# 1 Characteristics

**Table 2. Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 1200 | V |
| $I_{F(RMS)}$ | Forward rms current | $D^2PAK$ | | 50 | A |
| $I_{F(AV)}$ | Average forward current, δ = 0.5 | $D^2PAK$ | $T_c$ = 130 °C | 15 | A |
| $I_{FRM}$ | Repetitive peak forward current | $t_p$ = 5 µs, F = 5 kHz square | | 200 | A |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms Sinusoidal | | 200 | A |
| $T_{stg}$ | Storage temperature range | | | -65 to + 175 | °C |
| $T_j$ | Operating junction temperature range | | | -40 to + 175 | °C |

**Table 3. Thermal parameters**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case | $D^2PAK$ | 1.3 | °C/W |

**Table 4. Static electrical characteristics**

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$(1) | Reverse leakage current | $T_j$ = 25 °C | $V_R = V_{RRM}$ | | | 15 | µA |
| | | $T_j$ = 125 °C | | | 10 | 100 | |
| $V_F$(2) | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 15 A | | | 2.10 | V |
| | | $T_j$ = 125 °C | | | 1.25 | 1.90 | |
| | | $T_j$ = 150 °C | | | 1.20 | 1.80 | |

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:
$P = 1.4 \times I_{F(AV)} + 0.027\ I_F{}^2{}_{(RMS)}$

**Table 5. Dynamic characteristics**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse recovery time | $I_F$ = 1 A, $dI_F/dt$ = -50 A/µs, $V_R$ = 30 V, $T_j$ = 25 °C | | | 105 | ns |
| | | $I_F$ = 1 A, $dI_F/dt$ = -100 A/µs, $V_R$ = 30 V, $T_j$ = 25 °C | | 53 | 75 | |
| $I_{RM}$ | Reverse recovery current | $I_F$ = 15 A, $dI_F/dt$ = -200 A/µs, $V_R$ = 600 V, $T_j$ = 125 °C | | 20 | 28 | A |
| S | Softness factor | $I_F$ = 15 A, $dI_F/dt$ = -200 A/µs, $V_R$ = 600 V, $T_j$ = 125 °C | | 1.5 | | |
| $t_{fr}$ | Forward recovery time | $I_F$ = 15 A $dI_F/dt$ = 50 A/µs $V_{FR}$ = 1.5 x $V_{Fmax}$, $T_j$ = 25 °C | | | 600 | ns |
| $V_{FP}$ | Forward recovery voltage | $I_F$ = 15 A, $dI_F/dt$ = 50 A/µs, $T_j$ = 25 °C | | 5.5 | | V |

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

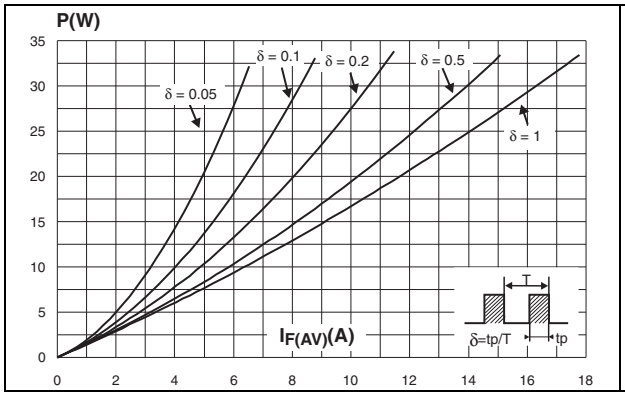



**Figure 2. Forward voltage drop versus forward current**

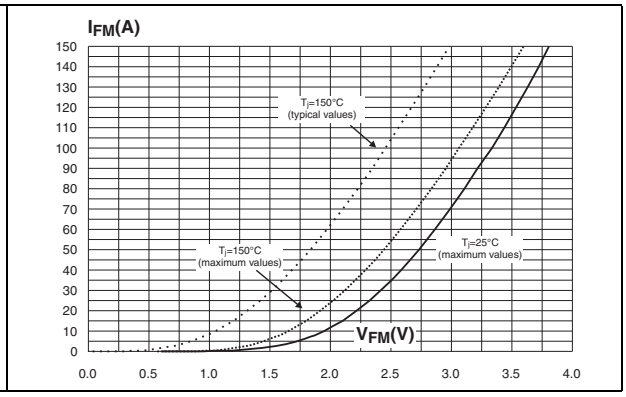



**Figure 3. Relative variation of thermal impedance junction to case versus pulse duration**

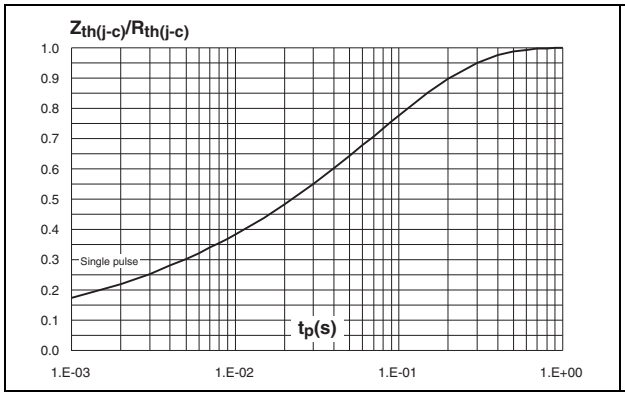



**Figure 4. Peak reverse recovery current versus $dI_F/dt$ (typical values)**

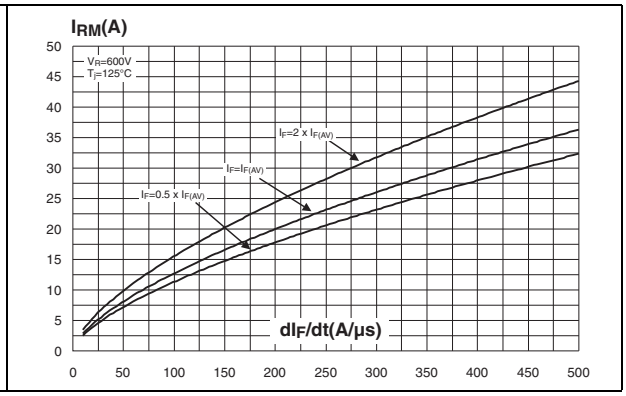


**Figure 5. Reverse recovery time versus $dI_F/dt$ (typical values)**

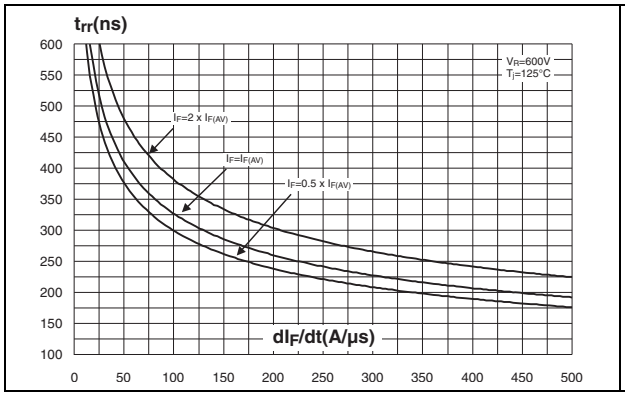



**Figure 6. Reverse recovery charge versus $dI_F/dt$ (typical values)**

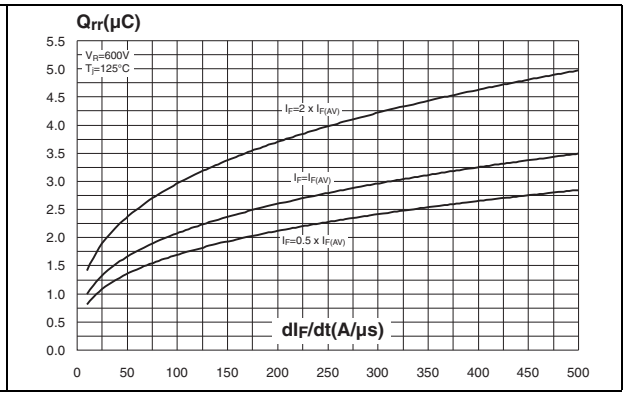



**Figure 7. Softness factor versus $dI_F/dt$ (typical values)**

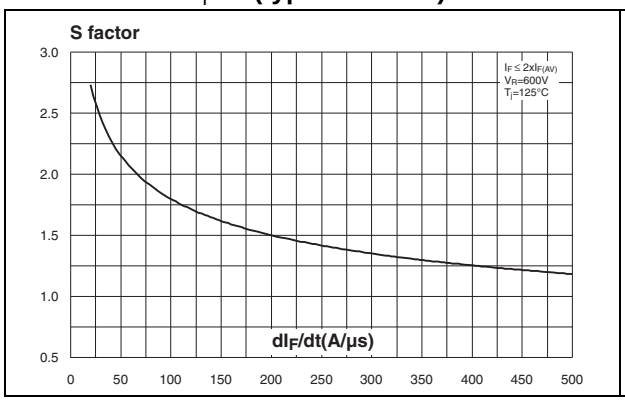



**Figure 8. Relative variations of dynamic parameters versus junction temperature**

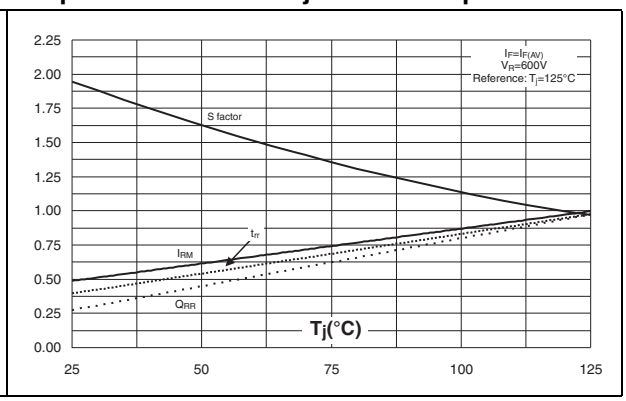



**Figure 9. Transient peak forward voltage versus $dI_F/dt$ (typical values)**

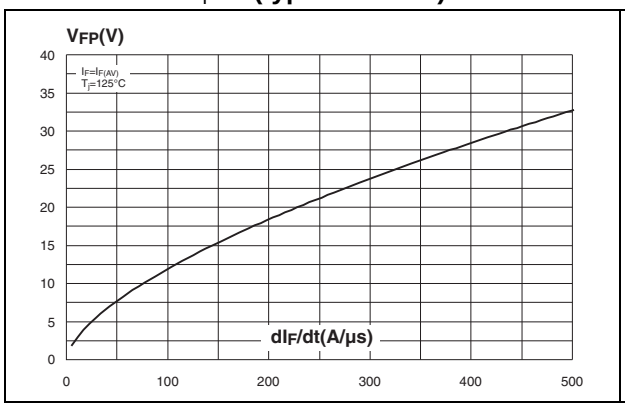



**Figure 10. Forward recovery time versus $dI_F/dt$ (typical values)**

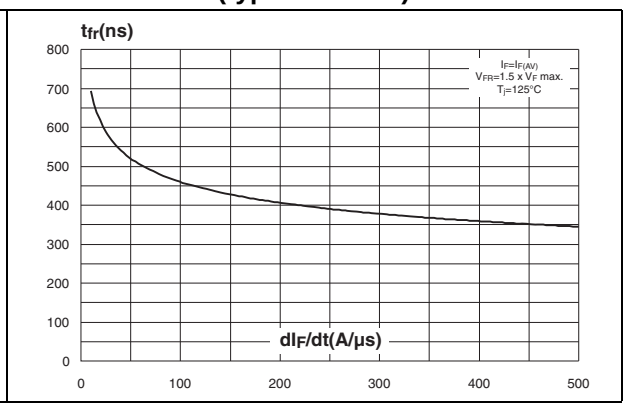


**Figure 11. Junction capacitance versus reverse voltage applied (typical values)**

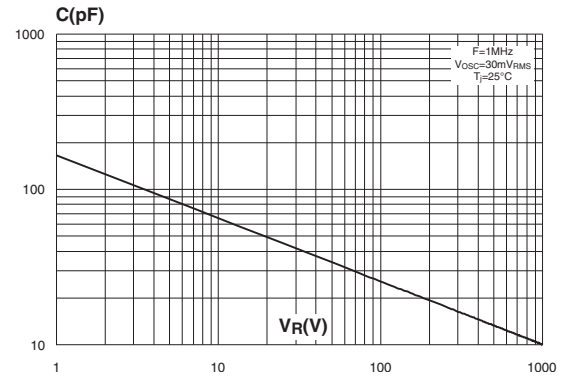
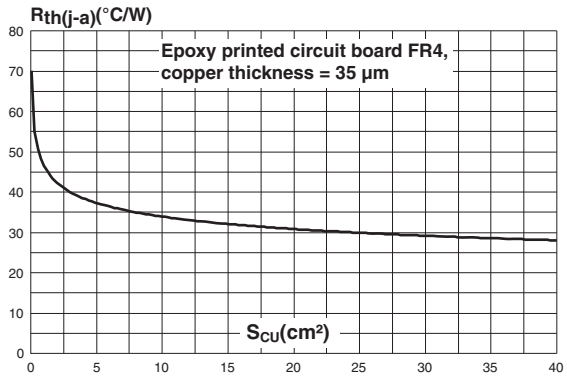



**Figure 12. Thermal resistance junction to ambient versus copper surface under each lead**



# 2 Package information

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

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**Figure 13. D²PAK dimension definitions**

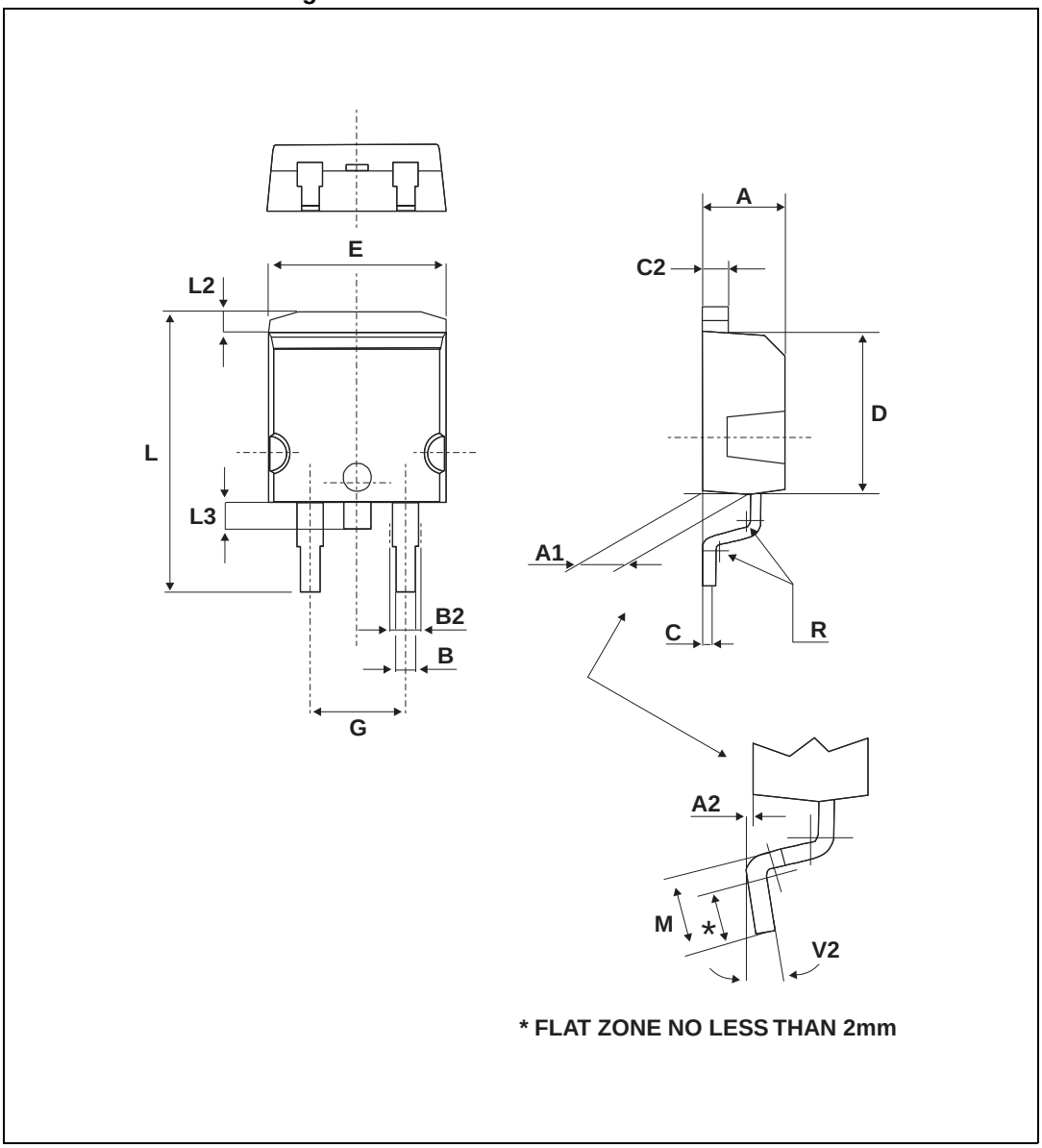
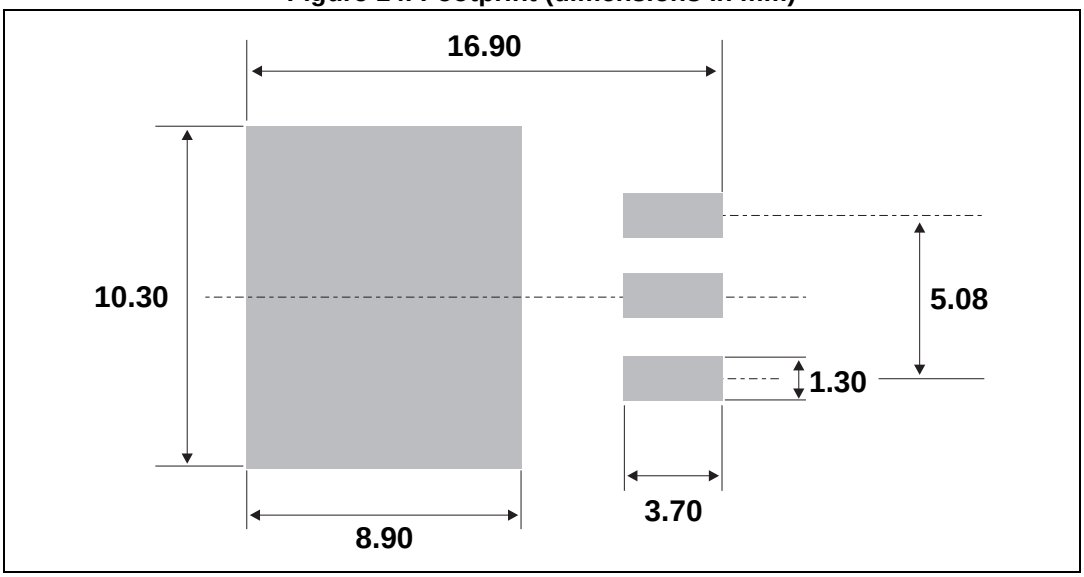


Table 6. D²PAK dimension values

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | 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 | 16 | 5.28 | 0.192 | 0.63 | 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 14. Footprint (dimensions in mm)



# 3 Ordering information

**Table 7. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STTH1512GY-TR | STTH1512GY | D²PAK | 1.48 g | 10000 | Tape and reel |

# 4 Revision history

**Table 8. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 11-Jul-2013 | 1 | Initial release. |

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