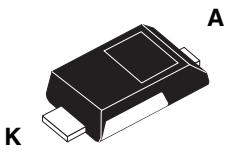
# STPS1H100MF

## High voltage 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




**STmite flat**
**(DO222-AA)**

## Description

Schottky rectifier designed for high frequency miniature switch mode power supplies such as adaptors and on-board DC/DC convertors. This device is packaged in STmite flat.

**Table 1. Device summary**

| | |
|---|---|
| $I_{F(AV)}$ | 1 A |
| $V_{RRM}$ | 100 V |
| $T_j$ (max) | 175 °C |
| $V_F$ (max) | 0.62 V |

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | 100 | V |
| $I_{F(RMS)}$ | Forward current rms | | 2 | A |
| $I_{F(AV)}$ | Average forward current | $T_c$ = 160 °C $\delta$ = 0.5 | 1 | A |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms sinusoidal | 50 | A |
| $I_{RRM}$ | Repetitive peak reverse current | $t_p$ = 2 µs, F = I kHz square | 1 | A |
| $I_{RSM}$ | Non-repetitive peak reverse current | $t_p$ = 100 µs square | 1 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | $t_p$ = 1 µs $T_j$ = 25 °C | 1500 | W |
| $T_{stg}$ | Storage temperature range | | -65 to + 175 | °C |
| $T_j$ | Maximum operating junction temperature(1) | | 175 | °C |
| dV/dt | Critical rate of rise of reverse voltage (rated $V_R$, $T_j$ = 25 °C) | | 10000 | V/µs |

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

**Table 3. Thermal resistance**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case | 20 | °C/W |

**Table 4. Static electrical characteristics**

| Symbol | Parameter | Tests conditions | | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ (1) | Reverse leakage current | $T_j$ = 25 °C | $V_R = V_{RRM}$ | | | 4 | µA |
| | | $T_j$ = 125 °C | | | 0.2 | 0.5 | mA |
| $V_F$(2) | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 1 A | | | 0.77 | V |
| | | $T_j$ = 125 °C | | | 0.58 | 0.62 | |
| | | $T_j$ = 25 °C | $I_F$ = 2 A | | | 0.86 | |
| | | $T_j$ = 125 °C | | | 0.65 | 0.7 | |

1. Pulse test: = 5 ms, $\delta$ < 2%
2. Pulse test: = 380 µs, $\delta$ < 2%

To evaluate the conduction losses use the following equation: $P = 0.54 \times I_{F(AV)} + 0.08\ I_{F^2(RMS)}$

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

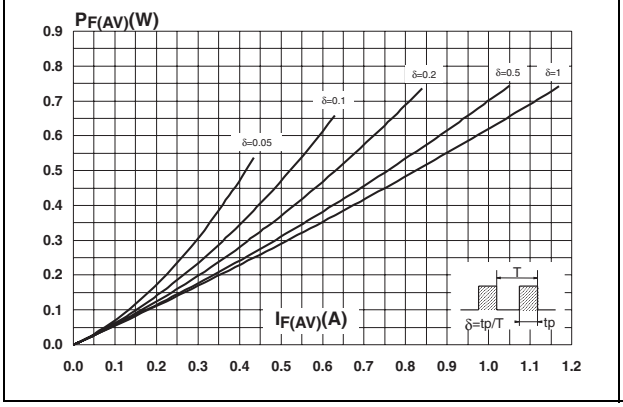



**Figure 2. Average forward current versus ambient temperature (δ = 0.5)**

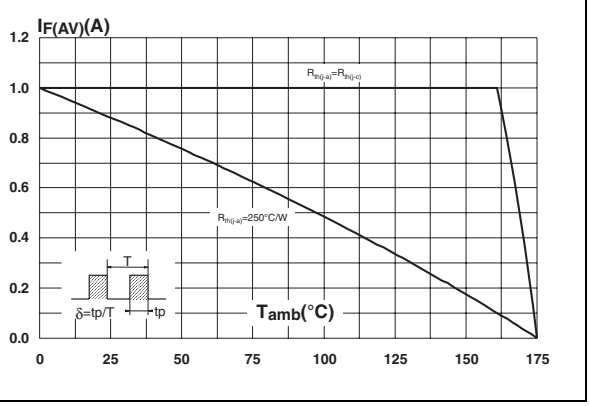



**Figure 3. Normalized avalanche power derating versus pulse duration**

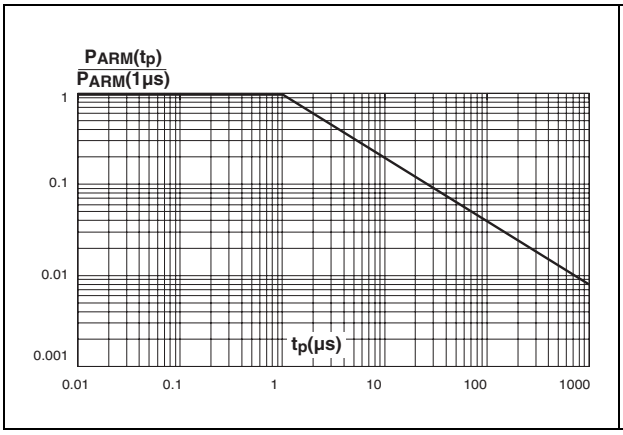



**Figure 4. Normalized avalanche power derating versus junction temperature**

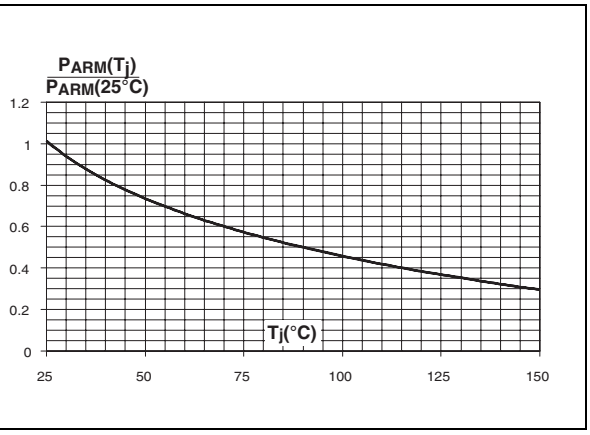



**Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)**

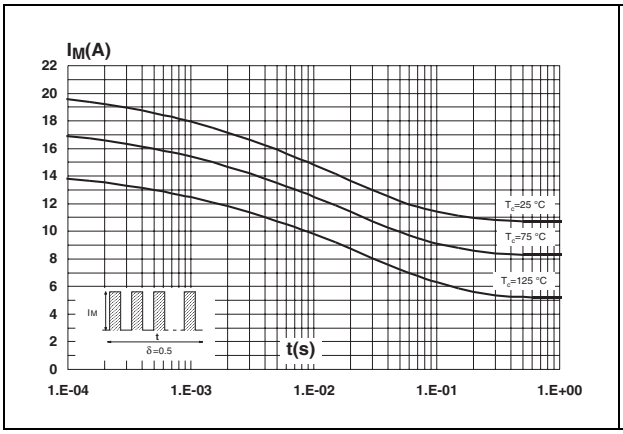



**Figure 6. Forward voltage drop versus forward current**

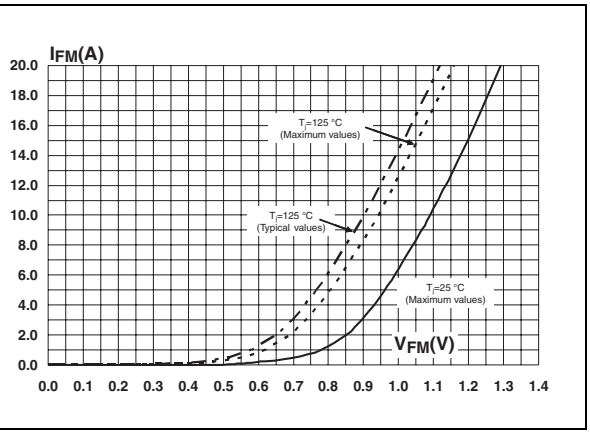


**Figure 7. Relative variation of thermal impedance, junction to ambient, versus pulse duration (epoxy printed circuit board, copper thickness = 35 µm, recommended pad layout)**

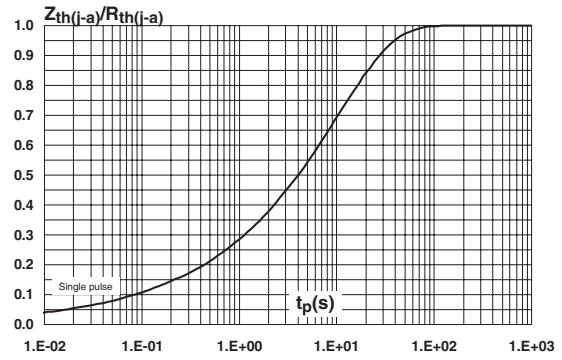



**Figure 8. Thermal resistance, junction to ambient, versus copper surface under each lead (epoxy printed board FR4, copper thickness = 35 µm)**

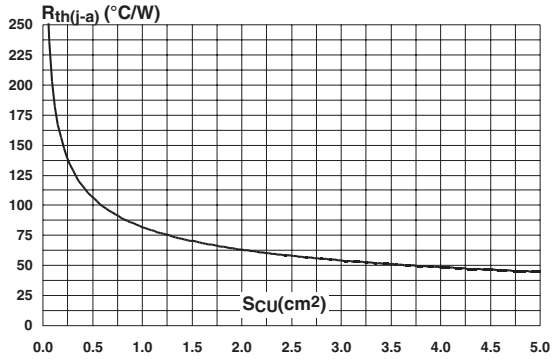



**Figure 9. Reverse leakage current versus voltage applied (typical values)**

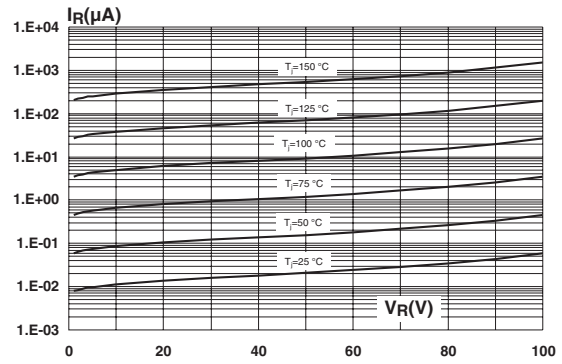
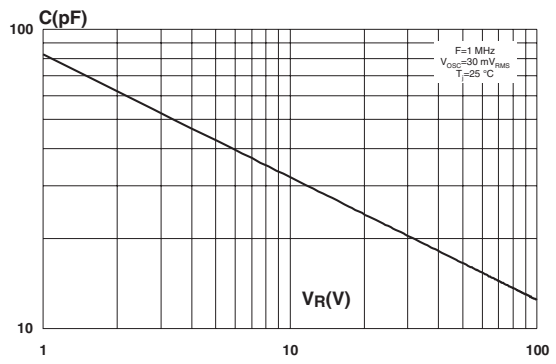



**Figure 10. Junction capacitance versus reverse voltage applied (typical values)**

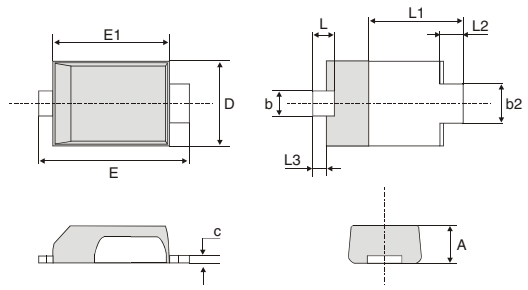


# 2 Package information

- Epoxy meets UL94, V0

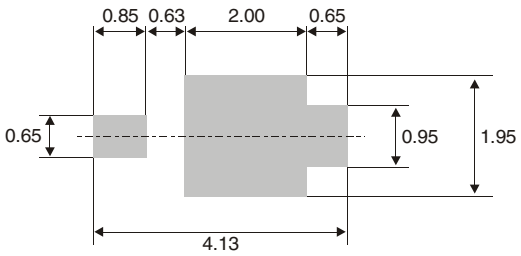
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at *www.st.com*.

**Table 5. STmite flat dimensions**




| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 0.80 | 0.85 | 0.95 | 0.031 | 0.033 | 0.037 |
| b | 0.40 | 0.55 | 0.65 | 0.016 | 0.022 | 0.026 |
| b2 | 0.70 | 0.85 | 1.00 | 0.027 | 0.033 | 0.039 |
| c | 0.10 | 0.15 | 0.25 | 0.004 | 0.006 | 0.009 |
| D | 1.75 | 1.90 | 2.05 | 0.069 | 0.075 | 0.081 |
| E | 3.60 | 3.80 | 3.90 | 0.142 | 0.150 | 0.154 |
| E1 | 2.80 | 2.95 | 3.10 | 0.110 | 0.116 | 0.122 |
| L | 0.50 | 0.55 | 0.80 | 0.020 | 0.022 | 0.031 |
| L1 | 2.10 | 2.40 | 2.60 | 0.083 | 0.094 | 0.102 |
| L2 | 0.45 | 0.60 | 0.75 | 0.018 | 0.024 | 0.030 |
| L3 | 0.20 | 0.35 | 0.50 | 0.008 | 0.014 | 0.020 |

**Figure 11. STmite flat recommended footprint (all dimensions in mm)**



# 3 Ordering information

**Table 6. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS1H100MF | M11 | STmite flat | 16 mg | 12000 | Tape and reel |

# 4 Revision history

**Table 7. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 15-May-2008 | 1 | First issue. |

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