

1 Characteristics

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

| Symbol | Parameter | | Value | Unit |
|--------------------|--|---|-------------|------|
| V_{RRM} | Repetitive peak reverse voltage | | 45 | V |
| $I_{F(RMS)}$ / pin | Forward rms current | | 7 | A |
| $I_{F(AV)}$ | Average forward current, $\delta = 0.5$, square wave | $T_c = 150\text{ °C}$ | 10 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ ms}$ sinusoidal | 75 | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 10\text{ }\mu\text{s}$, $T_j = 125\text{ °C}$ | 285 | W |
| T_{stg} | Storage temperature range | | -65 to +175 | °C |
| T_j | Maximum operating junction temperature ⁽¹⁾ | | 175 | °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

Table 3. Thermal resistance

| Symbol | Parameter | Max. value | Unit |
|---------------|------------------|------------|------|
| $R_{th(j-c)}$ | Junction to case | 3 | °C/W |

Table 4. Static electrical characteristics

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|----------------------|-------------------------|-----------------------|---------------------|------|------|------|---------------|
| I_R ⁽¹⁾ | Reverse leakage current | $T_j = 25\text{ °C}$ | $V_R = V_{RRM}$ | - | | 100 | μA |
| | | $T_j = 125\text{ °C}$ | | - | 7 | 15 | mA |
| V_F ⁽²⁾ | Forward voltage drop | $T_j = 25\text{ °C}$ | $I_F = 10\text{ A}$ | - | | 0.63 | V |
| | | $T_j = 125\text{ °C}$ | | - | 0.50 | 0.57 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 20\text{ A}$ | - | | 0.84 | |
| | | $T_j = 125\text{ °C}$ | | - | 0.65 | 0.72 | |

1. Pulse test: $t_p = 5\text{ ms}$, $\delta < 2\%$

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

To evaluate the conduction losses, use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.015 \times I_{F(RMS)}^2$$

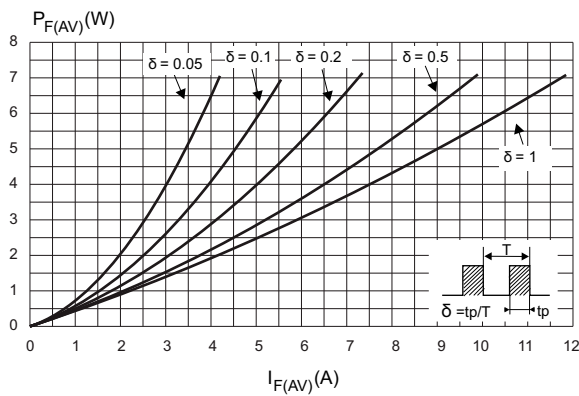
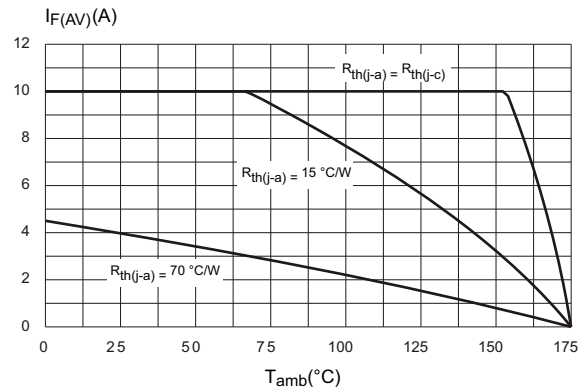
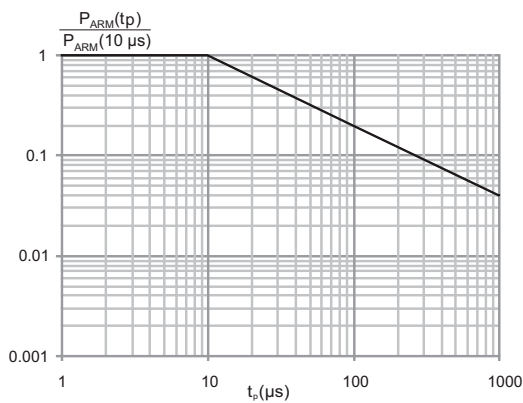
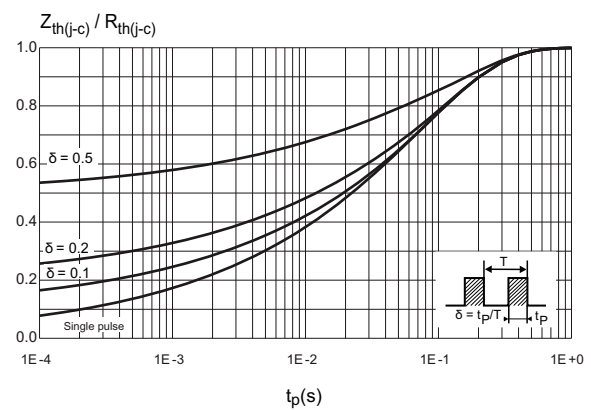
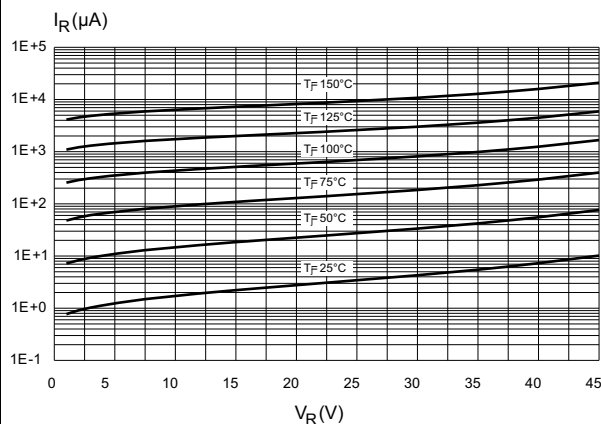
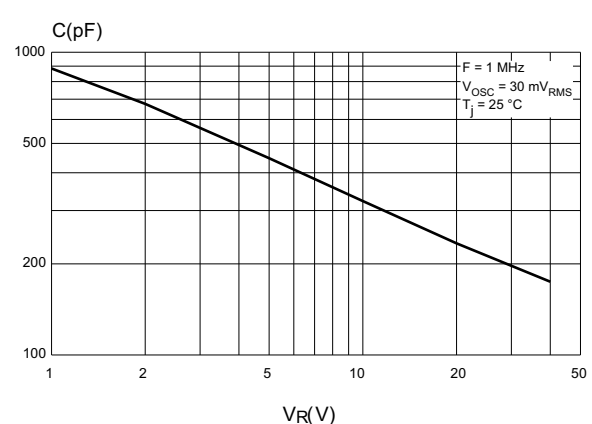
Figure 1. Average forward power dissipation versus average forward current**Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)****Figure 3. Normalized avalanche power derating versus pulse duration at $T_j = 125\text{ °C}$** **Figure 4. Relative variation of thermal impedance junction to case versus pulse duration****Figure 5. Reverse leakage current versus reverse voltage applied (typical values)****Figure 6. Junction capacitance versus reverse voltage applied (typical values)**

Figure 7. Forward voltage drop versus forward current

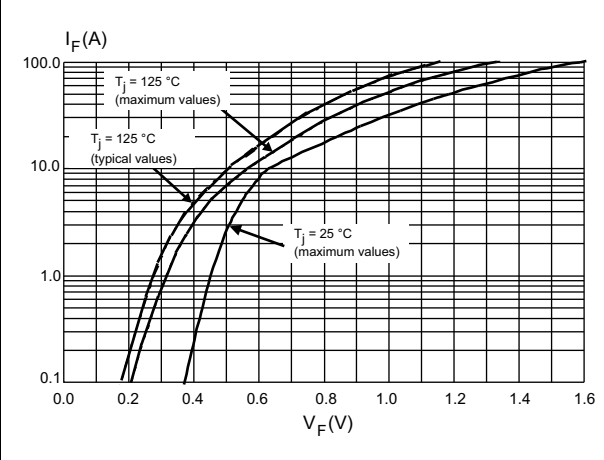
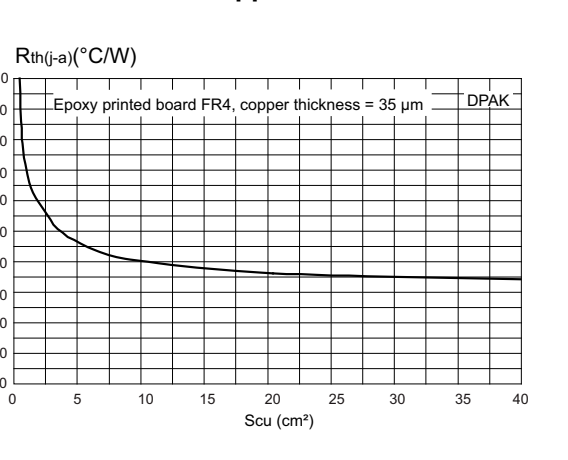


Figure 8. Thermal resistance junction to ambient versus copper surface under tab



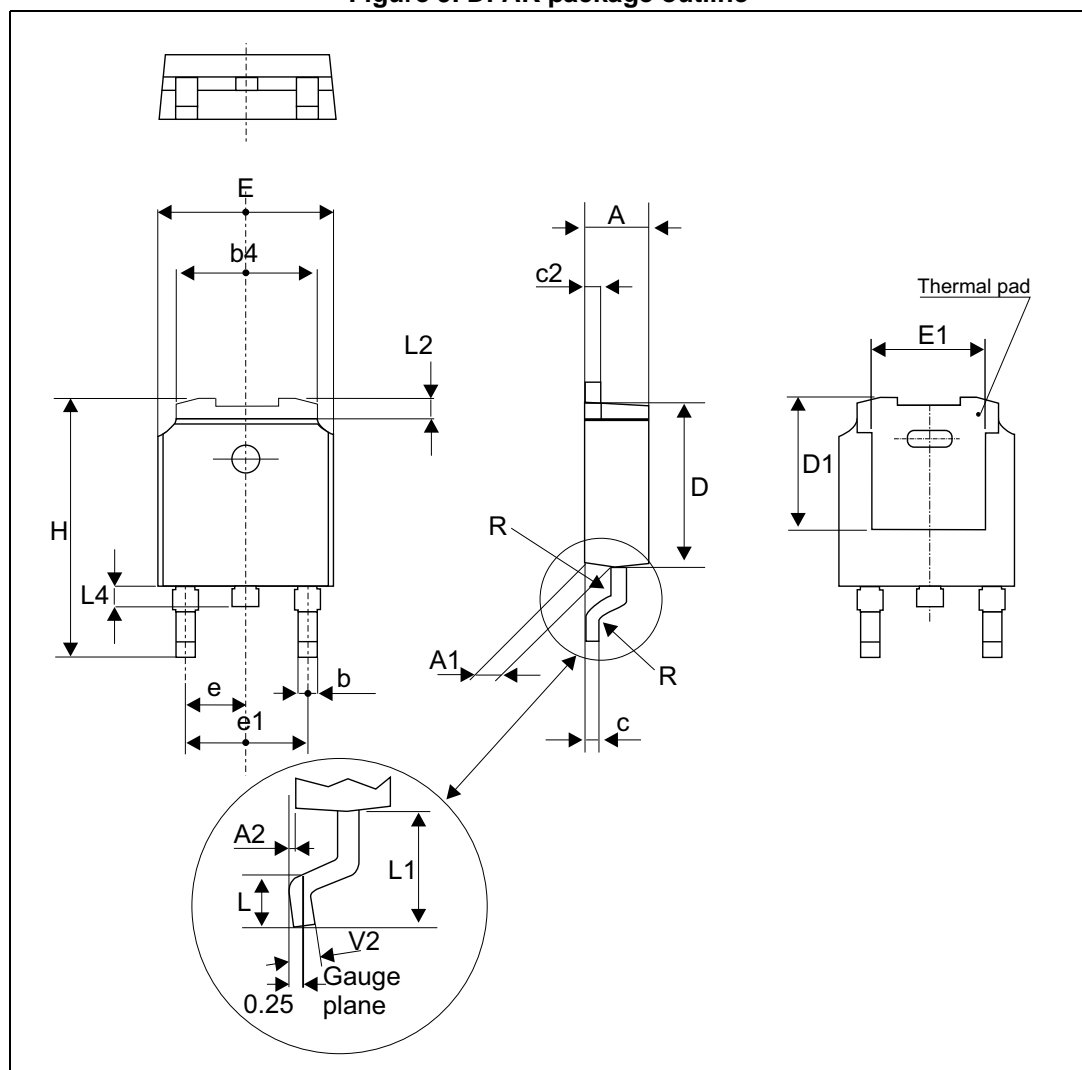
2 Package Information

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

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2.1 DPAK package information

Figure 9. DPAK package outline

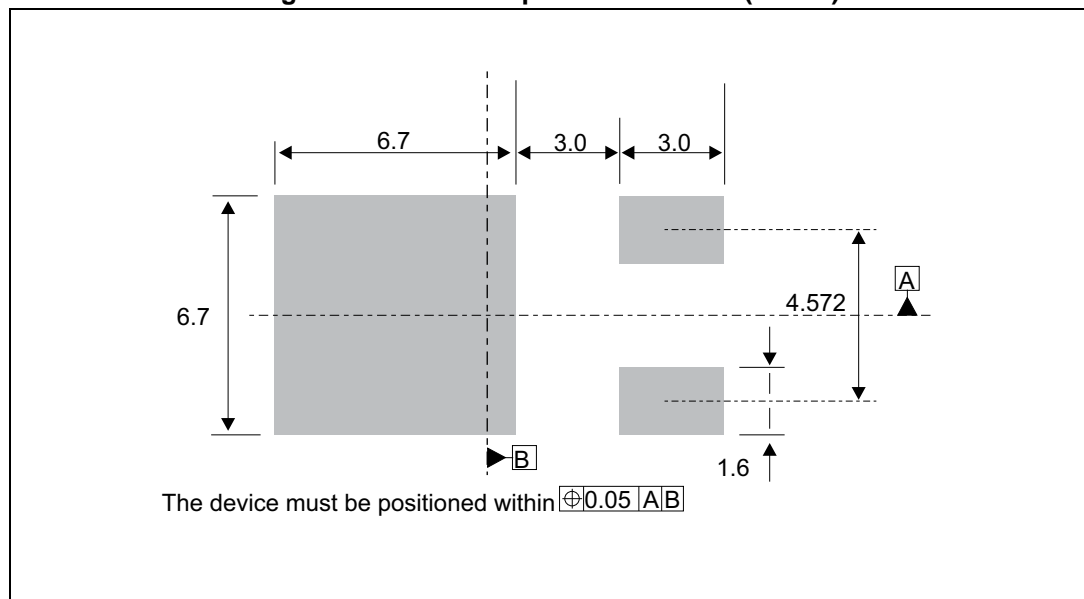


Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 5. DPAK package mechanical data

| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.18 | | 2.40 | 0.085 | | 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 |
| b4 | 4.95 | | 5.46 | 0.194 | | 0.214 |
| c | 0.46 | | 0.61 | 0.018 | | 0.024 |
| c2 | 0.46 | | 0.60 | 0.018 | | 0.023 |
| D | 5.97 | | 6.22 | 0.235 | | 0.244 |
| D1 | 4.95 | | 5.60 | 0.194 | | 0.220 |
| E | 6.35 | | 6.73 | 0.250 | | 0.264 |
| E1 | 4.32 | | 5.50 | 0.170 | | 0.216 |
| e | | 2.28 | | | 0.090 | |
| e1 | 4.40 | | 4.70 | 0.173 | | 0.185 |
| H | 9.35 | | 10.40 | 0.368 | | 0.409 |
| L | 1.00 | | 1.78 | 0.039 | | 0.070 |
| L2 | | | 1.27 | | | 0.050 |
| L4 | 0.60 | | 1.02 | 0.023 | | 0.040 |
| V2 | -8° | | +8° | -8° | | 8° |

Figure 10. DPAK footprint dimensions (in mm)



3 Ordering information

Table 6. Ordering information

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|--------------|---------|---------|--------|----------|---------------|
| STPS1045B | S10 45 | DPAK | 0.30 g | 75 | Tube |
| STPS1045B-TR | S10 45 | | | 2500 | Tape and reel |

4 Revision history

Table 7. Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| Jul-2003 | 3B | Last issue |
| 21-Apr-2005 | 4 | IPAK package removed |
| 03-Nov-2005 | 5 | DPAK foot print dimensions updated. |
| 01-Jul-2010 | 6 | Updated Figure 10 Updated ECOPACK statement. |
| 04-Nov-2014 | 7 | Updated DPAK package information, Table 2 and Figure 5. Removed P_{ARM} ($T_j = 25\text{ °C}$). |
| 07-Apr-2015 | 8 | Updated Table 2. Format update to current standard. |
| 05-Oct-2016 | 9 | Updated DPAK package information. |

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