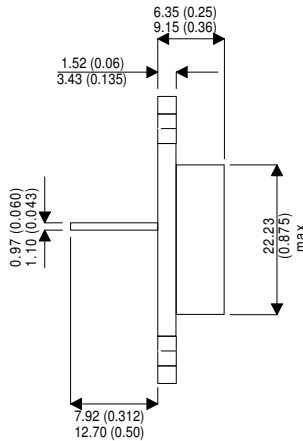
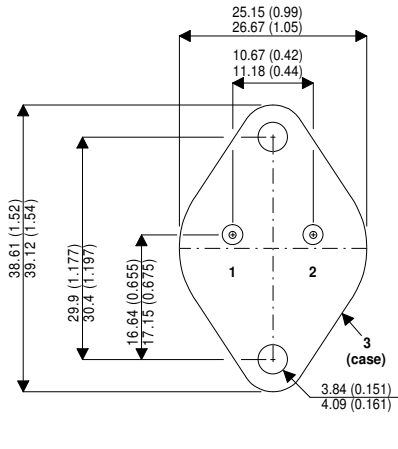


## MECHANICAL DATA

Dimensions in mm (inches)



### TO3 (TO204AA)

Pin 1 = Base      Pin 2 = Emitter      Case = Collector

## HIGH CURRENT NPN SILICON TRANSISTOR

### FEATURES

- HIGH SWITCHING CURRENTS
- HIGH RELIABILITY
- CECC SCREENING OPTIONS
- SPACE QUALITY LEVELS OPTIONS
- JAN LEVEL SCREENING OPTIONS

### APPLICATIONS

- SWITCHING REGULATORS
- LINEAR APPLICATIONS

## ABSOLUTE MAXIMUM RATINGS

$T_{CASE} = 25^{\circ}C$  unless otherwise stated

|           |   |                            |
|-----------|---|----------------------------|
| $V_{CBO}$ | Collector - Base Voltage  | 300V                       |
| $V_{CEO}$ | Collector - Emitter Voltage   | 180V                       |
| $V_{EBO}$ | Emitter - Base Voltage  | 10V                        |
| $I_C$     | Continuous Collector Current  | 6A                         |
| $I_B$     | Base Current  | 3A                         |
| $P_{tot}$ | Total Power Dissipation at $T_{case} = 25^{\circ}C$<br>Derate above $25^{\circ}C$ | 50W<br>0.29 W/ $^{\circ}C$ |
| $T_J$     | Junction Temperature  | 200 $^{\circ}C$            |
| $T_{stg}$ | Storage Temperature   | -65 to 200 $^{\circ}C$     |

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

**THERMAL CHARACTERISTICS**

|                  |                            | <b>Max</b> | <b>Unit</b>   |
|------------------|----------------------------|------------|---------------|
| $R_{th(j-case)}$ | Thermal resistance to case | 3.5        | $^{\circ}C/W$ |

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

| Parameter       | Test Conditions  | Min.                         | Typ. | Max. | Unit |
|-----------------|--|------------------------------|------|------|------|
| $I_{CEO}$       | Collector Cut-Off Current<br>$V_{CE} = 140V$ $I_B = 0$             |                              |      | 1.0  | mA   |
| $I_{CES}$       | Collector Cut-Off Current<br>$V_{CE} = 180V$ $V_{BE} = 0$          |                              |      | 1.0  |      |
| $I_{EBO}$       | Emitter Cut-Off Current<br>$V_{EB} = 10V$ $I_C = 0$                |                              |      | 1.0  |      |
| $V_{(BR)CEO}^*$ | Collector-Emitter Breakdown Voltage<br>$I_C = 50mA$ $I_B = 0$      | 180                          |      |      | V    |
| $V_{(BR)CBO}^*$ | Collector-Base Breakdown Voltage<br>$I_C = 3mA$                    | 300                          |      |      |      |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage<br>$I_C = 2.0A$ $I_B = 0.25A$ |                              |      | 0.6  |      |
| $V_{BE(sat)}^*$ | Base-Emitter Saturation Voltage<br>$I_C = 2.0A$ $I_B = 0.25A$      |                              |      | 1.2  |      |
| $h_{FE}^*$      | Forward-current transfer ratio                                     | $I_C = 1.0A$ $V_{CE} = 4.0V$ |      | 65   |      |
|                 |  | $I_C = 2.0A$ $V_{CE} = 4.0V$ | 30   | 45   |      |

**DYNAMIC CHARACTERISTICS**

|           |                      |                               |                           |    |    |     |         |
|-----------|----------------------|-------------------------------|---------------------------|----|----|-----|---------|
| $C_{obo}$ | Output Capacitance   | $I_E = 0$<br>$f = 1.0MHz$     | $V_{CB} = 10V$            |    | 65 | 120 | $\mu F$ |
| $F_T$     | Transition Frequency | $I_C = 0.5A$<br>$f = 10.0MHz$ | $V_{CE} = 15V$            | 10 |    |     | MHz     |
| $T_{on}$  | Turn-on time         | $I_C = 5.0A$                  | $I_{B1} = 1.0A$           |    |    | 1.0 | $\mu s$ |
| $T_{off}$ | Turn-off time        | $I_C = 5.0A$                  | $I_{B1} = -I_{B2} = 1.0A$ |    |    | 3.5 |         |

\* Pulse test  $t_p = 300\mu s$ ,  $\delta < 2\%$

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