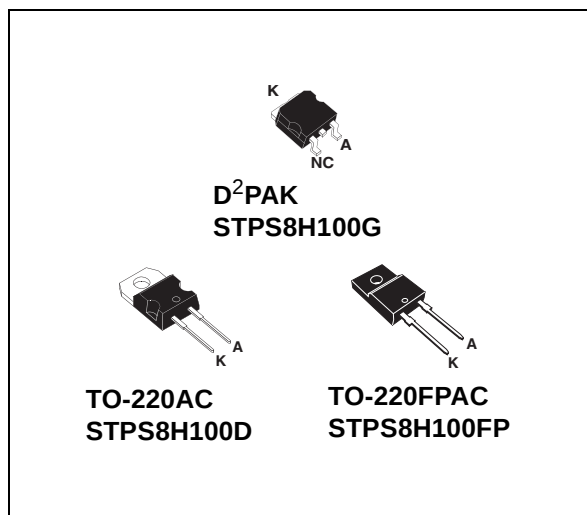


## High voltage power Schottky rectifier

Datasheet - production data



### Description

Schottky barrier rectifier designed for high frequency compact switched mode power supplies such as adaptators and on board DC/DC converters.

Table 1. Device summary

| Symbol      | Value  |
|-------------|--------|
| $I_{F(AV)}$ | 8 A    |
| $V_{RRM}$   | 100 V  |
| $T_j$ (max) | 175° C |
| $V_F$ (max) | 0.58 V |

### Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Insulated package:
  - TO-220FPAC  
Insulating voltage = 2000 V AC  
Typical package capacitance = 12 pF
- Avalanche capability specified

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

| Symbol       | Parameter                                 |                              |                                                   | Value        | Unit              |
|--------------|-------------------------------------------|------------------------------|---------------------------------------------------|--------------|-------------------|
| $V_{RRM}$    | Repetitive peak reverse voltage           |                              |                                                   | 100          | V                 |
| $I_{F(RMS)}$ | RMS forward voltage                       |                              |                                                   | 30           | A                 |
| $I_{F(AV)}$  | Average forward current<br>$\delta = 0.5$ | TO-220AC, D <sup>2</sup> PAK | $T_C = 165^\circ \text{C}$                        | 8            | A                 |
|              |                                           | TO-220FPAC                   | $T_C = 150^\circ \text{C}$                        |              |                   |
| $I_{FSM}$    | Surge non repetitive forward current      |                              | $t_p = 10 \text{ ms}$ sinusoidal                  | 250          | A                 |
| $P_{ARM}$    | Repetitive peak avalanche power           |                              | $t_p = 10 \mu\text{s}$ $T_j = 125^\circ \text{C}$ | 750          | W                 |
| $T_{stg}$    | Storage temperature range                 |                              |                                                   | -65 to + 175 | $^\circ \text{C}$ |
| $T_j$        | Maximum operating junction temperature    |                              |                                                   | 175          | $^\circ \text{C}$ |

**Table 3. Thermal resistance**

| Symbol        | Parameter        |                              | Value | Unit                |
|---------------|------------------|------------------------------|-------|---------------------|
| $R_{th(j-c)}$ | Junction to case | TO-220AC, D <sup>2</sup> PAK | 1.6   | $^\circ \text{C/W}$ |
|               |                  | TO-220FPAC                   | 4     |                     |

**Table 4. Static electrical characteristics (per diode)**

| Symbol      | Parameter               | Tests conditions           |                      | Min. | Typ  | Max. | Unit          |
|-------------|-------------------------|----------------------------|----------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25^\circ \text{C}$  | $V_R = V_{RRM}$      |      |      | 4.5  | $\mu\text{A}$ |
|             |                         | $T_j = 125^\circ \text{C}$ |                      |      | 2    | 6.0  | mA            |
| $V_F^{(2)}$ | Forward voltage drop    | $T_j = 25^\circ \text{C}$  | $I_F = 8 \text{ A}$  |      |      | 0.71 | V             |
|             |                         | $T_j = 125^\circ \text{C}$ |                      |      | 0.56 | 0.58 |               |
|             |                         | $T_j = 25^\circ \text{C}$  | $I_F = 10 \text{ A}$ |      |      | 0.77 |               |
|             |                         | $T_j = 125^\circ \text{C}$ |                      |      | 0.59 | 0.64 |               |
|             |                         | $T_j = 25^\circ \text{C}$  | $I_F = 16 \text{ A}$ |      |      | 0.81 |               |
|             |                         | $T_j = 125^\circ \text{C}$ |                      |      | 0.65 | 0.68 |               |

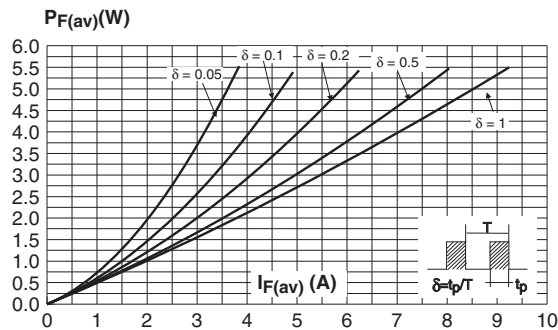
1.  $t_p = 5 \text{ ms}$ ,  $\delta < 2\%$

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

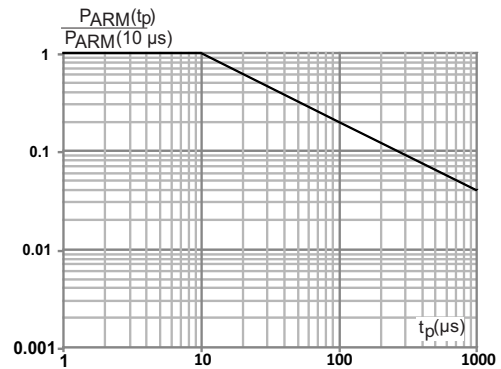
To evaluate the conduction losses use the following equation:

$$P = 0.48 \times I_{F(AV)} + 0.0125 I_{F(RMS)}^2$$

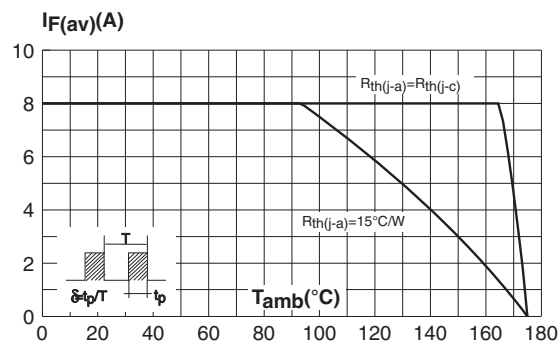
**Figure 1. Average forward power dissipation versus average forward current**



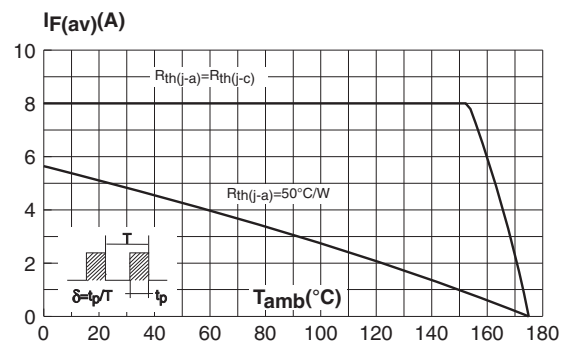
**Figure 2. Normalized avalanche power derating versus pulse duration**



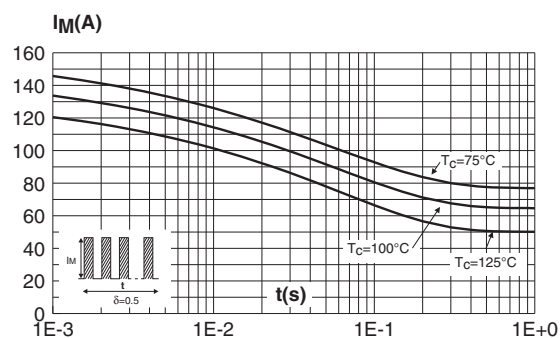
**Figure 3. Average forward current versus ambient temperature,  $\delta = 0.5$ , (TO-220AC, D<sup>2</sup>PAK)**



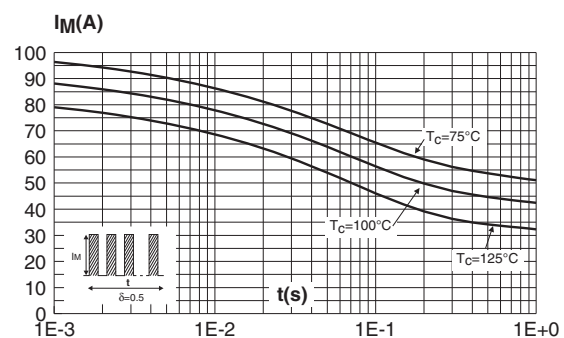
**Figure 4. Average forward current versus ambient temperature,  $\delta = 0.5$ , (TO-220FPAC)**



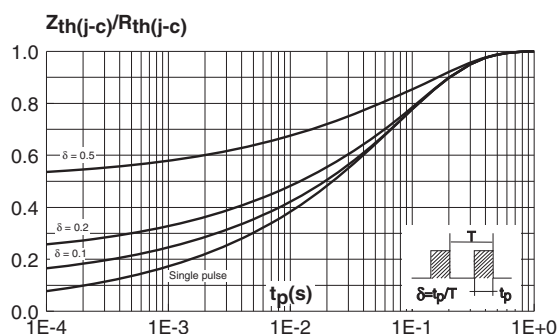
**Figure 5. Non repetitive surge peak forward current versus overload duration - maximum values, per diode (TO-220AC, D<sup>2</sup>PAK)**



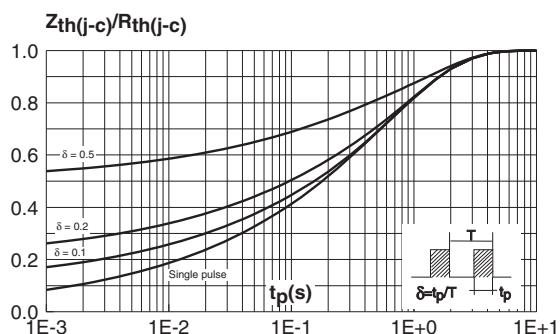
**Figure 6. Non repetitive surge peak forward current versus overload duration - maximum values (TO-220FPAC)**



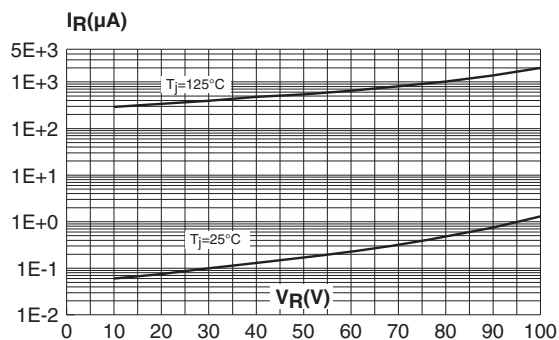
**Figure 7. Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, D<sup>2</sup>PAK)**



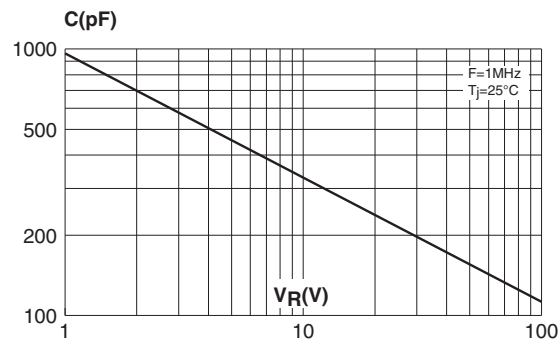
**Figure 8. Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC)**



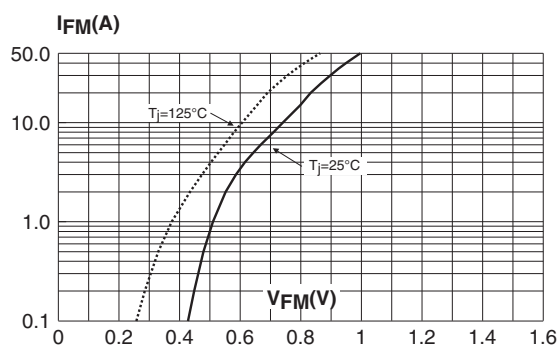
**Figure 9. Reverse leakage current versus reverse voltage applied (typical values)**



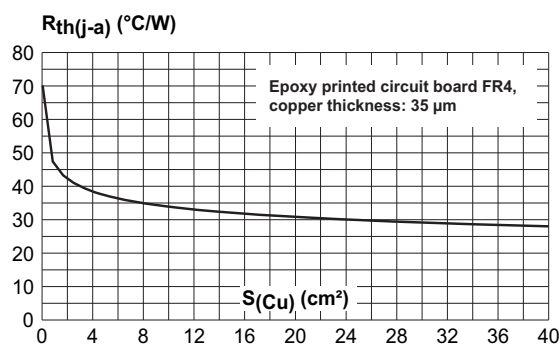
**Figure 10. Junction capacitance versus reverse voltage applied (typical values)**



**Figure 11. Forward voltage drop versus forward current (maximum values)**



**Figure 12. Thermal resistance junction to ambient versus copper surface under tab (D<sup>2</sup>PAK)**



## 2 Package Information

- Epoxy meets UL94,V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.4 to 0.6 N·m (TO-220AC)

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](http://www.st.com). ECOPACK® is an ST trademark.

**Figure 13. D<sup>2</sup>PAK dimension definitions**

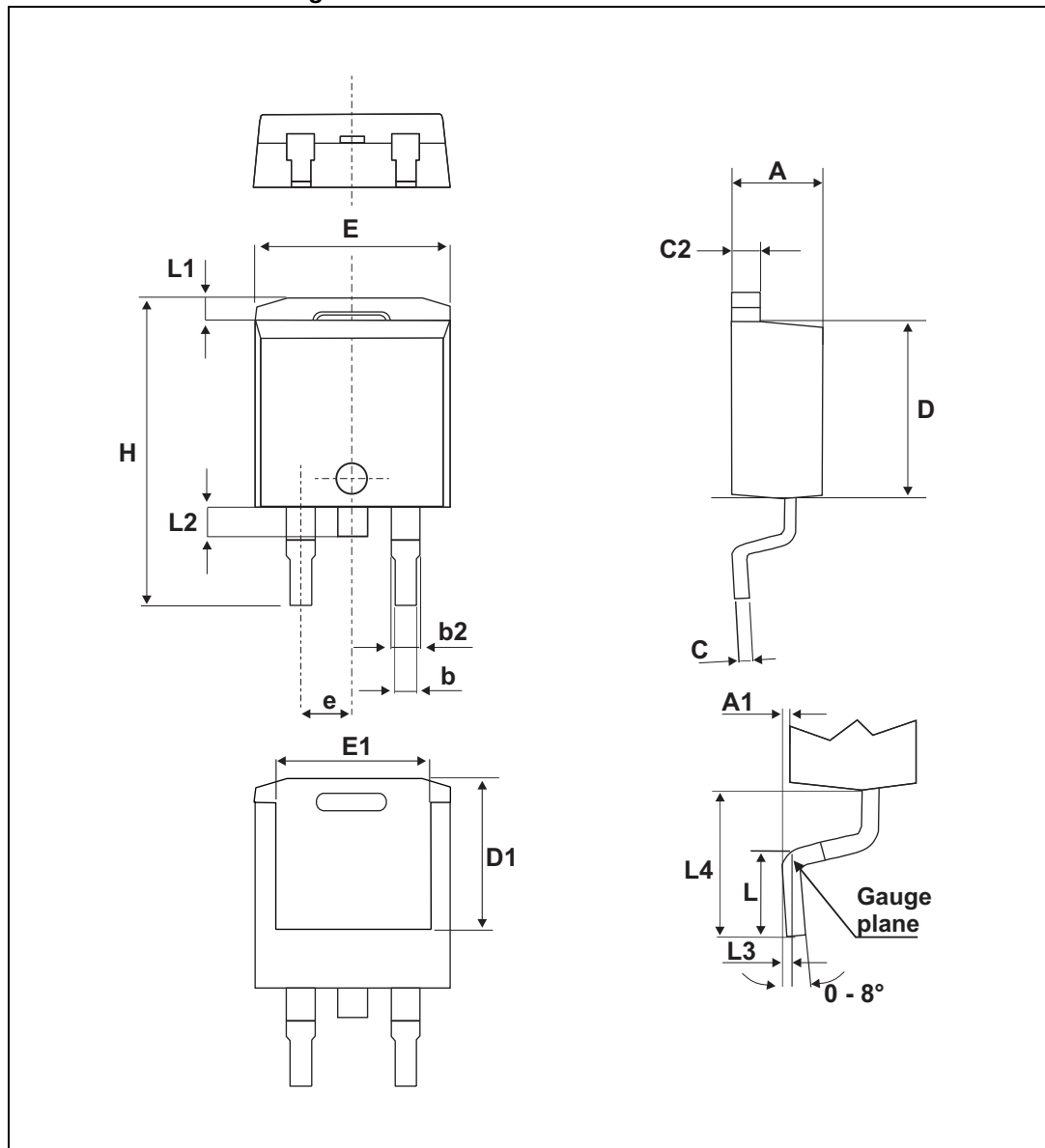


Table 5. D<sup>2</sup>PAK dimension values

| 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        | 0.694 | 0.015      | 0.027 |
| c1   | 0.38        | 0.534 | 0.015      | 0.021 |
| c2   | 1.19        | 1.36  | 0.047      | 0.053 |
| D    | 8.60        | 9.35  | 0.339      | 0.368 |
| D1   | 6.90        | -     | 0.272      | -     |
| E    | 10.00       | 10.55 | 0.394      | 0.415 |
| E1   | 8.10        | -     | 0.319      | -     |
| e    | 2.54 typ.   |       | 0.100 typ. |       |
| H    | 15.00       | 15.85 | 0.591      | 0.624 |
| L    | 1.90        | 2.79  | 0.075      | 0.110 |
| L1   | -           | 1.65  | -          | 0.065 |
| L2   | -           | 1.78  | -          | 0.070 |
| L3   | 0.25 typ.   |       | 0.010 typ. |       |
| L4   | 4.78        | 5.28  | 0.188      | 0.208 |

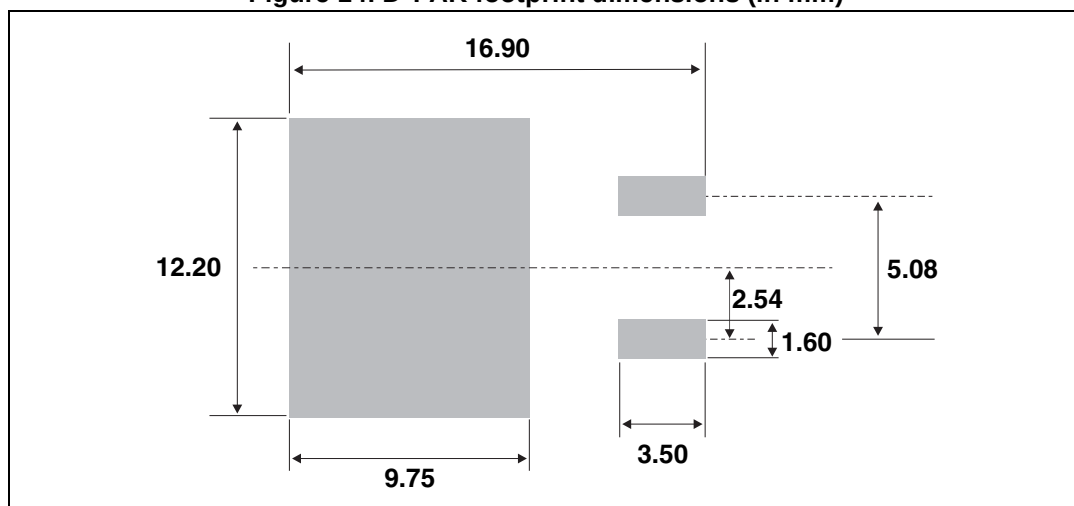
Figure 14. D<sup>2</sup>PAK footprint dimensions (in mm)

Figure 15. TO-220AC dimension definitions

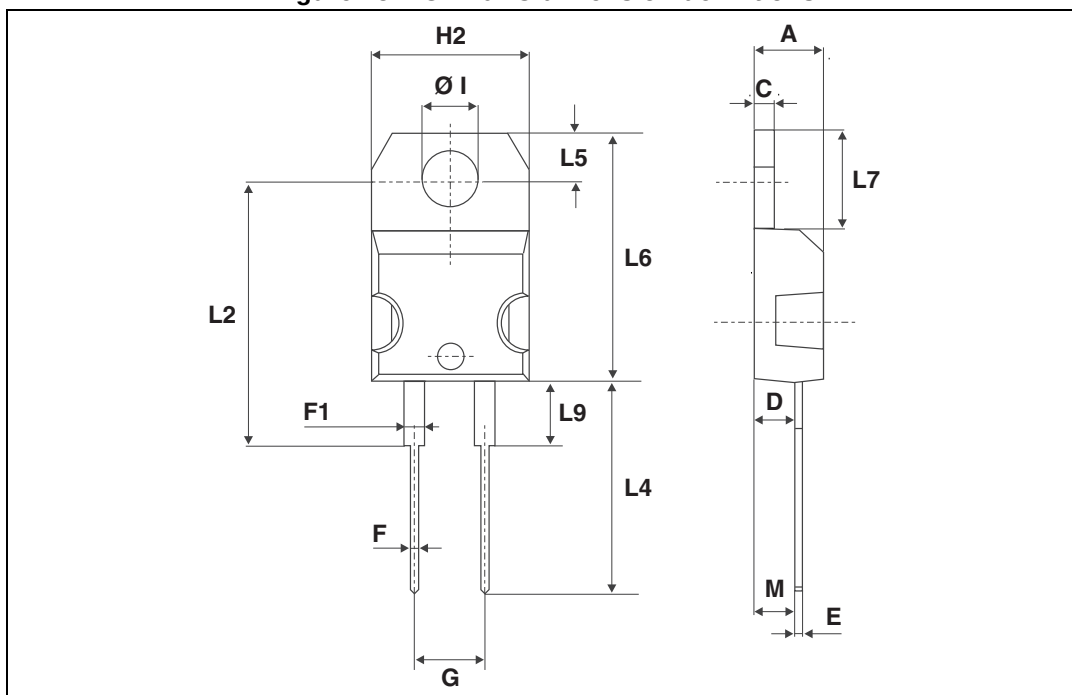


Table 6. TO-220AC dimension values

| Ref.    | Dimensions  |       |            |       |
|---------|-------------|-------|------------|-------|
|         | Millimeters |       | Inches     |       |
|         | Min.        | Max.  | Min.       | Max.  |
| A       | 4.40        | 4.60  | 0.173      | 0.181 |
| C       | 1.23        | 1.32  | 0.048      | 0.051 |
| D       | 2.40        | 2.72  | 0.094      | 0.107 |
| E       | 0.49        | 0.70  | 0.019      | 0.027 |
| F       | 0.61        | 0.88  | 0.024      | 0.034 |
| F1      | 1.14        | 1.70  | 0.044      | 0.066 |
| G       | 4.95        | 5.15  | 0.194      | 0.202 |
| H2      | 10.00       | 10.40 | 0.393      | 0.409 |
| L2      | 16.40 typ.  |       | 0.645 typ. |       |
| L4      | 13.00       | 14.00 | 0.511      | 0.551 |
| L5      | 2.65        | 2.95  | 0.104      | 0.116 |
| L6      | 15.25       | 15.75 | 0.600      | 0.620 |
| L7      | 6.20        | 6.60  | 0.244      | 0.259 |
| L9      | 3.50        | 3.93  | 0.137      | 0.154 |
| M       | 2.6 typ.    |       | 0.102 typ. |       |
| Diam. I | 3.75        | 3.85  | 0.147      | 0.151 |

Figure 16. TO-220FPAC dimension definitions

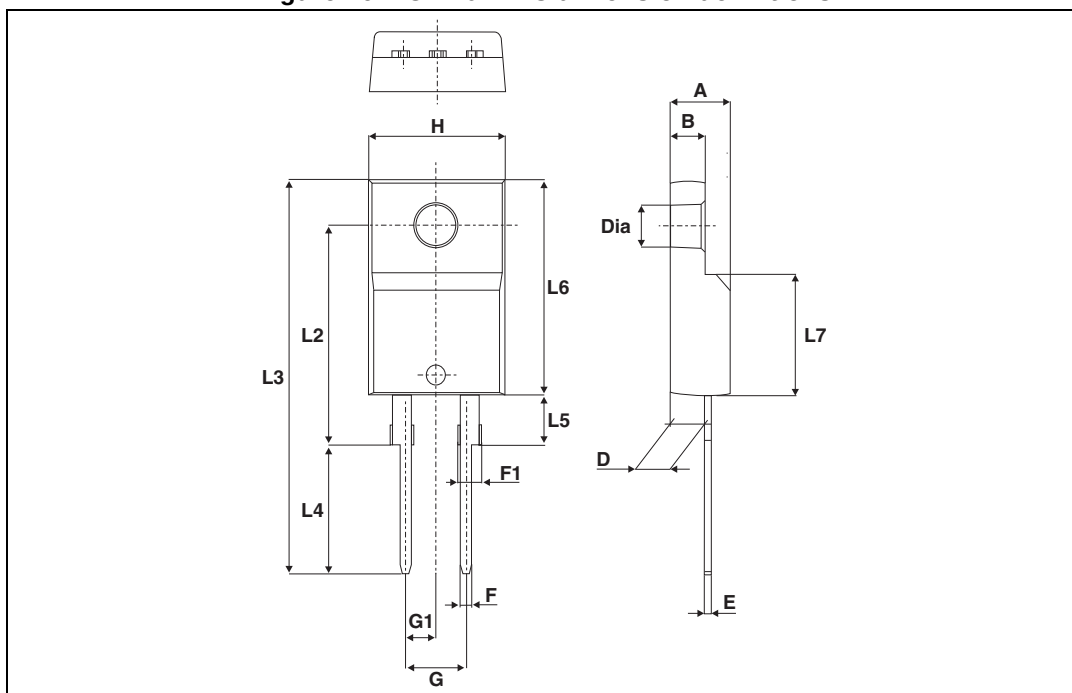


Table 7. TO-220FPAC dimension values

| Ref. | Dimensions  |      |           |       |
|------|-------------|------|-----------|-------|
|      | Millimeters |      | Inches    |       |
|      | Min.        | Max. | Min.      | Max.  |
| A    | 4.4         | 4.6  | 0.173     | 0.181 |
| B    | 2.5         | 2.7  | 0.098     | 0.106 |
| D    | 2.5         | 2.75 | 0.098     | 0.108 |
| E    | 0.45        | 0.70 | 0.018     | 0.027 |
| F    | 0.75        | 1    | 0.030     | 0.039 |
| F1   | 1.15        | 1.70 | 0.045     | 0.067 |
| G    | 4.95        | 5.20 | 0.195     | 0.205 |
| G1   | 2.4         | 2.7  | 0.094     | 0.106 |
| H    | 10          | 10.4 | 0.393     | 0.409 |
| L2   | 16 Typ.     |      | 0.63 Typ. |       |
| L3   | 28.6        | 30.6 | 1.126     | 1.205 |
| L4   | 9.8         | 10.6 | 0.386     | 0.417 |
| L5   | 2.9         | 3.6  | 0.114     | 0.142 |
| L6   | 15.9        | 16.4 | 0.626     | 0.646 |
| L7   | 9.00        | 9.30 | 0.354     | 0.366 |
| Dia. | 3.00        | 3.20 | 0.118     | 0.126 |

### 3 Ordering Information

**Table 8. Ordering information**

| Order code    | Marking     | Package            | Weight | Base qty | Delivery mode |
|---------------|-------------|--------------------|--------|----------|---------------|
| STPS8H100D    | STPS8H100D  | TO-220AC           | 1.86 g | 50       | Tube          |
| STPS8H100FP   | STPS8H100FP | TO-220FPAC         | 1.9 g  | 50       | Tube          |
| STPS8H100G    | STPS8H100G  | D <sup>2</sup> PAK | 1.48 g | 50       | Tube          |
| STPS8H100G-TR | STPS8H100G  | D <sup>2</sup> PAK | 1.48 g | 500      | Tape and reel |

### 4 Revision history

**Table 9. Document revision history**

| Date        | Revision | Description of Changes                                                                                                                               |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Jul-2003    | 6D       | Last update.                                                                                                                                         |
| 1-June-2006 | 10       | Reformatted to current standard. Added ECOPACK statement. Changed nF to pF in Figure 11. Revision number set to 10 to align with on-line versioning. |
| 08-Apr-2014 | 11       | Updated D <sup>2</sup> PAK package information and <a href="#">Figure 2</a> .                                                                        |

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**ST PRODUCTS ARE NOT DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER'S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR "AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL" INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2014 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)