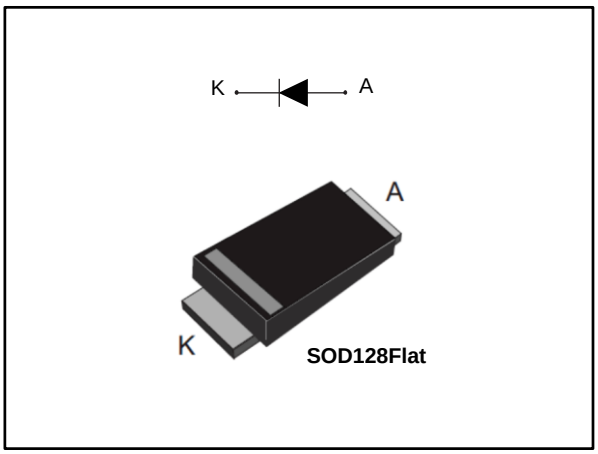
# STPS5H100AFY

## Automotive high voltage power Schottky rectifier

Datasheet - production data




## Description

This high voltage Schottky barrier rectifier device is packaged in SOD128Flat and designed for high frequency miniature switched mode power supplies and for board DC to DC converters for automotive applications.

**Table 1: Device summary**

| Symbol | Value |
|---|---|
| $I_{F(AV)}$ | 5 A |
| $V_{RRM}$ | 100 V |
| $T_j$(max.) | 175 °C |
| $V_F$(typ.) | 0.51 V |

## Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche specification
- ECOPACK® compliant component
- AEC-Q101
- PPAP capable
- $V_{RRM}$ guaranteed from -40 to +175 °C

# 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 °C to +175 °C) | | 100 | V |
| $I_{F(AV)}$ | Average forward current | $T_L$ = 115 °C, δ = 0.5, square pulse | 5 | A |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms sinusoidal | 125 | A |
| | | $t_p$ = 8.3 ms sinusoidal | 130 | |
| $P_{ARM}$ | Repetitive peak avalanche power | $t_p$ = 10 µs, $T_j$ = 125 °C | 300 | W |
| $T_{stg}$ | Storage temperature range | | -65 to +175 | °C |
| $T_j$ | Operating junction temperature range(1) | | -40 to +175 | °C |

**Notes:**

(1)$(dP_{tot}/dT_j) < (1/R_{th(j-a)})$ 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 | 16 | °C/W |

**Table 4: Static electrical characteristics**

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$(1) | Reverse leakage current | $T_j$ = 25 °C | $V_R$ = 100 V | - | 0.7 | 3.5 | µA |
| | | $T_j$ = 125 °C | | - | 1 | 4 | mA |
| | | $T_j$ = 150 °C | | - | | 16 | |
| $V_F$(2) | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 2.5 A | - | | 0.67 | V |
| | | $T_j$ = 125 °C | | - | 0.51 | 0.55 | |
| | | $T_j$ = 25 °C | $I_F$ = 5 A | - | | 0.76 | |
| | | $T_j$ = 125 °C | | - | 0.57 | 0.61 | |

**Notes:**

(1)Pulse test: $t_p$ = 5 ms, δ < 2%

(2)Pulse test: $t_p$ = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$P = 0.49 \times I_{F(AV)} + 0.024 \times I_{F^2(RMS)}$

## 1.1 Characteristics (curves)

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

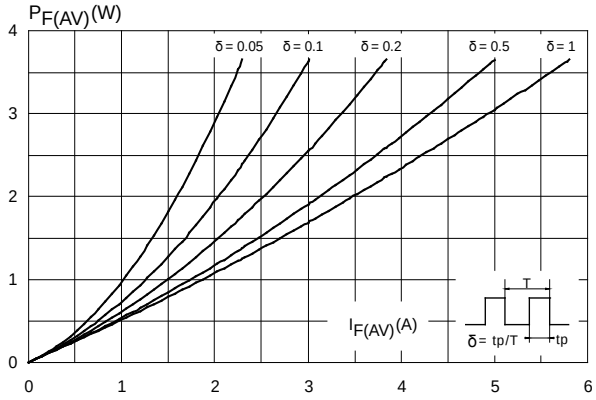



**Figure 2: Average forward current versus ambient temperature (δ = 0.5)**

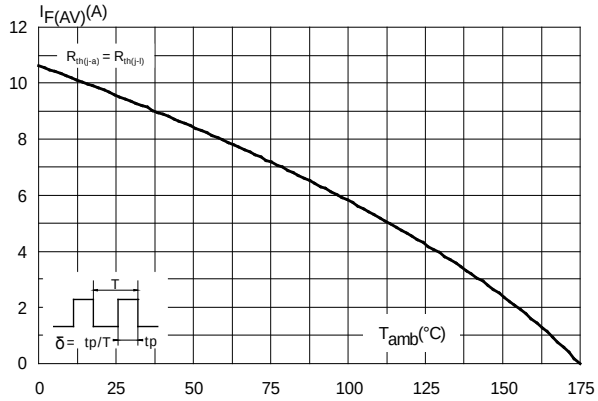



**Figure 3: Normalized avalanche power derating versus pulse duration**

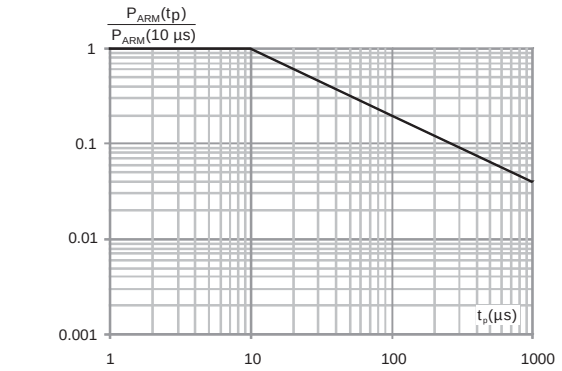



**Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration**

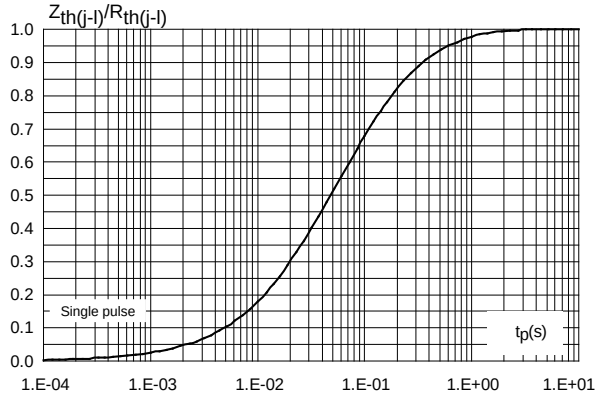



**Figure 5: Reverse leakage current versus reverse voltage applied (typical values)**

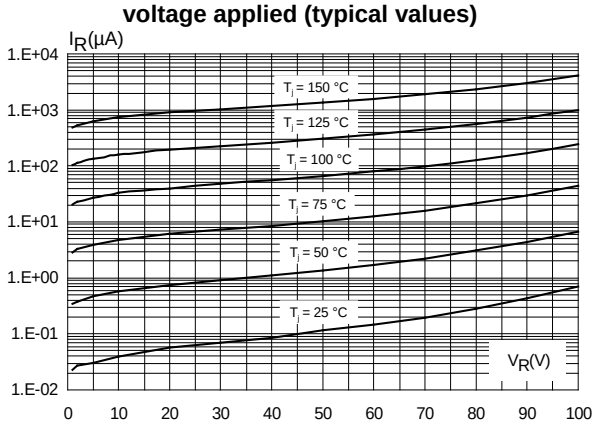



**Figure 6: Junction capacitance versus reverse voltage applied (typical values)**

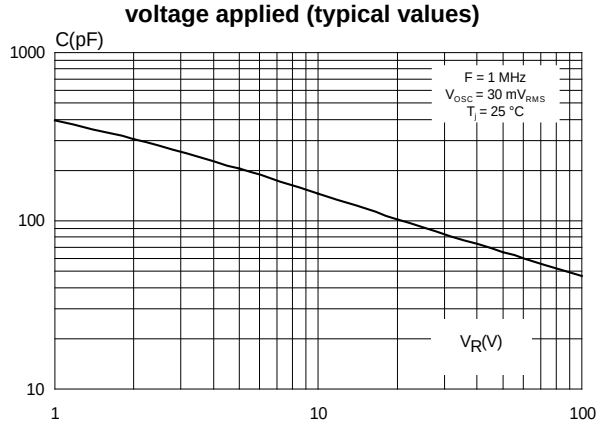


**Figure 7: Forward voltage drop versus forward current (typical values)**

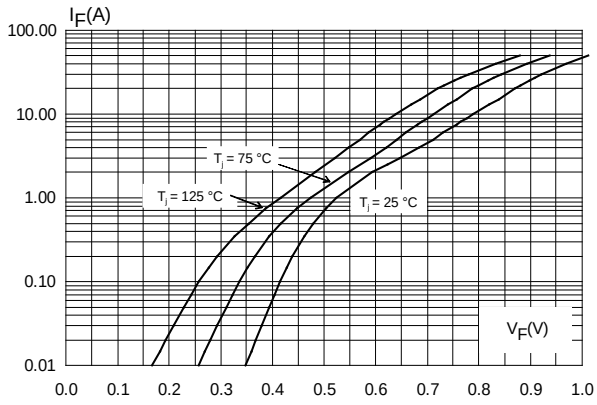
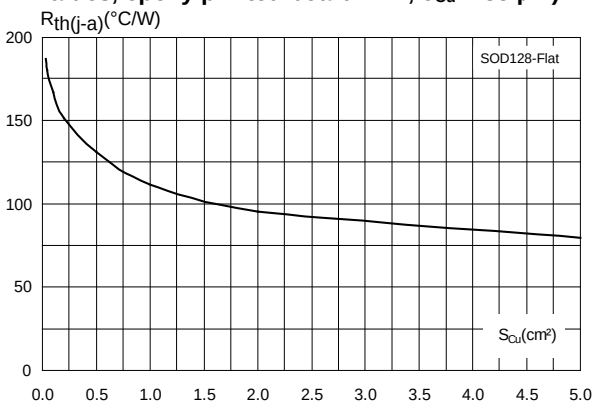



**Figure 8: Thermal resistance junction to ambient versus copper surface under each lead (typical values, epoxy printed board FR4, $e_{Cu}$ = 35 µm)**



# 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***. ECOPACK® is an ST trademark.

- Epoxy meets UL94, V0
- Lead-free package

## 2.1 SOD128Flat package information

**Figure 9: SOD128Flat package outline**

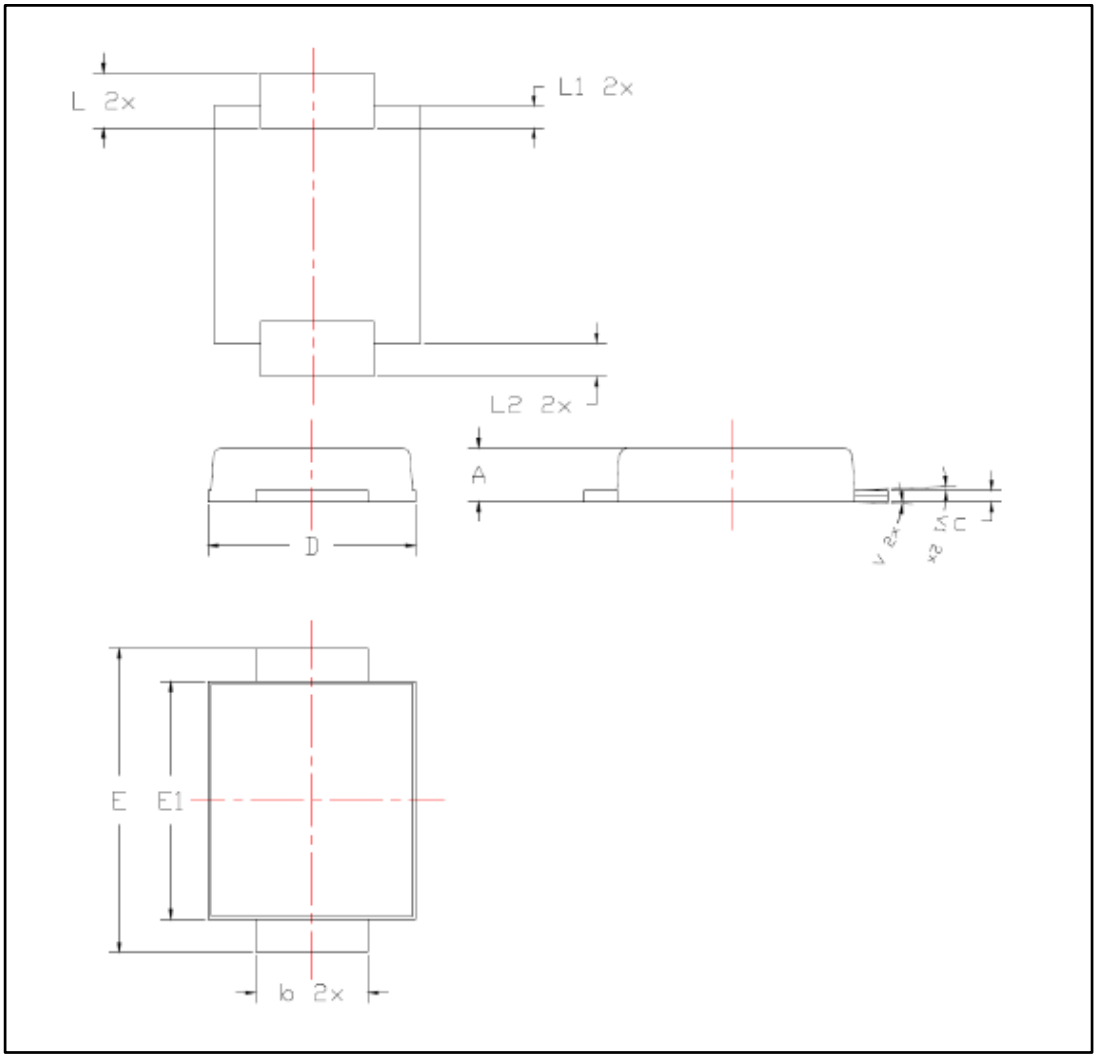
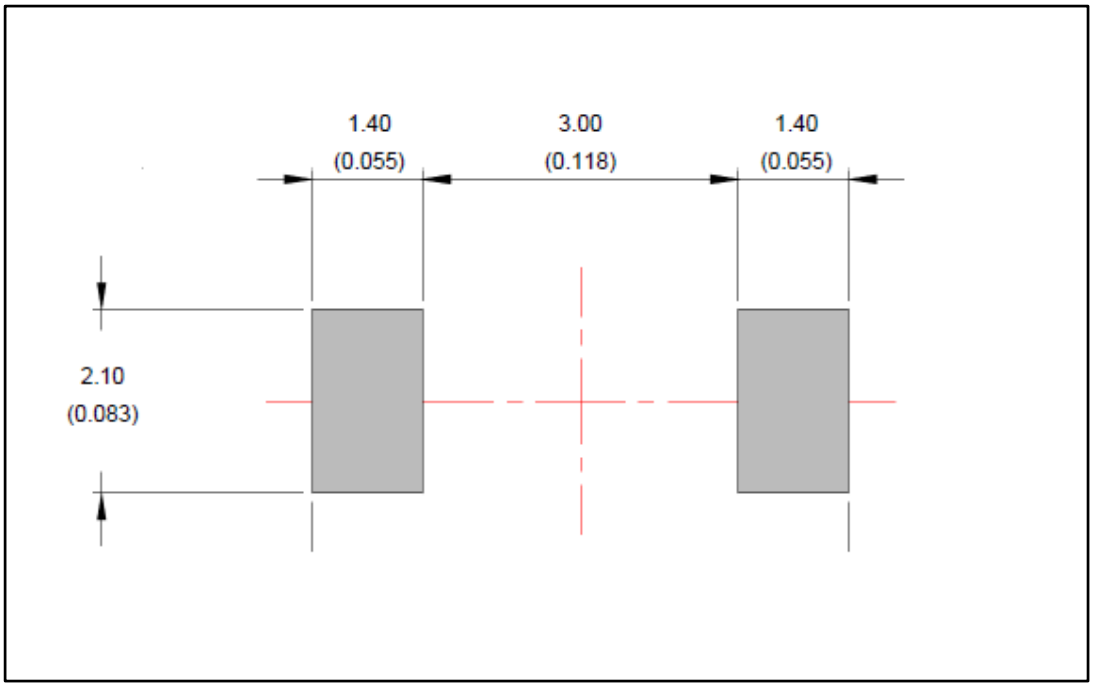


**Table 5: SOD128Flat package mechanical data**

| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 0.93 | 1.03 | 0.037 | 0.041 |
| b | 1.69 | 1.81 | 0.067 | 0.071 |
| c | 0.10 | 0.22 | 0.004 | 0.009 |
| D | 2.30 | 2.50 | 0.091 | 0.098 |
| E | 4.60 | 4.80 | 0.181 | 0.189 |
| E1 | 3.70 | 3.90 | 0.146 | 0.154 |
| L | 0.55 | 0.85 | 0.026 | 0.033 |
| L1 | 0.30 typ. | | 0.012 typ. | |
| L2 | 0.45 typ. | | 0.018 typ. | |

**Figure 10: SOD128Flat footprint in mm (inches)**



# 3 Ordering information

**Table 6: Ordering information**

| Order code | Marking | Package | Weight | Base qty. | Delivery mode |
|---|---|---|---|---|---|
| STPS5H100AFY | 5H100Y | SOD128Flat | 26.4 mg | 3000 | Tape and reel |

# 4 Revision history

**Table 7: Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 14-Jun-2016 | 1 | Initial release. |
| 24-Jun-2016 | 2 | Updated *Table 2: "Absolute ratings (limiting values at 25 °C, unless otherwise specified)"*. |

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