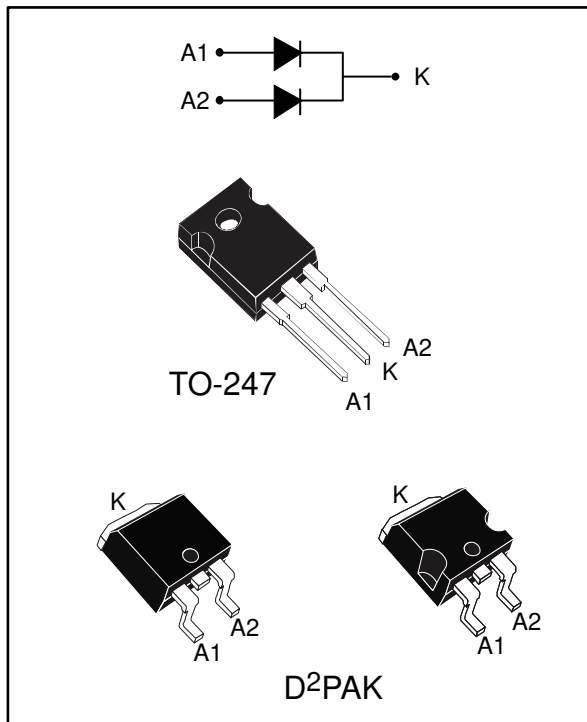


High voltage power Schottky rectifier

Datasheet - production data



Features

- High junction temperature capability
- Good trade off between leakage current and forward voltage drop
- Low leakage current
- Avalanche capability specified
- ECOPACK®2 compliant component for D²PAK on demand

Description

Dual center tap Schottky rectifier designed for high frequency switch mode power supply.

Table 1: Device summary

| Symbol | Value |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 15 A |
| V_{RRM} | 170 V |
| T_j (max) | 175 °C |
| V_F (typ) | 0.69 V |

1 Characteristics

Table 2: Absolute ratings (limiting values, per diode, at 25 °C, unless otherwise specified)

| Symbol | Parameter | | Value | Unit | |
|---------------------|---|-------------------------------------|-------------|------|---|
| V _{RRM} | Repetitive peak reverse voltage | | 170 | V | |
| I _{F(RMS)} | Forward rms current | | 30 | A | |
| I _{F(AV)} | Average forward current δ = 0.5, square wave | T _C = 150 °C | Per diode | 15 | A |
| | | | Per device | 30 | |
| I _{FSM} | Surge non repetitive forward current | tp = 10 ms sinusoidal | 220 | A | |
| P _{ARM} | Repetitive peak avalanche power | tp = 10 μs, T _j = 125 °C | 750 | W | |
| T _{stg} | Storage temperature range | | -65 to +175 | °C | |
| T _j | Maximum operating junction temperature ⁽¹⁾ | | +175 | °C | |

Notes:

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

Table 3: Thermal parameter

| Symbol | Parameter | | Max. value | Unit | |
|----------------------|------------------|--------------------|------------|------|------|
| R _{th(j-c)} | Junction to case | D ² PAK | Per diode | 1.6 | °C/W |
| | | TO-247 | | 1.5 | |
| | | D ² PAK | Total | 0.95 | |
| | | TO-247 | | 0.9 | |
| R _{th(c)} | Coupling | D ² PAK | Coupling | 0.3 | °C/W |
| | | TO-247 | | | |

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode1}) = P_{(\text{diode1})} \times R_{th(j-c)} (\text{per diode}) + P_{(\text{diode2})} \times R_{th(c)}$$

Table 4: Static electrical characteristics (per diode)

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|-------------|-------------------------|-----------------------|---------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ °C}$ | $V_R = V_{RRM}$ | - | | 20 | μA |
| | | $T_j = 125\text{ °C}$ | | - | 5 | 20 | mA |
| $V_F^{(2)}$ | Forward voltage drop | $T_j = 25\text{ °C}$ | $I_F = 15\text{ A}$ | - | | 0.92 | V |
| | | $T_j = 125\text{ °C}$ | | - | 0.69 | 0.75 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 30\text{ A}$ | - | | 1 | |
| | | $T_j = 125\text{ °C}$ | | - | 0.8 | 0.86 | |

Notes:

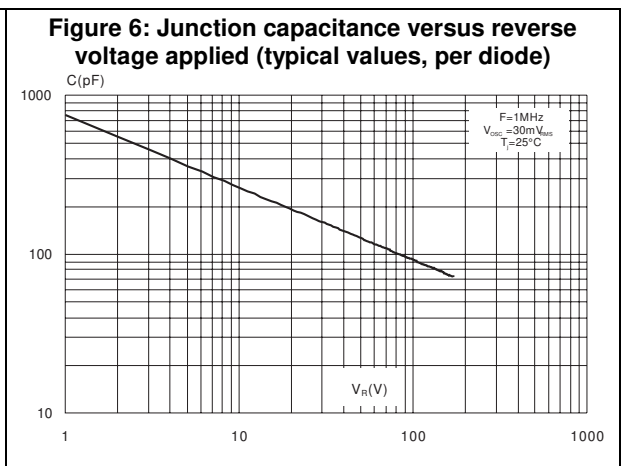
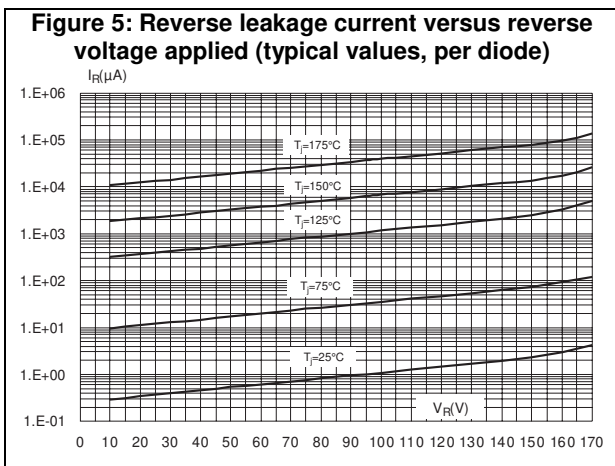
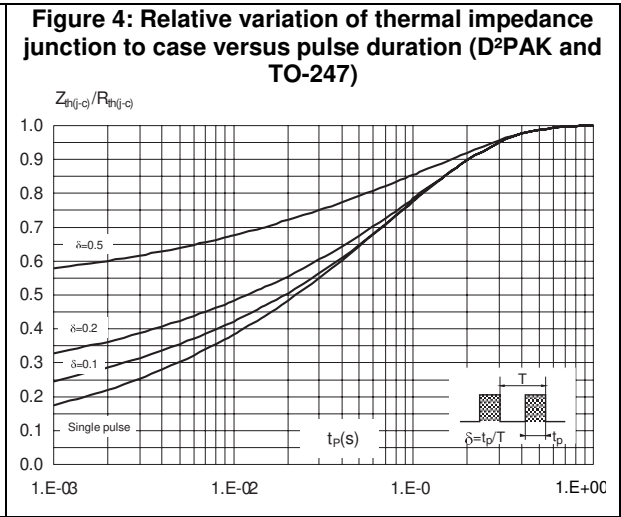
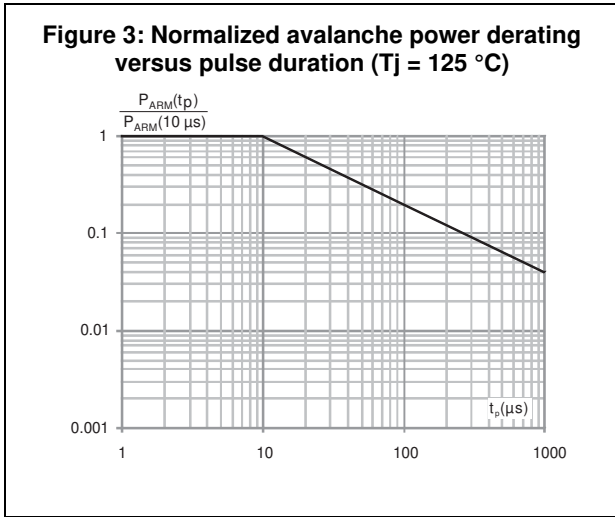
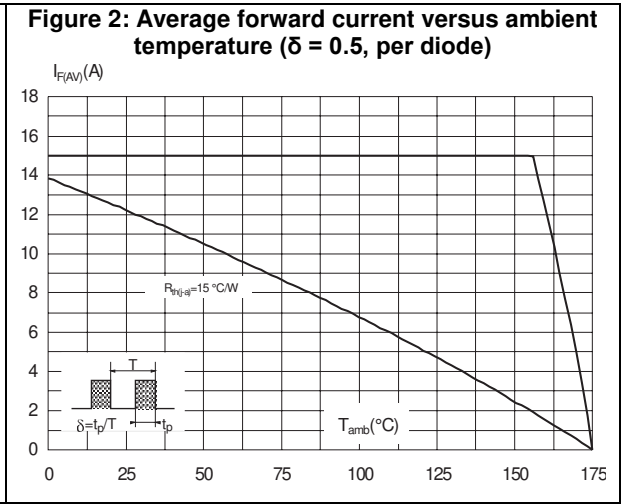
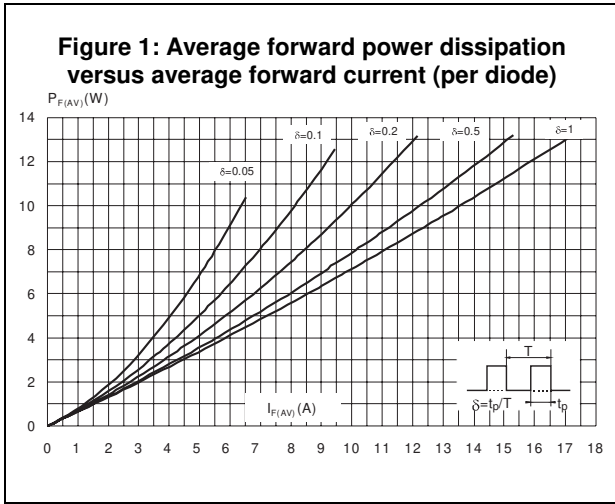
⁽¹⁾Pulse test: $t_p = 5\text{ ms}$, $\delta < 2\%$

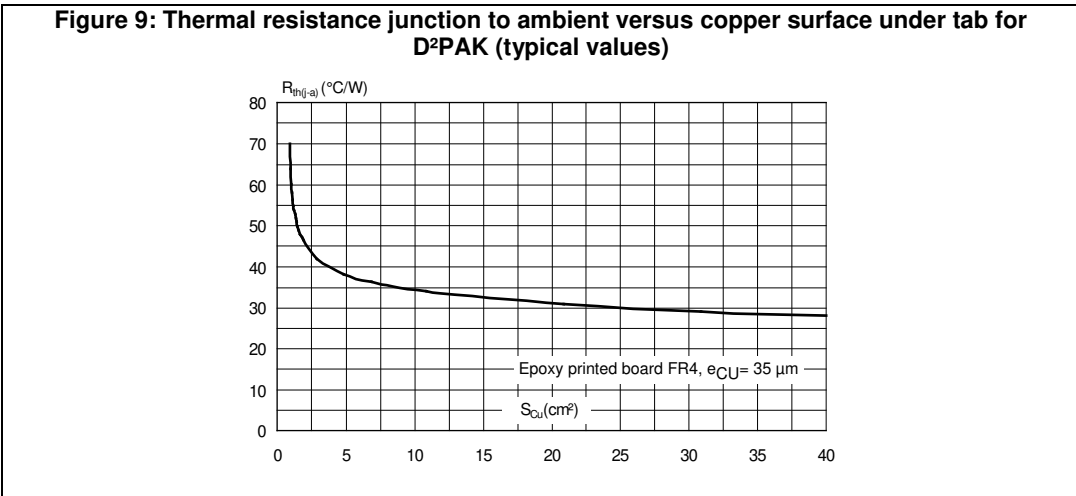
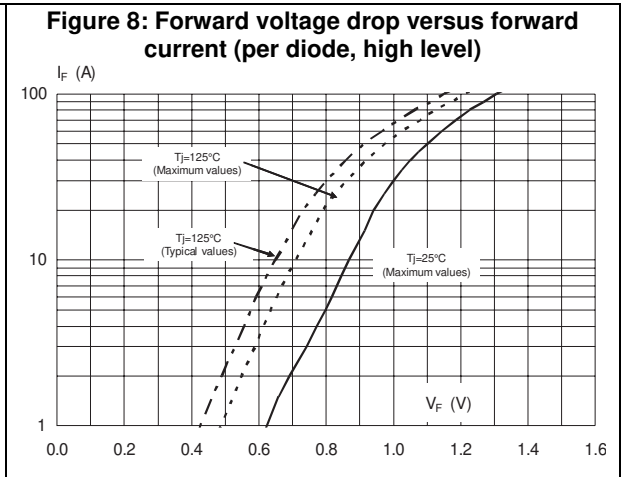
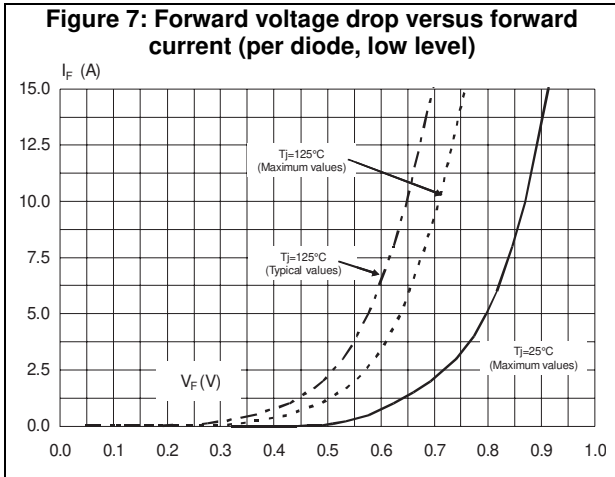
⁽²⁾Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

$$P = 0.64 \times I_{F(AV)} + 0.0073 I_{F(RMS)}^2$$

1.1 Characteristics (curves)





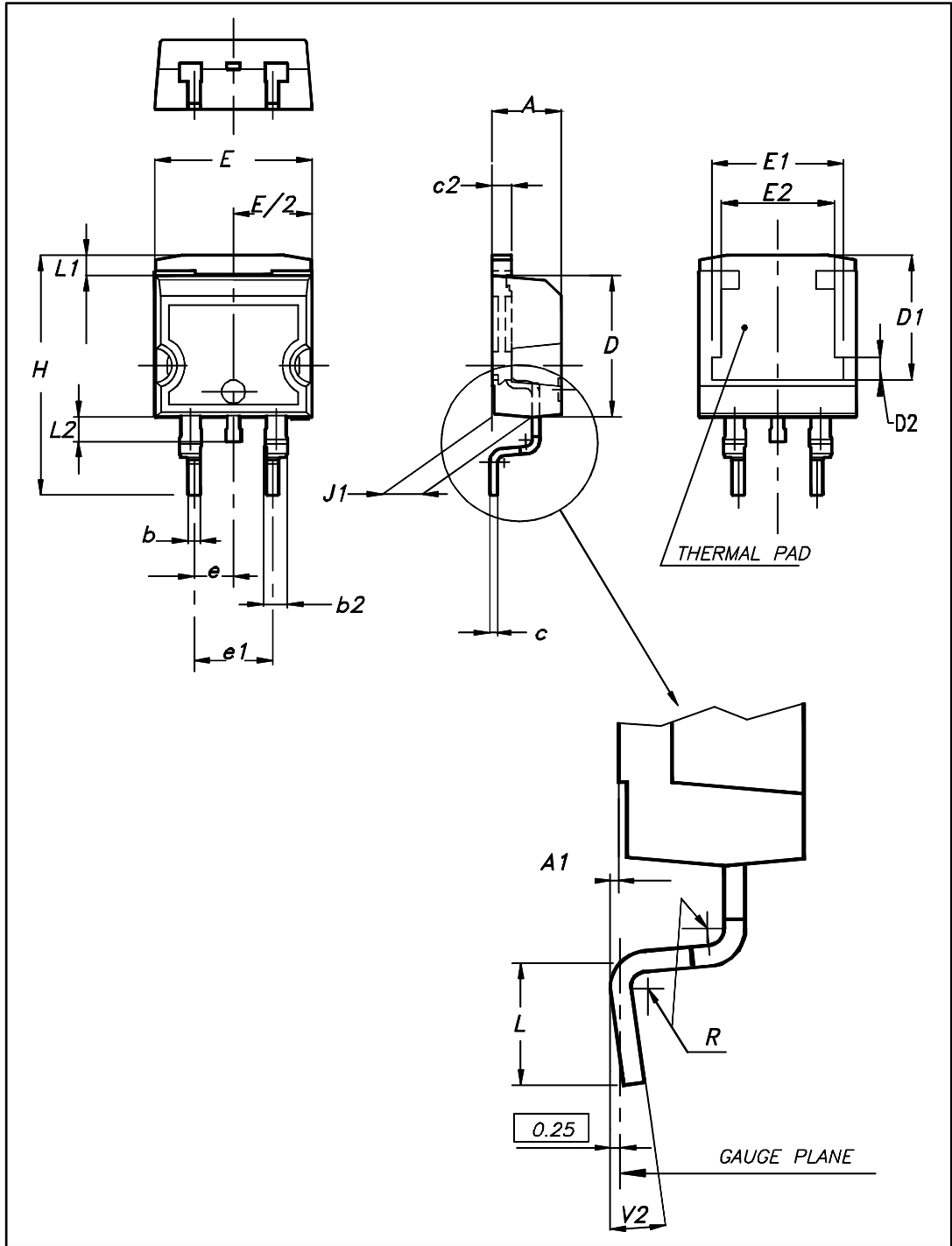
2 Package information

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.

- Cooling method: by conduction (C)
- Epoxy meets UL 94, V0
- Recommended torque values: 0.55 N·m (for TO-247)
- Maximum torque values: 1.0 N·m maximum (for TO-247)

2.1 D²PAK package information

Figure 10: D²PAK package outline

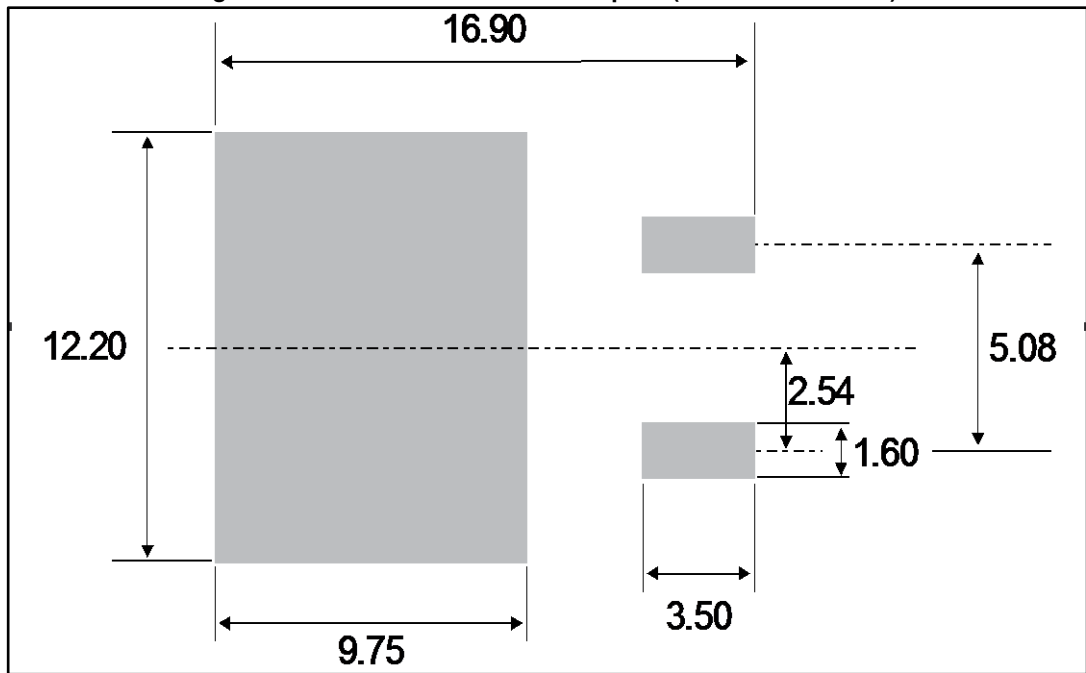


This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 5: D²PAK package mechanical data

| Ref. | Dimensions | | | |
|------|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.36 | 4.60 | 0.172 | 0.181 |
| A1 | 0.00 | 0.25 | 0.000 | 0.010 |
| b | 0.70 | 0.93 | 0.028 | 0.037 |
| b2 | 1.14 | 1.70 | 0.045 | 0.067 |
| c | 0.38 | 0.69 | 0.015 | 0.027 |
| c2 | 1.19 | 1.36 | 0.047 | 0.053 |
| D | 8.60 | 9.35 | 0.339 | 0.368 |
| D1 | 6.90 | 8.00 | 0.272 | 0.311 |
| D2 | 1.10 | 1.50 | 0.043 | 0.060 |
| E | 10.00 | 10.55 | 0.394 | 0.415 |
| E1 | 8.10 | 8.90 | 0.319 | 0.346 |
| E2 | 6.85 | 7.25 | 0.266 | 0.282 |
| e | 2.54 typ. | | 0.100 | |
| e1 | 4.88 | 5.28 | 0.190 | 0.205 |
| H | 15.00 | 15.85 | 0.591 | 0.624 |
| J1 | 2.49 | 2.90 | 0.097 | 0.112 |
| L | 1.90 | 2.79 | 0.075 | 0.110 |
| L1 | 1.27 | 1.65 | 0.049 | 0.065 |
| L2 | 1.30 | 1.78 | 0.050 | 0.070 |
| R | 0.4 typ. | | 0.015 | |
| V2 | 0° | 8° | 0° | 8° |

Figure 11: D²PAK recommended footprint (dimensions in mm)



2.2 TO-247 package information

Figure 12: TO-247 package outline

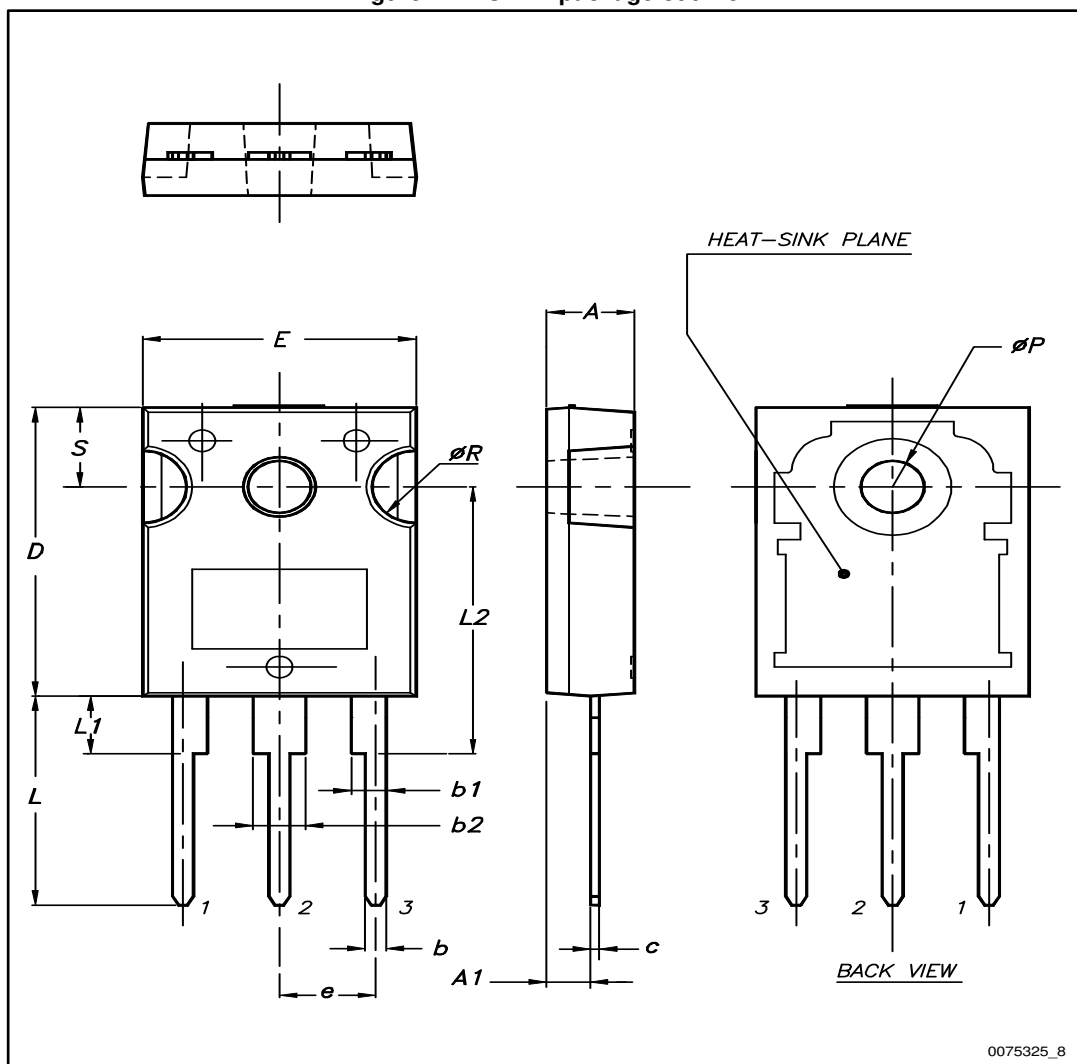


Table 6: TO-247 package mechanical data

| Ref. | Dimensions | | | | | |
|-------------------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.85 | | 5.15 | 0.191 | | 0.203 |
| A1 | 2.20 | | 2.60 | 0.086 | | 0.102 |
| b | 1.00 | | 1.40 | 0.039 | | 0.055 |
| b1 | 2.00 | | 2.40 | 0.078 | | 0.094 |
| b2 | 3.00 | | 3.40 | 0.118 | | 0.133 |
| c | 0.40 | | 0.80 | 0.015 | | 0.031 |
| D ⁽¹⁾ | 19.85 | | 20.15 | 0.781 | | 0.793 |
| E | 15.45 | | 15.75 | 0.608 | | 0.620 |
| e | 5.30 | 5.45 | 5.60 | 0.209 | 0.215 | 0.220 |
| L | 14.20 | | 14.80 | 0.559 | | 0.582 |
| L1 | 3.70 | | 4.30 | 0.145 | | 0.169 |
| L2 | | 18.50 | | | 0.728 | |
| ØP ⁽²⁾ | 3.55 | | 3.65 | 0.139 | | 0.143 |
| ØR | 4.50 | | 5.50 | 0.177 | | 0.217 |
| S | 5.30 | 5.50 | 5.70 | 0.209 | 0.216 | 0.224 |

Notes:

⁽¹⁾Dimension D plus gate protusion does not exceed 20.5 mm

⁽²⁾Resin thickness around the mounting hole is not less than 0.9 mm.

3 Ordering information

Table 7: Ordering information

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|----------------|-------------|--------------------|--------|----------|---------------|
| STPS30170CW | STPS30170CW | TO-247 | 4.40g | 30 | Tube |
| STPS30170CG-TR | STPS30170CG | D ² PAK | 1.48g | 1000 | Tape and reel |

4 Revision history

Table 8: Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| 16-Sep-2005 | 1 | First issue. |
| 16-May-2017 | 2 | Updated features, package silhouette and Table 1: "Device summary" . Updated Section 1: "Characteristics" , Section 1.1: "Characteristics (curves)" , Section 2: "Package information" and Table 7: "Ordering information" . |

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