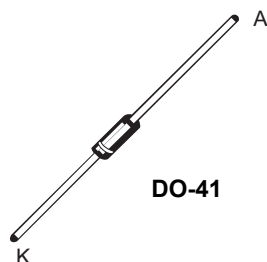


## 100 V, 2 A power Schottky rectifier



### Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified
- ECOPACK2 compliant

### Applications

- Switching diode
- LED lighting
- DC/DC converter

### Description

The [STPS2H100RL](#) is an axial power Schottky rectifier ideal for switch mode power supply and high frequency DC/DC converters.

Packaged in DO-41, this device is optimized for use in low voltage, high frequency inverters and small battery chargers.

| Product status link         |        |
|-----------------------------|--------|
| <a href="#">STPS2H100RL</a> |        |
| Product summary             |        |
| Symbol                      | Value  |
| $I_{F(AV)}$                 | 2 A    |
| $V_{RRM}$                   | 100 V  |
| $T_j$ (max.)                | 175 °C |
| $V_F$ (max.)                | 0.70 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                       |                                                       | 100         | V    |
| $I_{F(AV)}$ | Average forward current                               | $T_L = 120\text{ °C}$ , $\delta = 0.5$                | 2           | A    |
| $I_{FSM}$   | Surge non repetitive forward current                  | $t_p = 10\text{ ms}$ sinusoidal                       | 50          | A    |
| $P_{ARM}$   | Repetitive peak avalanche power                       | $t_p = 10\text{ }\mu\text{s}$ , $T_j = 125\text{ °C}$ | 108         | 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 parameters**

| Symbol        | Parameter           |                     | Max. value | Unit |
|---------------|---------------------|---------------------|------------|------|
| $R_{th(j-a)}$ | Junction to ambient | Lead length = 10 mm | 100        | °C/W |
| $R_{th(j-l)}$ | Junction to lead    |                     | 35         |      |

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 | $T_j = 25\text{ °C}$  | $V_R = V_{RRM}$    | -    |      | 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 |               |
|             |                         | $T_j = 25\text{ °C}$  | $I_F = 4\text{ A}$ | -    |      | 0.92 |               |
|             |                         | $T_j = 125\text{ °C}$ |                    | -    | 0.72 | 0.78 |               |

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:

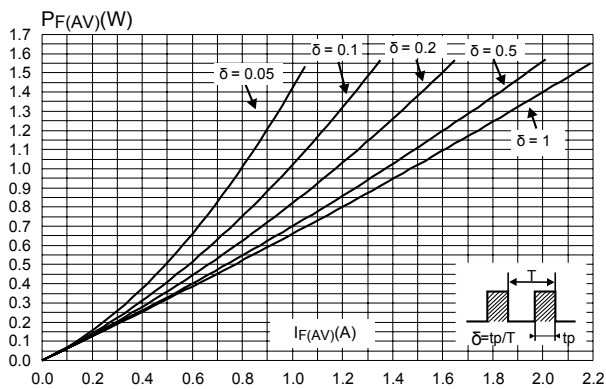
$$P = 0.62 \times I_{F(AV)} + 0.04 \times I_F^2(\text{RMS})$$

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

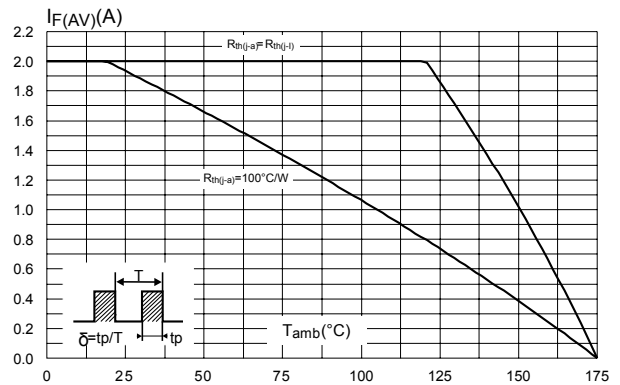
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode.

## 1.1 Characteristics (curves)

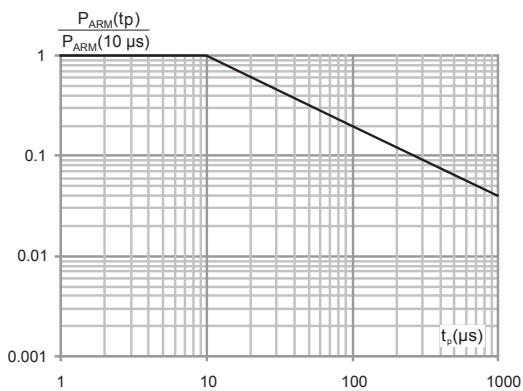
**Figure 1. Average forward power dissipation versus average forward current**



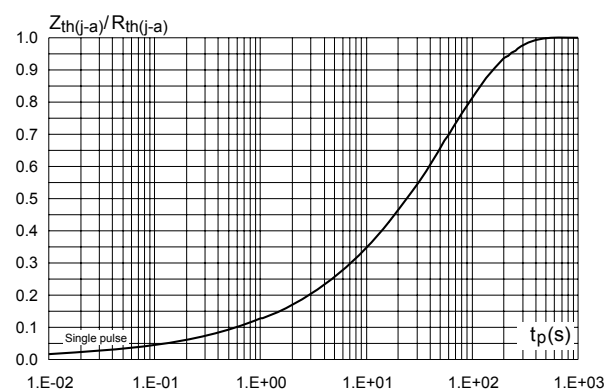
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



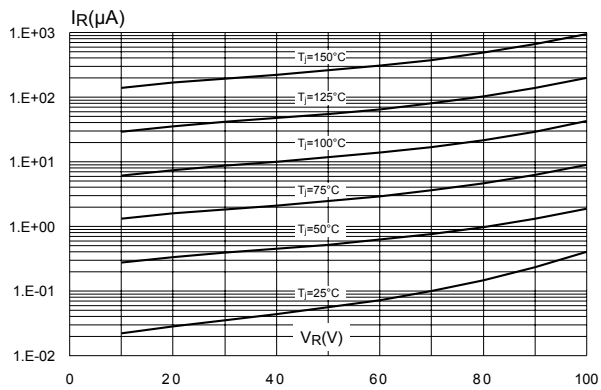
**Figure 3. Normalized avalanche power derating versus junction temperature ( $T_j = 125^\circ\text{C}$ )**



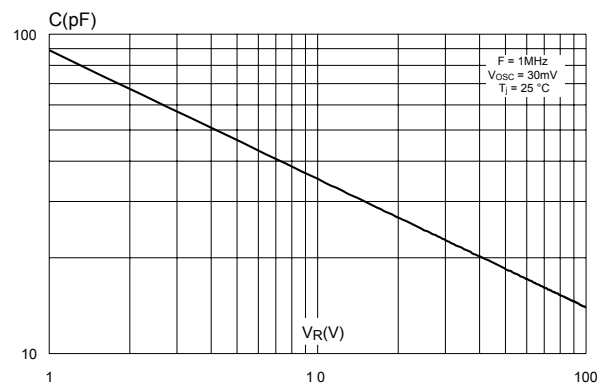
**Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration**



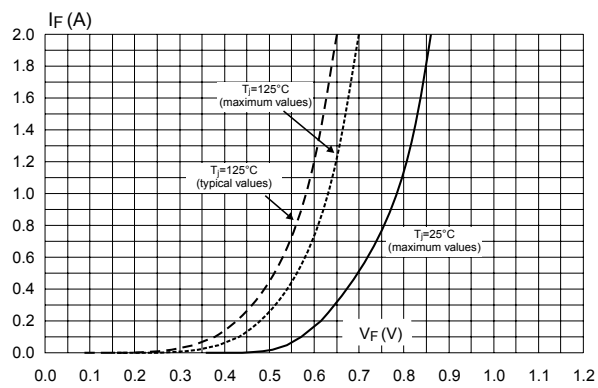
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values)**



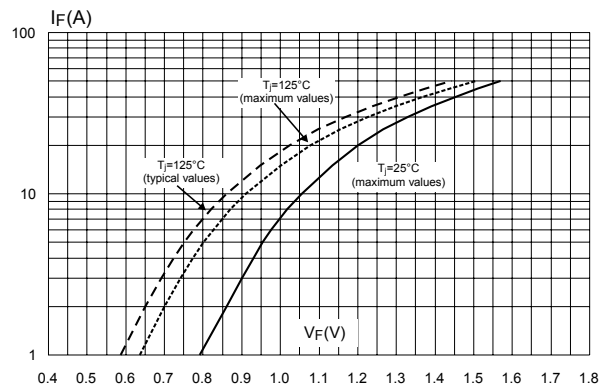
**Figure 6. Junction capacitance versus reverse voltage applied (typical values)**



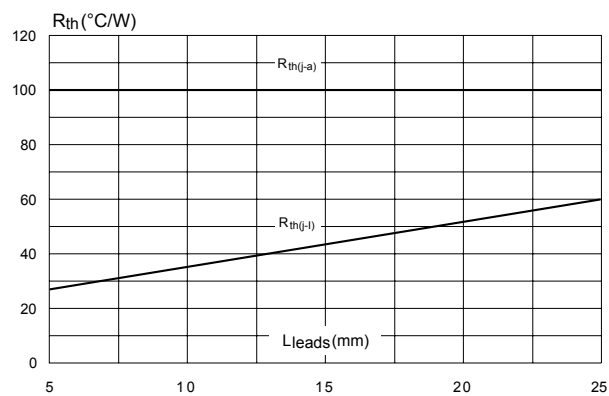
**Figure 7. Forward voltage drop versus forward current (low level)**



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



**Figure 9. Thermal resistance versus lead length**



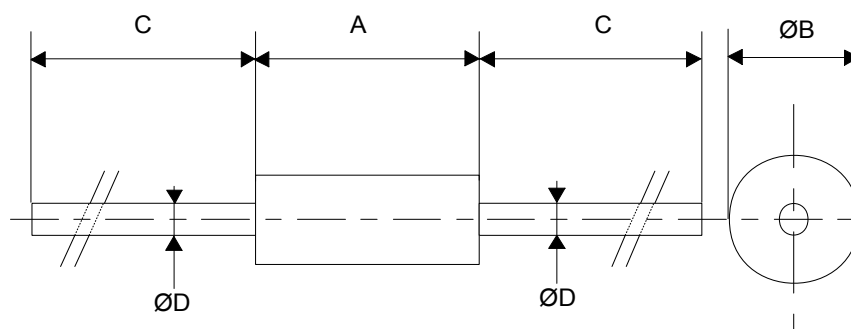
## 2 Package information

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-41 package information

- Epoxy meets UL94, V0
- Band indicates cathode

**Figure 10.** DO-41 package outline



**Table 4.** DO-41 package mechanical data

| Ref. | Dimensions  |      |        |       |
|------|-------------|------|--------|-------|
|      | Millimeters |      | Inches |       |
|      | Min.        | Max. | Min.   | Max.  |
| A    | 4.07        | 5.20 | 0.160  | 0.205 |
| ØB   | 2.04        | 2.71 | 0.080  | 0.107 |
| C    | 25.40       |      | 1      |       |
| ØD   | 0.71        | 0.86 | 0.028  | 0.034 |

### 3 Ordering Information

**Table 5. Ordering information**

| Order code | Marking                   | Package | Weight | Base qty. | Delivery mode |
|------------|---------------------------|---------|--------|-----------|---------------|
| STPS2H100  | STPS2H100<br>Cathode ring | DO-41   | 0.34 g | 2000      | Ammopack      |

## Revision history

**Table 6. Document revision history**

| Date        | Version | Changes                                                                                                                                                                                                                                                                           |
|-------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Jul-2003    | 2A      | Initial release.                                                                                                                                                                                                                                                                  |
| 23-Jun-2009 | 3       | Updated dimension C in table 5.                                                                                                                                                                                                                                                   |
| 05-Oct-2009 | 4       | Updated table 5 package dimensions.                                                                                                                                                                                                                                               |
| 17-May-2018 | 5       | Removed figure 4 and figure 5.<br>Updated Figure 3. Normalized avalanche power derating versus junction temperature ( $T_j = 125\text{ °C}$ ) and Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified).<br>Minor text changes to improve readability. |
| 01-Apr-2020 | 6       | Updated Table 5. Ordering information.                                                                                                                                                                                                                                            |

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