

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 D²PAK, this device is intended for use in high frequency inverters for automotive applications.

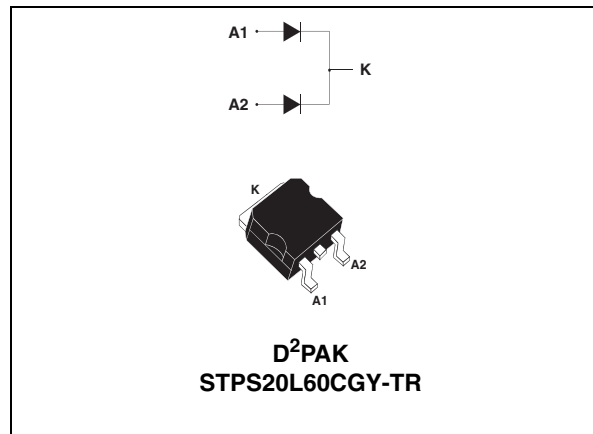


Table 1. Device summary

| | |
|-------------|----------|
| $I_{F(AV)}$ | 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 _{RRM} | Repetitive peak reverse voltage | | 60 | V | |
| I _{F(RMS)} | Forward rms current | | 30 | A | |
| I _{F(AV)} | Average forward current | T _C = 140 °C δ = 0.5 | Per diode 20 Per device | A | |
| I _{FSM} | Surge non repetitive forward current | | t _p = 10 ms, sinusoidal | 220 | A |
| I _{RRM} | Repetitive peak reverse current | | t _p = 2 μs square, F = 1 kHz | 1 | A |
| P _{ARM} | Repetitive peak avalanche power | | t _p = 1 μs, T _j = 25 °C | 5800 | W |
| T _{stg} | Storage temperature range | | -65 to + 175 | °C | |
| T _j | Operating junction temperature range ⁽¹⁾ | | -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 _{th(j-c)} | Junction to case | Per diode Total | 1.6 0.85 | °C/W |
| R _{th(c)} | 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 _R ⁽¹⁾ | Reverse leakage current | T _j = 25 °C | V _R = V _{RRM} | | | 350 | μA |
| | | T _j = 125 °C | | | 65 | 95 | mA |
| V _F ⁽¹⁾ | Forward voltage drop | T _j = 25 °C | I _F = 10 A | | | 0.6 | V |
| | | T _j = 125 °C | I _F = 10 A | | 0.48 | 0.56 | |
| | | T _j = 25 °C | I _F = 20 A | | | 0.74 | |
| | | T _j = 125 °C | I _F = 20 A | | 0.62 | 0.7 | |

1. Pulse test: t_p = 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)

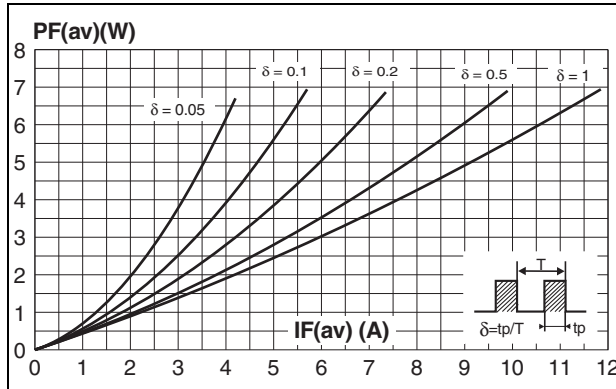


Figure 2. Average current versus ambient temperature (delta = 0.5) (per diode)

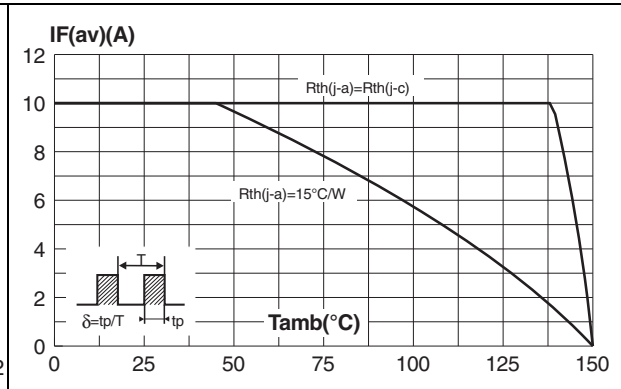


Figure 3. Normalized avalanche power derating versus pulse duration

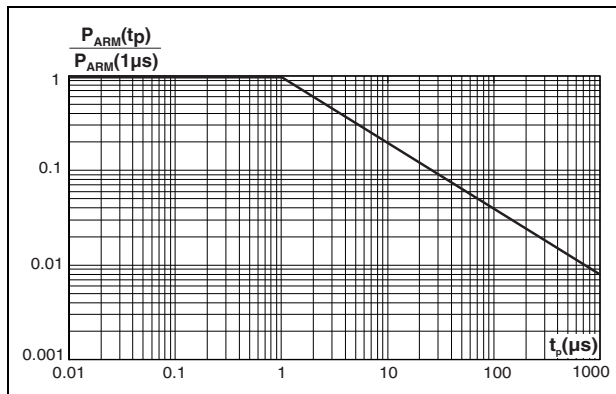


Figure 4. Normalized avalanche power derating versus junction temperature

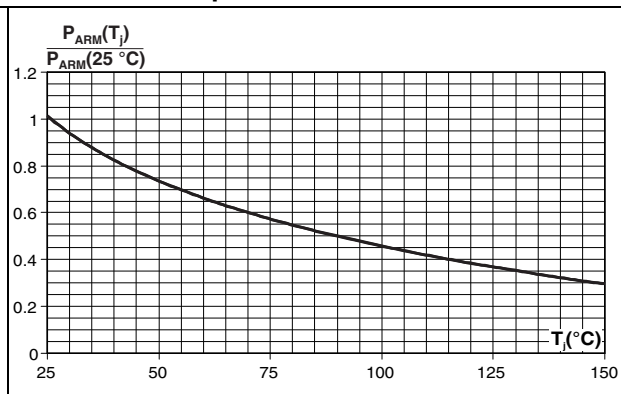


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

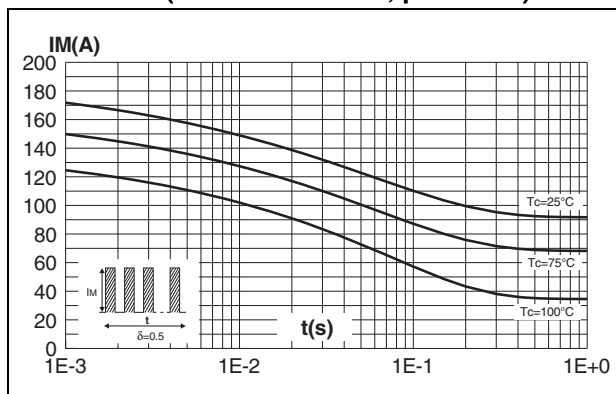


Figure 6. Relative variation of thermal transient impedance junction to case versus pulse duration

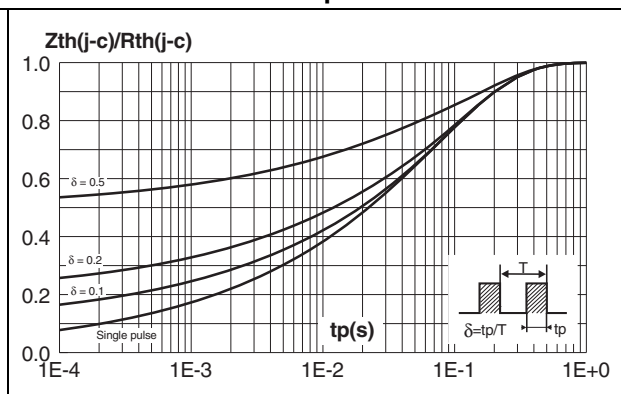


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

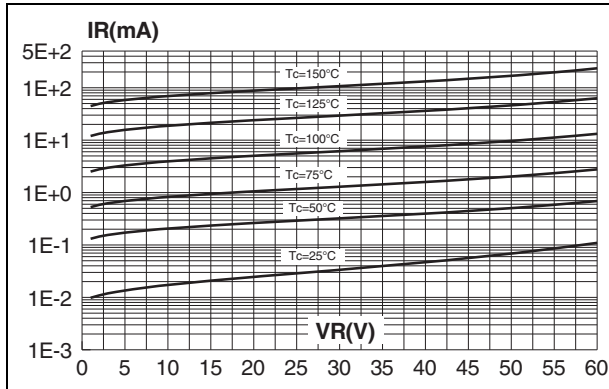


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

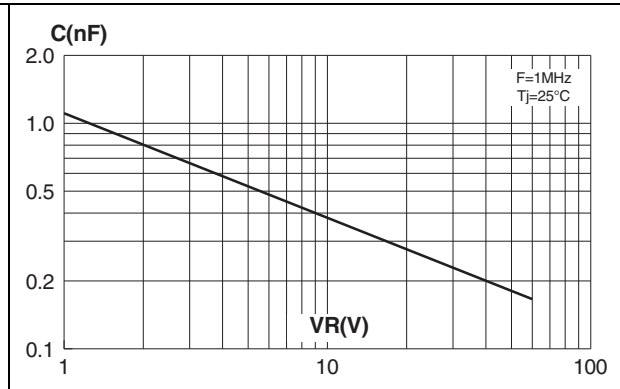
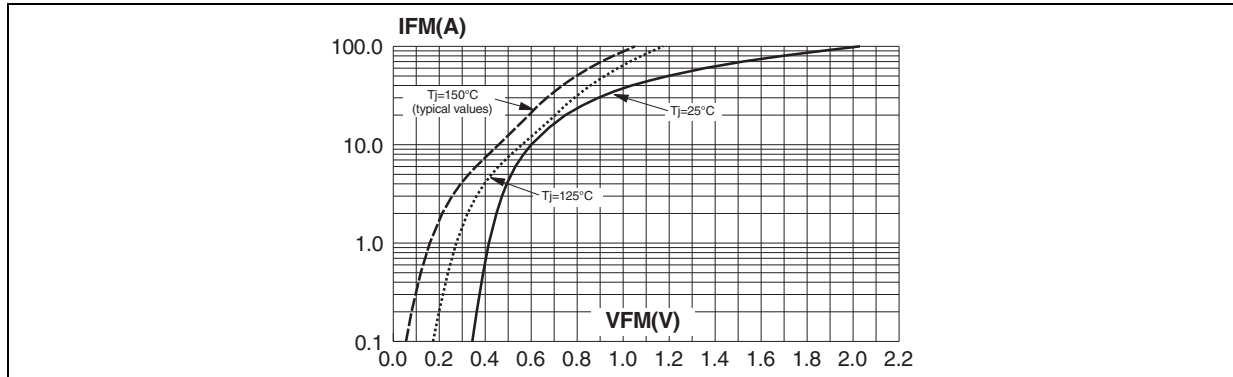


Figure 9. Forward voltage drop versus forward current (maximum values, per diode)



2 Package information

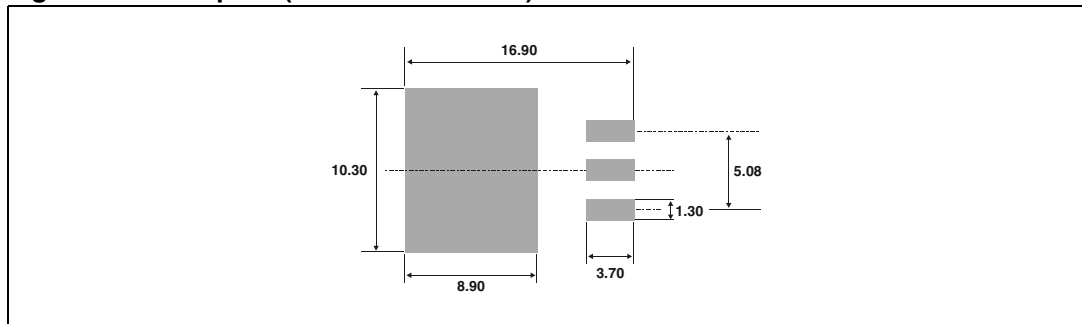
- Epoxy meets UL94, V0
- Cooling method: by conduction (method C)

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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 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 ² 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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