

Main product characteristics

| | |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 20 A |
| V_{RRM} | 60 V |
| $T_j(max)$ | 150° C |
| $V_F(max)$ | 0.58 V |

Features and benefits

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

Description

Dual center tap Schottky rectifiers suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in D²PAK, I²PAK and TO-220AB, this device is intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.

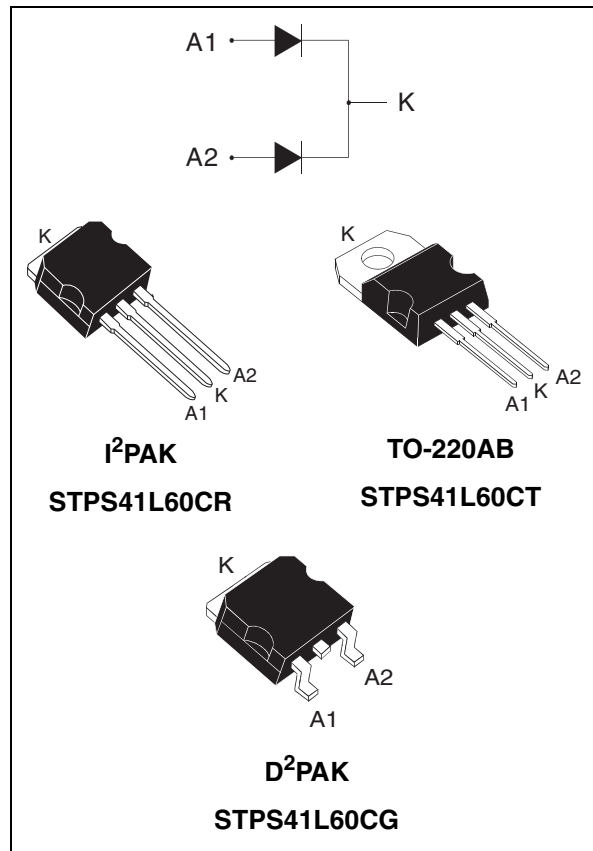


Table 1. Absolute ratings (limiting values, per diode)

| Symbol | Parameter | | Value | Unit | |
|--------------|---|---|--------------|------|---|
| V_{RRM} | Repetitive peak reverse voltage | | 60 | V | |
| $I_{F(RMS)}$ | RMS forward current | | 30 | A | |
| $I_{F(AV)}$ | Average forward current | $T_C = 125^\circ\text{C}$ | Per diode | 20 | A |
| | | $\delta = 0.5$ | Per device | 40 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ ms}$ Sinusoidal | 220 | A | |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1\ \mu\text{s}$ $T_j = 25^\circ\text{C}$ | 9500 | W | |
| T_{stg} | Storage temperature range | | -65 to + 175 | ° C | |
| T_j | Maximum operating junction temperature ⁽¹⁾ | | 150 | ° C | |

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

1 Characteristics

Table 2. Thermal resistances

| 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 | |

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 3. Static electrical characteristics (per diode)

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|-------------|-------------------------|---------------------------|--------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = V_{RRM}$ | | | 600 | μA |
| | | $T_j = 125^\circ\text{C}$ | | | 100 | 175 | mA |
| $V_F^{(1)}$ | Forward voltage drop | $T_j = 25^\circ\text{C}$ | $I_F = 20\text{A}$ | | | 0.60 | V |
| | | $T_j = 125^\circ\text{C}$ | $I_F = 20\text{A}$ | | 0.50 | 0.58 | |
| | | $T_j = 25^\circ\text{C}$ | $I_F = 40\text{A}$ | | | 0.77 | |
| | | $T_j = 125^\circ\text{C}$ | $I_F = 40\text{A}$ | | 0.67 | 0.71 | |

1. Pulse test: $t_p = 380\ \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:
 $P = 0.42 \times I_{F(AV)} + 0.007 \times I_F^2(\text{RMS})$

Figure 1. Conduction losses versus average current

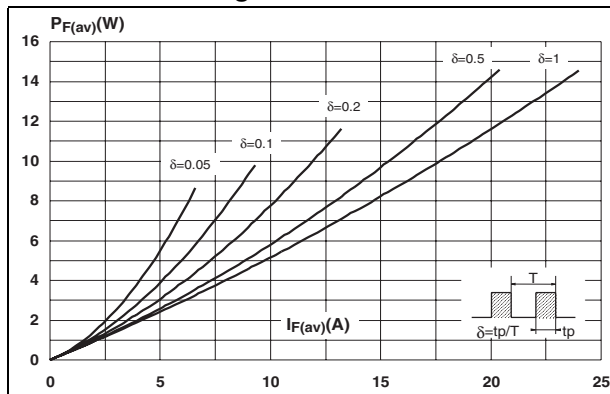


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

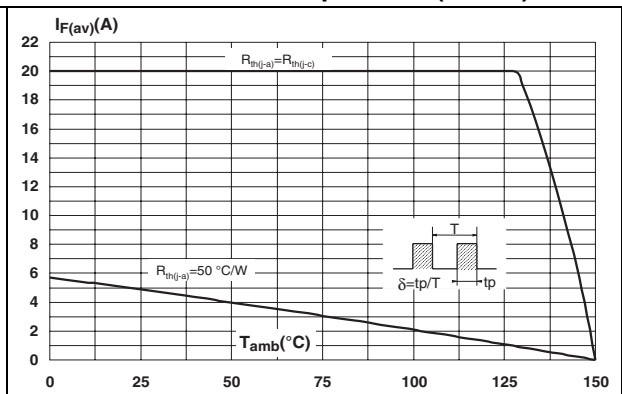


Figure 3. Normalized avalanche power derating versus pulse duration

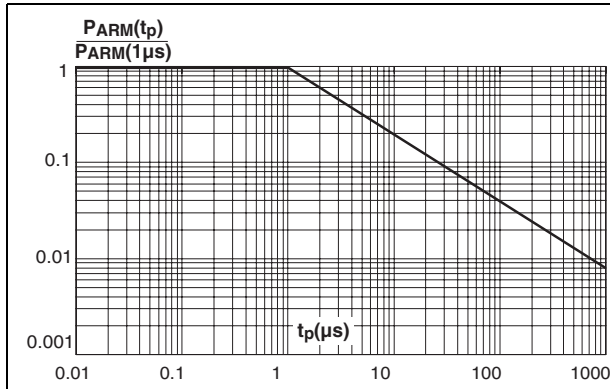


Figure 4. Normalized avalanche power derating versus junction temperature

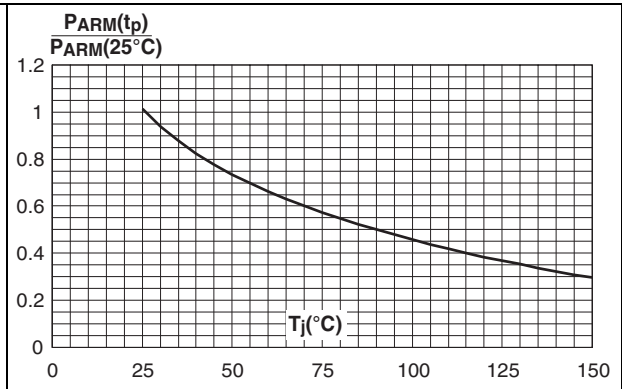


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

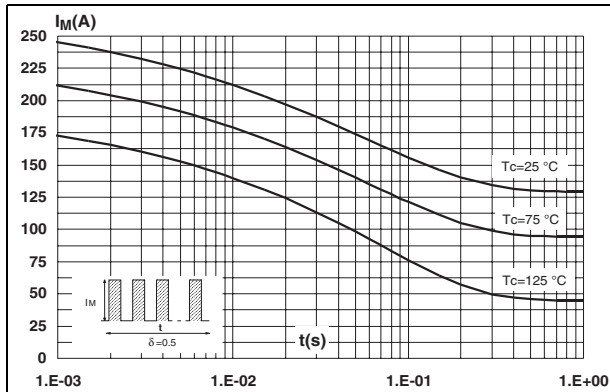


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

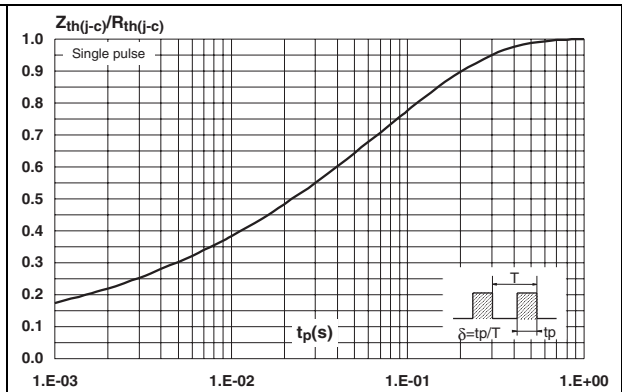


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

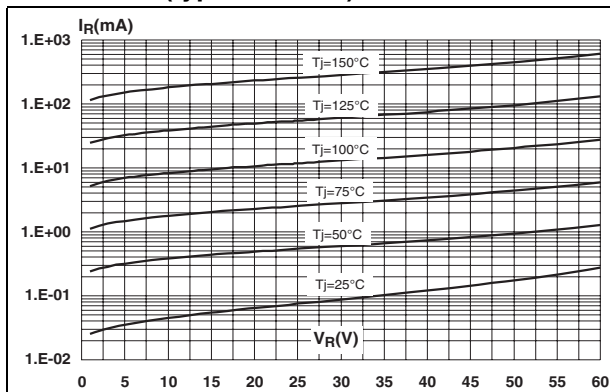


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

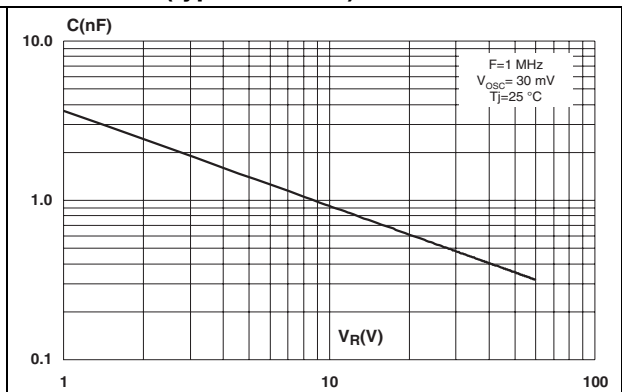


Figure 9. Forward voltage drop versus forward current

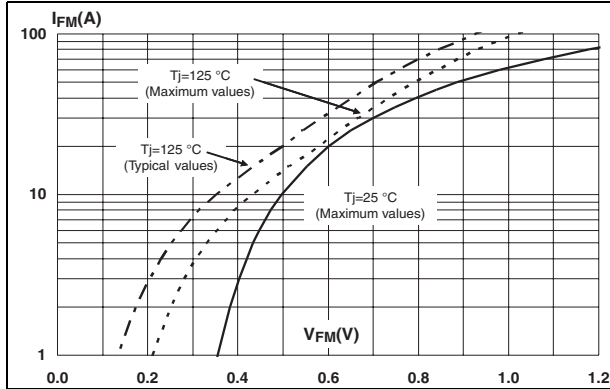
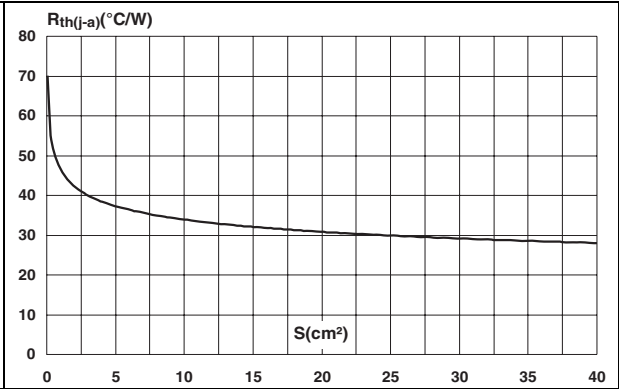


Figure 10. Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35 μm) (STPS41L60CG only)



2 Package information

- Epoxy meets UL94,V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 Nm
- Maximum torque value: 1.0 Nm

Figure 11. Package dimensions I²PAK

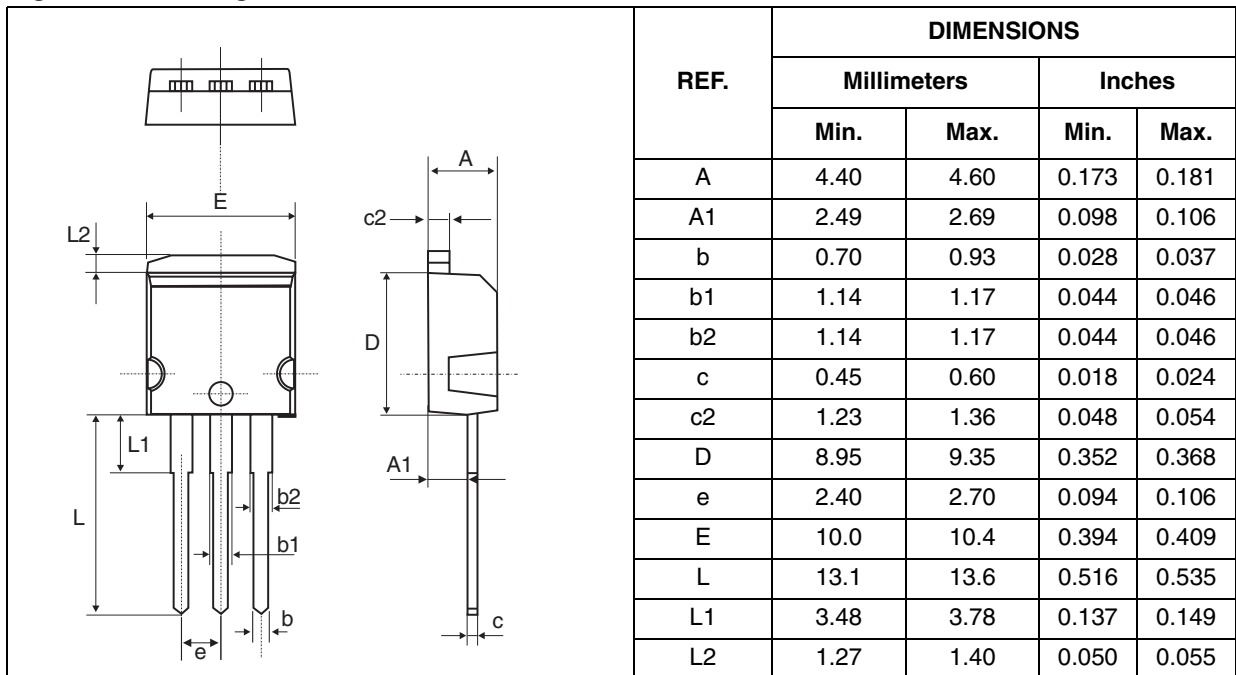


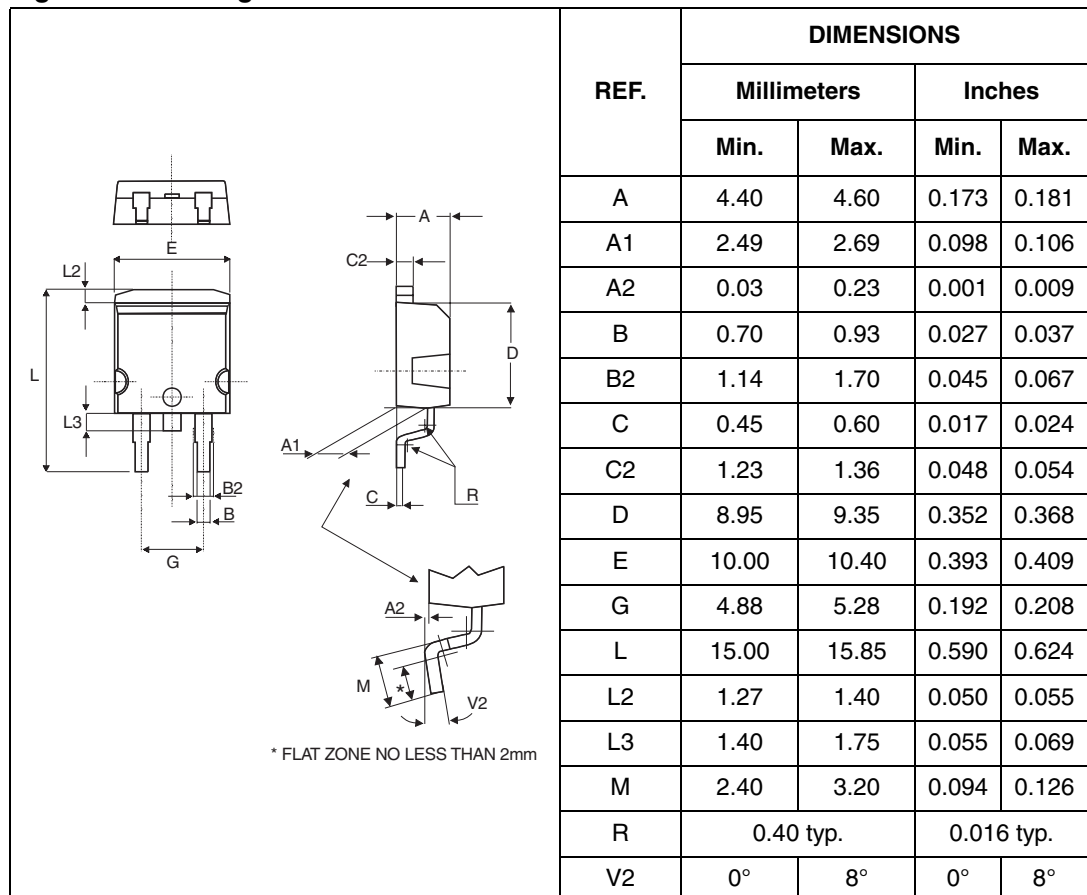
Figure 12. Package dimensions D²PAK

Figure 13. Footprint

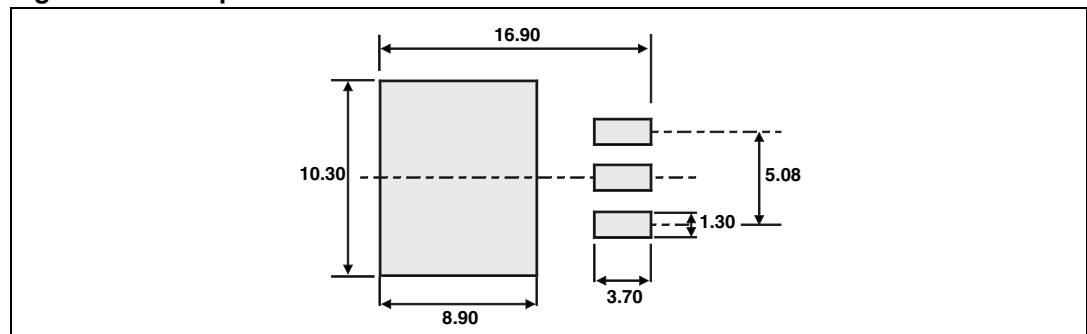
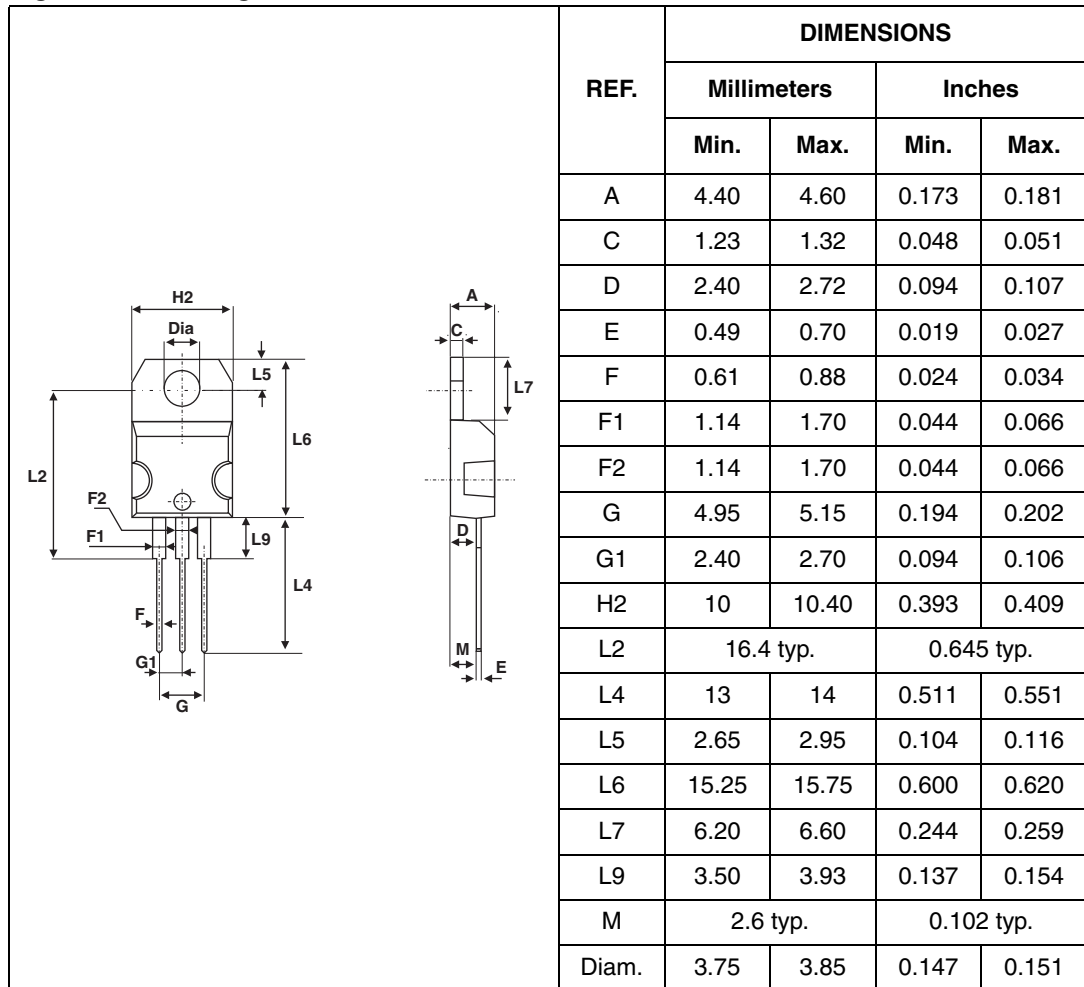


Figure 14. Package dimensions TO-220AB



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

| Type | Marking | Package | Weight | Base qty | Delivery mode |
|----------------|-------------|--------------------|--------|----------|---------------|
| STPS41L60CG | STPS41L60CG | D ² PAK | 1.48 g | 50 | Tube |
| STPS41L60CG-TR | STPS41L60CG | D ² PAK | 1.48 g | 1000 | Tape and reel |
| STPS41L60CT | STPS41L60CT | TO-220AB | 2.20 g | 50 | Tube |
| STPS41L60CR | STPS41L60CR | I ² PAK | 1.49 g | 50 | Tube |

4 Revision history

| Date | Revision | Description of Changes |
|-------------|----------|---|
| July 2003 | 3A | Previous issue |
| 10-Jan-2007 | 4 | Reformatted to current standards. Added ECOPACK statement Removed I _{RRM} and dV/dT from the Absolute ratings table on page 1. Updated reverse leakage current values in Table 3 and Figure 7. |
| 28-May-2007 | 5 | Updated figures 1, 2, and 5 to 10. |

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