

# SILICON MULTI-EPITAXIAL NPN TRANSISTOR

## BUP53

- Low  $V_{CE(SAT)}$ , Fast switching.
- Hermetic TO3 Metal package.
- Ideally suited for Motor Control, Switching and Linear Applications
- Screening Options Available



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

|           |                                                     |                         |                             |
|-----------|-----------------------------------------------------|-------------------------|-----------------------------|
| $V_{CEX}$ | Collector – Emitter Voltage                         | $V_{BE} = -1.5\text{V}$ | 400V                        |
| $V_{CEO}$ | Collector – Emitter Voltage                         |                         | 250V                        |
| $V_{EBO}$ | Emitter – Base Voltage                              |                         | 10V                         |
| $I_C$     | Continuous Collector Current                        |                         | 60A                         |
| $I_{CM}$  | Peak Collector Current                              |                         | 80A                         |
| $P_D$     | Total Power Dissipation at $T_C = 25^\circ\text{C}$ |                         | 300W                        |
|           | Derate Above $25^\circ\text{C}$                     |                         | 1.72W/ $^\circ\text{C}$     |
| $T_J$     | Junction Temperature Range                          |                         | -55 to $+200^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                           |                         | -55 to $+200^\circ\text{C}$ |

### THERMAL PROPERTIES

| Symbols         | Parameters                           | Min. | Typ. | Max. | Units              |
|-----------------|--------------------------------------|------|------|------|--------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction To Case |      |      | 0.58 | $^\circ\text{C/W}$ |

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Page 1 of 3

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

| Symbols             | Parameters                           | Test Conditions                  | Min. | Typ | Max. | Units |
|---------------------|--------------------------------------|----------------------------------|------|-----|------|-------|
| $I_{CEX}$           | Collector Cut-Off Current            | $V_{CE} = 400V$ $V_{BE} = -1.5V$ |      |     | 0.1  | mA    |
|                     |                                      | $T_C = 150^\circ\text{C}$        |      |     | 5    |       |
| $I_{EBO}$           | Emitter Cut-Off Current              | $V_{EB} = 8V$ $I_C = 0$          |      |     | 0.1  |       |
| $V_{(BR)CEO}^{(1)}$ | Collector-Emitter Breakdown Voltage  | $I_C = 10mA$                     | 250  |     |      | V     |
| $V_{CE(sat)}^{(1)}$ | Collector-Emitter Saturation Voltage | $I_C = 20A$ $I_B = 2A$           |      |     | 0.6  |       |
|                     |                                      | $I_C = 50A$ $I_B = 8A$           |      |     | 0.8  |       |
| $V_{BE(sat)}^{(1)}$ | Base-Emitter Saturation Voltage      | $I_C = 20A$ $I_B = 2A$           |      |     | 1.1  |       |
|                     |                                      | $I_C = 50A$ $I_B = 5A$           |      |     | 1.4  |       |
| $h_{FE}^{(1)}$      | Forward-current transfer ratio       | $I_C = 20A$ $V_{CE} = 4V$        | 12   |     |      |       |
|                     |                                      | $I_C = 50A$ $V_{CE} = 4V$        | 5    |     |      |       |

## DYNAMIC CHARACTERISTICS

|       |              |                             |  |  |      |         |
|-------|--------------|-----------------------------|--|--|------|---------|
| $t_s$ | Storage Time | $I_C = 30A$ $V_{CC} = 200V$ |  |  | 1.8  | $\mu s$ |
| $t_f$ | Fall Time    | $I_{B1} = -I_{B2} = 10A$    |  |  | 0.35 |         |

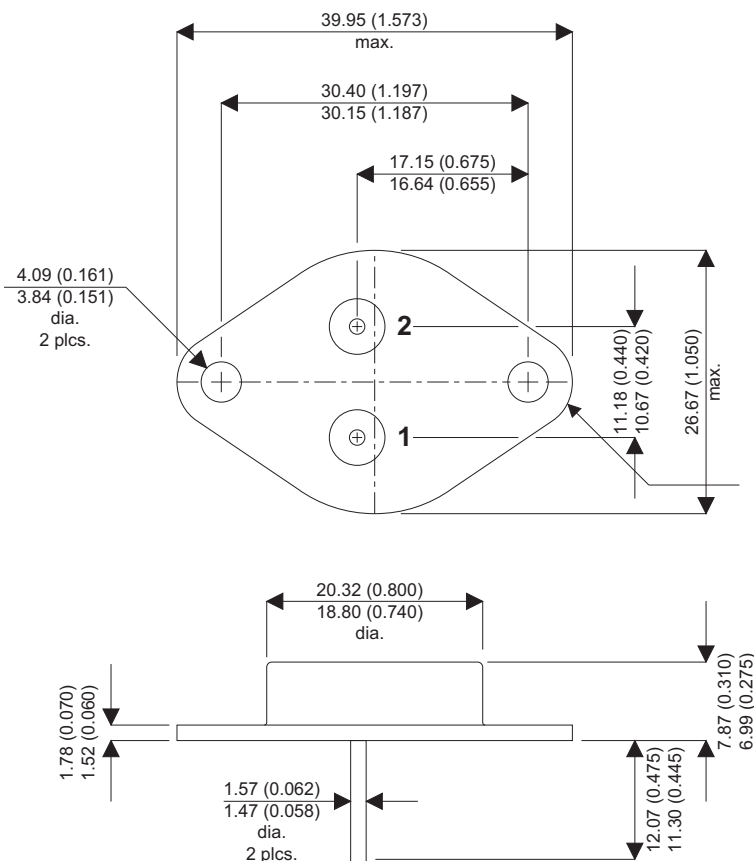
### Notes

(1) Pulse Width  $\leq 300\mu s$ ,  $\delta \leq 2\%$

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## MECHANICAL DATA

Dimensions in mm (inches)



## TO3 (TO-204AE)

Pin 1 - Base

Pin 2 - Emitter

Case - Collector