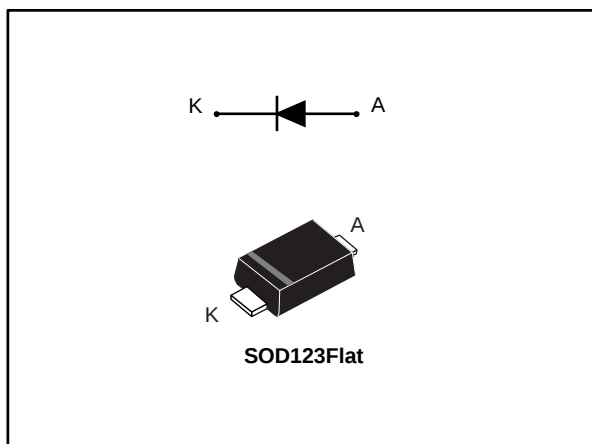


## Power Schottky rectifier

Datasheet - production data



### Description

Single chip Schottky rectifiers suited to surface mounting and especially intended for use in high frequency converters, free-wheeling and reverse polarity protection..

**Table 1: Device summary**

| Symbol       | Value  |
|--------------|--------|
| $I_{F(AV)}$  | 2 A    |
| $V_{RRM}$    | 100 V  |
| $V_F$ (typ.) | 0.60 V |
| $T_j$ (max.) | 175 °C |

### Features

- High junction temperature capability
- Low leakage current
- Negligible switching losses
- Avalanche capability specified
- ECOPACK®2 compliant component

# 1 Characteristics

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

| Symbol      | Parameter                                             |                                                         | Value       | Unit |
|-------------|-------------------------------------------------------|---------------------------------------------------------|-------------|------|
| $V_{RRM}$   | Repetitive peak reverse voltage                       |                                                         | 100         | V    |
| $I_{F(AV)}$ | Average forward current                               | $T_L = 140\text{ °C}$ /<br>$\delta = 0.5$ , square wave | 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   |
| $T_j$       | Maximum operating junction temperature <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:

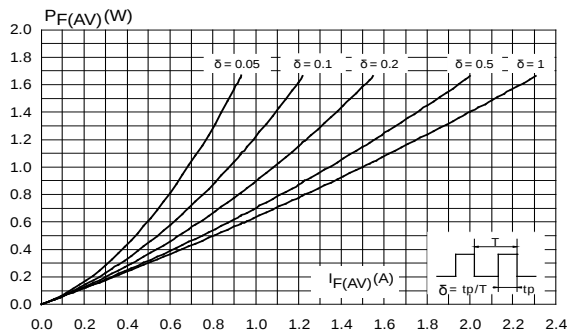
$$P = 0.57 \times I_{F(AV)} + 0.065 \times I_F^2(RMS)$$

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

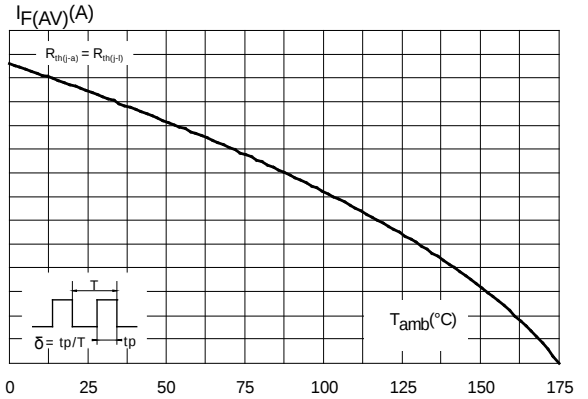
- AN604 (Calculation of conduction losses in a power rectifier)
- AN4021 (Calculation of reverse losses in a power diode)

## 1.1 Characteristics (curves)

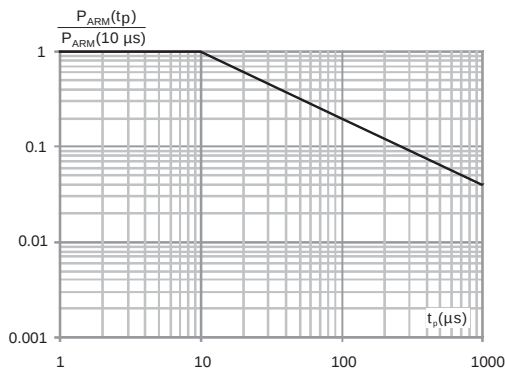
**Figure 1: Average forward power dissipation versus average forward current**



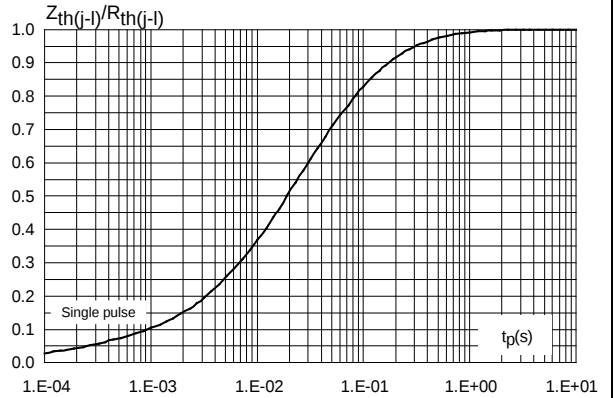
**Figure 2: Average forward current versus ambient temperature ( $\delta = 0.5$ )**



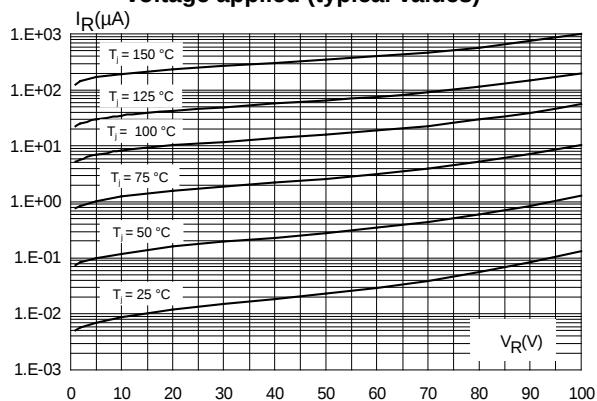
**Figure 3: Normalized avalanche power derating versus pulse duration ( $T_J = 125^\circ\text{C}$ )**



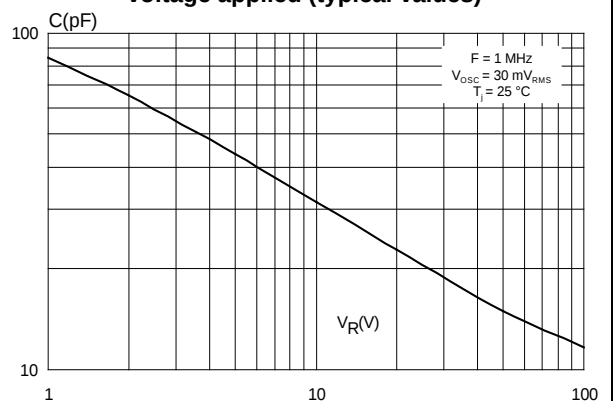
**Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration**

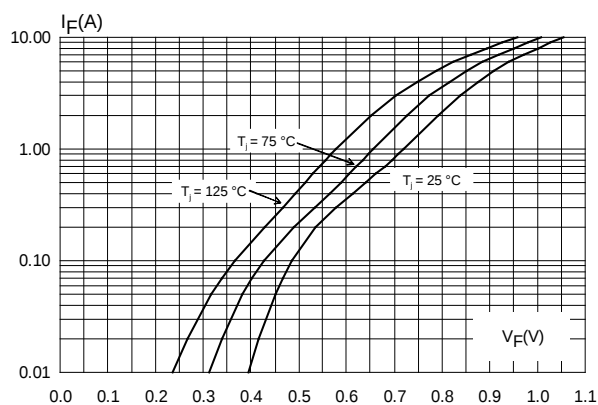
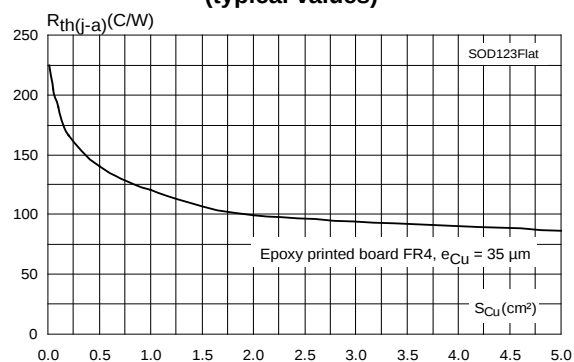


**Figure 5: Reverse leakage current versus reverse voltage applied (typical values)**



**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

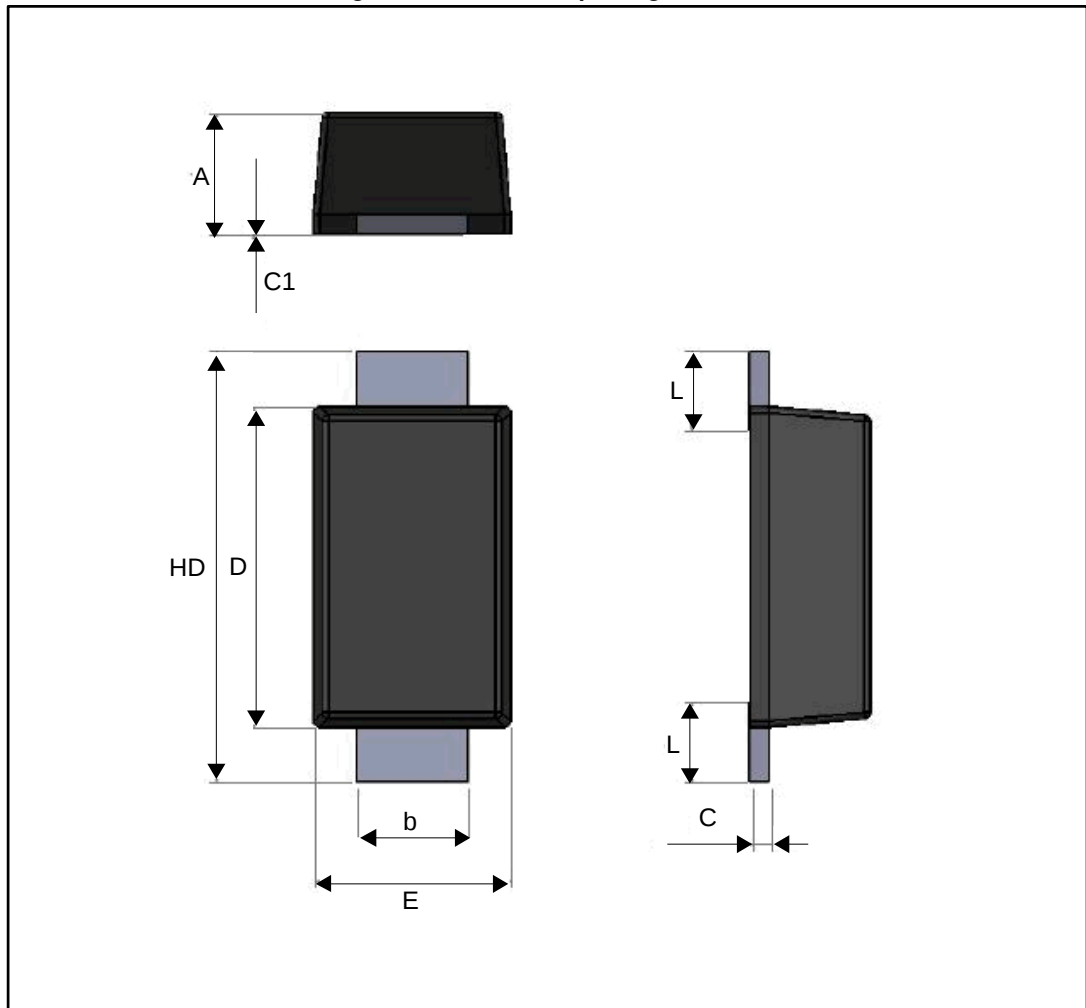
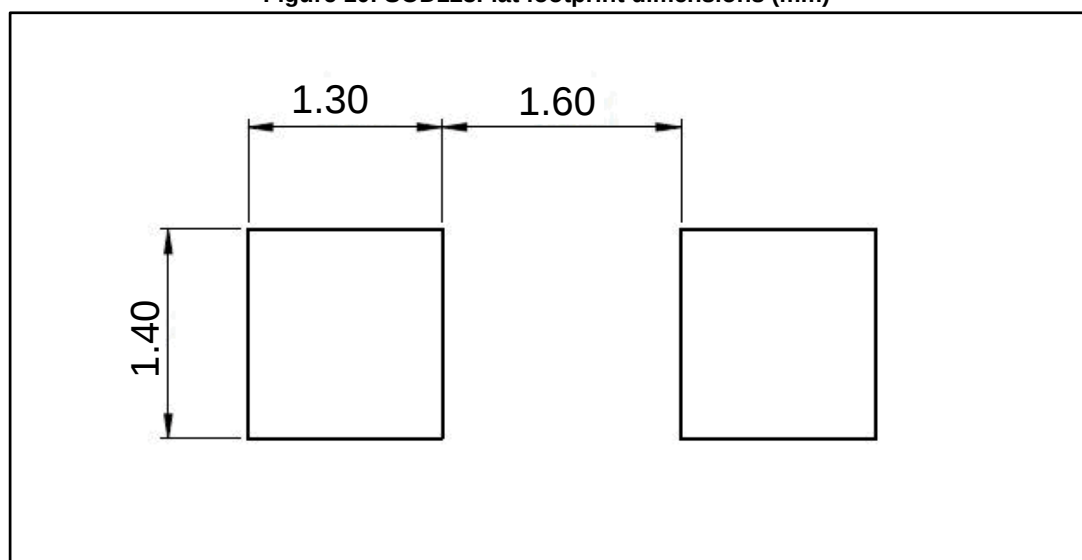


Table 5: SOD123Flat package mechanical data

| 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 |
|-------------|---------|------------|---------|-----------|---------------|
| STPS2H100ZF | 2H1     | SOD123Flat | 12.5 mg | 3000      | Tape and reel |

### 4 Revision history

Table 7: Document revision history

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 19-Aug-2016 | 1        | Initial release. |

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