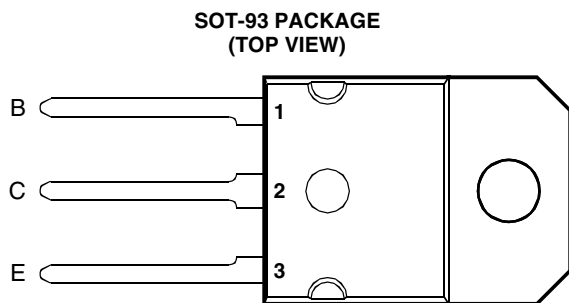


- Designed for Complementary Use with the TIP3055 Series
- 90 W at 25°C Case Temperature
- 15 A Continuous Collector Current
- Customer-Specified Selections Available



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 ( $I_E = 0$ )                                               | $V_{CBO}$           | -100        | V    |
| Collector-emitter voltage ( $I_B = 0$ ) (see Note 1)                               | $V_{CER}$           | -70         | V    |
| Emitter-base voltage                                                               | $V_{EBO}$           | -7          | V    |
| Continuous collector current                                                       | $I_C$               | -15         | A    |
| Continuous base current                                                            | $I_B$               | -7          | A    |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 2)     | $P_{tot}$           | 90          | W    |
| Continuous device dissipation at (or below) 25°C free air temperature (see Note 3) | $P_{tot}$           | 3.5         | W    |
| Unclamped inductive load energy (see Note 4)                                       | $\frac{1}{2}LI_C^2$ | 62.5        | mJ   |
| Operating junction temperature range                                               | $T_j$               | -65 to +150 | °C   |
| Storage temperature range                                                          | $T_{stg}$           | -65 to +150 | °C   |
| Lead temperature 3.2 mm from case for 10 seconds                                   | $T_L$               | 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:  $L = 20 \text{ mH}$ ,  $I_{B(on)} = -0.4 \text{ A}$ ,  $R_{BE} = 100 \Omega$ ,  $V_{BE(off)} = 0$ ,  $R_S = 0.1 \Omega$ ,  $V_{CC} = -10 \text{ V}$ .

**PRODUCT INFORMATION**

**electrical characteristics at 25°C case temperature**

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

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

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

**thermal characteristics**

| PARAMETER                                               | MIN | 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          |
|-------------------------|-------------------------------------------------------------------------------------|-----|-----|-----|---------------|
| $t_{on}$ Turn-on time   | $I_C = -6 \text{ A}$ $I_{B(on)} = -0.6 \text{ A}$ $I_{B(off)} = 0.6 \text{ A}$      |     | 0.4 |     | $\mu\text{s}$ |
| $t_{off}$ Turn-off time | $V_{BE(off)} = 4 \text{ V}$ $R_L = 5 \Omega$ $t_p = 20 \mu\text{s}$ , $dc \leq 2\%$ |     | 0.7 |     | $\mu\text{s}$ |

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

**TYPICAL CHARACTERISTICS**

**TYPICAL DC CURRENT GAIN  
vs  
COLLECTOR CURRENT**

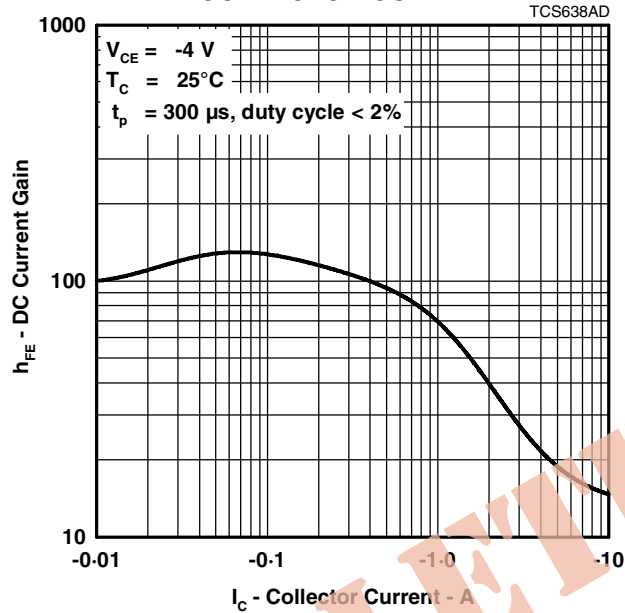


Figure 1.

**MAXIMUM SAFE OPERATING REGIONS**

**MAXIMUM FORWARD-BIAS  
SAFE OPERATING AREA**

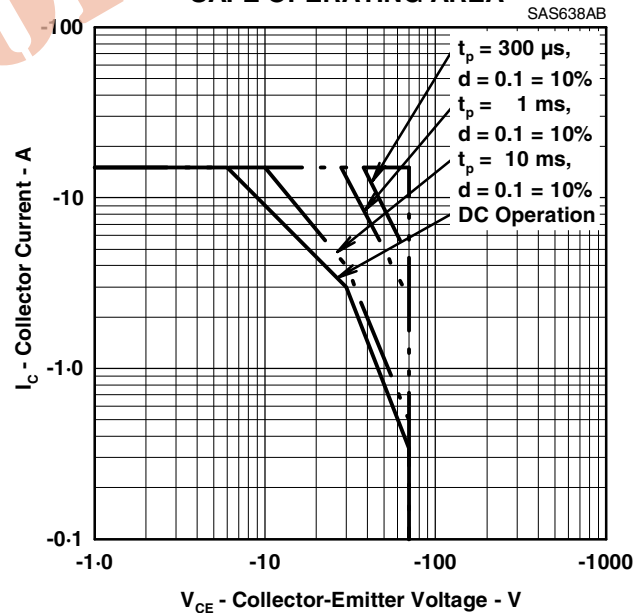


Figure 2.

**PRODUCT INFORMATION**

JANUARY 1972 - REVISED SEPTEMBER 2002  
 Specifications are subject to change without notice.

**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
vs  
CASE TEMPERATURE**

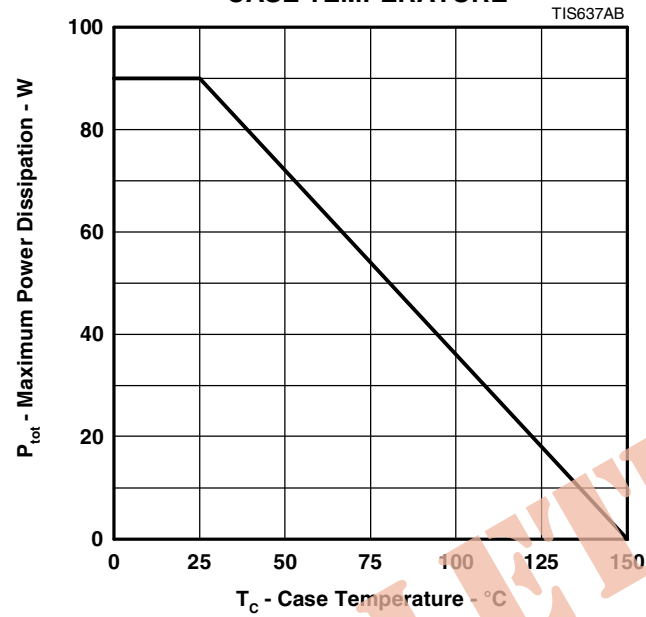


Figure 3.

**PRODUCT INFORMATION**

JANUARY 1972 - REVISED SEPTEMBER 2002  
Specifications are subject to change without notice.