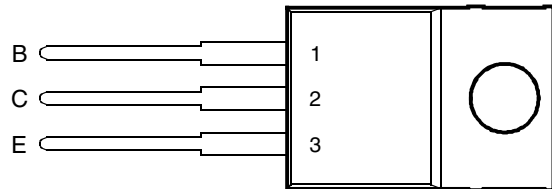


- Designed for Complementary Use with TIP135, TIP136 and TIP137
- 70 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Minimum  $h_{FE}$  of 1000 at 4 V, 4 A



This series is obsolete and not recommended for new designs.

TO-220 PACKAGE  
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDTRACA

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

| RATING   |        | SYMBOL              | VALUE       | UNIT |
|--|--------|---------------------|-------------|------|
| Collector-base voltage ( $I_E = 0$ )   | TIP130 | $V_{CB0}$           | 60          | V    |
|  | TIP131 |                     | 80          |      |
|  | TIP132 |                     | 100         |      |
| Collector-emitter voltage ( $I_B = 0$ )  | TIP130 | $V_{CEO}$           | 60          | V    |
|  | TIP131 |                     | 80          |      |
|  | TIP132 |                     | 100         |      |
| Emitter-base voltage   |        | $V_{EBO}$           | 5           | V    |
| Continuous collector current   |        | $I_C$               | 8           | A    |
| Peak collector current (see Note 1)  |        | $I_{CM}$            | 12          | A    |
| Continuous base current  |        | $I_B$               | 0.3         | A    |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 2)     |        | $P_{tot}$           | 70          | W    |
| Continuous device dissipation at (or below) 25°C free air temperature (see Note 3) |        | $P_{tot}$           | 2           | W    |
| Unclamped inductive load energy (see Note 4)                                       |        | $\frac{1}{2}LI_C^2$ | 75          | 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 for  $t_p \leq 0.3$  ms, duty cycle  $\leq 10\%$ .  
 2. Derate linearly to 150°C case temperature at the rate of 0.56 W/°C.  
 3. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.  
 4. This rating is based on the capability of the transistor to operate safely in a circuit of:  $L = 20$  mH,  $I_{B(on)} = 5$  mA,  $R_{BE} = 100 \Omega$ ,  $V_{BE(off)} = 0$ ,  $R_S = 0.1 \Omega$ ,  $V_{CC} = 20$  V.

**PRODUCT INFORMATION**

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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)   | TIP130<br>TIP131<br>TIP132 | 60<br>80<br>100 |                   | V    |
| $I_{CEO}$ Collector-emitter cut-off current        | $V_{CE} = 30 \text{ V}$<br>$V_{CE} = 40 \text{ V}$<br>$V_{CE} = 50 \text{ V}$ | $I_B = 0$<br>$I_B = 0$<br>$I_B = 0$ |  | TIP130<br>TIP131<br>TIP132 |                 | 0.5<br>0.5<br>0.5 | mA   |
| $I_{CBO}$ Collector cut-off current                | $V_{CB} = 60 \text{ V}$   | $I_E = 0$                           |  | TIP130                     |                 | 0.2               | mA   |
|  | $V_{CB} = 80 \text{ V}$   | $I_E = 0$                           |  | TIP131                     |                 | 0.2               |      |
|  | $V_{CB} = 100 \text{ V}$  | $I_E = 0$                           |  | TIP132                     |                 | 0.2               |      |
|  | $V_{CB} = 60 \text{ V}$   | $I_E = 0$                           | $T_C = 100^\circ\text{C}$                              | TIP130                     |                 | 1                 |      |
|  | $V_{CB} = 80 \text{ V}$<br>$V_{CB} = 100 \text{ V}$                           | $I_E = 0$<br>$I_E = 0$              | $T_C = 100^\circ\text{C}$<br>$T_C = 100^\circ\text{C}$ | TIP131<br>TIP132           |                 | 1<br>1            |      |
| $I_{EBO}$ Emitter cut-off current                  | $V_{EB} = 5 \text{ V}$  | $I_C = 0$                           |  |                            |                 | 5                 | mA   |
| $h_{FE}$ Forward current transfer ratio            | $V_{CE} = 4 \text{ V}$  | $I_C = 1 \text{ A}$                 | (see Notes 5 and 6)                                    |                            | 500             |                   |      |
|  | $V_{CE} = 4 \text{ V}$  | $I_C = 4 \text{ A}$                 |  |                            | 1000            | 15000             |      |
| $V_{CE(sat)}$ Collector-emitter saturation voltage | $I_B = 16 \text{ mA}$<br>$I_B = 30 \text{ mA}$                                | $I_C = 4 \text{ A}$                 | (see Notes 5 and 6)                                    |                            |                 | 2                 | V    |
|  |   | $I_C = 6 \text{ A}$                 |  |                            |                 | 3                 |      |
| $V_{BE}$ Base-emitter voltage                      | $V_{CE} = 4 \text{ V}$  | $I_C = 4 \text{ A}$                 | (see Notes 5 and 6)                                    |                            |                 | 2.5               | V    |
| $C_{obo}$ Output capacitance                       | $V_{CB} = 10 \text{ V}$   | $I_E = 0$                           |  |                            |                 | 200               | pF   |
| $V_{EC}$ Parallel diode forward voltage            | $I_E = 8 \text{ A}$   | $I_B = 0$                           | (see Notes 5 and 6)                                    |                            |                 | 3.5               | V    |

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     |     |     | 1.78 | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ Junction to free air thermal resistance |     |     | 62.5 | $^\circ\text{C/W}$ |

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**TYPICAL CHARACTERISTICS**

**TYPICAL DC CURRENT GAIN  
vs  
COLLECTOR CURRENT**

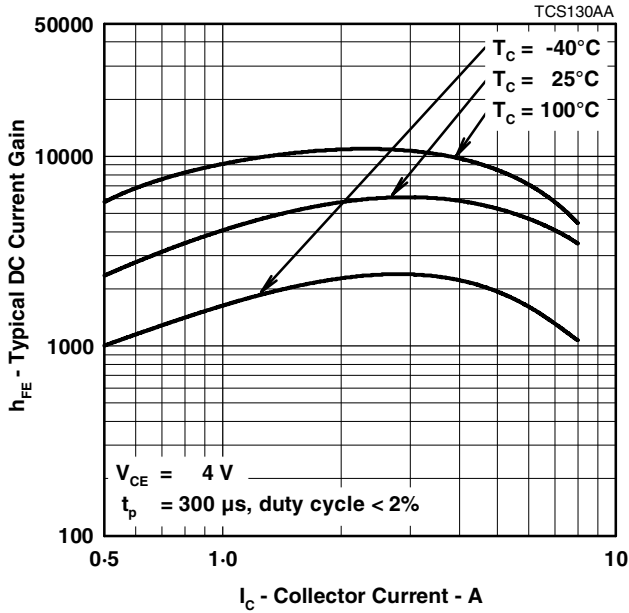


Figure 1.

**COLLECTOR-EMITTER SATURATION VOLTAGE  
vs  
COLLECTOR CURRENT**

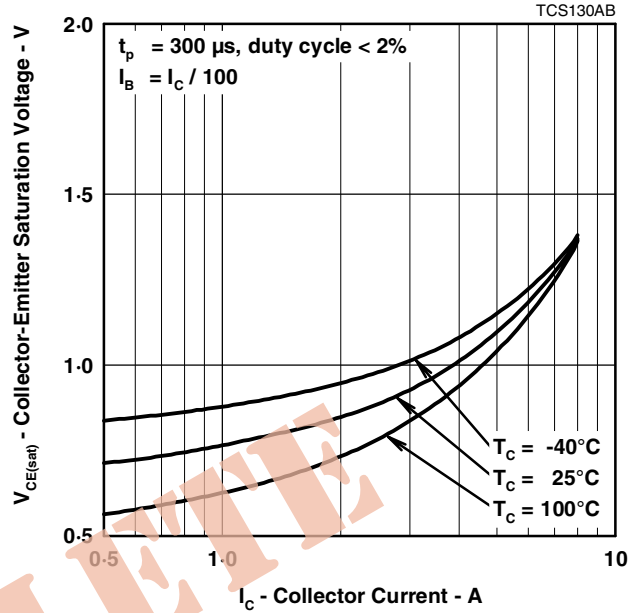


Figure 2.

**BASE-EMITTER SATURATION VOLTAGE  
vs  
COLLECTOR CURRENT**

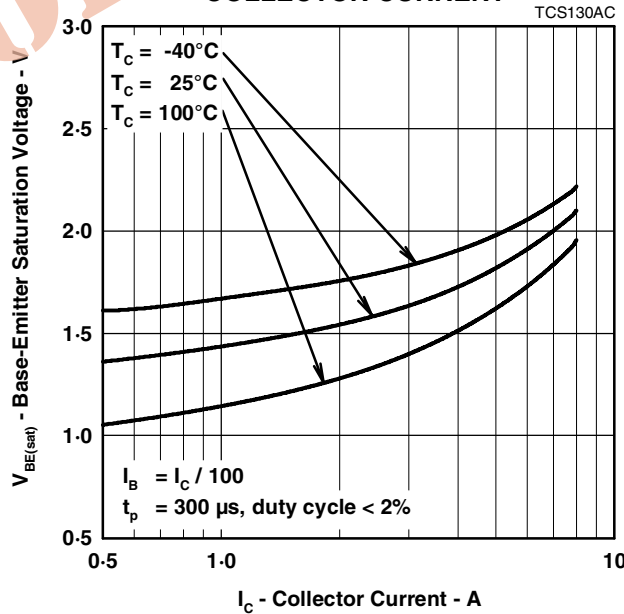
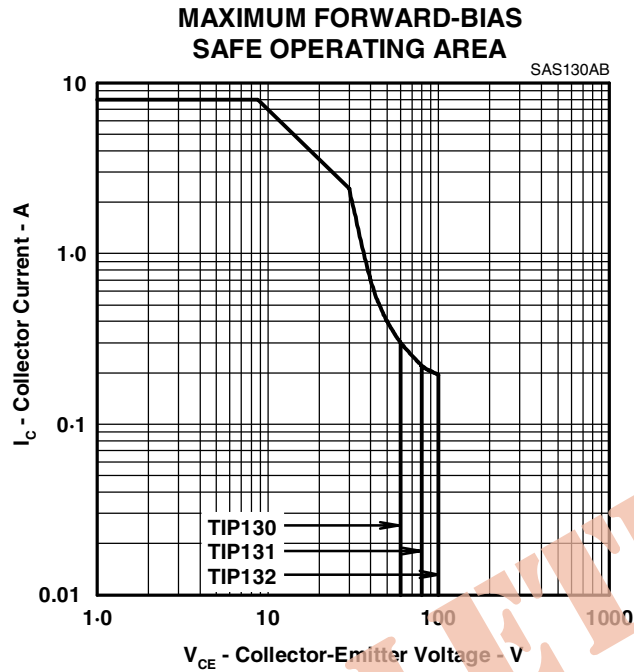


Figure 3.

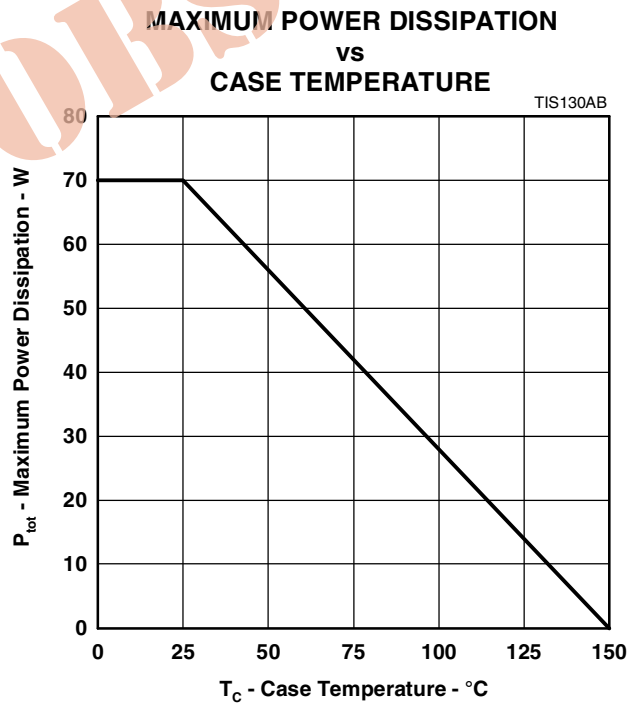
**PRODUCT INFORMATION**

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**MAXIMUM SAFE OPERATING REGIONS**



**THERMAL INFORMATION**



**PRODUCT INFORMATION**

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