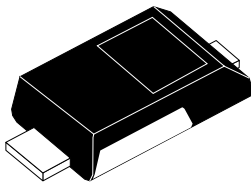


High voltage power Schottky rectifier


STmite Flat

Features

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

Description

The **STPS1H100MF** is a Schottky rectifier designed for high frequency miniature switch mode power supplies such as adaptors and on-board DC/DC convertors. This device is housed in STmite flat package.

It is ideal for lighting and telecom power applications.

| Product status link | |
|-----------------------------|--------|
| STPS1H100MF | |
| Product summary | |
| Symbol | Value |
| $I_{F(AV)}$ | 1 A |
| V_{RRM} | 100 V |
| T_j (max.) | 175 °C |
| V_F (max.) | 0.62 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(RMS)} | Forward rms current | | 2 | A |
| I _{F(AV)} | Average forward current | T _c = 160 °C, δ = 0.5 | 1 | A |
| I _{FSM} | Surge non repetitive forward current | t _p = 10 ms sinusoidal | 50 | A |
| P _{ARM} | Repetitive peak avalanche power | t _p = 10 μs, T _j = 125 °C | 108 | W |
| T _{stg} | Storage temperature range | | -65 to +175 | °C |
| T _j | Operating junction temperature range ⁽¹⁾ | | 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 parameters

| Symbol | Parameter | Max. value | Unit |
|----------------------|------------------|------------|------|
| R _{th(j-c)} | Junction to case | 20 | °C/W |

Table 3. Static electrical characteristics

| Symbol | Parameter | Test 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: t_p = 5 ms, δ < 2%

2. Pulse test: t_p = 380 μs, δ < 2%

To evaluate the conduction losses, use the following equation:

$$P = 0.54 \times I_{F(AV)} + 0.08 \times I_{F(RMS)}^2$$

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

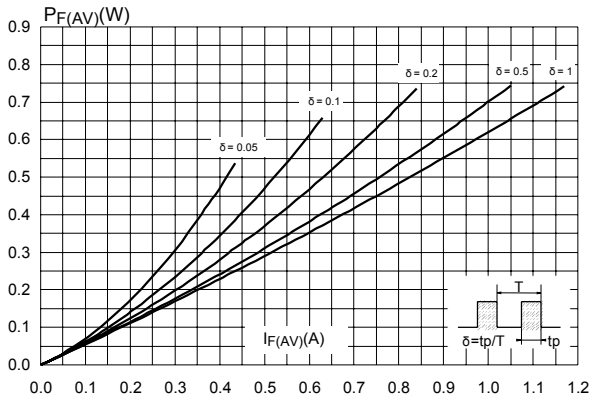


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

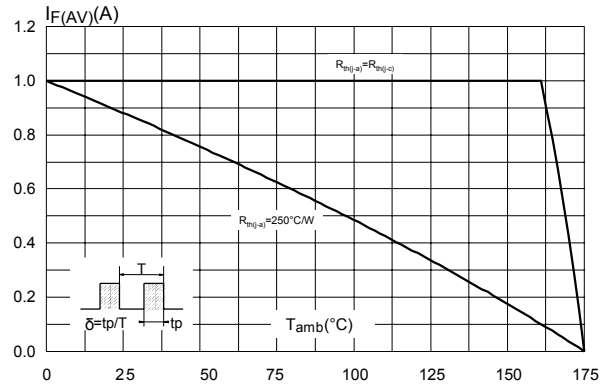


Figure 3. Normalized avalanche power derating versus junction temperature ($T_j = 125^\circ\text{C}$)

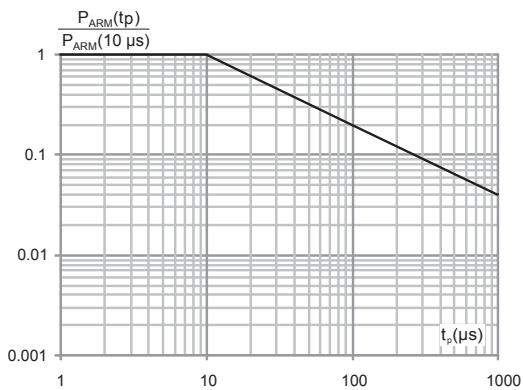


Figure 4. Forward voltage drop versus forward current

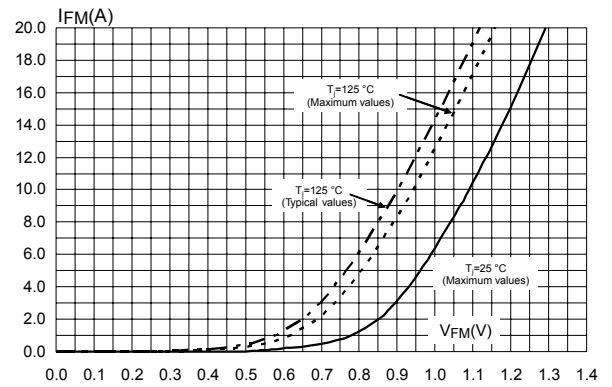


Figure 5. Relative variation of thermal impedance, junction to ambient, versus pulse duration (epoxy printed circuit board, copper thickness = 35 μm, recommended pad layout)

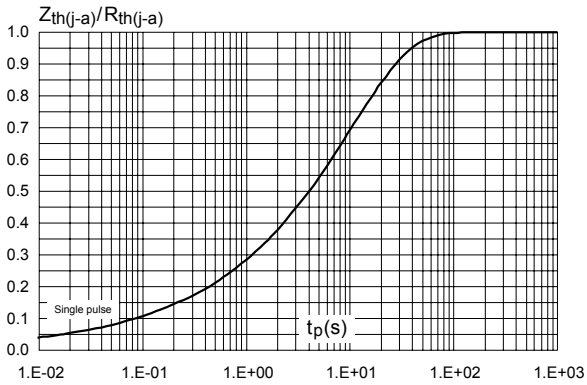


Figure 6. Thermal resistance, junction to ambient, versus copper surface under tab (epoxy printed board FR4, copper thickness = 35 μm)

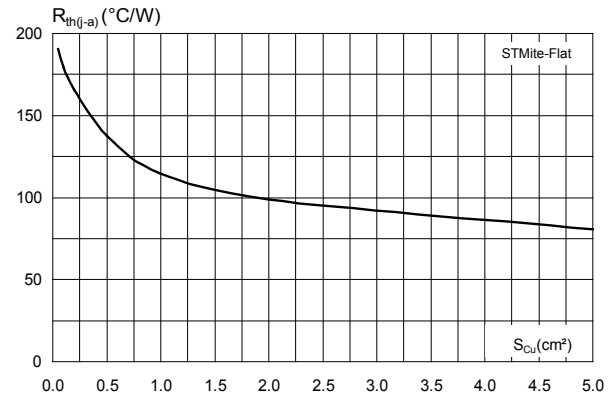


Figure 7. Reverse leakage current versus voltage applied (typical values)

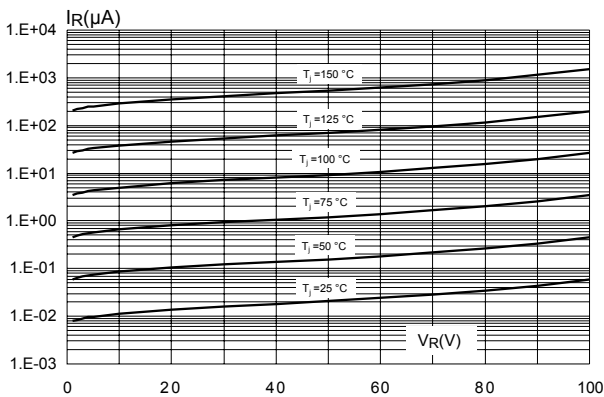
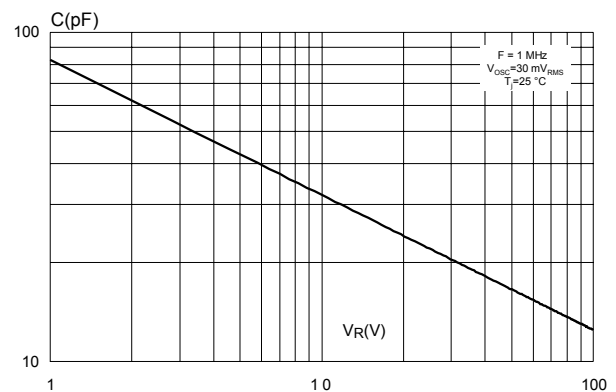


Figure 8. Junction capacitance versus reverse voltage applied (typical values)



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. ECOPACK® is an ST trademark.

2.1 STmite Flat package information

- Epoxy meets UL 94,V0

Figure 9. STmite Flat package outline

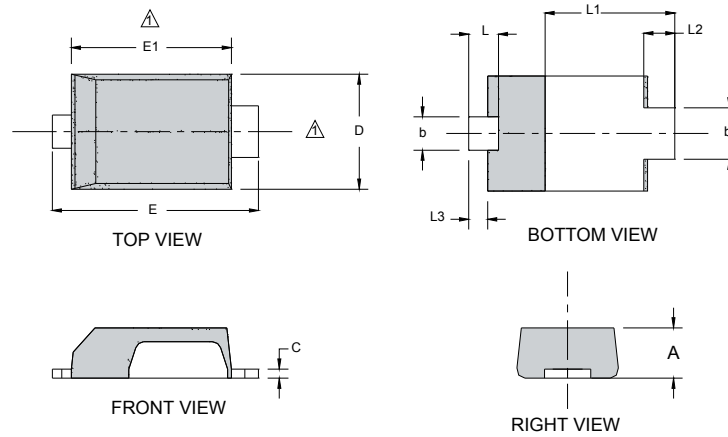
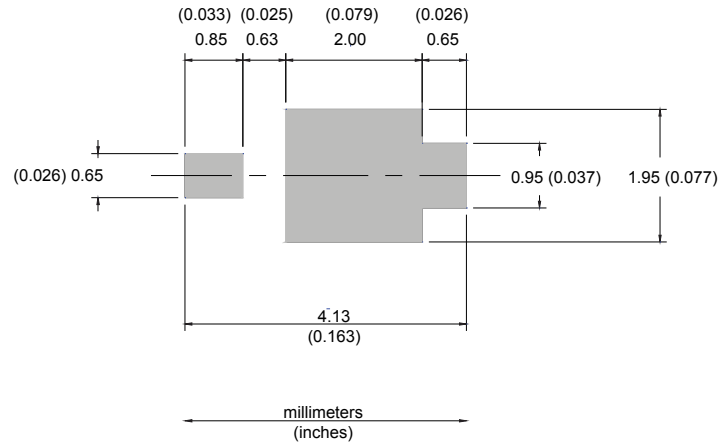


Table 4. STmite Flat package mechanical data

| 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 10. STmite Flat Recommended footprint



3 Ordering information

Table 5. Ordering information

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

Revision history

Table 6. Document revision history

| Date | Version | Changes |
|-------------|---------|--|
| 15-May-2008 | 1 | First issue. |
| 10-Apr-2018 | 2 | <p>Removed figure 4 and figure 5.</p> <p>Updated Section • Description, Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified) and Figure 3. Normalized avalanche power derating versus junction temperature (T_j = 125 °C).</p> <p>Minor text changes to improve readability.</p> |

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