

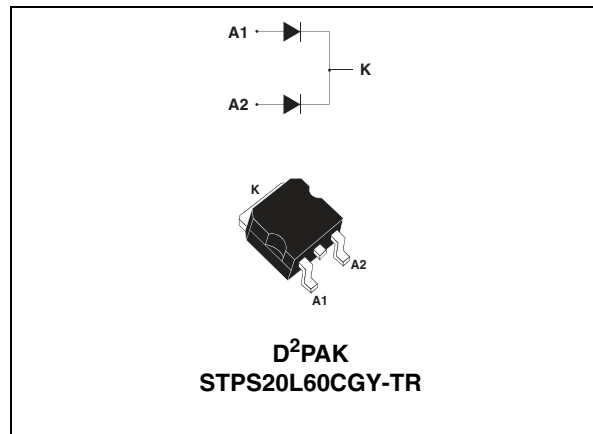
### Features

- Low forward voltage drop
- Negligible switching losses
- Low thermal resistance
- Avalanche capability specified
- AEC-Q101 qualified

### Description

This dual center tap Schottky rectifier is suited for switched mode power supplies and high frequency DC to DC converters.

Packaged in D<sup>2</sup>PAK, this device is intended for use in high frequency inverters for automotive applications.



**Table 1. Device summary**

|             |          |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 10 A |
| $V_{RRM}$   | 60 V     |
| $T_j(max)$  | 150 °C   |
| $V_F(max)$  | 0.56 V   |

# 1 Characteristics

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

| Symbol              | Parameter   |                                    | Value   | Unit |   |
|---------------------|---|------------------------------------|---|------|---|
| V <sub>RRM</sub>    | Repetitive peak reverse voltage                     |                                    | 60  | V    |   |
| I <sub>F(RMS)</sub> | Forward rms current                                 |                                    | 30  | A    |   |
| I <sub>F(AV)</sub>  | Average forward current                             | T <sub>C</sub> = 140 °C<br>δ = 0.5 | Per diode<br>20<br>Per device                 | A    |   |
| I <sub>FSM</sub>    | Surge non repetitive forward current                |                                    | t <sub>p</sub> = 10 ms, sinusoidal            | 220  | A |
| I <sub>RRM</sub>    | Repetitive peak reverse current                     |                                    | t <sub>p</sub> = 2 μs square, F = 1 kHz       | 1    | A |
| P <sub>ARM</sub>    | Repetitive peak avalanche power                     |                                    | t <sub>p</sub> = 1 μs, T <sub>j</sub> = 25 °C | 5800 | W |
| T <sub>stg</sub>    | Storage temperature range                           |                                    | -65 to + 175                                  | °C   |   |
| T <sub>j</sub>      | Operating junction temperature range <sup>(1)</sup> |                                    | -40 to + 150                                  | °C   |   |
| dV/dt               | Critical rate of rise reverse voltage               |                                    | 10000   | V/μs |   |

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  condition to avoid thermal runaway for a diode on its own heatsink

**Table 3. Thermal resistances**

| Symbol               | Parameter        |                    | Value       | Unit |
|----------------------|------------------|--------------------|-------------|------|
| R <sub>th(j-c)</sub> | Junction to case | Per diode<br>Total | 1.6<br>0.85 | °C/W |
| R <sub>th(c)</sub>   | Coupling         |                    | 0.1         | °C/W |

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_{j(\text{diode } 1)} = P_{(\text{diode } 1)} \times R_{th(j-c)}(\text{per diode}) + P_{(\text{diode } 2)} \times R_{th(c)}$$

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

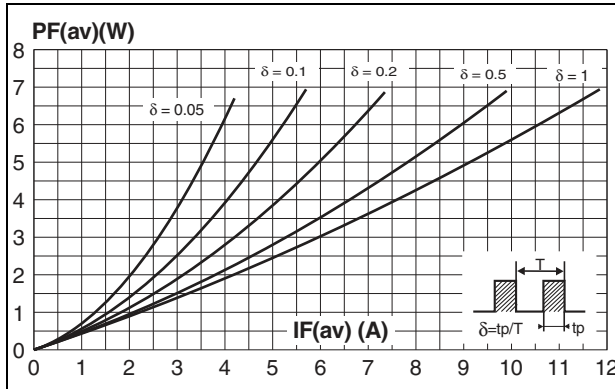
| Symbol                        | Parameter               | Tests conditions        |                                   | Min. | Typ. | Max. | Unit |
|-------------------------------|-------------------------|-------------------------|-----------------------------------|------|------|------|------|
| I <sub>R</sub> <sup>(1)</sup> | Reverse leakage current | T <sub>j</sub> = 25 °C  | V <sub>R</sub> = V <sub>RRM</sub> |      |      | 350  | μA   |
|                               |                         | T <sub>j</sub> = 125 °C |                                   |      | 65   | 95   | mA   |
| V <sub>F</sub> <sup>(1)</sup> | Forward voltage drop    | T <sub>j</sub> = 25 °C  | I <sub>F</sub> = 10 A             |      |      | 0.6  | V    |
|                               |                         | T <sub>j</sub> = 125 °C | I <sub>F</sub> = 10 A             |      | 0.48 | 0.56 |      |
|                               |                         | T <sub>j</sub> = 25 °C  | I <sub>F</sub> = 20 A             |      |      | 0.74 |      |
|                               |                         | T <sub>j</sub> = 125 °C | I <sub>F</sub> = 20 A             |      | 0.62 | 0.7  |      |

1. Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

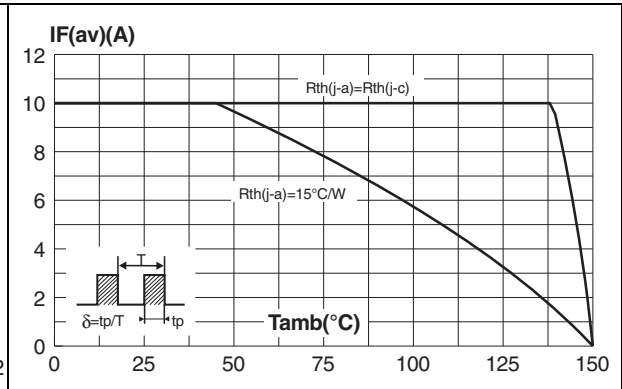
To evaluate the conduction losses use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.014 \times I_{F(RMS)}^2$$

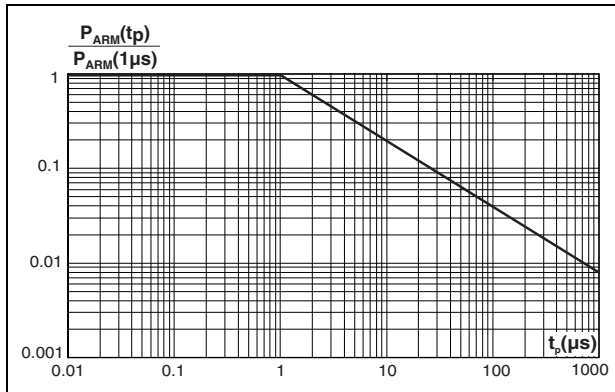
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



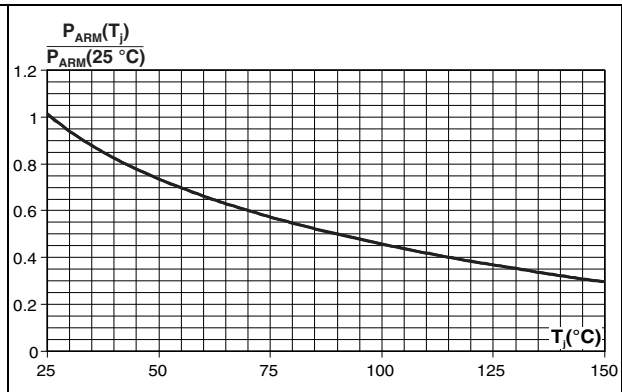
**Figure 2. Average current versus ambient temperature (delta = 0.5) (per diode)**



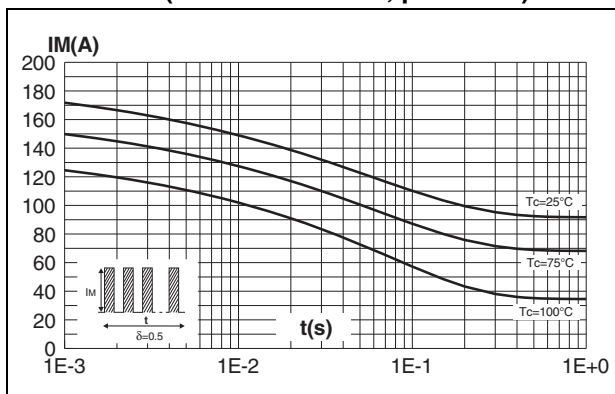
**Figure 3. Normalized avalanche power derating versus pulse duration**



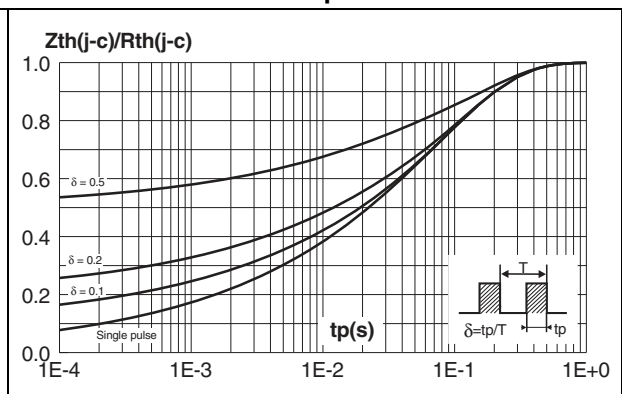
**Figure 4. Normalized avalanche power derating versus junction temperature**



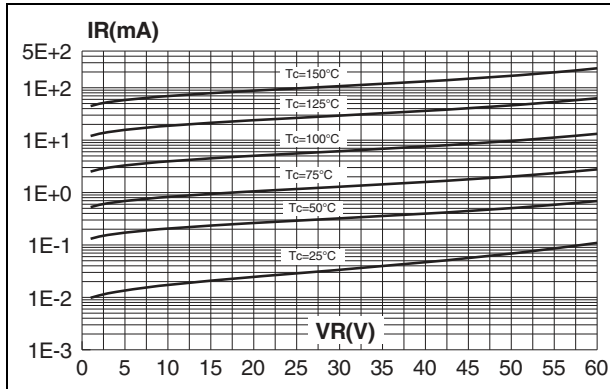
**Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)**



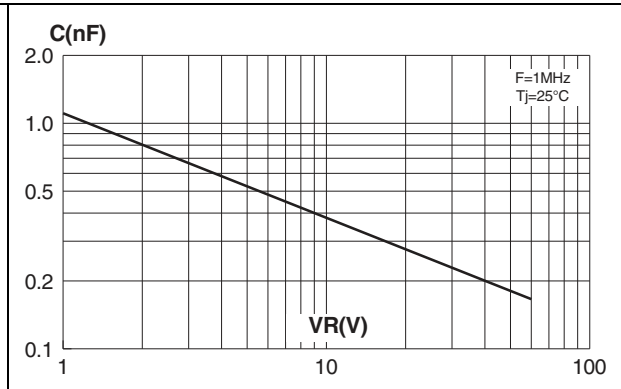
**Figure 6. Relative variation of thermal transient impedance junction to case versus pulse duration**



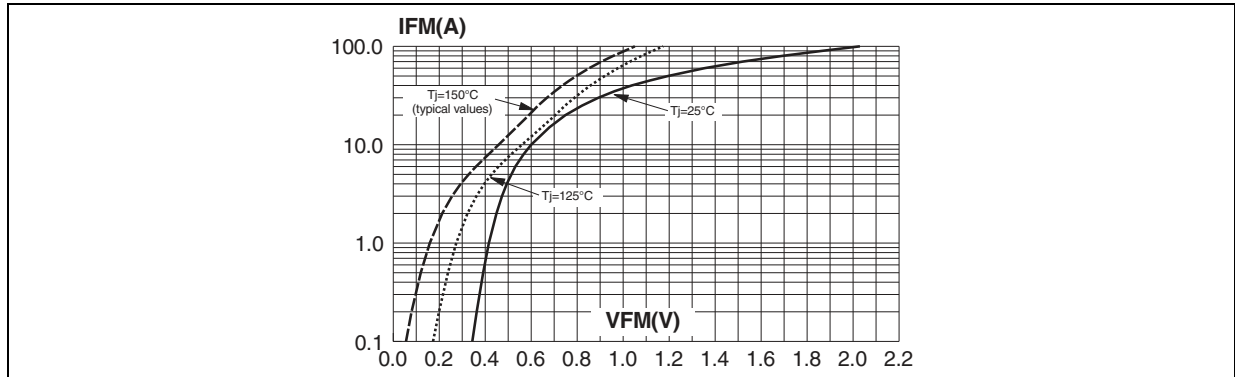
**Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



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



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



## 2 Package information

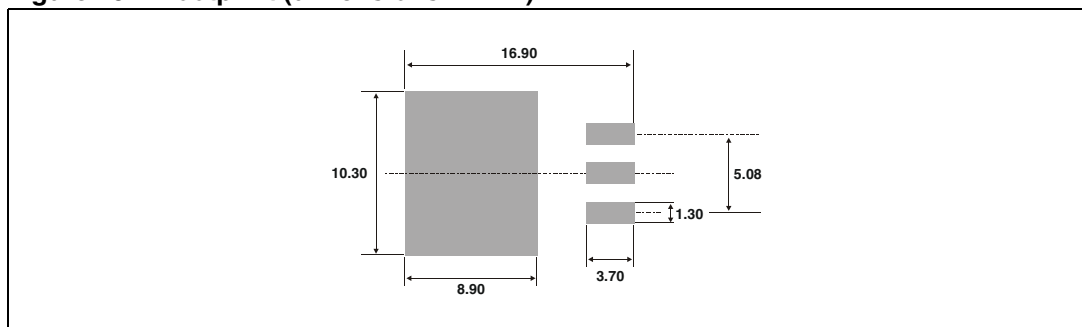
- Epoxy meets UL94, V0
- Cooling method: by conduction (method C)

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](http://www.st.com). ECOPACK® is an ST trademark.

**Table 5. D<sup>2</sup>PAK 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 10. Footprint (dimensions in mm)**



### 3 Ordering information

Table 6. Ordering information

| Order code      | Marking      | Package            | Weight | Base qty | Delivery mode |
|-----------------|--------------|--------------------|--------|----------|---------------|
| STPS20L60CGY-TR | STPS20L60CGY | D <sup>2</sup> PAK | 1.48 g | 1000     | Tape and reel |

### 4 Revision history

Table 7. Document revision history

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 24-Oct-2012 | 1        | Initial release. |

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