 125\text{ °C}$ | 170          | W    |
| $T_{stg}$    | Storage temperature range                             |  | -65 to + 175 | °C   |
| $T_j$        | Maximum operating junction temperature <sup>(1)</sup> |  | + 175        | °C   |

1.  $(dP_{tot}/dT_j) < (1/R_{th(j-a)})$  condition to avoid thermal runaway for a diode on its own heatsink.

**Table 2. Thermal resistance parameter**

| Symbol        | Parameter        |                     | Value | Unit |
|---------------|------------------|---------------------|-------|------|
| $R_{th(j-L)}$ | Junction to lead |                     | SMA   | °C/W |
|               | Junction to lead | Lead length = 10 mm | DO-15 |      |

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics**

| Symbol      | Parameter               | Test conditions       | Min.               | Typ. | Max. | Unit |               |
|-------------|-------------------------|-----------------------|--------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ °C}$  | $V_R = V_{RRM}$    | -    | 0.5  | 1.5  | $\mu\text{A}$ |
|             |                         | $T_j = 125\text{ °C}$ |                    | -    | 0.5  | 1.5  | mA            |
| $V_F^{(2)}$ | Forward voltage drop    | $T_j = 25\text{ °C}$  | $I_F = 2\text{ A}$ | -    | 0.78 | 0.82 | V             |
|             |                         | $T_j = 125\text{ °C}$ |                    | -    | 0.62 | 0.67 |               |
|             |                         | $T_j = 25\text{ °C}$  | $I_F = 4\text{ A}$ | -    | 0.86 | 0.89 |               |
|             |                         | $T_j = 125\text{ °C}$ |                    | -    | 0.70 | 0.75 |               |

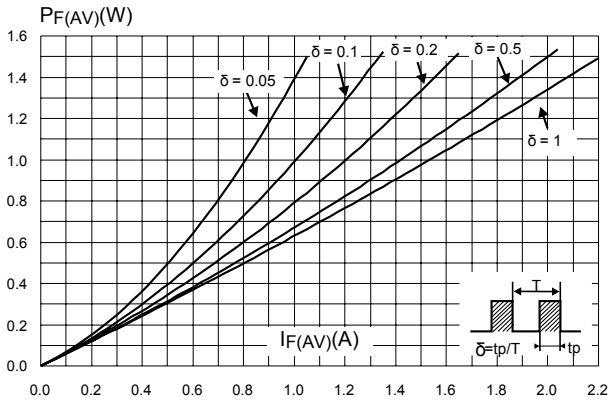
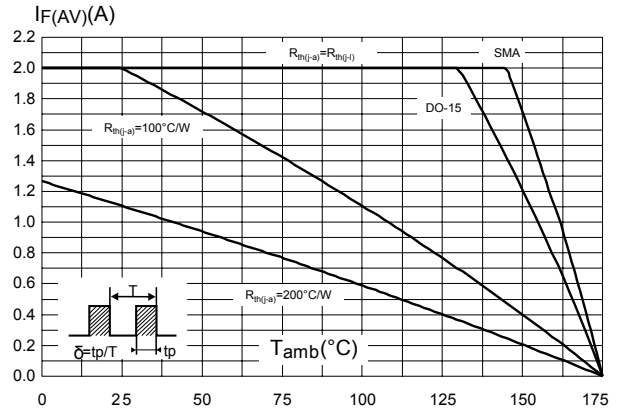
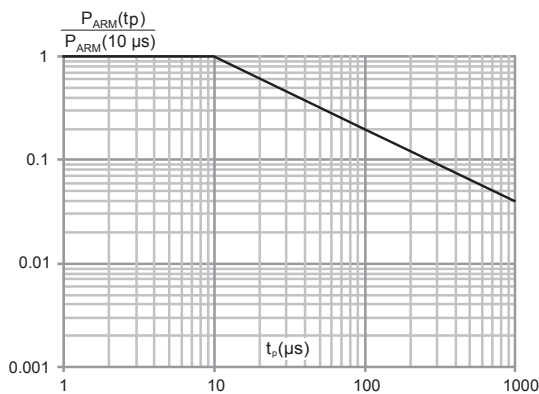
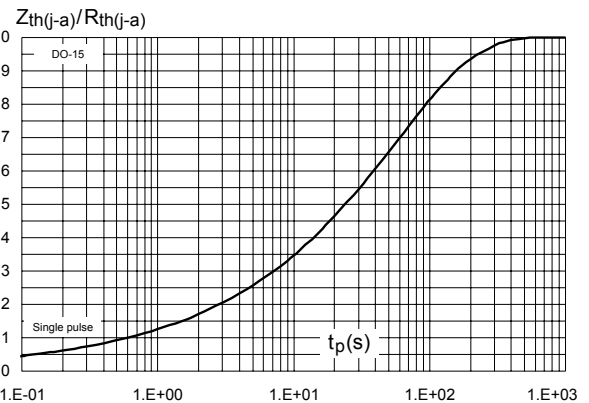
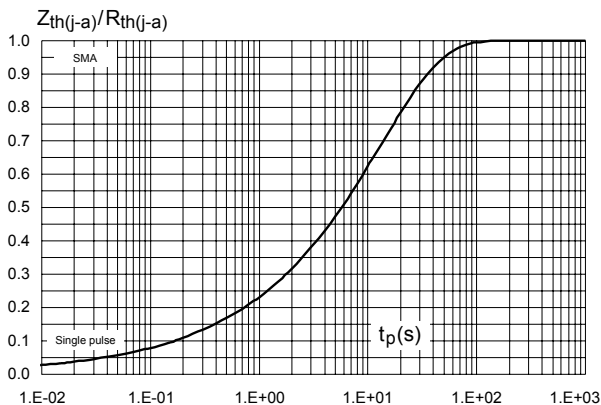
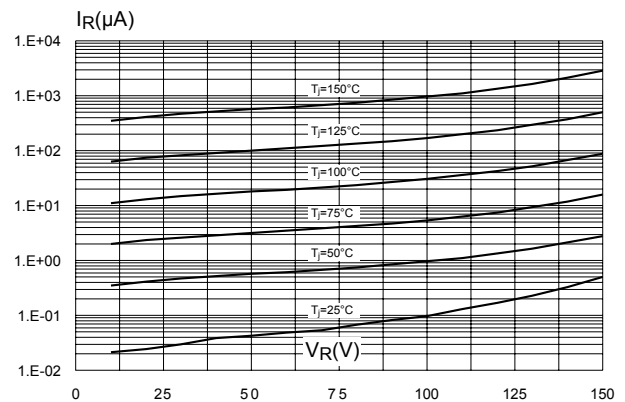
1. Pulse test:  $t_p = 5\text{ ms}, \delta < 2\%$

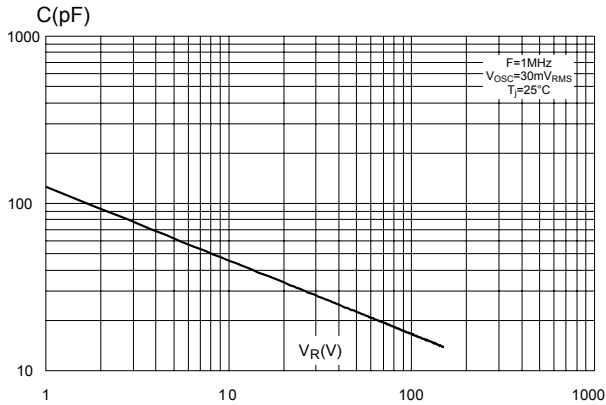
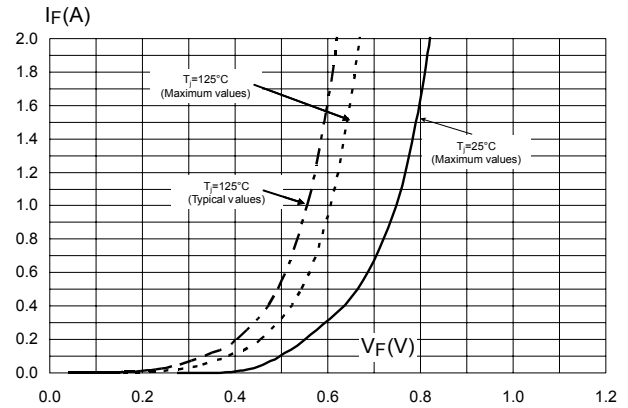
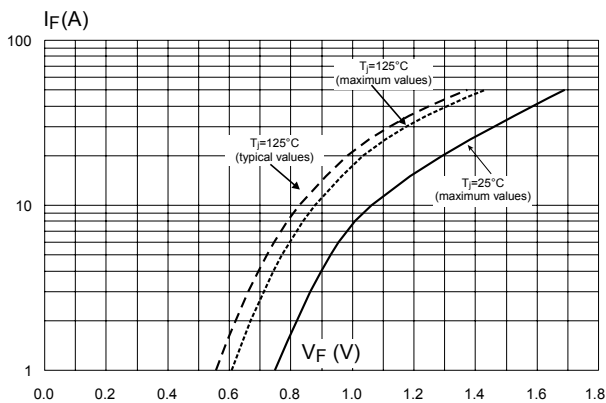
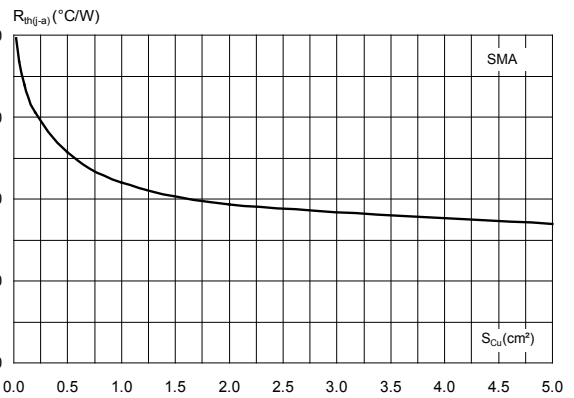
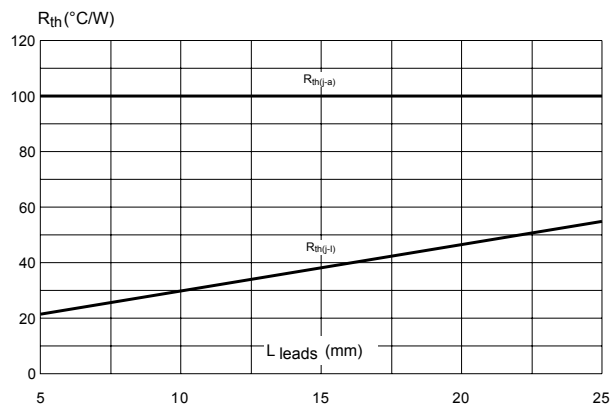
2. Pulse test:  $t_p = 380\text{ }\mu\text{s}, \delta < 2\%$

To evaluate the conduction losses use the following equation:  $P = 0.59 \times I_{F(AV)} + 0.04 I_{F(RMS)}^2$

For more information, please refer to the following application notes related to the power losses :

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

**1.1 Characteristics (curves)**
**Figure 1. Average forward power dissipation versus average forward current**

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

**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125^\circ\text{C}$ )**

**Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration (DO-15)**

**Figure 5. Relative variation of thermal impedance junction to ambient versus pulse duration (SMA)**

**Figure 6. Reverse leakage current versus reverse voltage applied (typical values)**


**Figure 7. Junction capacitance versus reverse voltage applied (typical values)**

**Figure 8. Forward voltage drop versus forward current (low level)**

**Figure 9. Forward voltage drop versus forward current (high level)**

**Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMA)**

**Figure 11. Thermal resistance versus lead length (DO-15)**


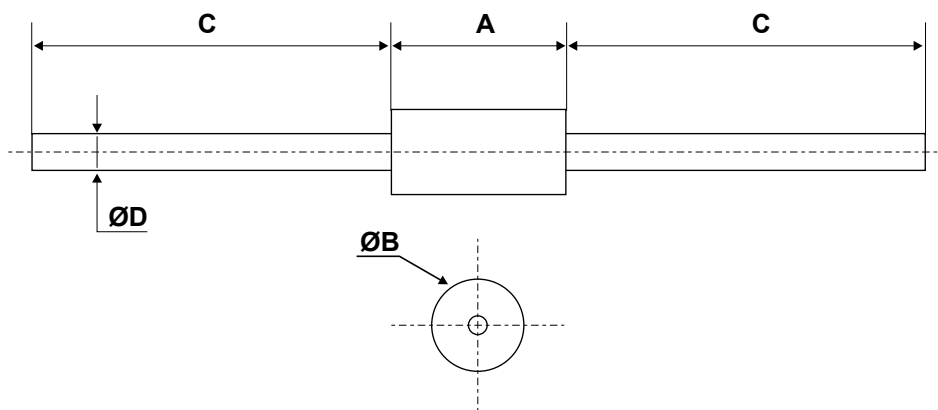
## 2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

### 2.1 DO-15 package information

- Epoxy meets UL 94, V0

**Figure 12. DO-15 package outline**



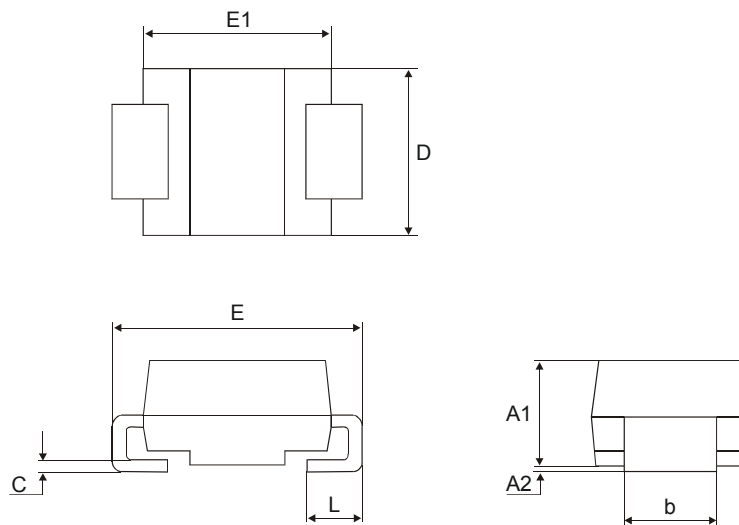
**Table 4. DO-15 package mechanical data**

| Ref. | Dimensions  |      |       |                             |      |        |
|------|-------------|------|-------|-----------------------------|------|--------|
|      | Millimeters |      |       | Inches (for reference only) |      |        |
|      | Min.        | Typ. | Max.  | Min.                        | Typ. | Max.   |
| A    | 6.05        | -    | 6.75  | 0.238                       | -    | 0.266  |
| B    | 2.95        | -    | 3.53  | 0.116                       | -    | 0.139  |
| C    | 26.00       | -    | 31.00 | 1.024                       | -    | 1.220  |
| D    | 0.71        | -    | 0.88  | 0.028                       | -    | 0.0035 |

## 2.2 SMA package information

- Epoxy meets UL 94, V0
- Cooling method : by conduction (C)

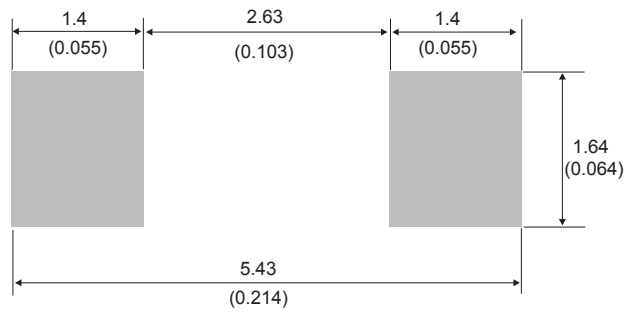
**Figure 13. SMA package outline**



**Table 5. SMA package mechanical data**

| Ref. | Dimensions  |      |      |                             |      |       |
|------|-------------|------|------|-----------------------------|------|-------|
|      | Millimeters |      |      | Inches (for reference only) |      |       |
|      | Min.        | Typ. | Max. | Min.                        | Typ. | Max.  |
| A1   | 1.90        | -    | 2.45 | 0.075                       | -    | 0.097 |
| A2   | 0.05        | -    | 0.20 | 0.002                       | -    | 0.008 |
| b    | 1.25        | -    | 1.65 | 0.049                       | -    | 0.065 |
| C    | 0.15        | -    | 0.40 | 0.006                       | -    | 0.016 |
| D    | 2.25        | -    | 2.90 | 0.089                       | -    | 0.114 |
| E    | 4.80        | -    | 5.35 | 0.189                       | -    | 0.211 |
| E1   | 3.95        | -    | 4.60 | 0.156                       | -    | 0.181 |
| L    | 0.75        | -    | 1.50 | 0.030                       | -    | 0.059 |

**Figure 14. SMA recommended footprint in mm (inches)**



### 3 Ordering information

**Table 6. Ordering information**

| Order code | Marking  | Package | Weight  | Base qty. | Delivery mode |
|------------|----------|---------|---------|-----------|---------------|
| STPS2150A  | 2150     | SMA     | 0.068 g | 5000      | Ammopack      |
| STPS2150   | STPS2150 | DO-15   | 0.4 g   | 2000      | Tape and reel |



## Revision history

**Table 7. Document revision history**

| Date        | Revision | Changes  |
|-------------|----------|--|
| Jul-2003    | 3A       | Last update.   |
| Aug-2004    | 4        | SMA package dimensions update. Reference A1 max. changed from 2.70mm (0.106) to 2.03mm (0.080).                              |
| 31-May-2006 | 5        | Reformatted to current standard. Added ECOPACK statement. Updated SMA footprint in Figure 15. Changed nF to pF in Figure 10. |
| 18-Sep-2008 | 6        | Reformatted to current standard. Added SMAflat package. Removed $I_{F(RMS)}$ from Table 2.                                   |
| 04-Jul-2018 | 7        | Removed SMAFlat package information. Updated <a href="#">Table 1.</a> and <a href="#">Figure 3.</a>                          |

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2018 STMicroelectronics – All rights reserved

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[STPS2150](#) [STPS2150A](#) [STPS2150RL](#)