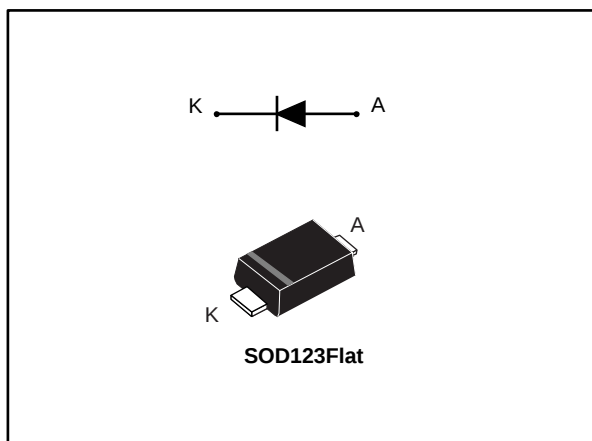


## Automotive high voltage power Schottky rectifier

Datasheet - production data



### Description

Single chip Schottky rectifiers suited to automotive applications, such as lighting, diesel injection, or engine control unit.

Packaged in SOD123Flat, this device is especially intended for surface mounting and used in high frequency converters, free wheeling and reverse polarity protection in automotive applications.

Table 1: Device summary

| Symbol       | Value  |
|--------------|--------|
| $I_{F(AV)}$  | 2 A    |
| $V_{RRM}$    | 100 V  |
| $V_F$ (typ.) | 0.65 V |
| $T_j$ (max.) | 175 °C |

### Features

- AEC-Q101 qualified
- High junction temperature capability
- Low leakage current
- Negligible switching losses
- Avalanche capability specified
- ECOPACK®2 compliant component
- PPAP capable



# 1 Characteristics

**Table 2: Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

| Symbol      | Parameter                                               |                                                       | Value       | Unit |
|-------------|---------------------------------------------------------|-------------------------------------------------------|-------------|------|
| $V_{RRM}$   | Repetitive peak reverse voltage                         | $T_j = -40\text{ °C to }+175\text{ °C}$               | 100         | V    |
| $I_{F(AV)}$ | Average forward current<br>$\delta = 0.5$ , square wave | $T_L = 140\text{ °C}$                                 | 2           | A    |
| $I_{FSM}$   | Surge non repetitive forward current                    | $t_p = 10\text{ ms}$ sinusoidal                       | 50          | A    |
| $P_{ARM}$   | Repetitive peak avalanche power                         | $t_p = 10\text{ }\mu\text{s}$ , $T_j = 125\text{ °C}$ | 105         | W    |
| $T_{stg}$   | Storage temperature range                               |                                                       | -65 to +175 | °C   |
| $T_j$       | Operating junction temperature range <sup>(1)</sup>     |                                                       | -40 to +175 |      |

**Notes:**

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

**Table 3: Thermal parameters**

| Symbol        | Parameter        | Max. value | Unit |
|---------------|------------------|------------|------|
| $R_{th(j-l)}$ | Junction to lead | 20         | °C/W |

**Table 4: Static electrical characteristics**

| Symbol      | Parameter               | Test conditions       |                    | Min. | Typ. | Max. | Unit          |
|-------------|-------------------------|-----------------------|--------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ °C}$  | $V_R = V_{RRM}$    | -    |      | 1    | $\mu\text{A}$ |
|             |                         | $T_j = 125\text{ °C}$ |                    | -    | 0.2  | 0.5  | mA            |
| $V_F^{(2)}$ | Forward voltage drop    | $T_j = 25\text{ °C}$  | $I_F = 2\text{ A}$ | -    |      | 0.86 | V             |
|             |                         | $T_j = 125\text{ °C}$ |                    | -    | 0.65 | 0.70 |               |
|             |                         | $T_j = 25\text{ °C}$  | $I_F = 4\text{ A}$ | -    |      | 0.96 |               |
|             |                         | $T_j = 125\text{ °C}$ |                    | -    | 0.75 | 0.83 |               |

**Notes:**

<sup>(1)</sup>Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

<sup>(2)</sup>Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

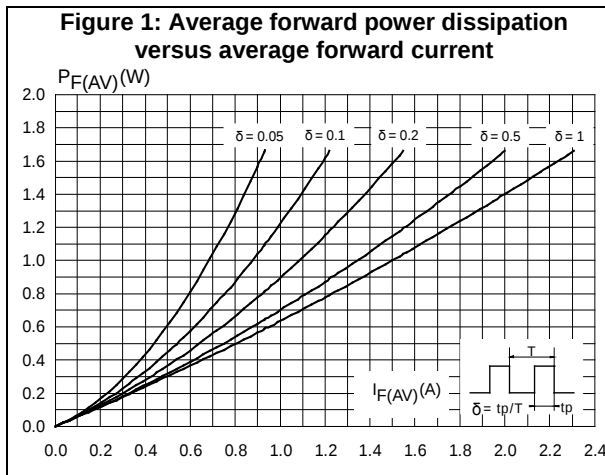
To evaluate the conduction losses, use the following equation:

$$P = 0.57 \times I_{F(AV)} + 0.065 \times I_F^2(RMS)$$

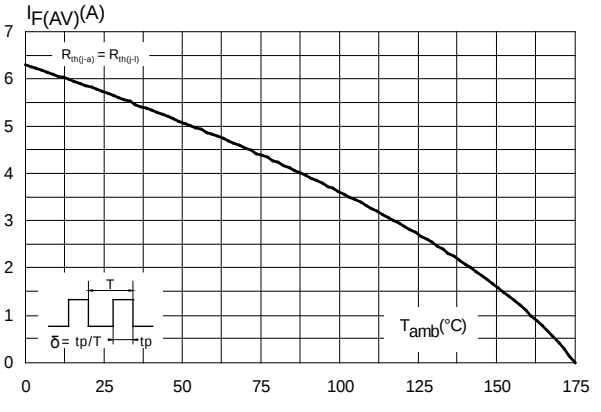
For more information, please refer to the following application notes related to the power losses.

- AN604 (Calculation of conduction losses in a power rectifier)
- AN4021 (Calculation of reverse losses in a power diode)

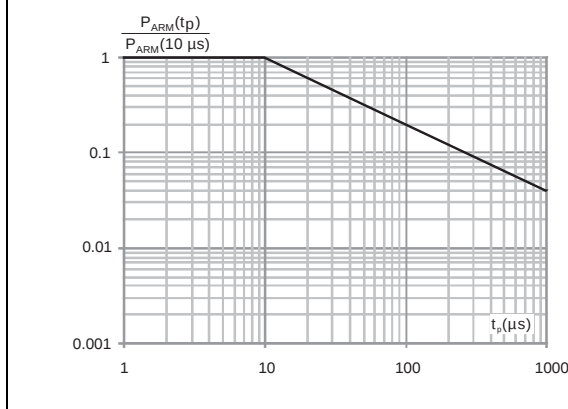
## 1.1 Characteristics (curves)



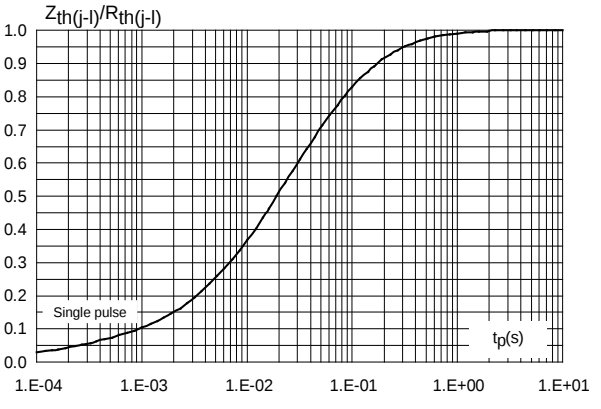
**Figure 2: Average forward current versus ambient temperature ( $\delta = 0.5$ )**



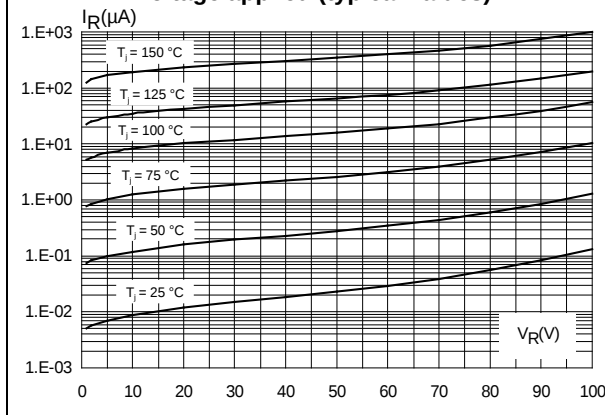
**Figure 3: Normalized avalanche power derating versus pulse duration ( $T_j = 125^\circ C$ )**



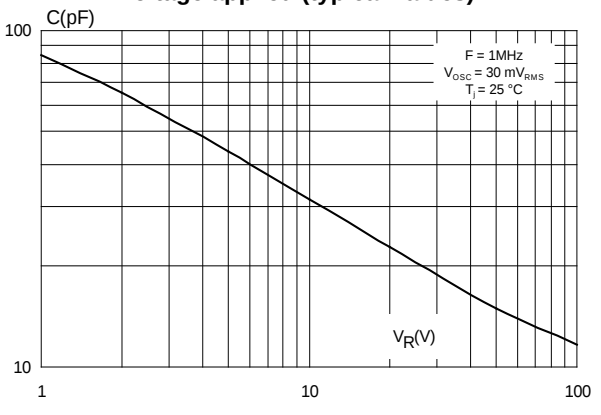
**Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration**

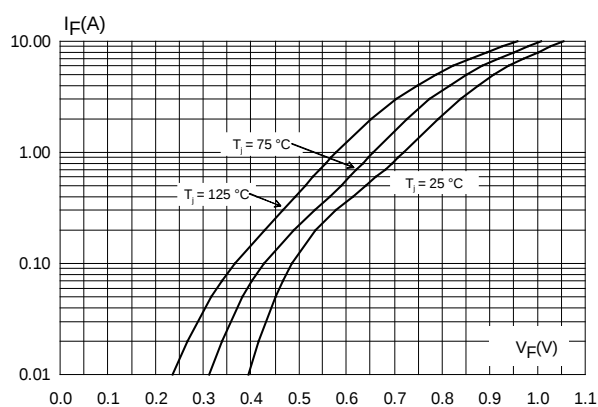
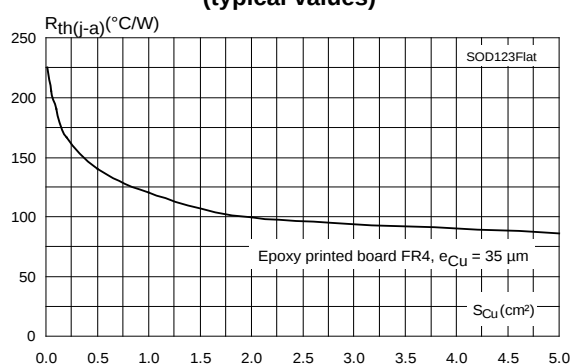


**Figure 5: Reverse leakage current versus reverse voltage applied (typical values)**



**Figure 6: Junction capacitance versus reverse voltage applied (typical values)**



**Figure 7: Forward voltage drop versus forward current (typical values)****Figure 8: Thermal resistance junction to ambient versus copper surface under each lead (typical values)**

## 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.

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

### 2.1 SOD123Flat package information

Figure 9: SOD123Flat package outline

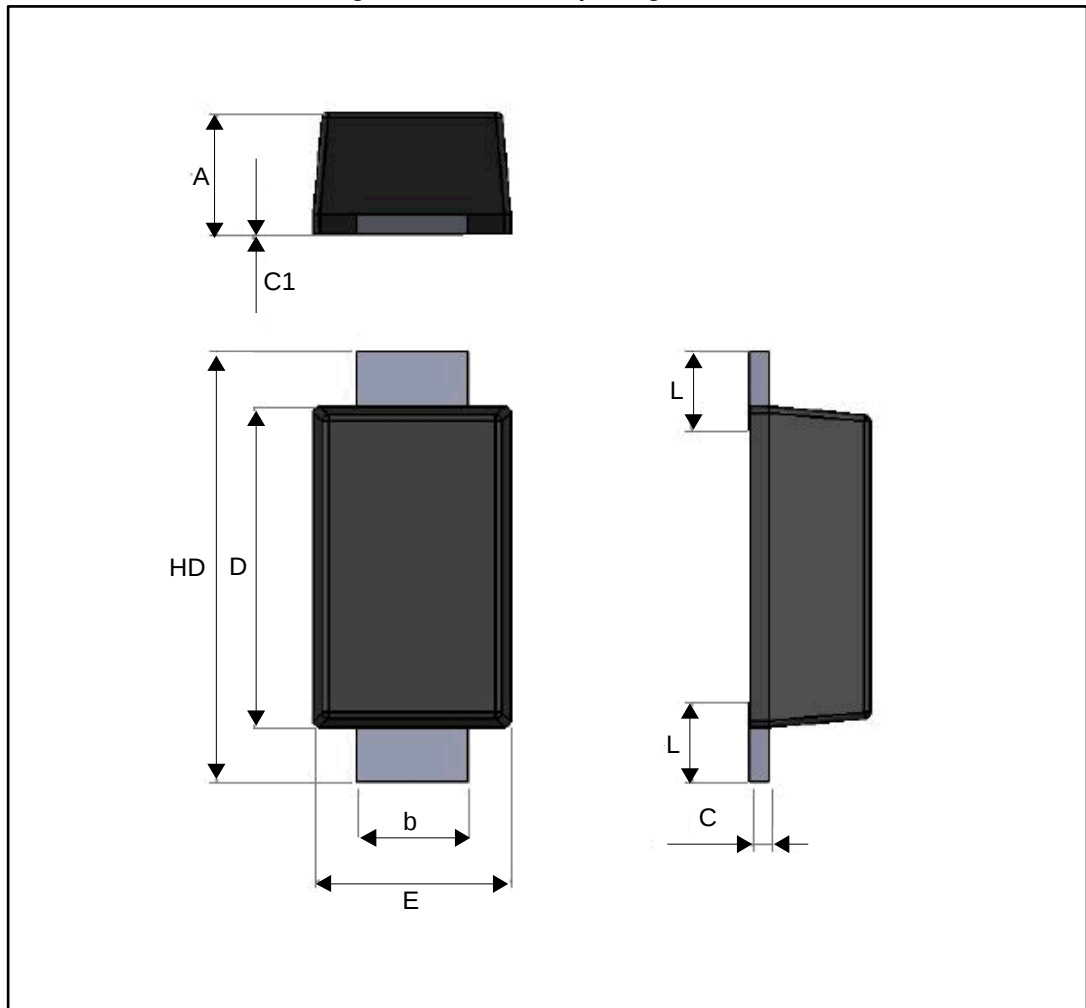
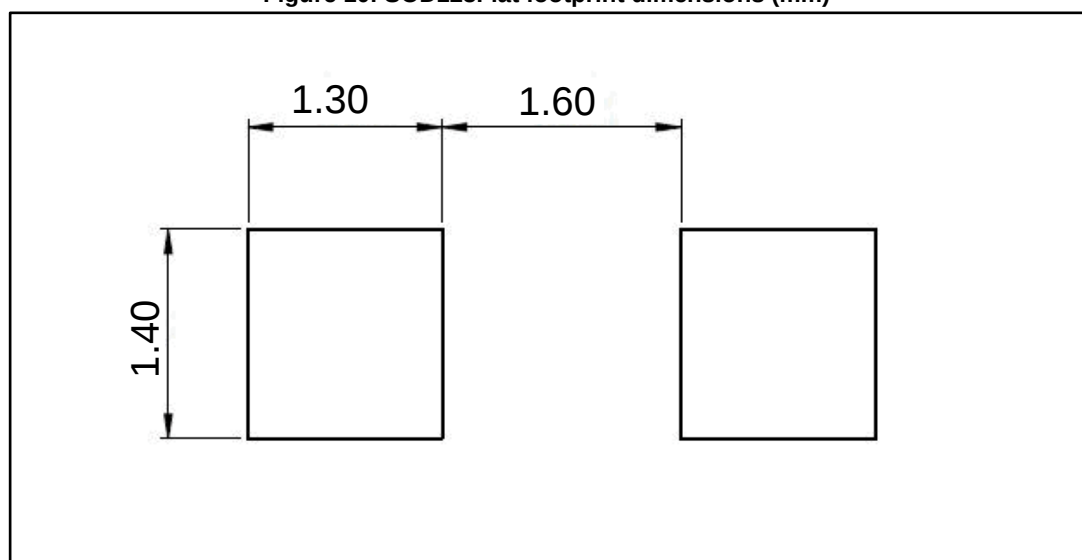


Table 5: SOD123Flat package mechanical data

| Ref. | Dimensions  |      |      |
|------|-------------|------|------|
|      | Millimeters |      |      |
|      | Min.        | Typ. | Max. |
| A    | 0.86        | 0.98 | 1.10 |
| b    | 0.80        | 0.90 | 1.00 |
| c    | 0.08        | 0.15 | 0.25 |
| c1   | 0.00        |      | 0.10 |
| D    | 2.50        | 2.60 | 2.70 |
| E    | 1.50        | 1.60 | 1.80 |
| HD   | 3.30        | 3.50 | 3.70 |
| L    | 0.45        | 0.65 | 0.85 |

Figure 10: SOD123Flat footprint dimensions (mm)



### 3 Ordering information

Table 6: Ordering information

| Order code   | Marking | Package    | Weight  | Base qty. | Delivery mode |
|--------------|---------|------------|---------|-----------|---------------|
| STPS2H100ZFY | 2Y1     | SOD123Flat | 12.5 mg | 3000      | Tape and reel |

### 4 Revision history

Table 7: Document revision history

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 20-Oct-2016 | 1        | Initial release. |

**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.

© 2016 STMicroelectronics – All rights reserved

# Mouser Electronics

Authorized Distributor

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

[STMicroelectronics:](#)

[STPS2H100ZFY](#)