

## HIGH CURRENT NPN SILICON TRANSISTOR

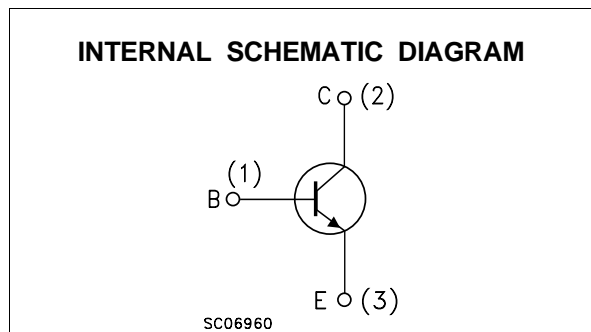
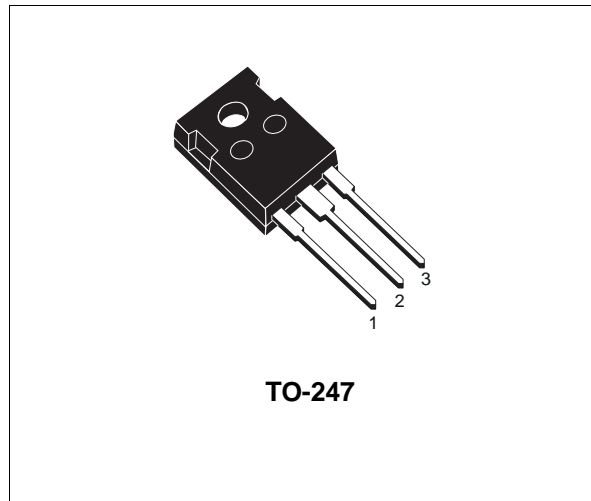
- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR

**APPLICATIONS:**

- MOTOR CONTROL
- HIGH FREQUENCY AND EFFICIENCY CONVERTERS

**DESCRIPTION**

High current, high speed transistor suited for power conversion applications, high efficiency converters and motor controls.


**ABSOLUTE MAXIMUM RATINGS**

| Symbol    | Parameter                                        | Value      | Unit             |
|-----------|--------------------------------------------------|------------|------------------|
| $V_{CES}$ | Collector-Emitter Voltage ( $V_{BE} = 0$ )       | 500        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )          | 250        | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )               | 7          | V                |
| $I_E$     | Emitter-Current                                  | 60         | A                |
| $I_{EM}$  | Emitter Peak Current ( $t_p < 5\text{ms}$ )      | 70         | A                |
| $I_B$     | Base Current                                     | 15         | A                |
| $I_{BM}$  | Base Peak Current ( $t_p < 5\text{ms}$ )         | 18         | A                |
| $P_{tot}$ | Total Dissipation at $T_c \leq 25^\circ\text{C}$ | 180        | W                |
| $T_{stg}$ | Storage Temperature                              | -65 to 150 | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature              | 150        | $^\circ\text{C}$ |

## BUTW92

### THERMAL DATA

|                       |                                  |     |     |      |
|-----------------------|----------------------------------|-----|-----|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | MAX | 0.7 | °C/W |
|-----------------------|----------------------------------|-----|-----|------|

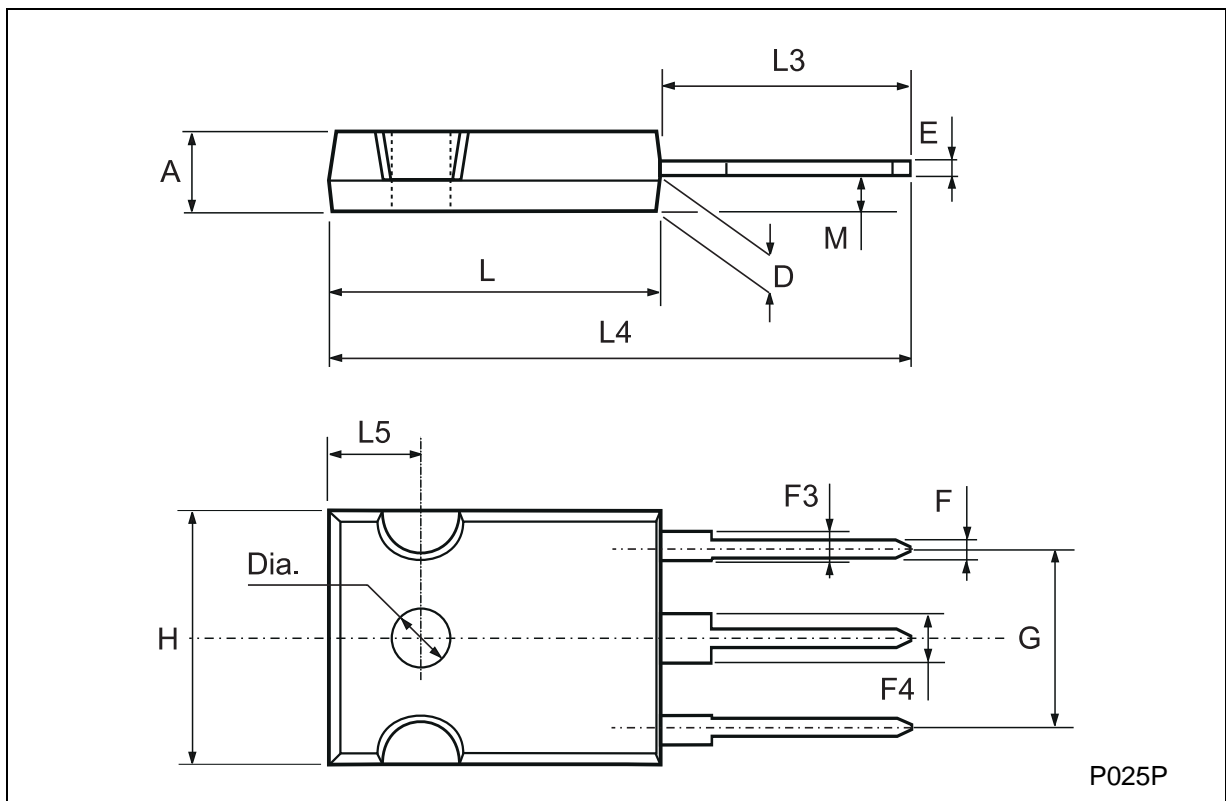
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                           | Parameter                                                 | Test Conditions                                                                                                                                                 | Min.   | Typ.       | Max.       | Unit     |
|----------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------|------------|----------|
| I <sub>CES</sub>                 | Collector Cut-off Current (V <sub>BE</sub> = -1.5V)       | V <sub>CE</sub> = 450 V<br>V <sub>CE</sub> = 450 V T <sub>C</sub> = 100°C                                                                                       |        |            | 50<br>1    | μA<br>mA |
| I <sub>EBO</sub>                 | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V                                                                                                                                           |        |            | 50         | μA       |
| V <sub>CES</sub>                 | Collector-Emitter Voltage (V <sub>EB</sub> = 0)           | I <sub>C</sub> = 5 mA                                                                                                                                           | 500    |            |            | V        |
| V <sub>EBO</sub>                 | Emitter-Base Voltage (I <sub>C</sub> = 0)                 | I <sub>E</sub> = 50 mA                                                                                                                                          | 7      |            |            | V        |
| V <sub>CEO(sus)*</sub>           | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 200 mA                                                                                                                                         | 250    |            |            | V        |
| V <sub>CE(sat)*</sub>            | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A<br>I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A T <sub>C</sub> = 100°C                                               |        | 0.8<br>1.1 | 1<br>1.5   | V<br>V   |
| V <sub>BE(sat)*</sub>            | Base-Emitter Saturation Voltage                           | I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A<br>I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A T <sub>C</sub> = 100°C                                               |        |            | 1.9<br>2   | V<br>V   |
| h <sub>FE*</sub>                 | DC Current Gain                                           | I <sub>C</sub> = 60 A V <sub>CE</sub> = 3 V<br>I <sub>C</sub> = 60 A V <sub>CE</sub> = 3 V T <sub>C</sub> = 100°C<br>I <sub>C</sub> = 5 A V <sub>CE</sub> = 3 V | 9<br>6 |            | 65         |          |
| t <sub>s</sub><br>t <sub>f</sub> | RESISTIVE LOAD<br>Storage Time<br>Fall Time               | I <sub>C</sub> = 50 A V <sub>CC</sub> = 250 V<br>I <sub>B1</sub> = -I <sub>B2</sub> = 10 A                                                                      |        | 1.2<br>250 | 1.4<br>300 | μs<br>ns |

\* Pulsed: Pulse duration = 300 ms, duty cycle 1.5 %

**TO-247 MECHANICAL DATA**

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 4.7  |      | 5.3  | 0.185 |       | 0.209 |
| D    | 2.2  |      | 2.6  | 0.087 |       | 0.102 |
| E    | 0.4  |      | 0.8  | 0.016 |       | 0.031 |
| F    | 1    |      | 1.4  | 0.039 |       | 0.055 |
| F3   | 2    |      | 2.4  | 0.079 |       | 0.094 |
| F4   | 3    |      | 3.4  | 0.118 |       | 0.134 |
| G    |      | 10.9 |      |       | 0.429 |       |
| H    | 15.3 |      | 15.9 | 0.602 |       | 0.626 |
| L    | 19.7 |      | 20.3 | 0.776 |       | 0.779 |
| L3   | 14.2 |      | 14.8 | 0.559 |       | 0.582 |
| L4   |      | 34.6 |      |       | 1.362 |       |
| L5   |      | 5.5  |      |       | 0.217 |       |
| M    | 2    |      | 3    | 0.079 |       | 0.118 |



P025P

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 trademark of STMicroelectronics

© 2001 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>