# STPS61H100C

## High voltage power Schottky rectifier

**Datasheet – production data**

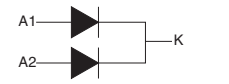
## Features

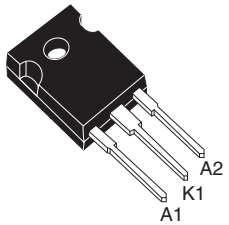
- High junction temperature capability
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Low thermal resistance
- High frequency operation

## Description

Dual center tap Schottky rectifier suited for high frequency switch mode power supply.

Packaged in TO-247, this device is intended for use to enhance the reliability of the application.




**TO-247**

**Table 1. Device summary**

| | |
|---|---|
| $I_{F(AV)}$ | 2 x 30 A |
| $V_{RRM}$ | 100 V |
| $T_j$ (max) | 175 °C |
| $V_F$(max) | 0.67 V |

# 1 Characteristics

**Table 2. Absolute ratings (limiting values, per diode)**

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 100 | V |
| $I_{F(RMS)}$ | Forward rms current | | | 80 | A |
| $I_{F(AV)}$ | Average forward current | $T_c$ = 150 °C<br>$\delta$ = 0.5 | Per diode<br>Per device | 30<br>60 | A |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms sinusoidal | | 450 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | $t_p$ = 1 µs $T_j$ = 25 °C | | 26400 | 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 | | | 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 | Per diode<br>Total | 0.9<br>0.6 | °C/W |
| $R_{th(c)}$ | Junction to case | Coupling | 0.3 | °C/W |

When the diodes 1 and 2 are used simultaneously:

$\Delta Tj$(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

**Table 4. Static electrical characteristics (per diode)**

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ (1) | Reverse leakage current | $T_j$ = 25 °C | $V_R = V_{RRM}$ | | 3 | 16 | µA |
| | | $T_j$ = 125 °C | | | 4 | 16 | mA |
| $V_F$ (1) | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 30 A | | | 0.79 | V |
| | | $T_j$ = 125 °C | $I_F$ = 30 A | | 0.63 | 0.67 | |
| | | $T_j$ = 25 °C | $I_F$ = 60 A | | | 0.93 | |
| | | $T_j$ = 125 °C | $I_F$ = 60 A | | 0.72 | 0.78 | |

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

To evaluate the conduction losses use the following equation:
$P = 0.56 \times I_{F(AV)} + 0.0036\ I_F{}^2{}_{(RMS)}$

**Figure 1. Conduction losses versus average current (per diode)**

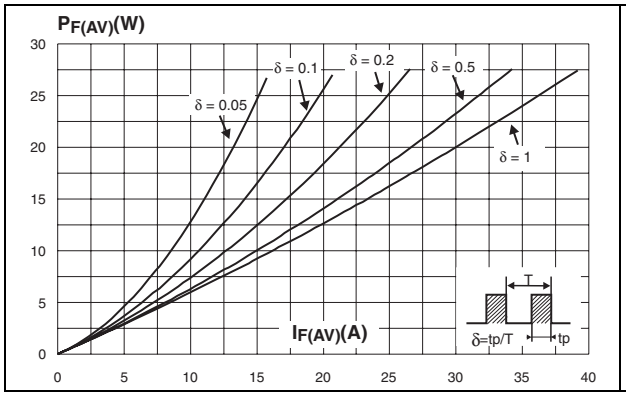



**Figure 2. Normalized avalanche power derating versus pulse duration**

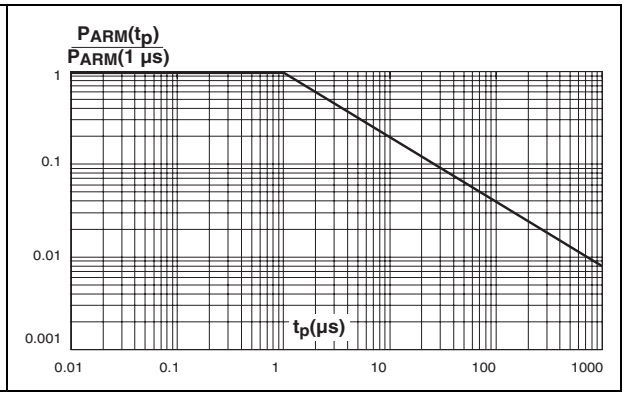



**Figure 3. Normalized avalanche power derating versus junction temperature**

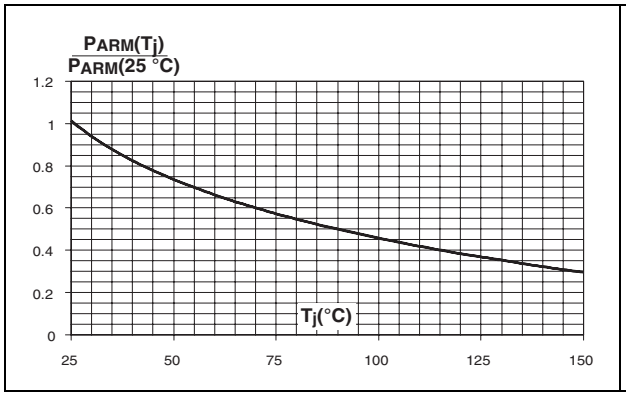



**Figure 4. Average forward current versus ambient temperature (δ = 0.5, per diode)**

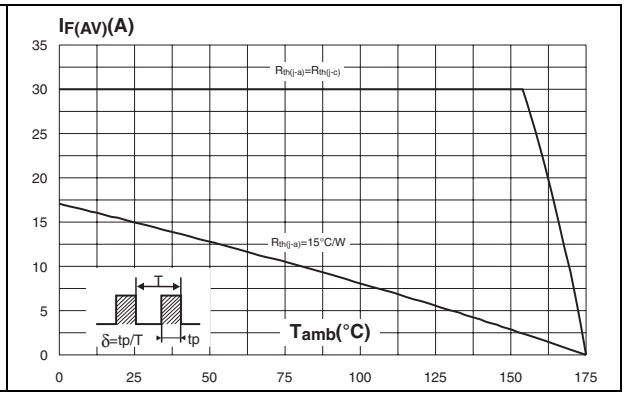



**Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)**

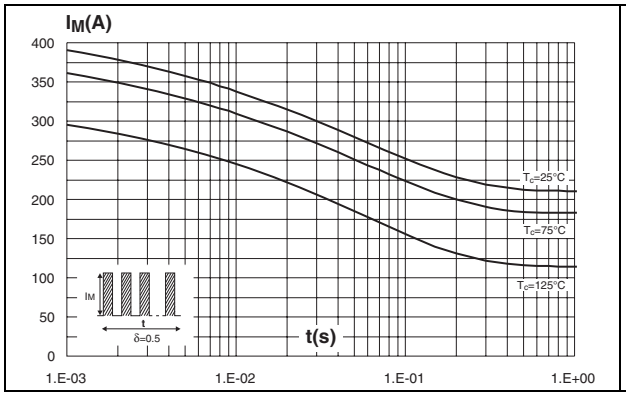



**Figure 6. Relative variation of thermal impedance junction to case versus pulse duration**

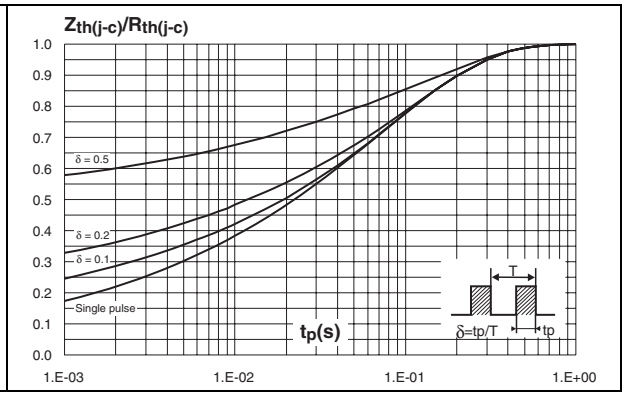


**Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)**

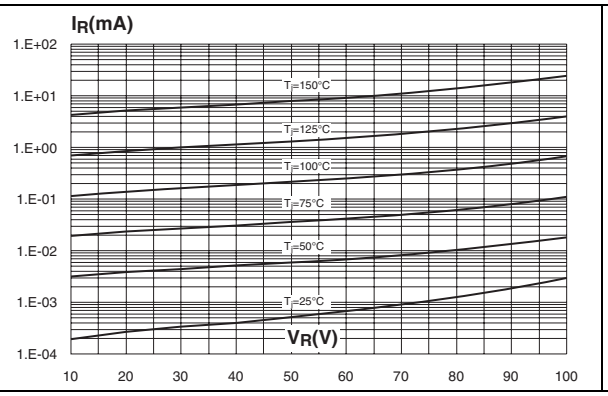



**Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)**

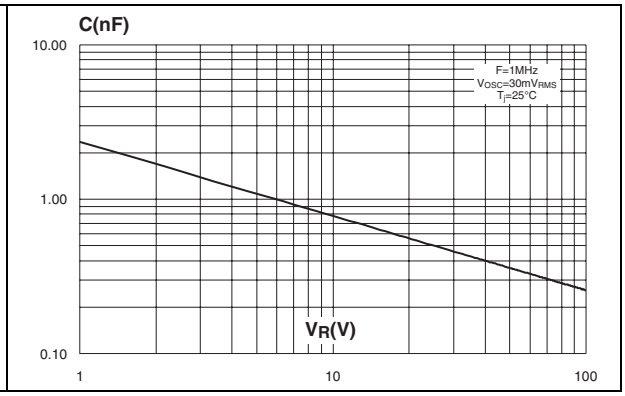
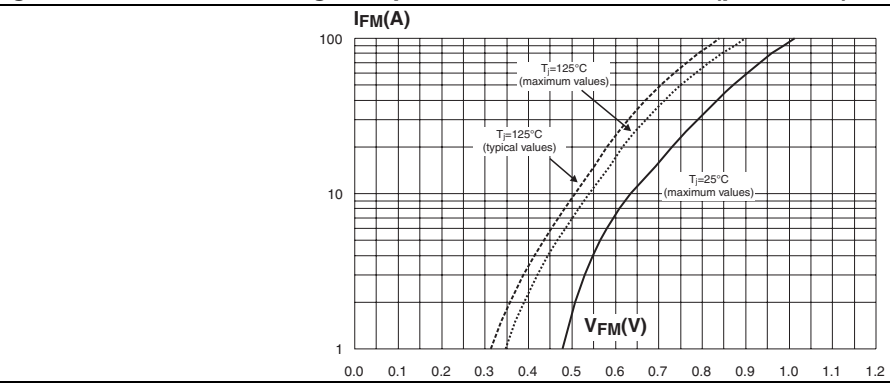



**Figure 9. Forward voltage drop versus forward current (per diode)**



# 2 Package information

- Epoxy meets UL94, V0
- Lead-free package
- Cooling method: Conduction
- Recommended torque value: 0.9 to 1.2 N·m

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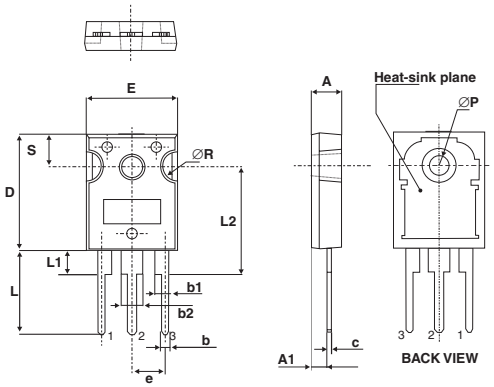
**Table 5. TO-247 dimensions**




| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.85 | | 5.15 | 0.191 | | 0.203 |
| A1 | 2.20 | | 2.60 | 0.086 | | 0.102 |
| b | 1.00 | | 1.40 | 0.039 | | 0.055 |
| b1 | 2.00 | | 2.40 | 0.078 | | 0.094 |
| b2 | 3.00 | | 3.40 | 0.118 | | 0.133 |
| c | 0.40 | | 0.80 | 0.015 | | 0.031 |
| D(1) | 19.85 | | 20.15 | 0.781 | | 0.793 |
| E | 15.45 | | 15.75 | 0.608 | | 0.620 |
| e | 5.30 | 5.45 | 5.60 | 0.209 | 0.215 | 0.220 |
| L | 14.20 | | 14.80 | 0.559 | | 0.582 |
| L1 | 3.70 | | 4.30 | 0.145 | | 0.169 |
| L2 | 18.50 typ. | | | 0.728 typ. | | |
| ∅P(2) | 3.55 | | 3.65 | 0.139 | | 0.143 |
| ∅R | 4.50 | | 5.50 | 0.177 | | 0.217 |
| S | 5.30 | 5.50 | 5.70 | 0.209 | 0.216 | 0.224 |

1. Dimension D plus gate protrusion does not exceed 20.5 mm
2. Resin thickness around the mounting hole is not less than 0.9 mm

# 3 Ordering information

**Table 6. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS61H100CW | STPS61H100CW | TO-247 | 4.4 g | 30 | Tube |

# 4 Revision history

**Table 7. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| Oct-2003 | 1A | Previous version |
| Sep-2006 | 2 | Reformatted for internal distribution. |
| 12-Mar-2012 | 3 | Updated package dimension nomenclature and illustration in *Table 5*. Dimensions of actual package remain unchanged. |

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