

## MECHANICAL DATA

Dimensions in mm

## NPN MULTI-EPITAXIAL VERY FAST SWITCHING HIGH POWER TRANSISTOR

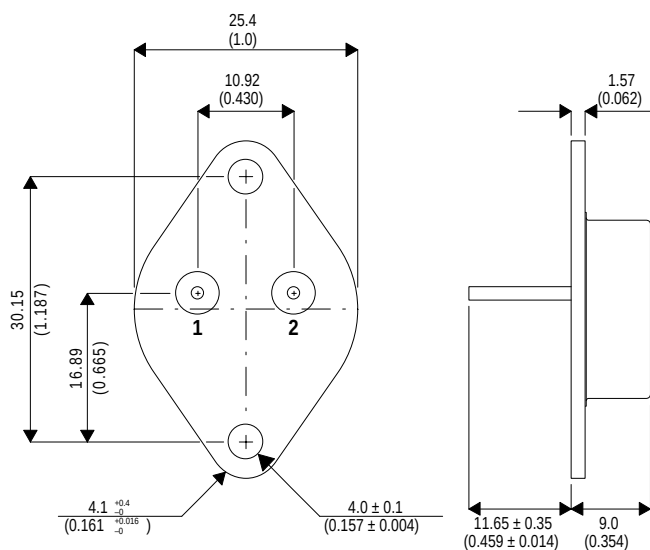
### FEATURES

- DIFFUSED BY SEMEFAB
- VERY LOW  $V_{CE(sat)}$
- VERY FAST SWITCHING
- HIGH SWITCHING CURRENTS
- HIGH RELIABILITY
- MILITARY OPTIONS AVAILABLE

### APPLICATIONS

- SWITCHING REGULATORS
- MOTOR CONTROLS
- HIGH POWER CONVERTORS

The BUP50A is a very fast switching, very low saturation, high power transistor using wafer diffused by Semefab. It is particularly suited to applications requiring robust, fast switching devices.



Tolerance ± 0.127 (0.005) unless otherwise stated

### TO3B

Pin 1 – Base

Pin 2 – Emitter

### ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}C$ unless otherwise stated)

|             |                                                  |              |
|-------------|--------------------------------------------------|--------------|
| $V_{CEX}$   | Collector – Emitter Voltage ( $V_{BE} = -1.5V$ ) | 200V         |
| $V_{CEO}$   | Collector – Emitter Voltage ( $I_B = 0$ )        | 120V         |
| $V_{EBO}$   | Emitter – Base Voltage                           | 10V          |
| $I_C$       | Collector Current                                | 100A         |
| $I_{C(PK)}$ | Peak Collector Current                           | 150A         |
| $P_{tot}$   | Total Dissipation at $T_{case} = 25^{\circ}C$    | 300W         |
| $T_{stg}$   | Storage Temperature                              | -55 to 175°C |
| $T_J$       | Maximum Operating Junction Temperature           | 200°C        |
| $R_{th}$    | Thermal Resistance (junction-case)               | 0.58°C/W     |

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

| Parameter                                                                    |                                        | Test Conditions                                                                            |                      | Min. | Typ. | Max.     | Unit |
|------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------|----------------------|------|------|----------|------|
| I <sub>CEX</sub>                                                             | Collector Cut–Off Current              | V <sub>BE</sub> = -1.5V    V <sub>CEX</sub> = 154<br>T <sub>C</sub> = 150°C                |                      |      |      | 0.1<br>5 | mA   |
| I <sub>EBO</sub>                                                             | Emitter Cut–Off Current                | V <sub>EB</sub> = 8V                                                                       |                      |      |      | 0.1      | mA   |
| V <sub>CE(sat)*</sub>                                                        | Collector – Emitter Saturation Voltage | I <sub>C</sub> = 25A                                                                       | I <sub>B</sub> = 2A  |      | 0.4  | 0.35     | V    |
|                                                                              |                                        | I <sub>C</sub> = 40A                                                                       | I <sub>B</sub> = 3A  |      | 0.5  | 0.5      |      |
|                                                                              |                                        | I <sub>C</sub> = 100A                                                                      | I <sub>B</sub> = 10A |      | 0.7  | 1        |      |
| V <sub>BE(sat)</sub>                                                         | Base – Emitter Saturation Voltage      | I <sub>C</sub> = 25A                                                                       | I <sub>B</sub> = 2A  |      | 0.9  | 1        | V    |
|                                                                              |                                        | I <sub>C</sub> = 40A                                                                       | I <sub>B</sub> = 3A  |      | 1.0  | 1.2      |      |
|                                                                              |                                        | I <sub>C</sub> = 100A                                                                      | I <sub>B</sub> = 10A |      | 1.3  | 1.5      |      |
| h <sub>FE</sub>                                                              | DC Current Gain                        | I <sub>C</sub> = 25A                                                                       | V <sub>CE</sub> = 4V | 25   | 55   |          | —    |
|                                                                              |                                        | I <sub>C</sub> = 40A                                                                       | V <sub>CE</sub> = 4V | 20   | 30   |          |      |
|                                                                              |                                        | I <sub>C</sub> = 100A                                                                      | V <sub>CE</sub> = 4V | 10   | 157  |          |      |
| SWITCHING CHARACTERISTICS (T <sub>case</sub> = 25°C unless otherwise stated) |                                        |                                                                                            |                      |      |      |          |      |
| t <sub>on</sub>                                                              | On Time                                | I <sub>C</sub> = 80A      V <sub>CC</sub> = 80V<br>I <sub>B1</sub> = -I <sub>B2</sub> = 8A |                      |      | 0.4  | 0.8      | μS   |
| t <sub>s</sub>                                                               | Storage Time                           |                                                                                            |                      |      | 0.3  | 0.5      |      |
| t <sub>f</sub>                                                               | Fall Time                              |                                                                                            |                      |      | 0.1  | 0.2      |      |

\* Pulse test  $t_{\text{p}} = 300\mu\text{s}$   $\delta \leq 2\%$