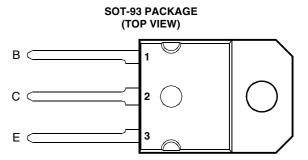
# **BOURNS®**

- Designed for Complementary Use with the TIP2955 Series
- 90 W at 25°C Case Temperature
- 15 A Continuous Collector Current
- Customer-Specified Selections Available



Pin 2 is in electrical contact with the mounting base.

MDTRAAA

## absolute maximum ratings at 25°C case temperature (unless otherwise noted)

| RATING   | SYMBOL                        | VALUE       | UNIT |
|--|-------------------------------|-------------|------|
| Collector-base voltage (I <sub>E</sub> = 0)  | V <sub>CBO</sub>              | 100         | V    |
| Collector-emitter voltage (I <sub>B</sub> = 0) (see Note 1)                        | V <sub>CER</sub>              | 70          | V    |
| Emitter-base voltage   | V <sub>EBO</sub>              | 7           | V    |
| Continuous collector current   | Ic                            | 15          | Α    |
| Continuous base current  | Ι <sub>Β</sub>                | 7           | Α    |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 2)     | P <sub>tot</sub>              | 90          | W    |
| Continuous device dissipation at (or below) 25°C free air temperature (see Note 3) | P <sub>tot</sub>              | 3.5         | W    |
| Unclamped inductive load energy (see Note 4)                                       | ½LI <sub>C</sub> <sup>2</sup> | 62.5        | mJ   |
| Operating junction temperature range   | T <sub>j</sub>                | -65 to +150 | °C   |
| Storage temperature range  | T <sub>stg</sub>              | -65 to +150 | °C   |
| Lead temperature 3.2 mm from case for 10 seconds                                   | T <sub>L</sub>                | 260         | °C   |

NOTES: 1. This value applies when the base-emitter resistance  $R_{BE}$  = 100  $\Omega$ .

- 2. Derate linearly to 150°C case temperature at the rate of 0.72 W/°C.
- 3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.
- 4. This rating is based on the capability of the transistor to operate safely in a circuit of: L = 20 mH,  $I_{B(on)}$  = 0.4 A,  $R_{BE}$  = 100  $\Omega$ ,  $V_{BE(off)}$  = 0,  $R_S$  = 0.1  $\Omega$ ,  $V_{CC}$  = 10 V.



## electrical characteristics at 25°C case temperature

| PARAMETER            |   |   | TEST CONDITION           | NS                  | MIN     | TYP | MAX      | UNIT |
|----------------------|---|---|--------------------------|---------------------|---------|-----|----------|------|
| V <sub>(BR)CEO</sub> | Collector-emitter breakdown voltage         | I <sub>C</sub> = 30 mA                      | I <sub>B</sub> = 0       | (see Note 5)        | 60      |     |          | ٧    |
| I <sub>CER</sub>     | Collector-emitter cut-off current           | V <sub>CE</sub> = 70 V                      | $R_{BE} = 100 \Omega$    |                     |         |     | 1        | mA   |
| I <sub>CEO</sub>     | Collector cut-off current                   | V <sub>CE</sub> = 30 V                      | I <sub>B</sub> = 0       |                     |         |     | 0.7      | mA   |
| I <sub>CEV</sub>     | Voltage between base and emitter            | V <sub>CE</sub> = 100 V                     | V <sub>BE</sub> = -1.5 V |                     |         |     | 5        | mA   |
| I <sub>EBO</sub>     | Emitter cut-off current                     | V <sub>EB</sub> = 7 V                       | I <sub>C</sub> = 0       |                     |         |     | 5        | mA   |
| h <sub>FE</sub>      | Forward current transfer ratio              | $V_{CE} = 4 V$ $V_{CE} = 4 V$               | $I_C = 4A$ $I_C = 10A$   | (see Notes 5 and 6) | 20<br>5 |     | 70       |      |
| V <sub>CE(sat)</sub> | Collector-emitter saturation voltage        | $I_B = 0.4 \text{ A}$ $I_B = 3.3 \text{ A}$ | $I_C = 4A$ $I_C = 10A$   | (see Notes 5 and 6) |         |     | 1.1<br>3 | V    |
| V <sub>BE</sub>      | Base-emitter voltage                        | V <sub>CE</sub> = 4 V                       | I <sub>C</sub> = 4 A     | (see Notes 5 and 6) |         |     | 1.8      | V    |
| h <sub>fe</sub>      | Small signal forward current transfer ratio | V <sub>CE</sub> = 10 V                      | I <sub>C</sub> = 0.5 A   | f = 1 kHz           | 15      |     |          |      |
| h <sub>fe</sub>      | Small signal forward current transfer ratio | V <sub>CE</sub> = 10 V                      | I <sub>C</sub> = 0.5 A   | f = 1 MHz           | 3       |     |          |      |

NOTES: 5. These parameters must be measured using pulse techniques,  $t_0 = 300 \mu s$ , duty cycle  $\leq 2\%$ .

### thermal characteristics

| PARAMETER       |   |  | TYP | MAX  | UNIT |
|-----------------|---|--|-----|------|------|
| $R_{\theta JC}$ | Junction to case thermal resistance     |  |     | 1.39 | °C/W |
| $R_{\theta JA}$ | Junction to free air thermal resistance |  |     | 35.7 | °C/W |

# resistive-load-switching characteristics at 25°C case temperature

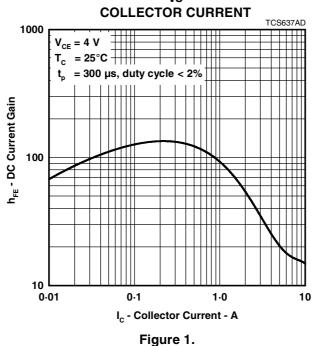
|                  | PARAMETER     | TEST CONDITIONS †    |                     |                                   | MIN | TYP | MAX | UNIT |
|------------------|---------------|----------------------|---------------------|-----------------------------------|-----|-----|-----|------|
| t <sub>on</sub>  | Turn-on time  | I <sub>C</sub> = 6 A | $I_{B(on)} = 0.6 A$ | $I_{B(off)} = -0.6 A$             |     | 0.6 |     | μs   |
| t <sub>off</sub> | Turn-off time | $V_{BE(off)} = -4 V$ | $R_L = 5 \Omega$    | $t_p$ = 20 $\mu s$ , $dc \le 2\%$ |     | 1   |     | μs   |

<sup>&</sup>lt;sup>†</sup> Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

<sup>6.</sup> These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

### **TYPICAL CHARACTERISTICS**

# TYPICAL DC CURRENT GAIN vs



### **MAXIMUM SAFE OPERATING REGIONS**

# 

Figure 2.

V<sub>CE</sub> - Collector-Emitter Voltage - V

## THERMAL INFORMATION

#### **MAXIMUM POWER DISSIPATION**

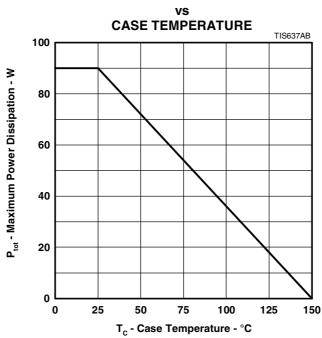


Figure 3.