# 1 Characteristics

**Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 40 | V |
| $I_{F(RMS)}$ | Forward rms current | | DPAK | 6 | A |
| $I_{F(AV)}$ | Average forward current, δ = 0.5, square wave | SMA Flat Notch | $T_L$ = 105 °C | 3 | A |
| | | SMB | $T_L$ = 95 °C | | |
| | | SMB Flat | $T_L$ = 115 °C | | |
| | | SMC | $T_L$ = 105 °C | | |
| | | DPAK | $T_C$ = 135°C | | |
| $I_{FSM}$ | Surge non repetitive forward current | SMA Flat Notch | $t_p$ = 10 ms sinusoidal | 105 | A |
| | | All others | | 75 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | | $t_p$ = 10 µs, $T_j$ = 125 °C | 90 | W |
| $T_{stg}$ | Storage temperature range | | | -65 to +150 | °C |
| $T_j$ | Maximum operating junction temperature(1) | | | +150 | °C |

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

**Table 2. Thermal resistance parameter**

| Symbol | Parameter | | Max. value | Unit |
|---|---|---|---|---|
| $R_{th(j-l)}$ | Junction to lead | SMA Flat Notch | 20 | °C/W |
| | | SMB | 25 | |
| | | SMB Flat | 15 | |
| | | SMC | 20 | |
| $R_{th(j-c)}$ | Junction to case | DPAK | 5.5 | |

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics**

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$(1) | Reverse leakage current | $T_j$ = 25 °C | $V_R = V_{RRM}$ | - | | 20 | µA |
| | | $T_j$ = 125 °C | | - | 2 | 10 | mA |
| $V_F$(1) | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 3 A | - | | 0.63 | V |
| | | $T_j$ = 125 °C | | - | 0.52 | 0.57 | |
| | | $T_j$ = 25 °C | $I_F$ = 6 A | - | | 0.84 | |
| | | $T_j$ = 125 °C | | - | 0.63 | 0.72 | |

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

To evaluate the conduction losses, use the following equation:

$P = 0.42 \times I_{F(AV)} + 0.050 \times I_F{}^2{}_{(RMS)}$

For more information, please refer to the following application notes related to the power losses :

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

## 1.1 Characteristics (curves)

**Figure 1. Average forward power dissipation versus average forward current**

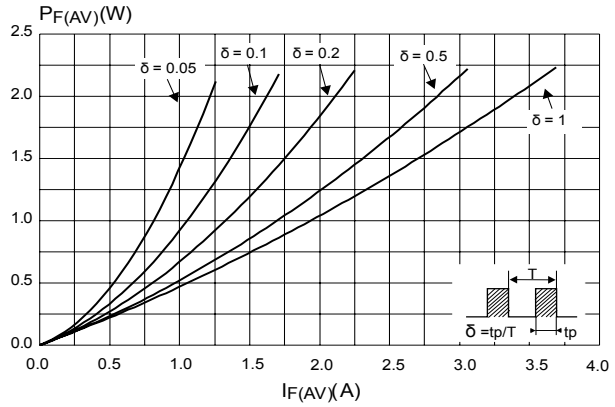



**Figure 2. Average forward current versus ambient temperature (δ = 0.5) (SMB, SMC, DPAK)**

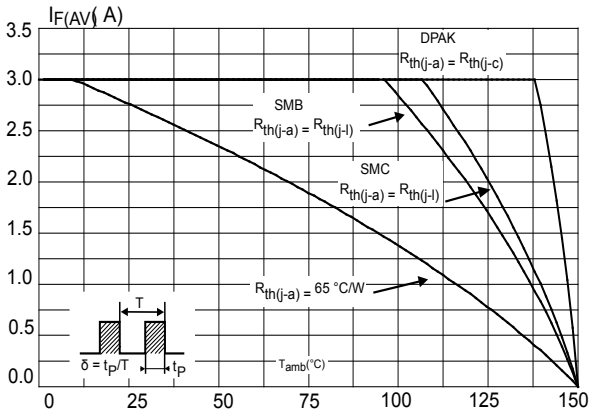



**Figure 3. Average forward current versus ambient temperature (δ = 0.5, SMB Flat)**

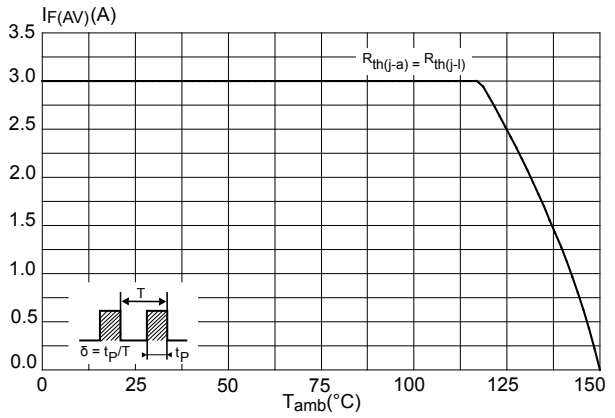



**Figure 4. Normalized avalanche power derating versus pulse duration ($T_j$ = 125 °C)**

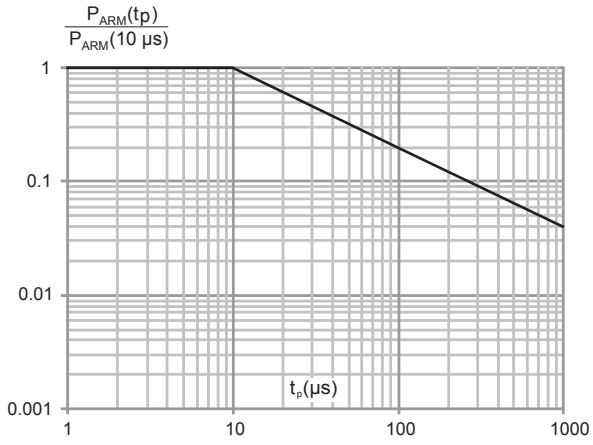



**Figure 5. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)**

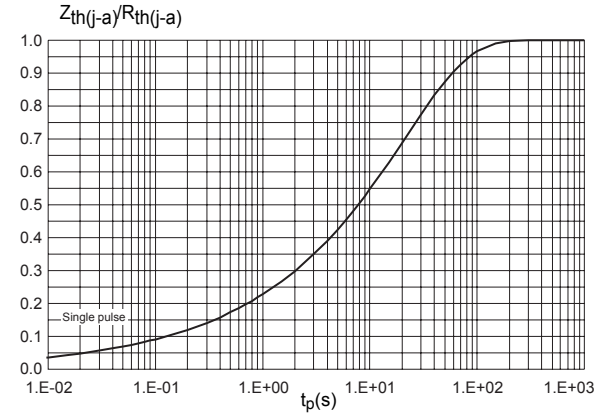



**Figure 6. Relative variation of thermal impedance junction to lead versus pulse duration (SMB flat)**

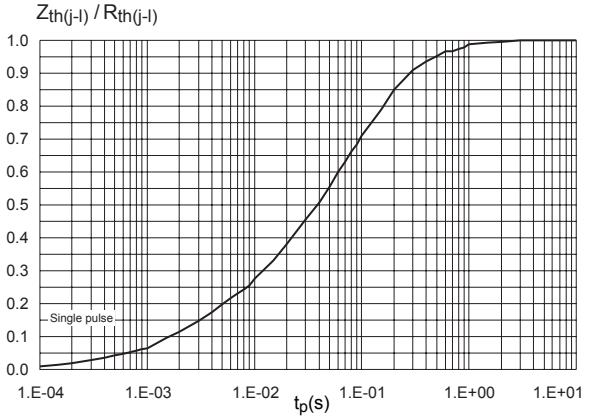


**Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SMC)**

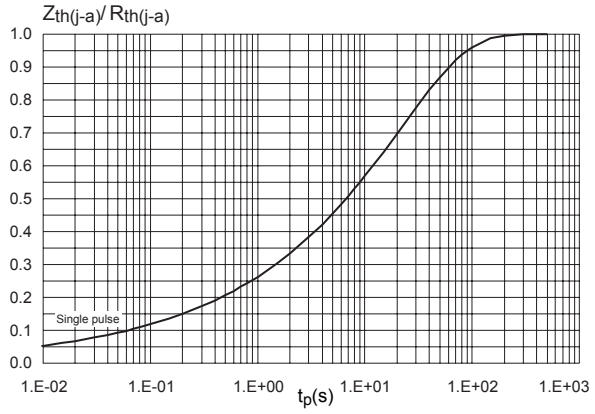



**Figure 8. Relative variation of thermal impedance junction to case versus pulse duration (DPAK)**

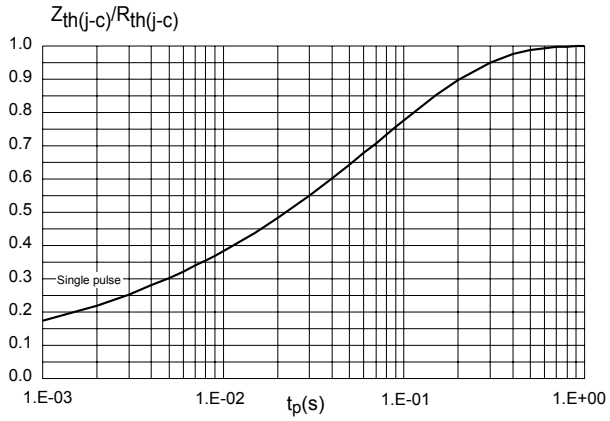



**Figure 9. Reverse leakage current versus reverse voltage applied (typical values)**

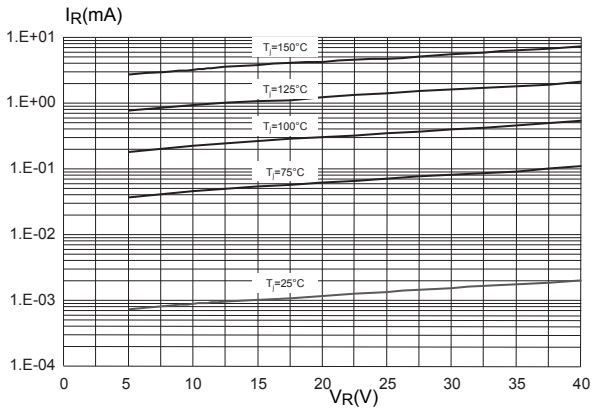



**Figure 10. Junction capacitance versus reverse voltage applied (typical values)**

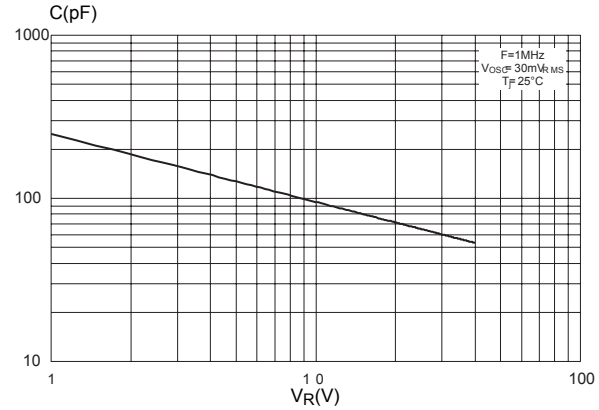



**Figure 11. Forward voltage drop versus forward current**

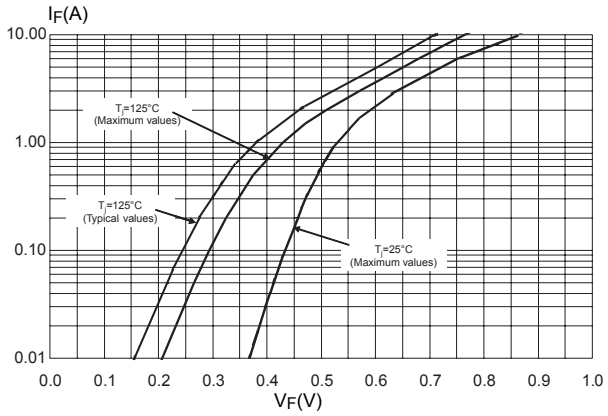



**Figure 12. Thermal resistance junction to ambient versus copper surface under each lead (SMA Flat Notch)**

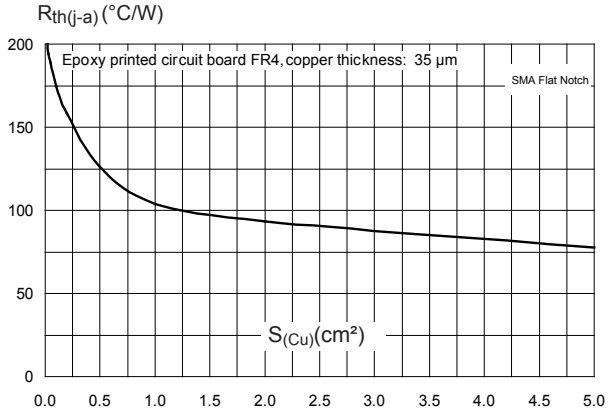


**Figure 13. Thermal resistance junction to ambient versus copper surface under each lead (SMB)**

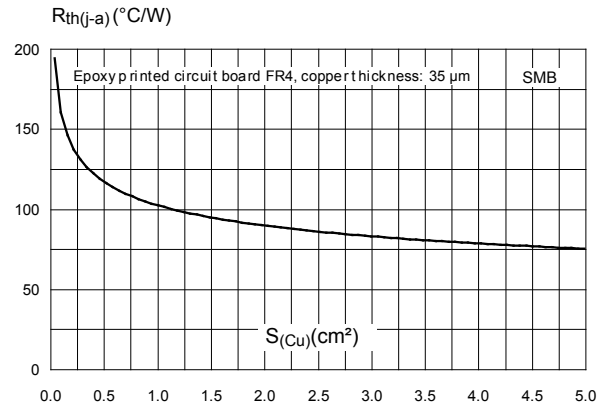



**Figure 14. Thermal resistance junction to ambient versus copper surface under each lead (SMB flat)**

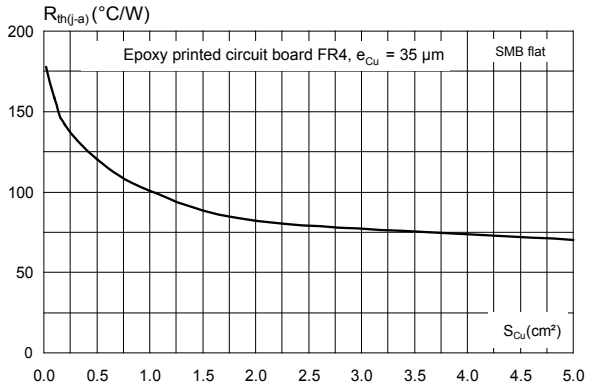



**Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (SMC)**

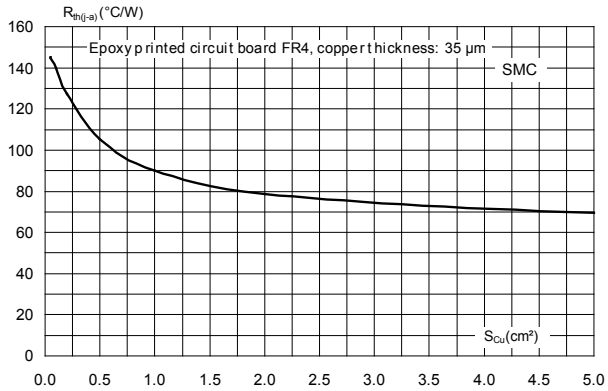
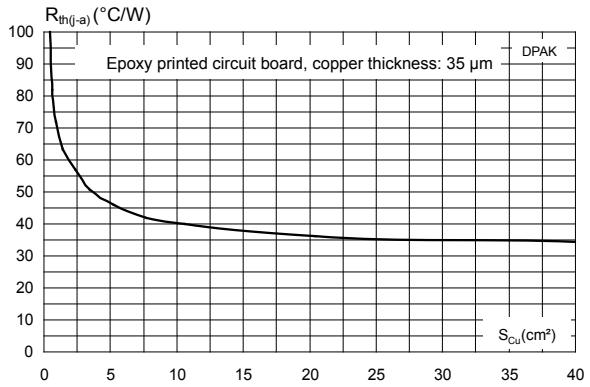



**Figure 16. Thermal resistance junction to ambient versus copper surface under tab (DPAK)**



# 2 Package information

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.

## 2.1 SMA Flat Notch package information

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

**Figure 17. SMA Flat Notch package outline**

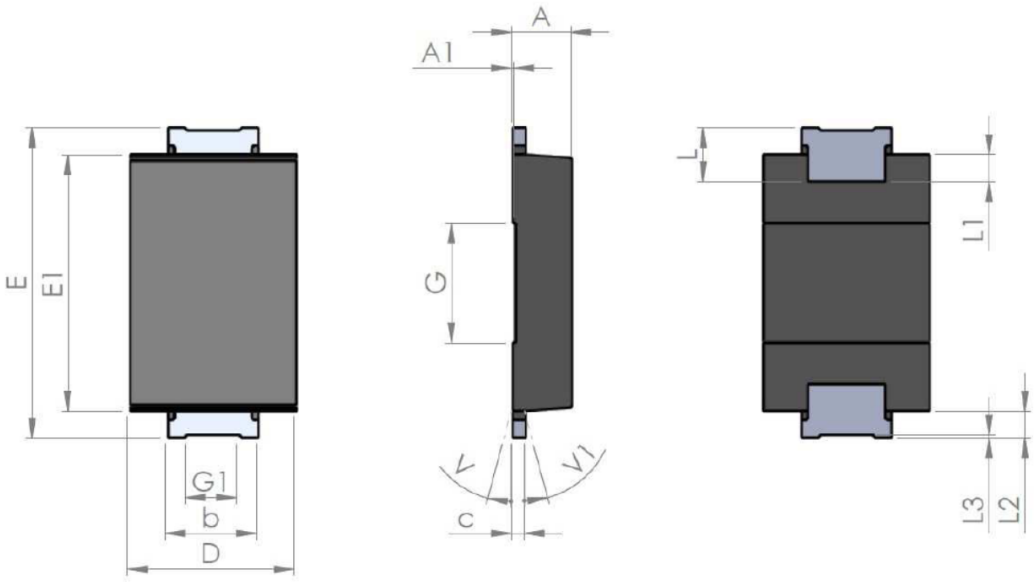
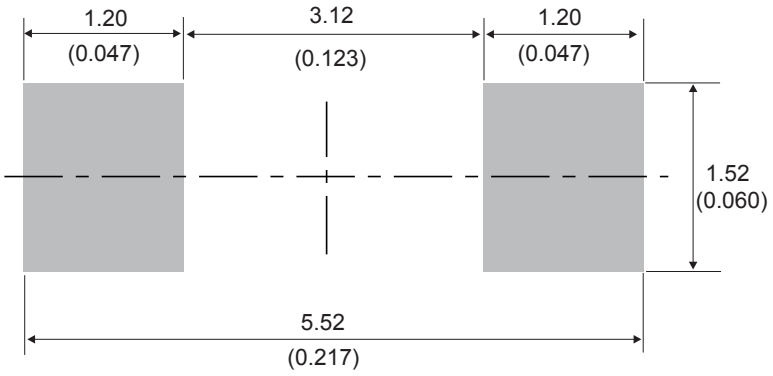


**Table 4. SMA Flat Notch package mechanical data**

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches (for reference only) | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A1 | 0.90 | | 1.10 | 0.035 | | 0.044 |
| A1 | | 0.05 | | | 0.002 | |
| b | 1.25 | | 1.65 | 0.049 | | 0.065 |
| C | 0.15 | | 0.40 | 0.005 | | 0.016 |
| D | 2.25 | | 2.90 | 0.088 | | 0.115 |
| E | 5.00 | | 5.35 | 0.196 | | 0.211 |
| E1 | 3.95 | | 4.60 | 0.155 | | 0.182 |
| G | | 2.00 | | | 0.079 | |
| G1 | | 0.85 | | | 0.033 | |
| L | 0.75 | | 1.20 | 0.029 | | |
| L1 | | 0.45 | | | 0.018 | |
| L2 | | 0.45 | | | 0.018 | |
| L3 | | 0.05 | | | 0.002 | |
| V | | | 8° | | | 8° |
| V1 | | | 8° | | | 8° |

**Figure 18. SMA Flat Notch recommended footprint in mm (inches)**



## 2.2 SMB package information

- Epoxy meets UL94, V0
- Lead-free package

**Figure 19. SMB package outline**

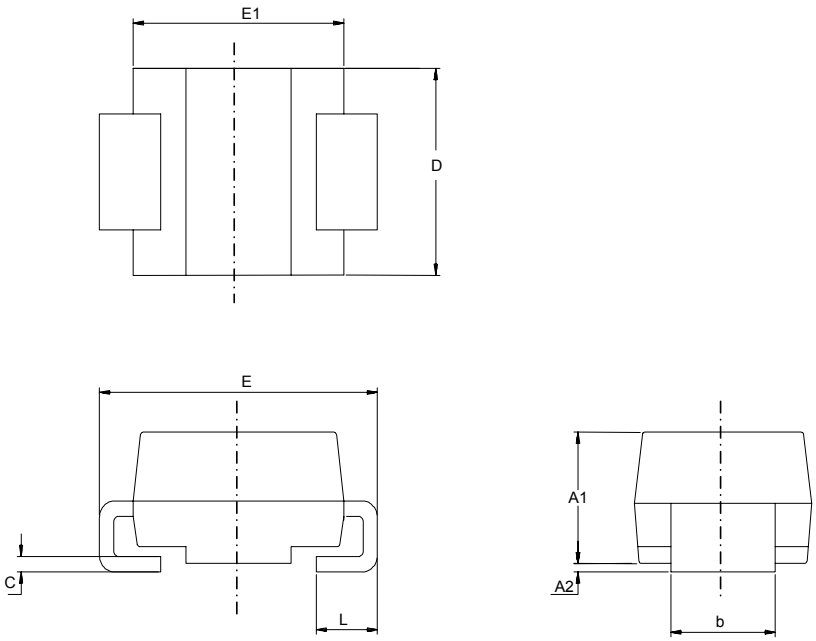
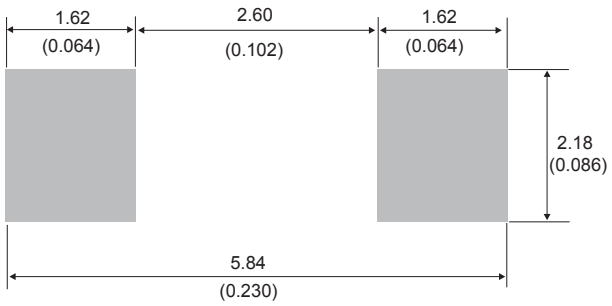



**Table 5. SMB package mechanical data**

| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches (for reference only) | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.45 | 0.074 | 0.097 |
| A2 | 0.05 | 0.20 | 0.001 | 0.008 |
| b | 1.95 | 2.20 | 0.076 | 0.087 |
| c | 0.15 | 0.40 | 0.005 | 0.016 |
| D | 3.30 | 3.95 | 0.129 | 0.156 |
| E | 5.10 | 5.60 | 0.200 | 0.221 |
| E1 | 4.05 | 4.60 | 0.159 | 0.182 |
| L | 0.75 | 1.50 | 0.029 | 0.060 |

Figure 20. **SMB recommended footprint**



## 2.3 SMB Flat package information

- Epoxy meets UL94, V0
- Lead-free package

**Figure 21. SMB Flat package outline**

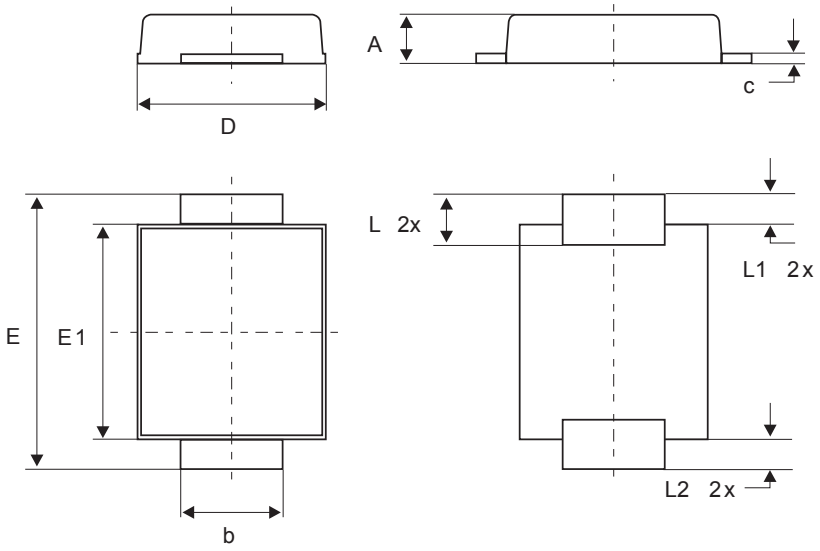
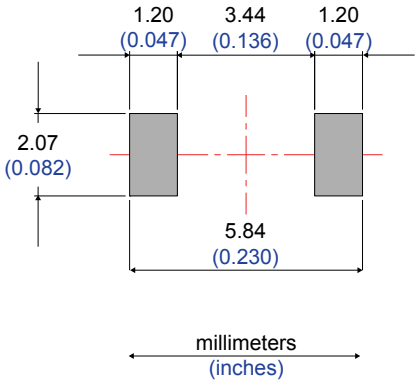



**Table 6. SMB Flat mechanical data**

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 0.90 | | 1.10 | 0.035 | | 0.044 |
| b | 1.95 | | 2.20 | 0.076 | | 0.087 |
| c | 0.15 | | 0.40 | 0.005 | | 0.016 |
| D | 3.30 | | 3.95 | 0.129 | | 0.156 |
| E | 5.10 | | 5.60 | 0.200 | | 0.221 |
| E1 | 4.05 | | 4.60 | 0.159 | | 0.182 |
| L | 0.75 | | 1.50 | 0.029 | | 0.060 |
| L1 | | 0.40 | | | 0.016 | |
| L2 | | 0.60 | | | 0.024 | |

**Figure 22. Footprint recommendations, dimensions in mm (inches)**



## 2.4 SMC package information

- Epoxy meets UL94, V0

Figure 23. **SMC package outline**

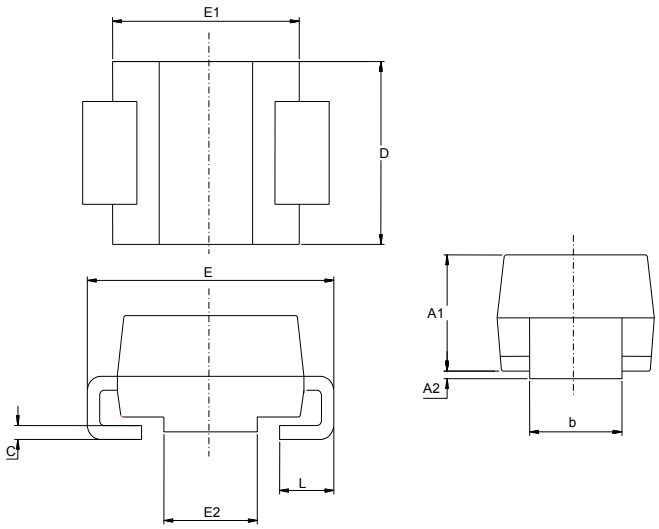
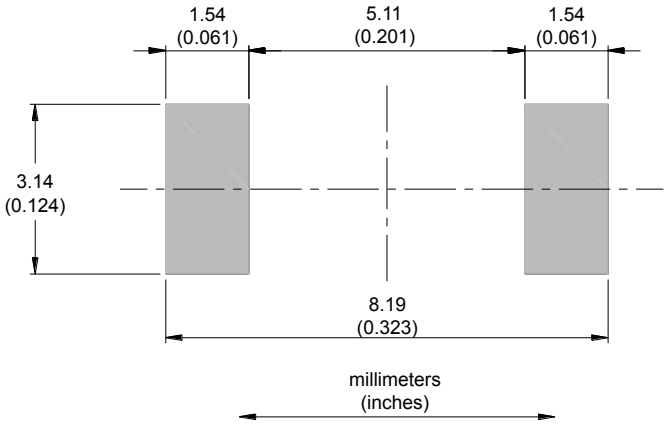



Table 7. **SMC package mechanical data**

| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches (for reference only) | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.45 | 0.0748 | 0.0965 |
| A2 | 0.05 | 0.20 | 0.0020 | 0.0079 |
| b | 2.90 | 3.20 | 0.1142 | 0.1260 |
| c | 0.15 | 0.40 | 0.0059 | 0.0157 |
| D | 5.55 | 6.25 | 0.2185 | 0.2461 |
| E | 7.75 | 8.15 | 0.3051 | 0.3209 |
| E1 | 6.60 | 7.15 | 0.2598 | 0.2815 |
| E2 | 4.40 | 4.70 | 0.1732 | 0.1850 |
| L | 0.75 | 1.50 | 0.0295 | 0.0591 |

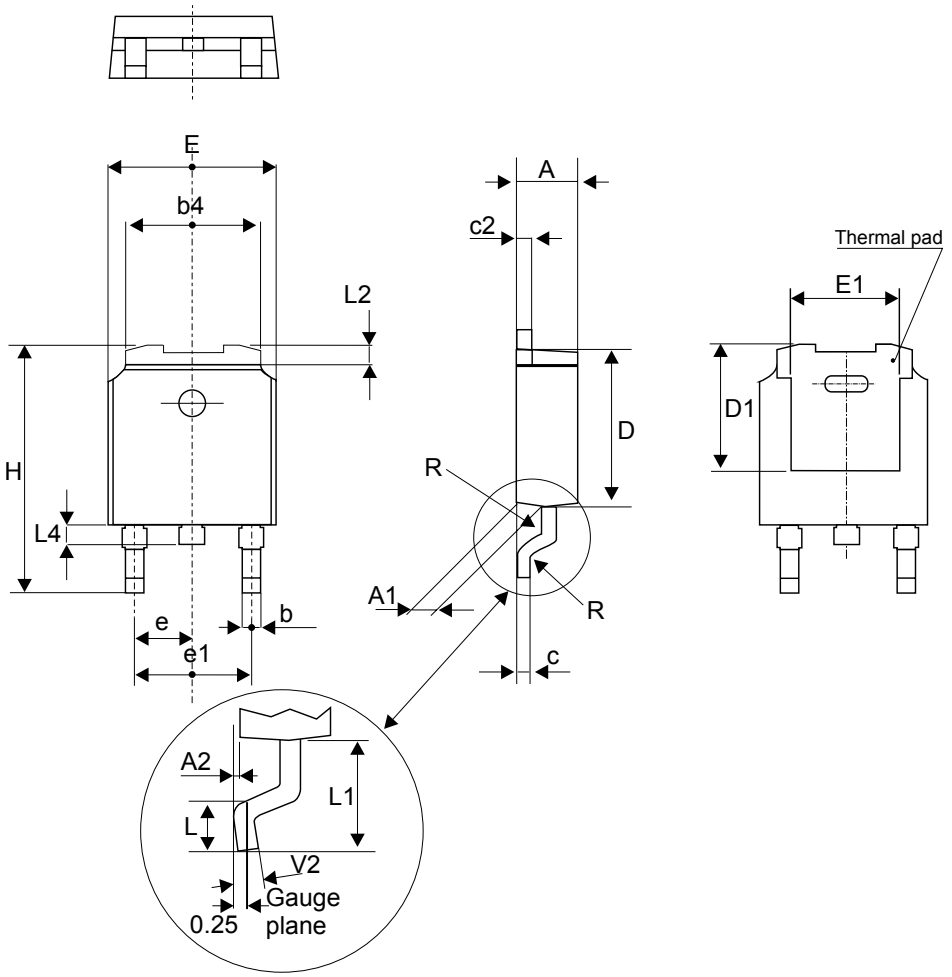
Figure 24. **SMC recommended footprint**



## 2.5 DPAK package information

- Epoxy meets UL 94,V0
- Cooling method: by conduction (C)

**Figure 25. DPAK package outline**

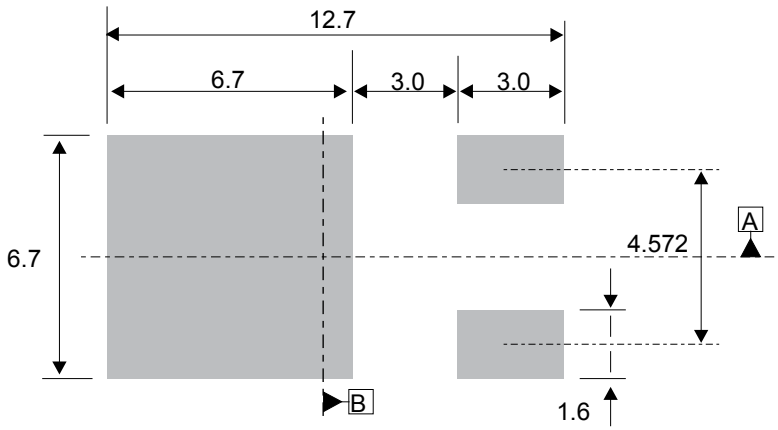



*Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.*

Table 8. **DPAK package mechanical data**

| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches (for reference only) | |
| | Min. | Max. | Min. | 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 | 0.215 |
| 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 | 0.265 |
| E1 | 4.32 | 5.50 | 0.170 | 0.216 |
| e | 2.286 typ. | | 0.090 typ. | |
| e1 | 4.40 | 4.70 | 0.173 | 0.185 |
| H | 9.35 | 10.40 | 0.368 | 0.409 |
| L | 1.0 | 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 26. **DPAK recommended footprint (dimensions in mm)**




The device must be positioned within ⌖ 0.05 A B

# 3 Ordering information

Table 9. **Ordering information**

| Order code | Marking | Package | Weight | Base qty. | Delivery mode |
|---|---|---|---|---|---|
| STPS340AFN | A340 | SMA Flat Notch | 0.039 g | 10 000 | Tape and reel |
| STPS340U | U34 | SMB | 0.107 g | 2500 | Tape and reel |
| STPS340UF | FU34 | SMB Flat | 0.050 g | 5000 | Tape and reel |
| STPS340S | S34 | SMC | 0.243 g | 10 000 | Tape and reel |
| STPS340B-TR | S3 40 | DPAK | 0.320 g | 2500 | Tape and reel |

## Revision history

Table 10. **Document revision history**

| Date | Version | Changes |
|---|---|---|
| Jul-2003 | 7 | Last update. |
| Feb-2005 | 8 | Layout update. No content change. |
| 08-Feb-2007 | 9 | Reformatted to current standard. Added ECOPACK statement. Added SMBflat package. |
| 10-Feb-2009 | 10 | Updated ECOPACK statement. Corrected Y axis in Figure 10. |
| 23-Apr-2015 | 11 | Updated DPAK and reformatted to current standard. |
| 22-Sep-2016 | 12 | Updated DPAK package information and reformatted to current standard. |
| 08-Oct-2019 | 13 | Added Section 2.1 SMA Flat Notch package information. |