# 1 Characteristics

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

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | 40 | V |
| $I_{F(RMS)}$ | Forward rms current | | 6 | A |
| $I_{F(AV)}$ | Average forward current, δ = 0.5, $T_c$ = 135 °C | per diode | 3 | A |
| | | per device | 6 | |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms sinusoidal, $T_c$ = 25 °C | 75 | A |
| $I_{RRM}$ | Peak repetitive reverse current | $t_p$ = 2 µs, F = 1kHz | 1 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | $t_p$ = 1 µs, $T_c$ = 25 °C | 1300 | W |
| $T_{stg}$ | Storage temperature range | | -65 to +150 | °C |
| $T_j$ | Operating junction temperature | | -40 to +150 | °C |

**Table 3. Thermal parameters**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case | per diode | 5.5 | °C/W |
| | | per device | 3 | |
| $R_{th(c)}$ | coupling | | 0.5 | |

When the diodes 1 and 2 are used simultaneously :
$\Delta Tj(diode\ 1) = P(diode1) \times R_{th(j-c)}(Per\ diode) + P(diode\ 2) \times R_{th(c)}$

**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 | $V_R = V_{RRM}$ | - | - | 100 | µA |
| | | $T_j$ = 125 °C | | - | 2 | 10 | mA |
| $V_F$(2) | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 3 A | - | - | 0.63 | V |
| | | $T_j$ = 125 °C | | - | 0.50 | 0.57 | |
| | | $T_j$ = 25 °C | $I_F$ = 6 A | - | - | 0.84 | |
| | | $T_j$ = 125 °C | | - | 0.67 | 0.72 | |

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

To evaluate the conduction losses use the following equation:
$P = 0.42 \times I_{F(AV)} + 0.050 \times I_F{}^2{}_{(RMS)}$

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

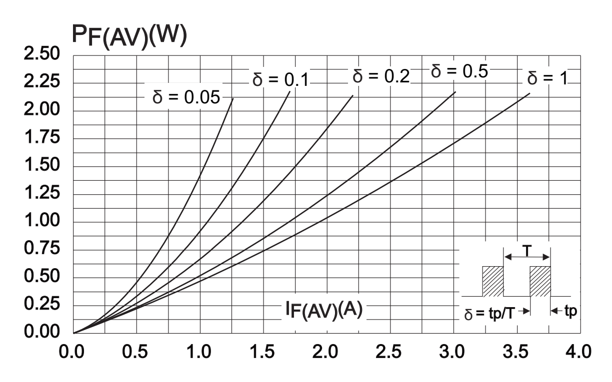



Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

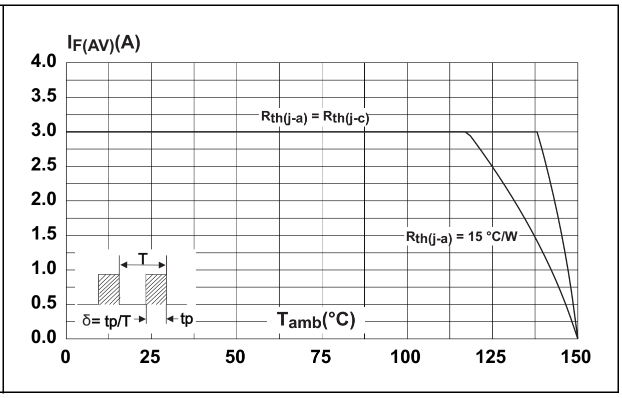



Figure 3. Normalized avalanche power derating versus pulse duration

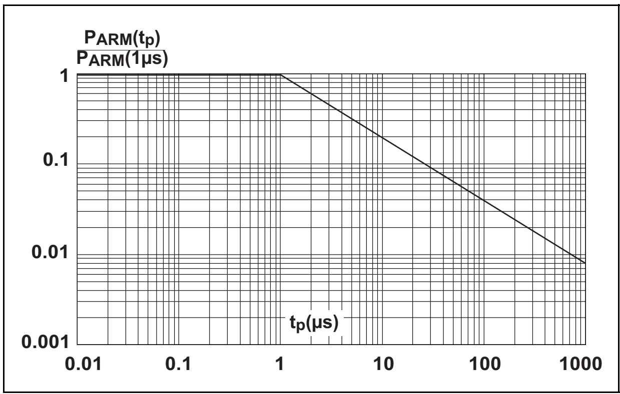



Figure 4. Normalized avalanche power derating versus junction temperature

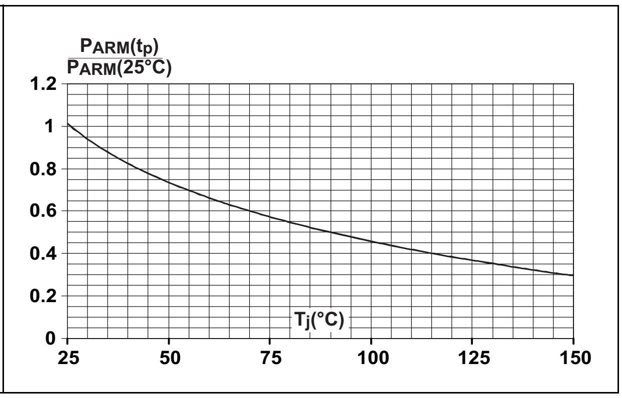



Figure 5. Relative variation of thermal impedance junction to case versus pulse duration

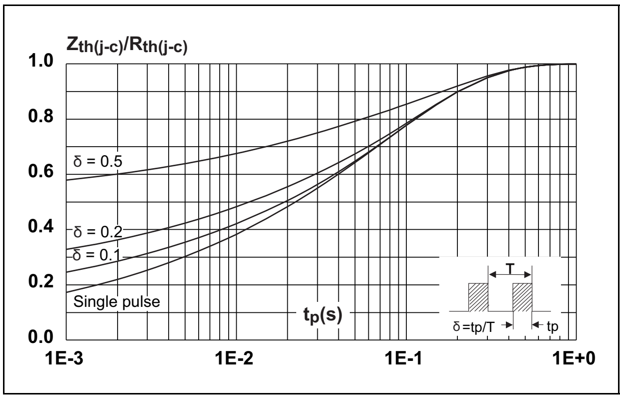



Figure 6. Reverse leakage current vs. reverse voltage applied (typical values, per diode)

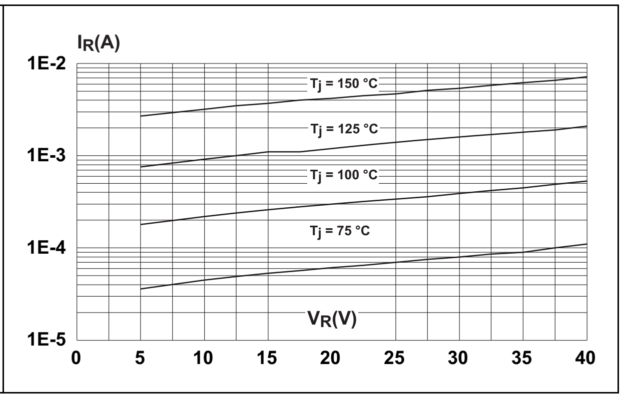


**Figure 7. Junction capacitance vs. reverse voltage applied (typical values, per diode)**

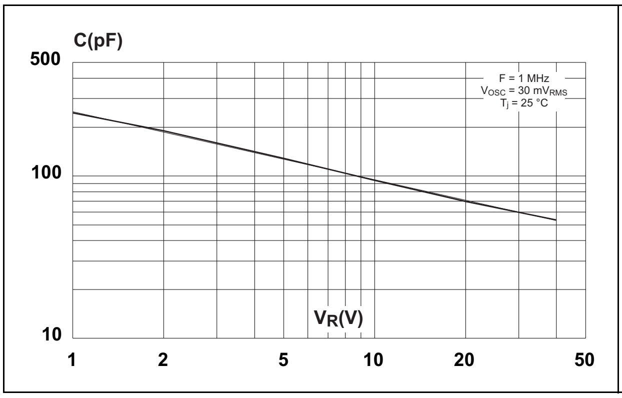



**Figure 8. Forward voltage drop vs. forward current (per diode)**

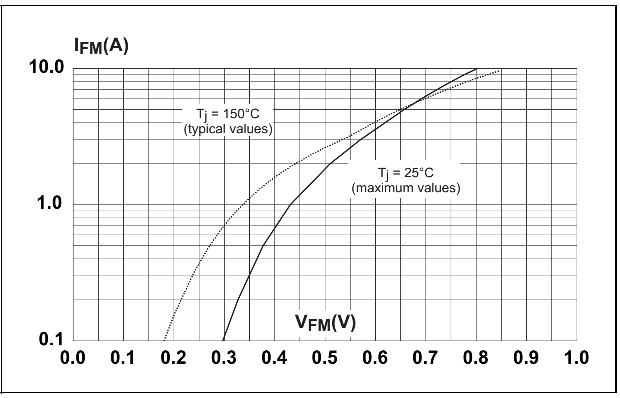
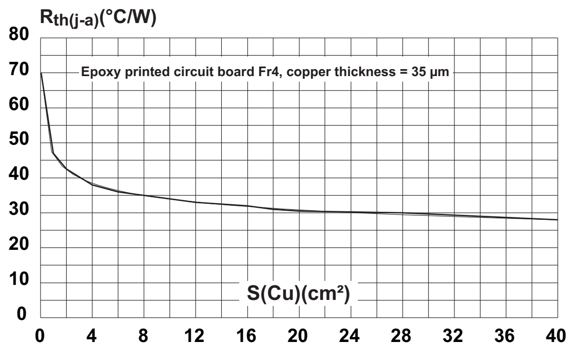



**Figure 9. Thermal resistance junction to ambient versus copper surface under tab**



# 2 Package information

- Epoxy meets UL94,V0
- Lead-free packages

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.

**Figure 10. DPAK dimension definitions**

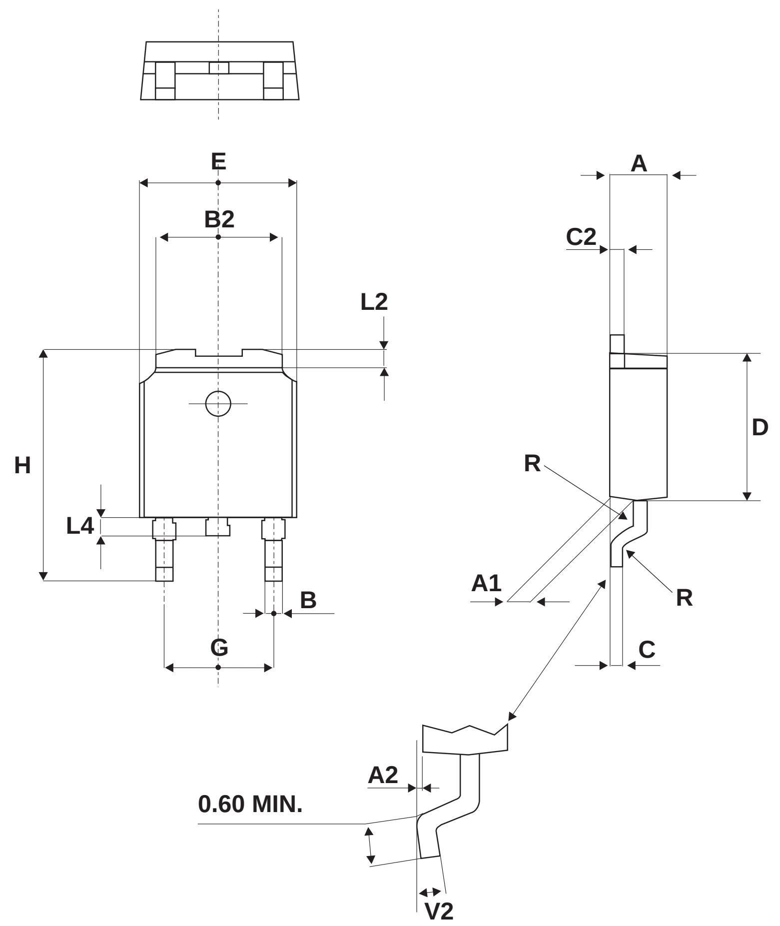
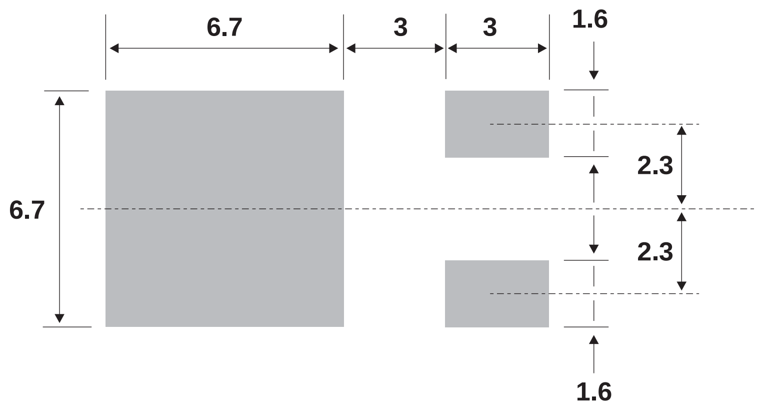


Table 5. DPAK dimension values

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.20 | | 2.40 | 0.086 | | 0.094 |
| A1 | 0.90 | | 1.10 | 0.035 | | 0.043 |
| A2 | 0.03 | | 0.23 | 0.001 | | 0.009 |
| B | 0.64 | | 0.90 | 0.025 | | 0.035 |
| B2 | 5.20 | | 5.40 | 0.204 | | 0.212 |
| C | 0.45 | | 0.60 | 0.017 | | 0.023 |
| C2 | 0.48 | | 0.60 | 0.018 | | 0.023 |
| D | 6.00 | | 6.20 | 0.236 | | 0.244 |
| E | 6.40 | | 6.60 | 0.251 | | 0.259 |
| G | 4.40 | | 4.60 | 0.173 | | 0.181 |
| H | 9.35 | | 10.10 | 0.368 | | 0.397 |
| L2 | | 0.80 typ. | | | 0.031 typ. | |
| L4 | 0.60 | | 1.00 | 0.023 | | 0.039 |
| V2 | 0° | | 8° | 0° | | 8° |

Figure 11. Footprint dimensions in mm (inches)



# 3 Ordering information

**Table 6. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS640CBY-TR | STPS640CY | DPAK | 0.3 g | 2500 | Tape and reel |

# 4 Revision history

**Table 7. Revision history**

| Date | Revision | Changes |
|---|---|---|
| 6-Nov-2013 | 1 | First issue |
| 04-Dec-2013 | 2 | Properties changed from preliminary data to production data. |