# STPS30H60-Y

## Automotive power Schottky rectifier

**Datasheet – production data**

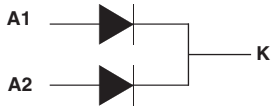
## Features

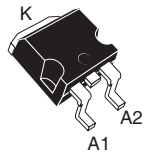
- High junction temperature capability
- Avalanche rated
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- High frequency operation
- AEC-Q 101 qualified

## Description

Dual centre tab Schottky rectifier suited for high frequency switch mode power supply.

Packaged in $D^2PAK$, this device is designed for use in automotive applications. In these applications this device provides a good margin between the remaining voltage applied on the diode and the voltage capability of the diode.




**$D^2PAK$**
**STPS30H60CGY-TR**

**Table 1. Device summary**

| Symbol | Value |
|---|---|
| $I_{F(AV)}$ | 2 X 15 A |
| $V_{RRM}$ | 60 V |
| $T_j$ | 175 °C |
| $V_{F\ (typ)}$ | 0.535 V |

# 1 Characteristics

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

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 60 | V |
| $I_{F(RMS)}$ | Forward rms current | | | 30 | A |
| $I_{F(AV)}$ | Average forward current, $\delta = 0.5$ | $T_c = 155$ °C | Per diode | 15 | A |
| | | | Total package | 30 | |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p = 10$ ms sinusoidal | | 230 | A |
| $P_{ARM}$ | Relative peak avalanche power | $T_j = 125$ °C | $t_p = 10$ µs | 715 | W |
| $T_j$ | Operating junction temperature range(1) | | | -40 to + 175 | °C |
| $T_{stg}$ | Storage temperature range | | | -65 to + 175 | °C |

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

**Table 3. Thermal parameters**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case | Per diode | 1.5 | °C/W |
| | | Total | 0.8 | |
| $R_{th(c)}$ | Coupling | | 0.1 | |

**Table 4. Static electrical characteristics**

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$(1) | Reverse leakage current | $T_j = 25$ °C | $V_R = V_{RRM}$ | | | 60 | µA |
| | | $T_j = 125$ °C | | | 8 | 25 | mA |
| $V_F$(2) | Forward voltage drop | $T_j = 25$ °C | $I_F = 7.5$ A | | | 550 | mV |
| | | $T_j = 125$ °C | | | 435 | 470 | |
| | | $T_j = 25$ °C | $I_F = 15$ A | | | 660 | |
| | | $T_j = 125$ °C | | | 535 | 570 | |
| | | $T_j = 25$ °C | $I_F = 30$ A | | | 820 | |
| | | $T_j = 125$ °C | | | 635 | 690 | |

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

To evaluate the conduction losses use the following equation:

$P = 0.45 \times I_{F(AV)} + 0.008 \times I_F{}^2{}_{(RMS)}$

**Figure 1. Conduction losses versus average forward current**

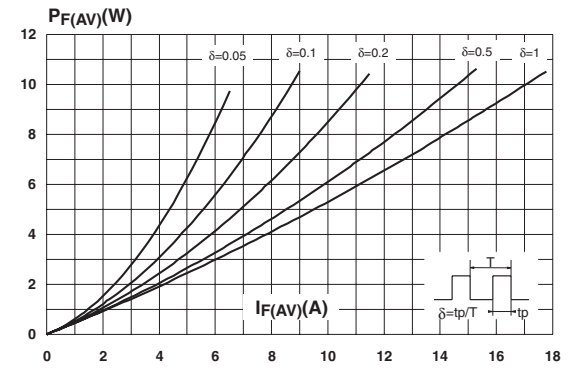



**Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)**

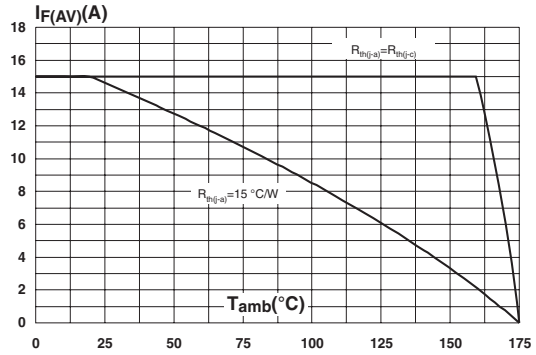



**Figure 3. Normalized avalanche power derating versus pulse duration**

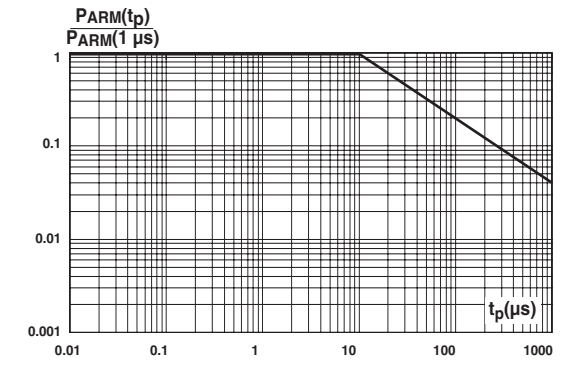



**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**

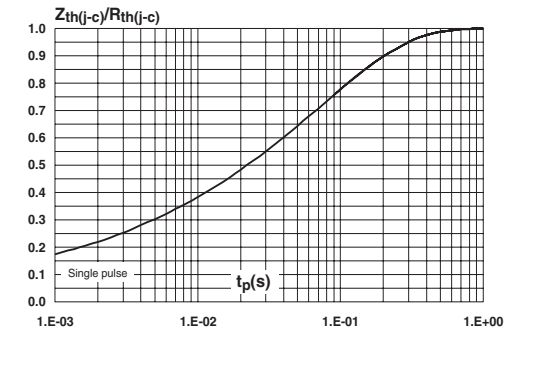



**Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)**

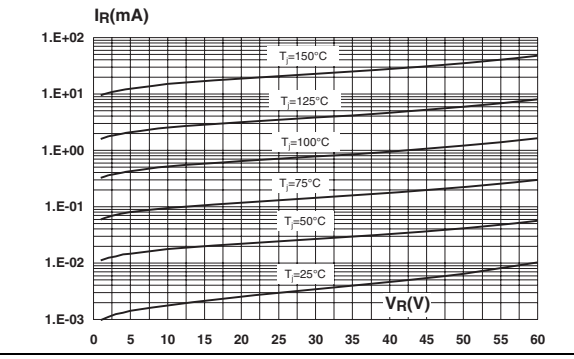



**Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)**

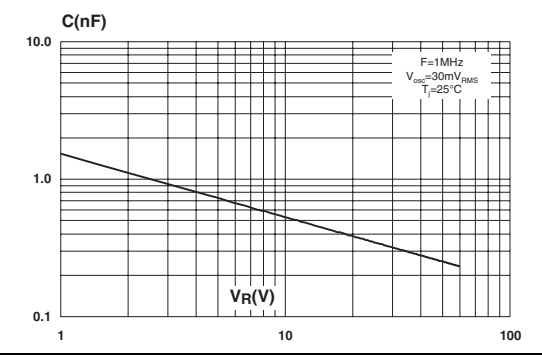


**Figure 7. Forward voltage drop versus forward current (per diode)**

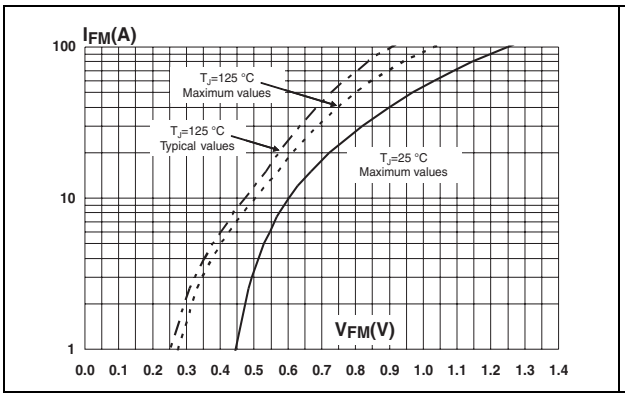
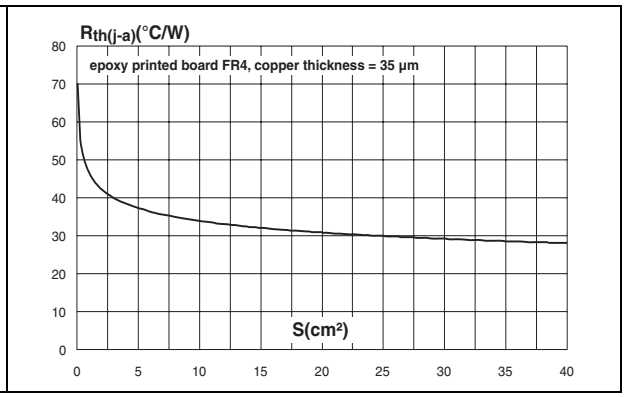



**Figure 8. Thermal resistance junction to ambient versus copper surface under tab**

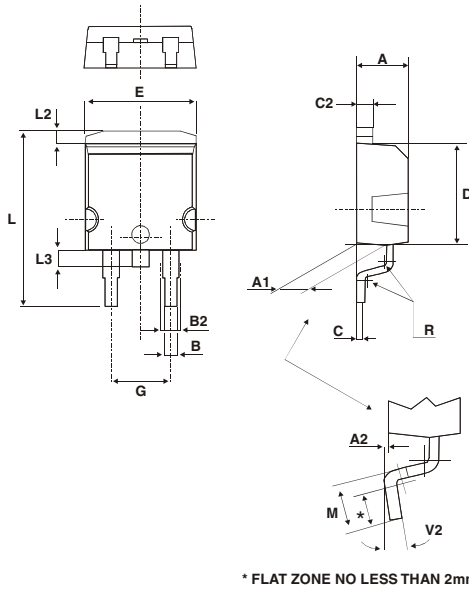


# 2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

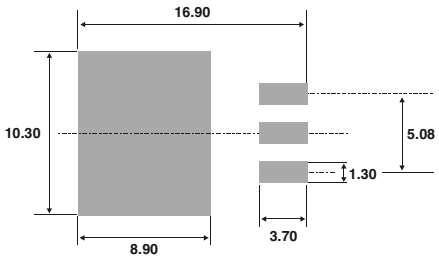
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

**Table 5. D²PAK dimensions**




| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| A1 | 2.49 | 2.69 | 0.098 | 0.106 |
| A2 | 0.03 | 0.23 | 0.001 | 0.009 |
| B | 0.70 | 0.93 | 0.027 | 0.037 |
| B2 | 1.14 | 1.70 | 0.045 | 0.067 |
| C | 0.45 | 0.60 | 0.017 | 0.024 |
| C2 | 1.23 | 1.36 | 0.048 | 0.054 |
| D | 8.95 | 9.35 | 0.352 | 0.368 |
| E | 10.00 | 10.40 | 0.393 | 0.409 |
| G | 4.88 | 5.28 | 0.192 | 0.208 |
| L | 15.00 | 15.85 | 0.590 | 0.624 |
| L2 | 1.27 | 1.40 | 0.050 | 0.055 |
| L3 | 1.40 | 1.75 | 0.055 | 0.069 |
| M | 2.40 | 3.20 | 0.094 | 0.126 |
| R | 0.40 typ. | | 0.016 typ. | |
| V2 | 0° | 8° | 0° | 8° |

**Figure 9. Footprint (dimensions in millimeters)**



# 3 Ordering information

**Table 6. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS30H60CGY-TR | STPS30H60CGY-TR | $D^2PAK$ | 1.48 g | 1000 | Tape and reel |

# 4 Revision history

**Table 7. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 20-Mar-2012 | 1 | First issue. |

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