

Click to view price, real time Inventory,
Delivery & Lifecycle Information ;

STPS3045CG-TR

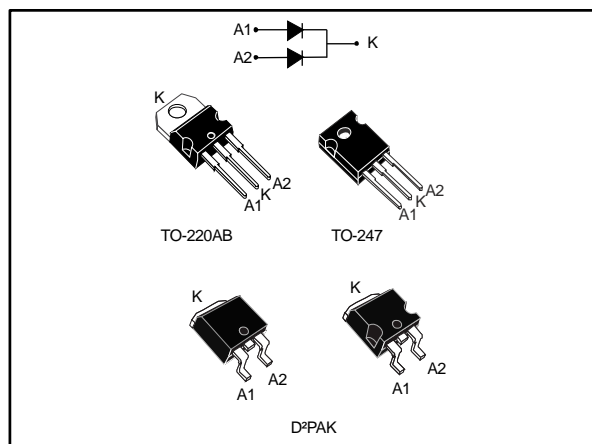
STMicroelectronics

Schottky Diodes & Rectifiers 2X15 Amp 45 Volt

Any questions, please feel free to contact us.
info@kaimte.com

Power Schottky rectifier

Datasheet - production data


Description

Dual center tap Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters. Packaged either in TO-220AB, TO-247, or D²PAK, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

Table 1: Device summary

| Symbol | Value |
|--------------|---|
| $I_{F(AV)}$ | 2 x 15 A |
| V_{RRM} | 45 V |
| V_F (typ.) | 0.5 V |
| T_j (max.) | 175 °C (up to 200 °C in forward mode for D ² PAK) |

Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Avalanche rated
- ECOPACK[®]2 compliant component for D²PAK on demand

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 | | 45 | V | |
| I _{F(RMS)} | Forward rms current | | 30 | A | |
| I _{F(AV)} | Average forward current δ = 0.5, square wave | T _C = 155 °C | Per diode | 15 | A |
| | | | Per device | 30 | |
| I _{FSM} | Surge non repetitive forward current | | t _p = 10 ms sinusoidal | 220 | A |
| P _{ARM} ⁽¹⁾ | Repetitive peak avalanche power | | t _p = 10 μs, T _j = 125 °C | 430 | W |
| T _{stg} | Storage temperature range | | -65 to +175 | | |
| T _j | Maximum operating junction temperature ⁽²⁾ | | 175 | | °C |
| | Maximum operating junction temperature (DC forward current without reverse bias, t = 1 hour for D ² PAK) | | 200 | | |

Notes:

⁽¹⁾For pulse time duration deratings, please refer to Figure 3. More details regarding the avalanche energy measurements and diode validation in the avalanche are provided in the STMicroelectronics Application notes AN1768, "Admissible avalanche power of Schottky diodes" and AN2025, "Converter improvement using Schottky rectifier avalanche specification".

⁽²⁾(dP_{tot}/dT_j) < (1/R_{th(j-a)}) condition to avoid thermal runaway for a diode on its own heatsink.

Table 3: Thermal parameters

| Symbol | Parameter | | Value | Unit | |
|----------------------|------------------|---------------------------------------|-----------|------|------|
| R _{th(j-c)} | Junction to case | TO-220AB / D ² PAK | Per diode | 1.60 | °C/W |
| | | | Total | 0.95 | |
| | | TO-247 | Per diode | 1.5 | |
| | | | Total | 0.9 | |
| R _{th(c)} | Coupling | TO-220AB / D ² PAK/ TO-247 | 0.3 | | |

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 | $T_j = 25\text{ °C}$ | $V_R = V_{RRM}$ | - | | 200 | μA |
| | | $T_j = 125\text{ °C}$ | | - | 11 | 40 | mA |
| $V_F^{(1)}$ | Forward voltage drop | $T_j = 125\text{ °C}$ | $I_F = 15\text{ A}$ | - | 0.5 | 0.57 | V |
| | | $T_j = 25\text{ °C}$ | $I_F = 30\text{ A}$ | - | | 0.84 | |
| | | $T_j = 125\text{ °C}$ | | - | 0.65 | 0.72 | |

Notes:

⁽¹⁾Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.01 \times I_{F(RMS)}^2$$

1.2 Characteristics (curves)

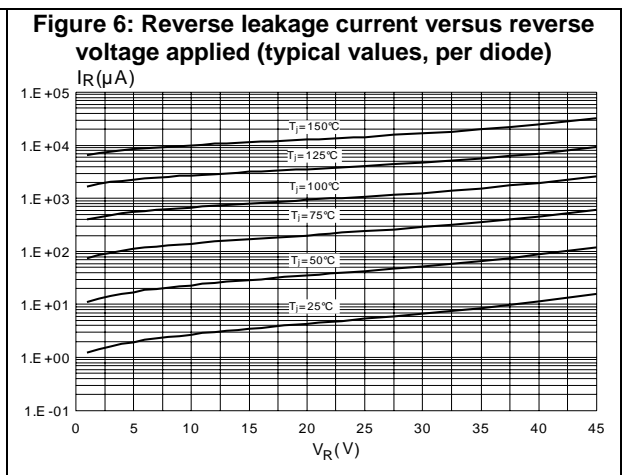
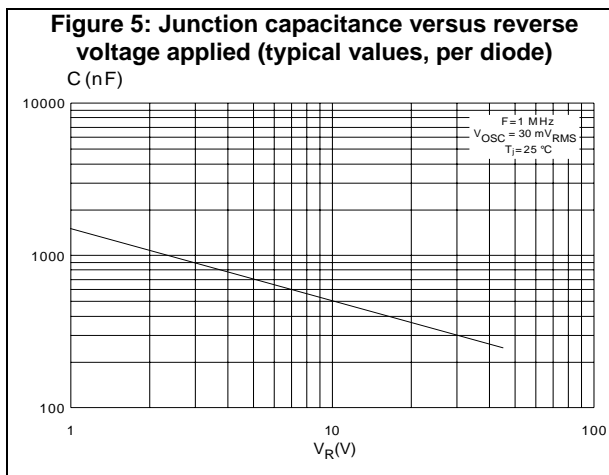
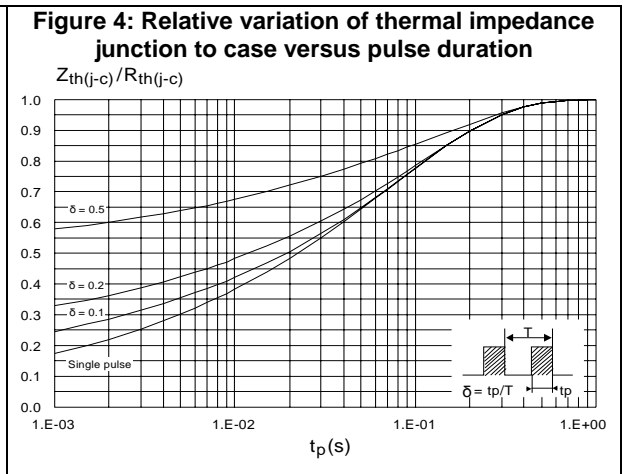
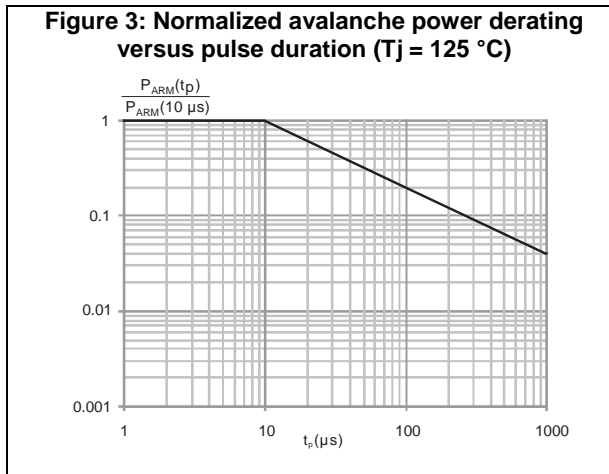
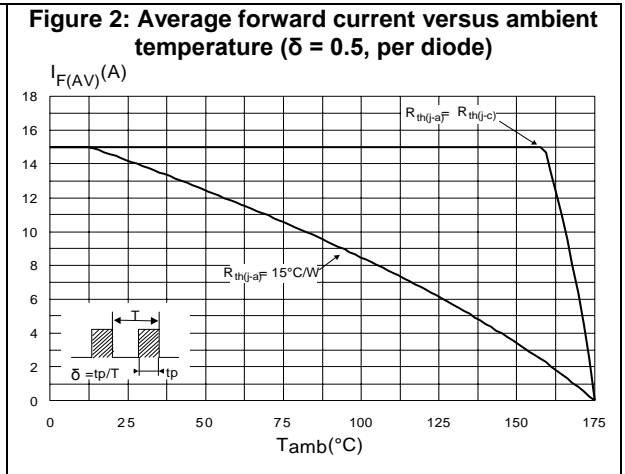
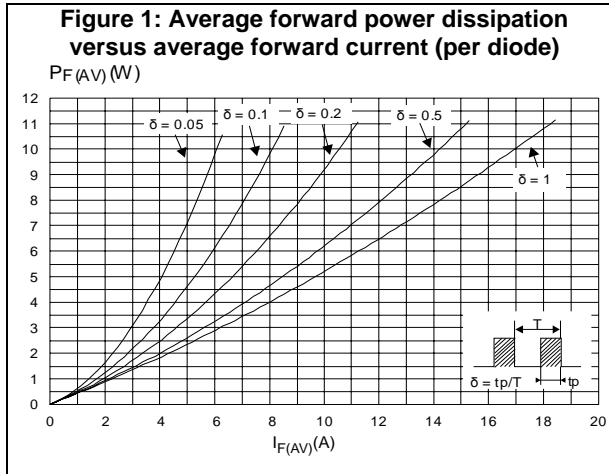


Figure 7: Forward voltage drop versus forward current (maximum values, per diode)

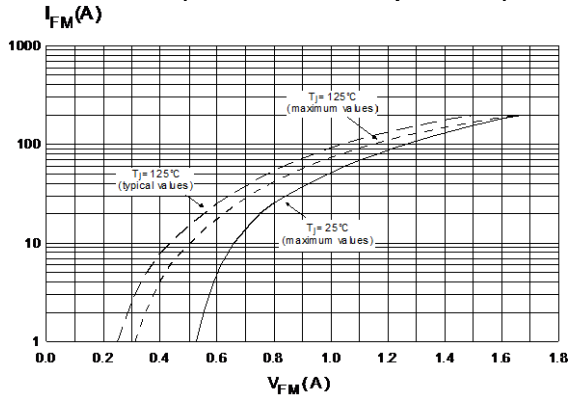
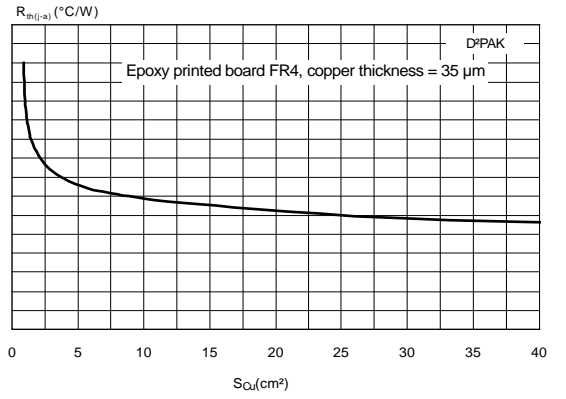


Figure 8: Thermal resistance junction to ambient versus copper surface under tab



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 value: 0.55 N·m (for TO-220AB and TO-247)
- Maximum torque value: 0.7 N·m (for TO-220AB)
- Maximum torque value: 1.0 N·m (for TO-247)

2.1 TO-220AB package information

Figure 9: TO-220AB package outline

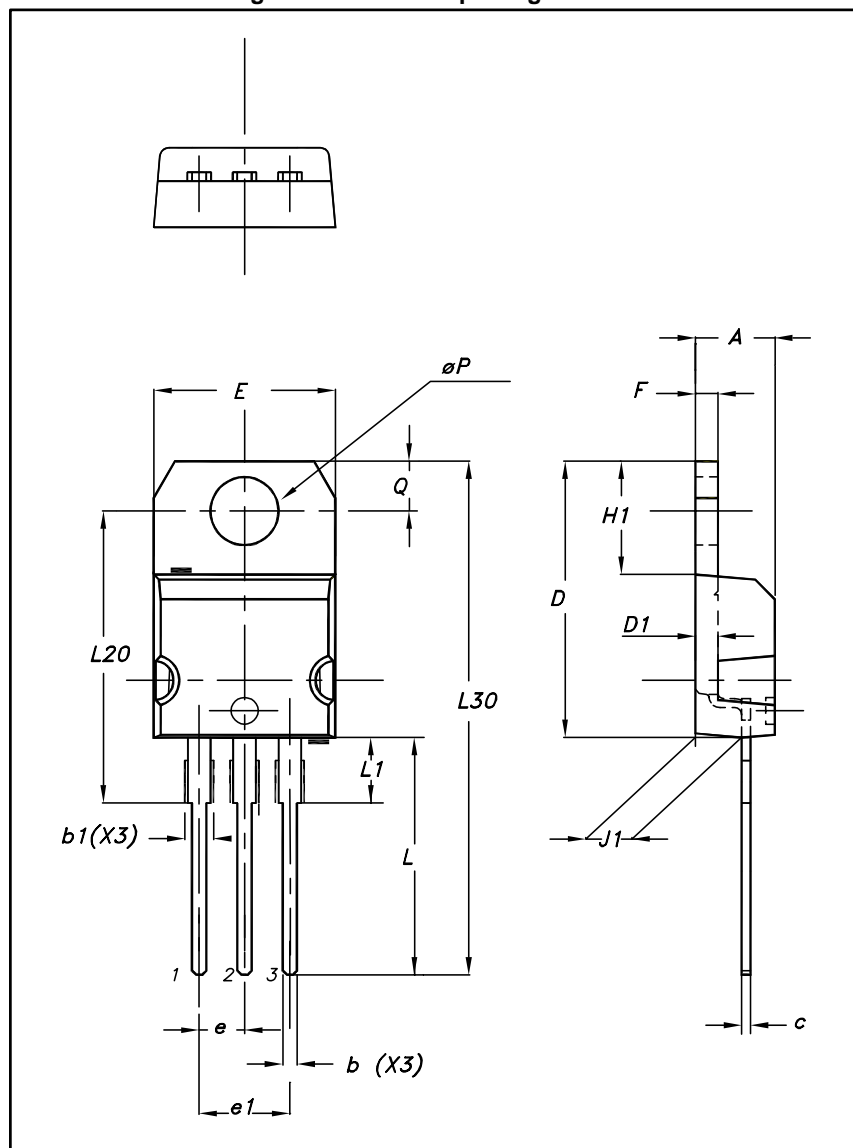


Table 5: TO-220AB package mechanical data

| Ref. | Dimensions | | | |
|------|-------------|-------|------------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| b | 0.61 | 0.88 | 0.024 | 0.035 |
| b1 | 1.14 | 1.55 | 0.045 | 0.061 |
| c | 0.48 | 0.70 | 0.019 | 0.028 |
| D | 15.25 | 15.75 | 0.600 | 0.620 |
| D1 | 1.27 typ. | | 0.050 typ. | |
| E | 10.00 | 10.40 | 0.394 | 0.409 |
| e | 2.40 | 2.70 | 0.094 | 0.106 |
| e1 | 4.95 | 5.15 | 0.195 | 0.203 |
| F | 1.23 | 1.32 | 0.048 | 0.052 |
| H1 | 6.20 | 6.60 | 0.244 | 0.260 |
| J1 | 2.40 | 2.72 | 0.094 | 0.107 |
| L | 13.00 | 14.00 | 0.512 | 0.551 |
| L1 | 3.50 | 3.93 | 0.138 | 0.155 |
| L20 | 16.40 typ. | | 0.646 typ. | |
| L30 | 28.90 typ. | | 1.138 typ. | |
| ØP | 3.75 | 3.85 | 0.148 | 0.152 |
| Q | 2.65 | 2.95 | 0.104 | 0.116 |

2.2 TO-247 package information

Figure 10: TO-247 package outline

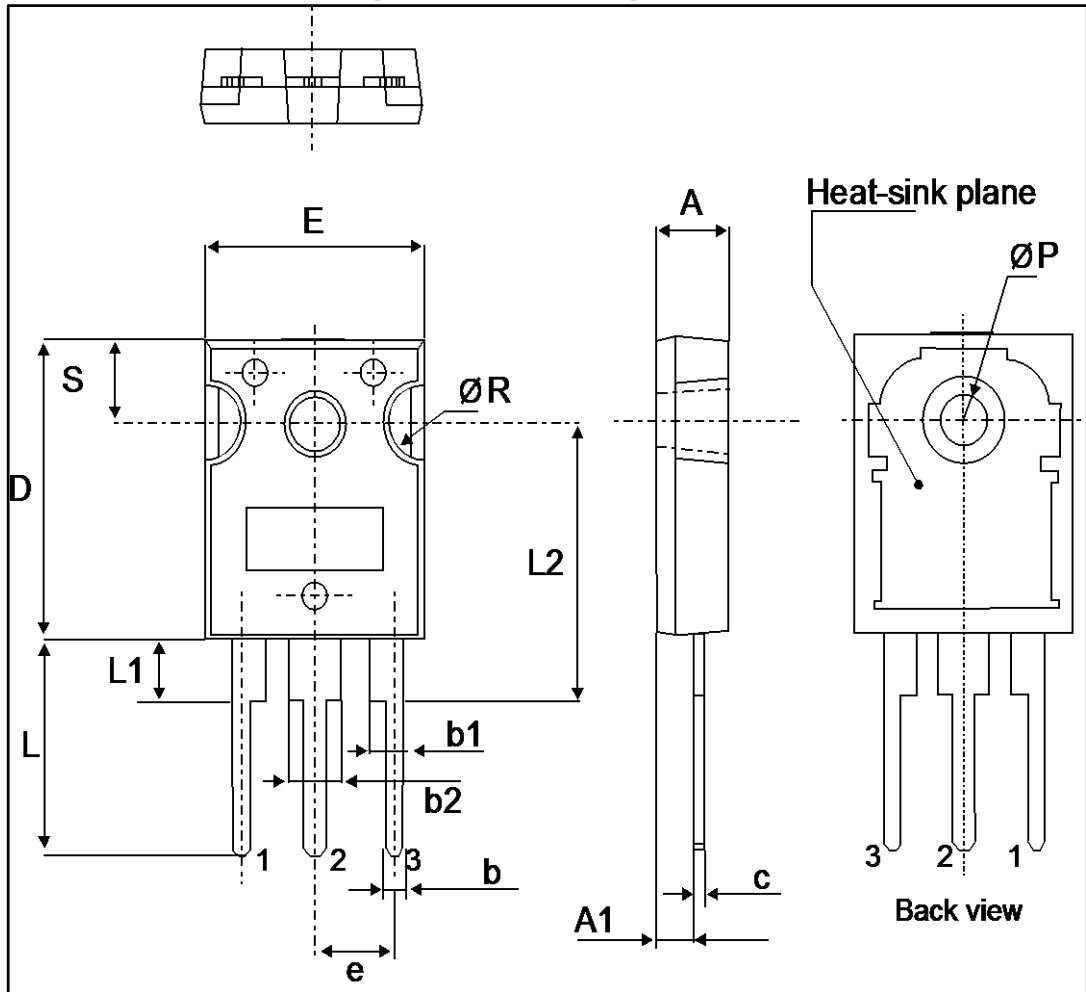


Table 6: TO-247 package mechanical data

| 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 |

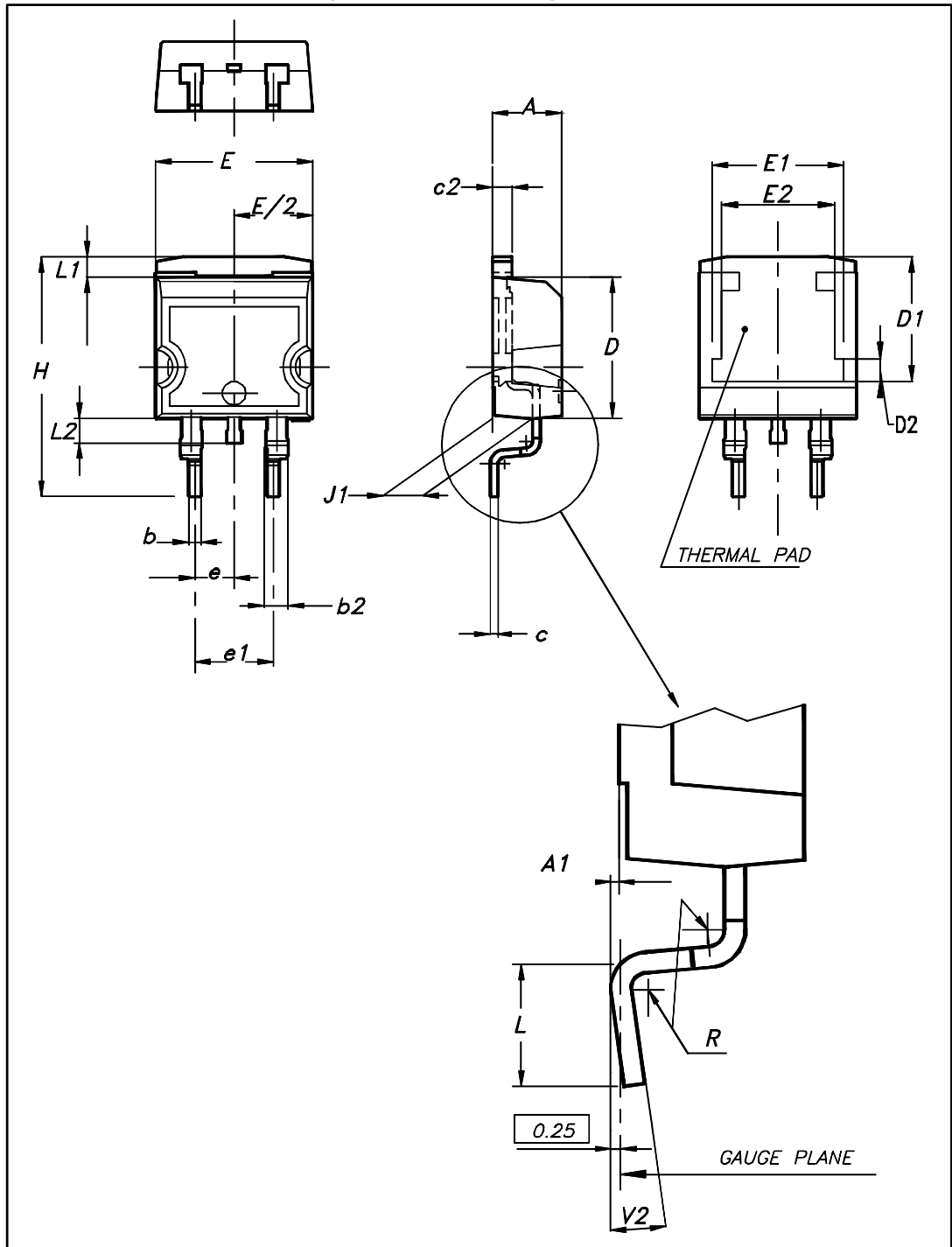
Notes:

⁽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.

2.3 D²PAK package information

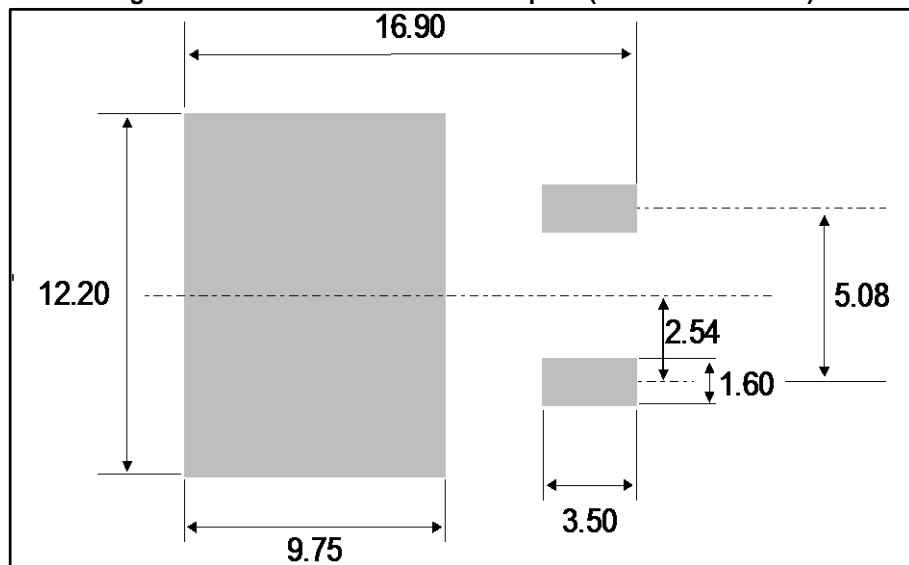
Figure 11: D²PAK package outline



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

Table 7: 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 12: D²PAK recommended footprint (dimensions in mm)

3 Ordering information

Table 8: Ordering information

| Order code | Marking | Package | Weight | Base qty. | Delivery mode |
|---------------|------------|--------------------|--------|-----------|---------------|
| STPS3045CT | STPS3045CT | TO-220AB | 1.9 g | 50 | Tube |
| STPS3045CG | STPS3045CG | D ² PAK | 1.38 g | 50 | Tube |
| STPS3045CG-TR | STPS3045CG | | | 1000 | Tape and reel |
| STPS3045CW | STPS3045CW | TO-247 | 4.46 g | 30 | Tube |

4 Revision history

Table 9: Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| Jul-2003 | 6E | Last update. |
| 06-Nov-2012 | 7 | Removed SOT-93 and TOP-3I packages. Table 2: Operating range (T_j) extension from -40 to +175° C, $I_{F(AV)}$ per diode updated to 15 A. Updated "Total" values in Table 3. Updated tables in Section 2: Package information. |
| 04-Apr-2013 | 8 | Added value for maximum T_j in forward mode. Updated Table 9. |
| 02-Aug-2016 | 9 | Updated D ² PAK package information. Removed I ² PAK and TO-220FPAB package information. |

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2016 STMicroelectronics – All rights reserved

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[STPS3045CG](#) [STPS3045CG-TR](#) [STPS3045CPIRG](#) [STPS3045CT](#) [STPS3045CW](#) [STPS3045CR](#)