



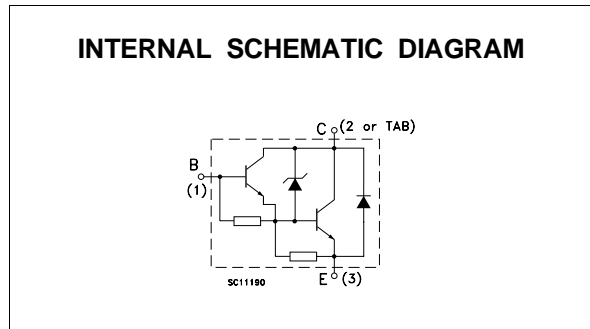
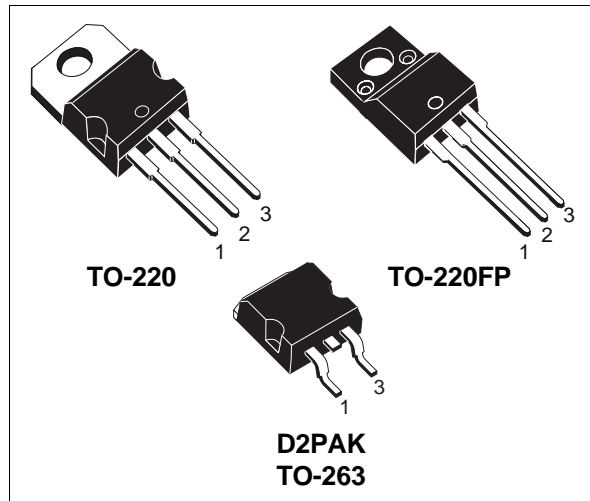
# BU941ZT/BU941ZTFP BUB941ZT

## HIGH VOLTAGE IGNITION COIL DRIVER NPN POWER DARLINGTON

- VERY RUGGED BIPOLAR TECHNOLOGY
- BUILT IN CLAMPING ZENER
- HIGH OPERATING JUNCTION TEMPERATURE
- WIDE RANGE OF PACKAGES
- SURFACE-MOUNTING D2PAK (TO-263) POWER PACKAGE IN TUBE (NO SUFFIX) OR IN TAPE & REEL (SUFFIX "T4")

### APPLICATIONS

- HIGH RUGGEDNESS ELECTRONIC IGNITIONS



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter   | Value          |                  |                 | Unit             |
|-----------|---|----------------|------------------|-----------------|------------------|
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )               | 350            |                  |                 | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                    | 5              |                  |                 | V                |
| $I_C$     | Collector Current                                     | 15             |                  |                 | A                |
| $I_{CM}$  | Collector Peak Current                                | 30             |                  |                 | A                |
| $I_B$     | Base Current  | 1              |                  |                 | A                |
| $I_{BM}$  | Base Peak Current                                     | 5              |                  |                 | A                |
|           |   | <b>BU941ZT</b> | <b>BU941ZTFP</b> | <b>BUB941ZT</b> |                  |
| $P_{tot}$ | Total Dissipation at $T_C = 25\text{ }^\circ\text{C}$ | 150            | 55               | 150             | W                |
| $T_{stg}$ | Storage Temperature                                   | -65 to 175     | -65 to 175       | -65 to 175      | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature                   | 175            | 175              | 175             | $^\circ\text{C}$ |

# BU941ZT / BU941ZTFP / BUB941ZT

## THERMAL DATA

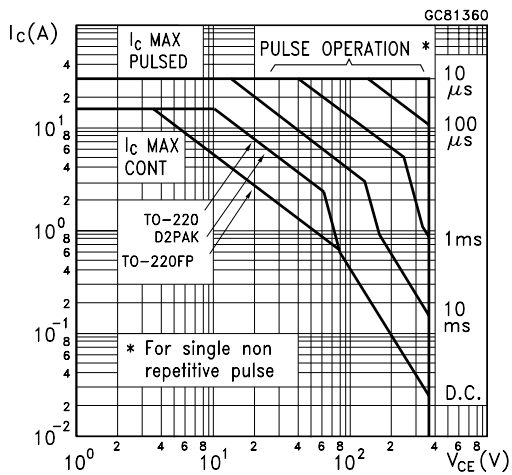
|                |                                  |     | TO-220<br>D2PAK | TO-220FP |               |
|----------------|----------------------------------|-----|-----------------|----------|---------------|
| $R_{thj-case}$ | Thermal Resistance Junction-case | Max | 1               | 2.7      | $^{\circ}C/W$ |

## ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$ unless otherwise specified)

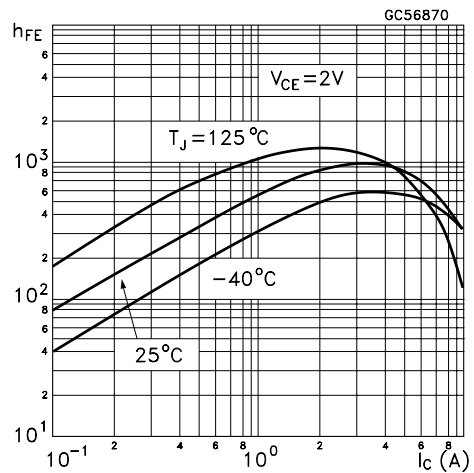
| Symbol          | Parameter   | Test Conditions   | Min. | Typ.      | Max.       | Unit               |
|-----------------|---|---|------|-----------|------------|--------------------|
| $I_{CEO}$       | Collector Cut-off Current ( $I_B = 0$ )               | $V_{CE} = 300 V$<br>$V_{CE} = 300 V \quad T_j = 125^{\circ}C$   |      |           | 100<br>0.5 | $\mu A$<br>mA      |
| $I_{EBO}$       | Emitter Cut-off Current ( $I_C = 0$ )                 | $V_{EB} = 5 V$  |      |           | 20         | mA                 |
| $V_{CL}^*$      | Clamping Voltage                                      | $I_C = 100 mA$  | 350  |           | 500        | V                  |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage                  | $I_C = 8 A \quad I_B = 100 mA$<br>$I_C = 10 A \quad I_B = 250 mA$   |      |           | 1.8<br>1.8 | V<br>V             |
| $V_{BE(sat)}^*$ | Base-Emitter Saturation Voltage                       | $I_C = 8 A \quad I_B = 100 mA$<br>$I_C = 10 A \quad I_B = 250 mA$   |      |           | 2.2<br>2.5 | V<br>V             |
| $h_{FE}^*$      | DC Current Gain                                       | $I_C = 5 A \quad V_{CE} = 10 V$   | 300  |           |            |                    |
| $V_F$           | Diode Forward Voltage                                 | $I_F = 10 A$  |      |           | 2.5        | V                  |
|                 | Functional Test (see fig. 1)                          | $V_{CC} = 24 V \quad L = 7 mH$  | 10   |           |            | A                  |
| $t_s$<br>$t_r$  | INDUCTIVE LOAD Storage Time<br>Fall Time (see fig. 3) | $V_{CC} = 12 V \quad L = 7 mH \quad V_{clamp} = 300V$<br>$I_C = 7 A \quad I_B = 70 mA$<br>$V_{BE} = 0 \quad R_{BE} = 47 \Omega$ |      | 15<br>0.5 |            | $\mu s$<br>$\mu s$ |

\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle 1.5 %

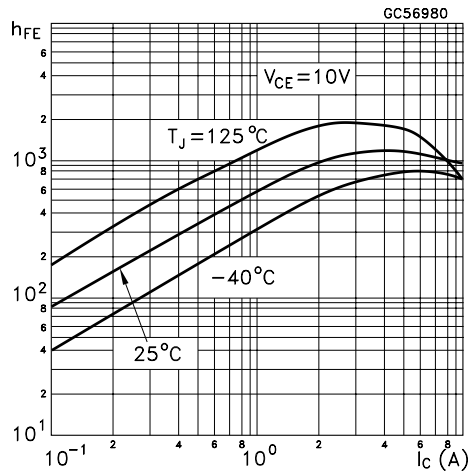
## Safe Operating Area



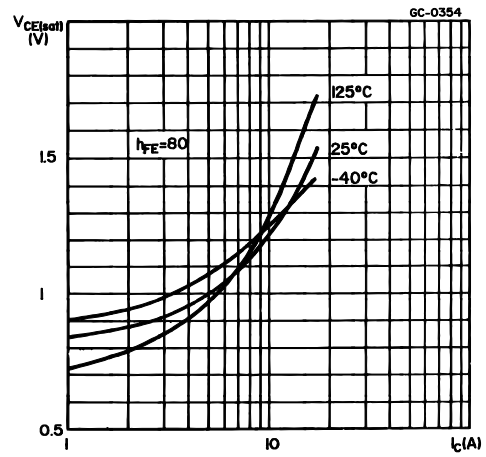
## DC Current Gain



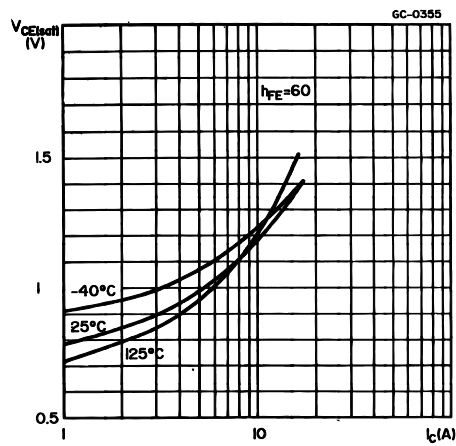
DC Current Gain



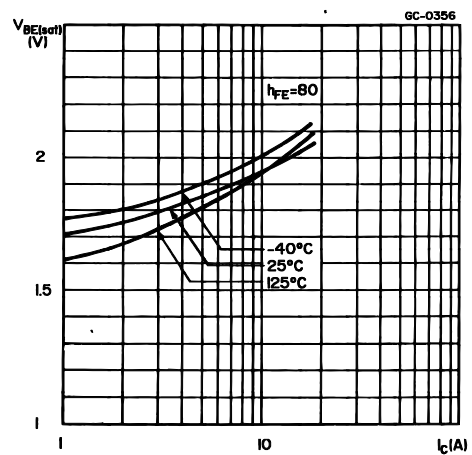
Collector-emitter Saturation Voltage



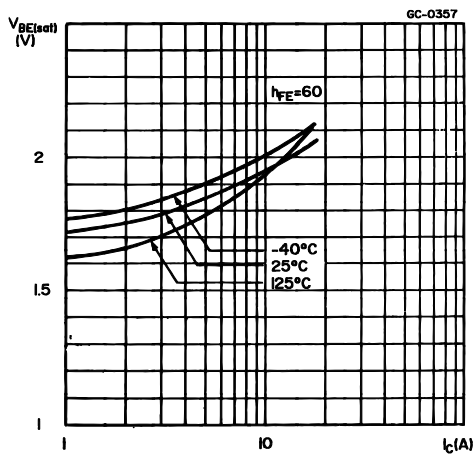
Collector-emitter Saturation Voltage



Base-emitter Saturation Voltage



Base-emitter Saturation Voltage



Collector-emitter Saturation Voltage

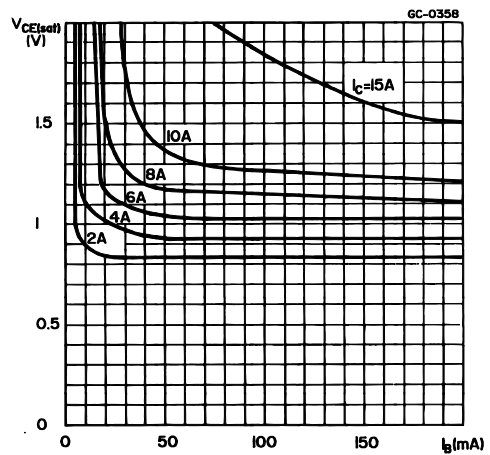


FIGURE 1: Functional Test Circuit

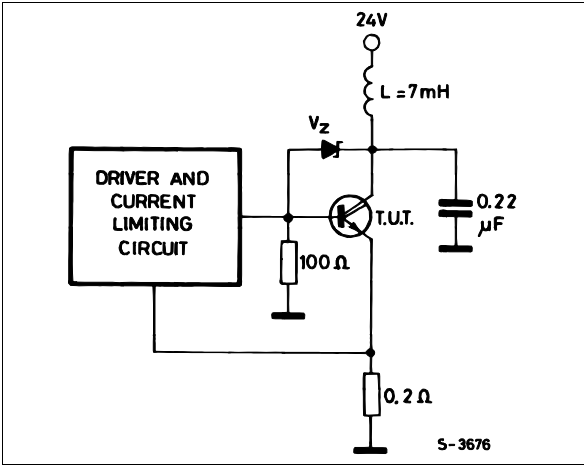


FIGURE 2: Functional Test Waveforms

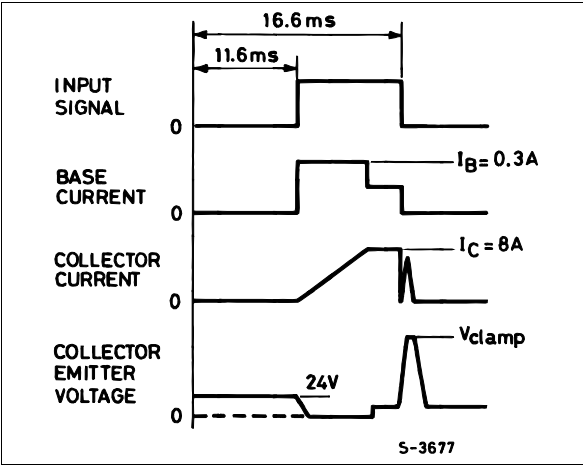
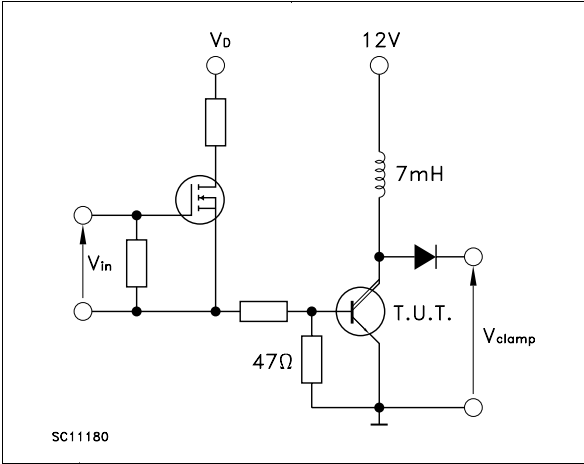
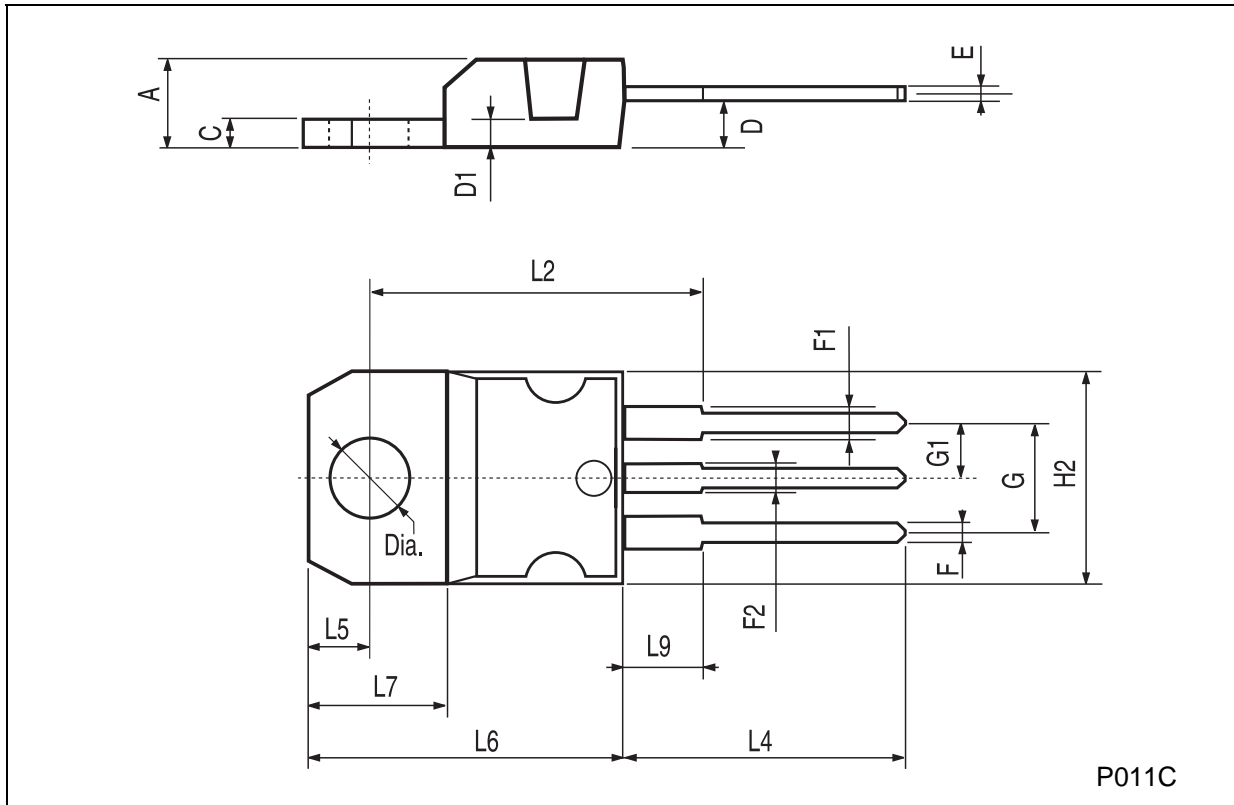


FIGURE 3: Switching Time Test Circuit



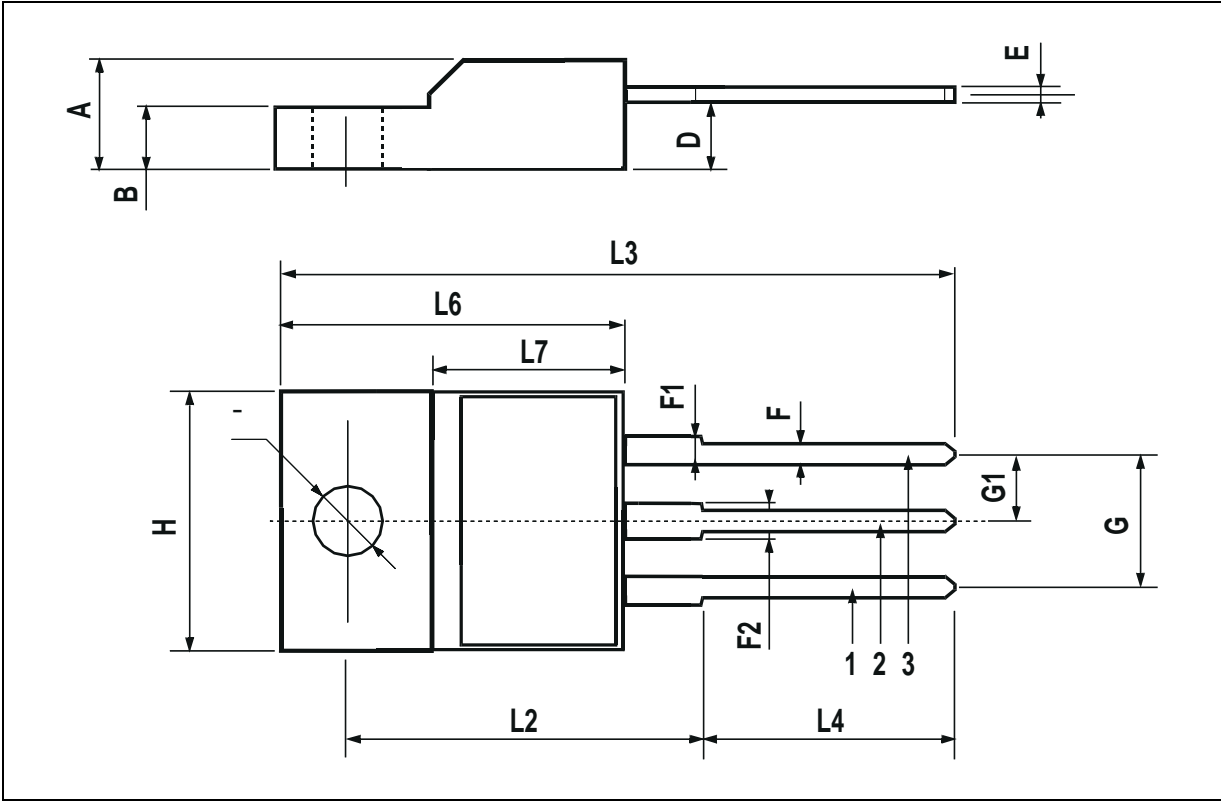
**TO-220 MECHANICAL DATA**

| DIM. | mm    |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP.  | 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 |
| D1   |       | 1.27 |       |       | 0.050 |       |
| 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 |       | 0.067 |
| F2   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| G    | 4.95  |      | 5.15  | 0.194 |       | 0.203 |
| G1   | 2.4   |      | 2.7   | 0.094 |       | 0.106 |
| H2   | 10.0  |      | 10.40 | 0.393 |       | 0.409 |
| L2   |       | 16.4 |       |       | 0.645 |       |
| L4   | 13.0  |      | 14.0  | 0.511 |       | 0.551 |
| L5   | 2.65  |      | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |      | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.2   |      | 6.6   | 0.244 |       | 0.260 |
| L9   | 3.5   |      | 3.93  | 0.137 |       | 0.154 |
| DIA. | 3.75  |      | 3.85  | 0.147 |       | 0.151 |



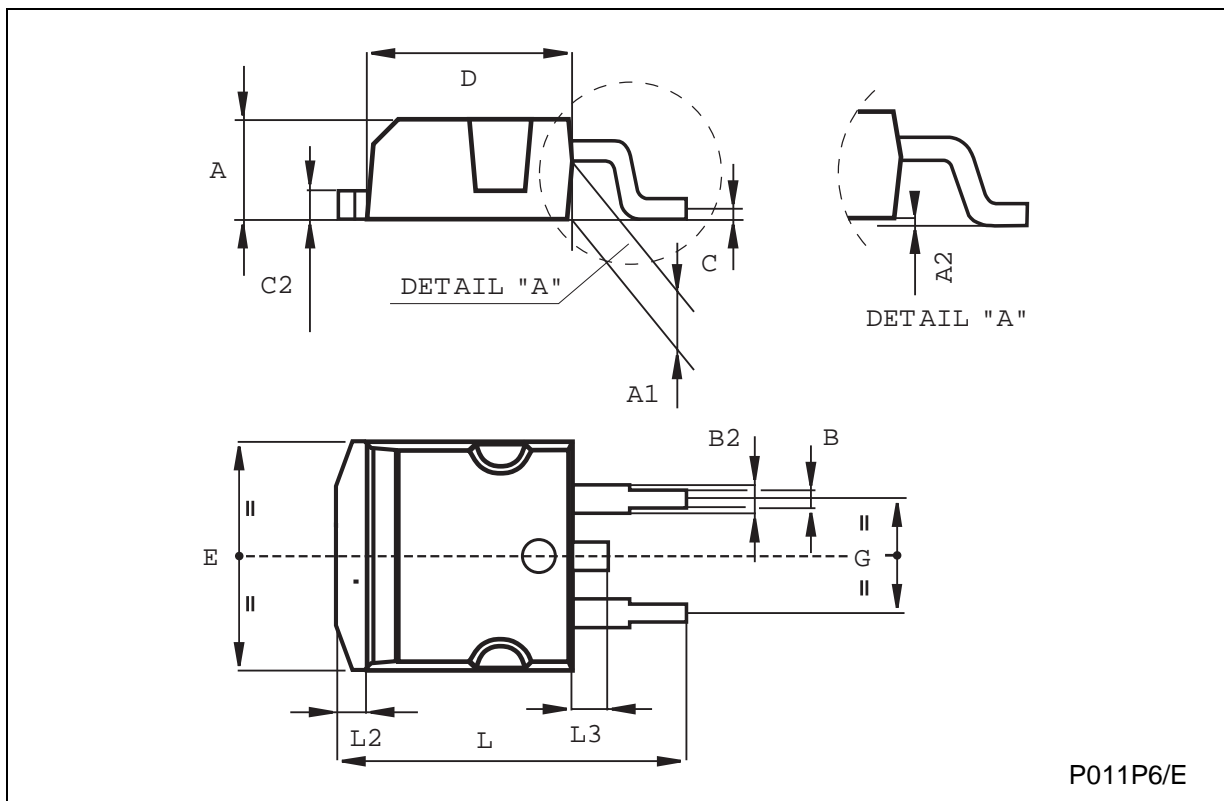
**TO-220FP MECHANICAL DATA**

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | 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 |      | 0.7  | 0.017 |       | 0.027 |
| F    | 0.75 |      | 1    | 0.030 |       | 0.039 |
| F1   | 1.15 |      | 1.7  | 0.045 |       | 0.067 |
| F2   | 1.15 |      | 1.7  | 0.045 |       | 0.067 |
| G    | 4.95 |      | 5.2  | 0.195 |       | 0.204 |
| G1   | 2.4  |      | 2.7  | 0.094 |       | 0.106 |
| H    | 10   |      | 10.4 | 0.393 |       | 0.409 |
| L2   |      | 16   |      |       | 0.630 |       |
| L3   | 28.6 |      | 30.6 | 1.126 |       | 1.204 |
| L4   | 9.8  |      | 10.6 | 0.385 |       | 0.417 |
| L6   | 15.9 |      | 16.4 | 0.626 |       | 0.645 |
| L7   | 9    |      | 9.3  | 0.354 |       | 0.366 |
| Ø    | 3    |      | 3.2  | 0.118 |       | 0.126 |



**TO-263 (D<sup>2</sup>PAK) MECHANICAL DATA**

| DIM. | mm   |      |       | inch  |      |       |
|------|------|------|-------|-------|------|-------|
|      | MIN. | TYP. | MAX.  | MIN.  | TYP. | MAX.  |
| A    | 4.4  |      | 4.6   | 0.173 |      | 0.181 |
| A1   | 2.49 |      | 2.69  | 0.098 |      | 0.106 |
| B    | 0.7  |      | 0.93  | 0.027 |      | 0.036 |
| B2   | 1.14 |      | 1.7   | 0.044 |      | 0.067 |
| C    | 0.45 |      | 0.6   | 0.017 |      | 0.023 |
| C2   | 1.21 |      | 1.36  | 0.047 |      | 0.053 |
| D    | 8.95 |      | 9.35  | 0.352 |      | 0.368 |
| E    | 10   |      | 10.4  | 0.393 |      | 0.409 |
| G    | 4.88 |      | 5.28  | 0.192 |      | 0.208 |
| L    | 15   |      | 15.85 | 0.590 |      | 0.624 |
| L2   | 1.27 |      | 1.4   | 0.050 |      | 0.055 |
| L3   | 1.4  |      | 1.75  | 0.055 |      | 0.068 |



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1998 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>