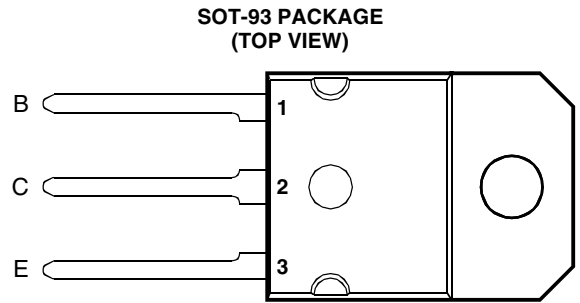


- **Designed for Complementary Use with the TIP3055 Series**
- **90 W at 25°C Case Temperature**
- **15 A Continuous Collector Current**
- **Customer-Specified Selections Available**



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**

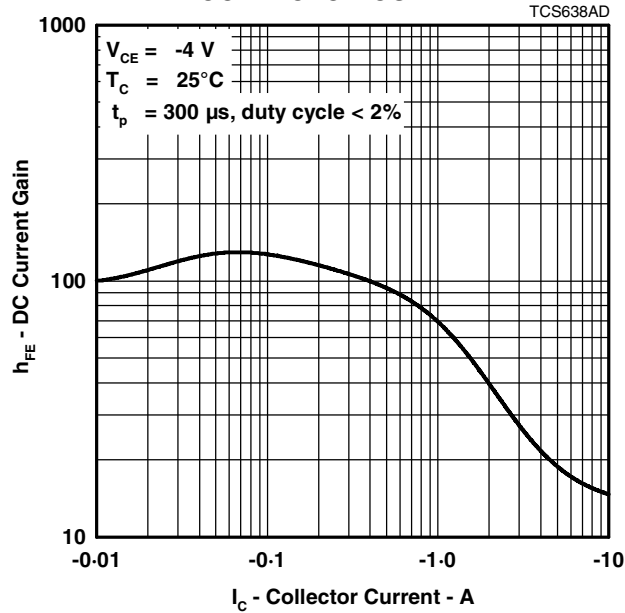


Figure 1.

**MAXIMUM SAFE OPERATING REGIONS**

**MAXIMUM FORWARD-BIAS  
SAFE OPERATING AREA**

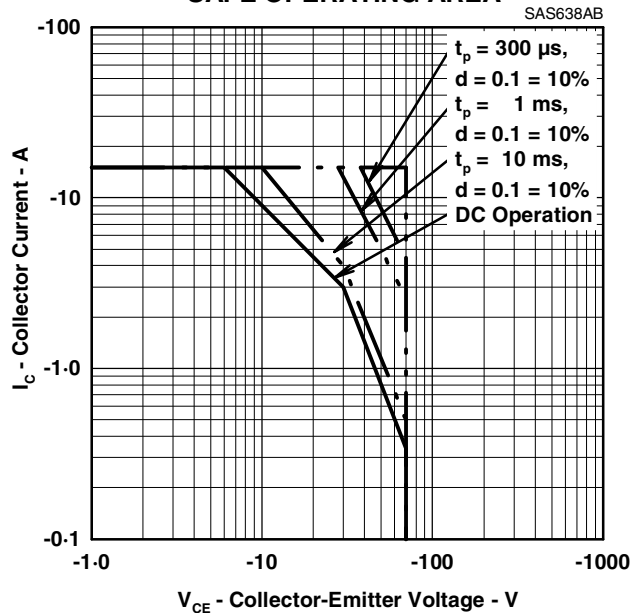
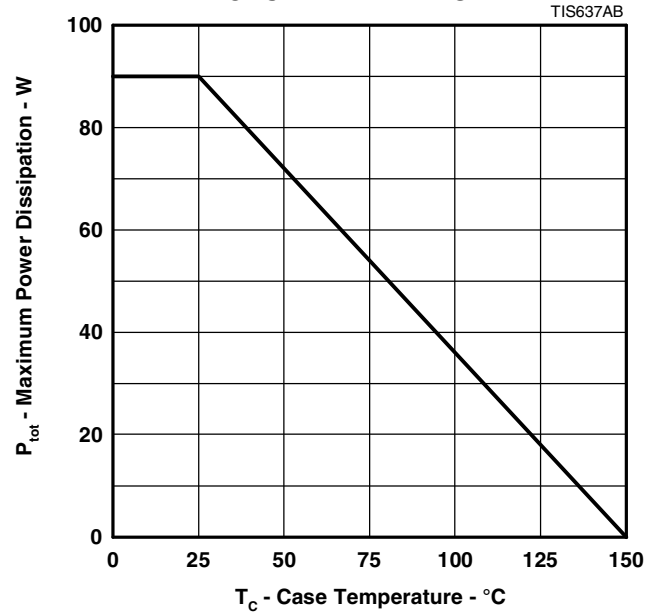


Figure 2.

**PRODUCT INFORMATION**

**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
VS  
CASE TEMPERATURE**



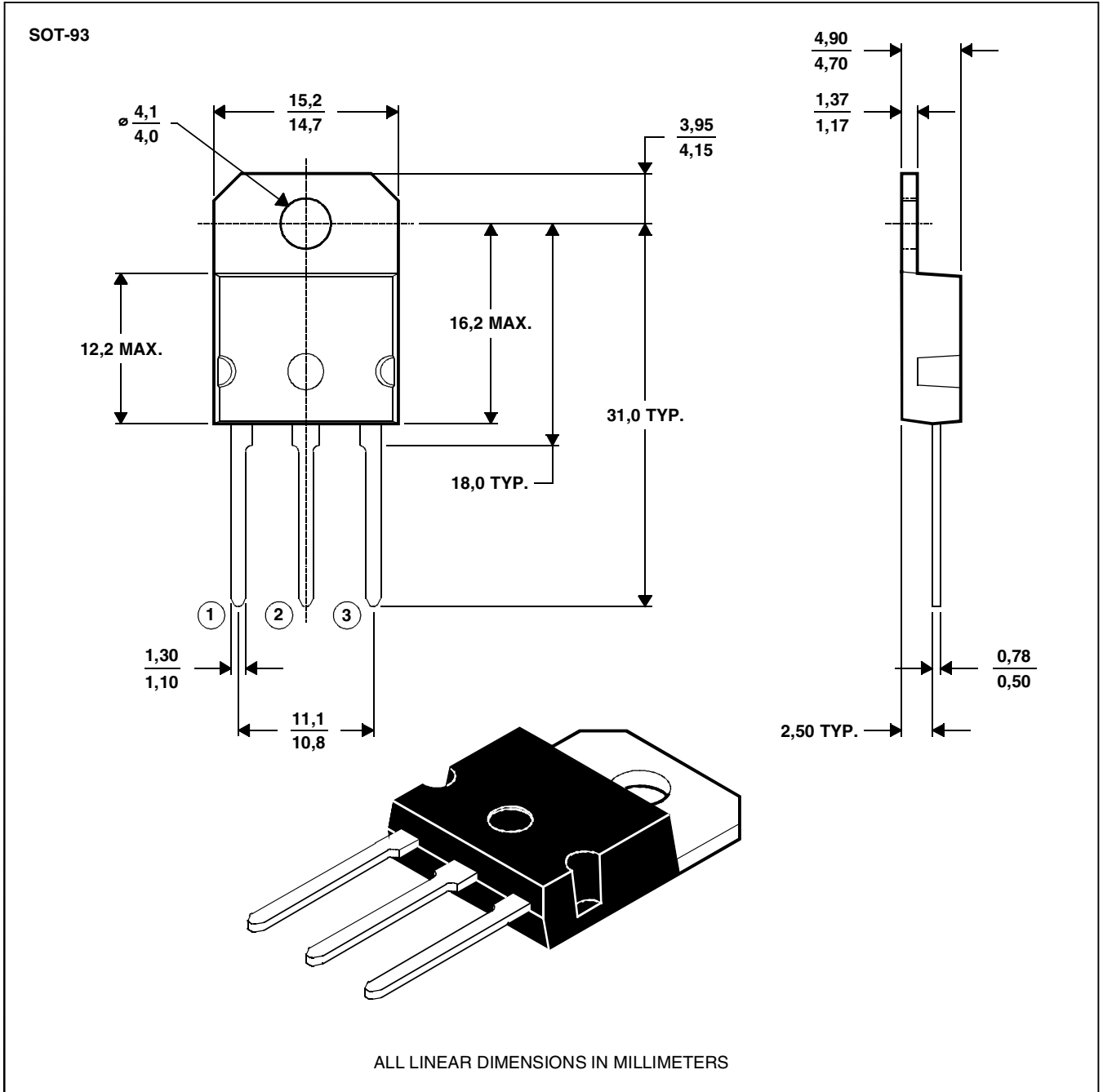
**Figure 3.**

**MECHANICAL DATA**

**SOT-93**

**3-pin plastic flange-mount package**

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.



NOTE A: The centre pin is in electrical contact with the mounting tab.

MDXXAW

**PRODUCT INFORMATION**

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