



PNP POWER TRANSISTORS

COMPLEMENTARY TO THE TIP29 SERIES

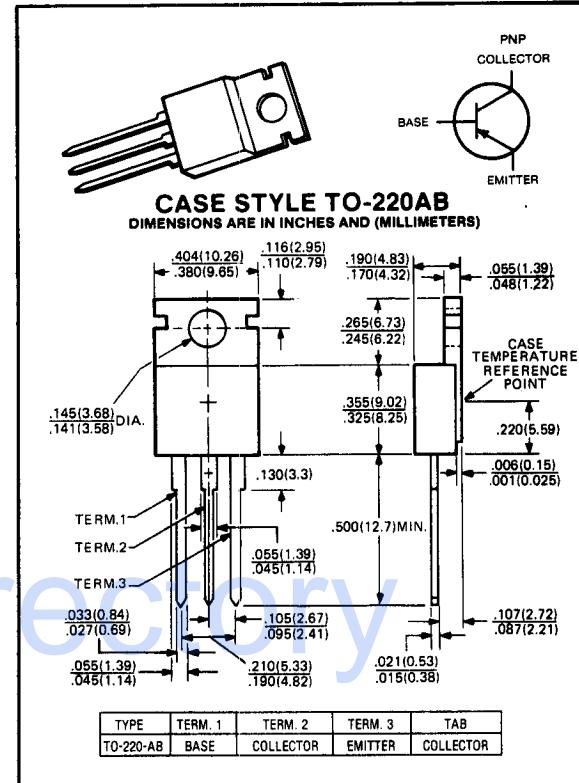
TIP 30 Series

-40 ~ -100 VOLTS
-1 AMP, 30 WATTS

The TIP30 Series power transistors are designed for use in general purpose amplifier and switching applications.

Features:

- Designed for complementary use with TIP29 series
- 30W at 25°C case temperature
- -1A continuous collector current
- -3A peak collector current
- Minimum f_T of 3 MHz at 10V, 0.02A
- Customer-specified selections available
- Designed for power amplifier and high-speed switching applications



maximum ratings ($T_C = 25^\circ\text{C}$) (unless otherwise noted)

| RATING | SYMBOL | TIP30 | TIP30A | TIP30B | TIP30C | UNITS |
|--|-------------------|-------------|-------------|-------------|-------------|-------|
| Collector-Emitter Voltage | V_{CEO} | -40 | -60 | -80 | -100 | Volts |
| Collector-Base Voltage | V_{CBO} | -80 | -100 | -120 | -140 | Volts |
| Emitter Base Voltage | V_{EBO} | -5 | -5 | -5 | -5 | Volts |
| Collector Current — Continuous Peak | I_C I_{CM} | -1 -3 | -1 -3 | -1 -3 | -1 -3 | A |
| Base Current — Continuous | I_B | -0.4 | -0.4 | -0.4 | -0.4 | A |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$ | P_D | 2 30 | 2 30 | 2 30 | 2 30 | Watts |
| Operating and Storage Junction Temperature Range | T_J, T_{STG} | -65 to +150 | -65 to +150 | -65 to +150 | -65 to +150 | °C |

thermal characteristics

| | | | | | | |
|--|-----------------|------|------|------|------|------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 4.17 | 4.17 | 4.17 | 4.17 | °C/W |
| Maximum Lead Temperature for Soldering Purposes: $\frac{1}{2}$ " from Case for 5 Seconds | T_L | 250 | 250 | 250 | 250 | °C |

electrical characteristics ($T_C = 25^\circ C$) (unless otherwise specified)

| CHARACTERISTIC | SYMBOL | MIN | TYP | MAX | UNIT |
|---|-------------------------------------|-----------|---------------------------|------------------------------|-------|
| off characteristics | | | | | |
| Collector-Emitter Breakdown Voltage ($I_C = -30\text{mA}$) | TIP30 TIP30A TIP30B TIP30C | V_{CEO} | -40 -60 -80 -100 | — — — — | Volts |
| Collector Cutoff Current ($V_{CE} = -30\text{V}$) ($V_{CE} = -60\text{V}$) | TIP30, TIP30A TIP30B, TIP30C | I_{CEO} | — — | -0.3 -0.3 | mA |
| Collector Cutoff Current ($V_{CE} = -80\text{V}$) ($V_{CE} = -100\text{V}$) ($V_{CE} = -120\text{V}$) ($V_{CE} = -140\text{V}$) | TIP30 TIP30A TIP30B TIP30C | I_{CES} | — — — — | -0.2 -0.2 -0.2 -0.2 | mA |
| Emitter Cutoff Current ($V_{EB} = -5\text{V}$, $I_C = 0$) | | I_{EBO} | — | — | -1 mA |

second breakdown

| | | |
|---|-------|--------------|
| Second Breakdown with Base Forward Biased | FBSOA | SEE FIGURE 3 |
|---|-------|--------------|

on characteristics

| | | | | | |
|---|----------------------|----------|---|---------|---|
| DC Current Gain ($I_C = -0.2\text{A}$, $V_{CE} = -4\text{V}$) ($I_C = 1\text{A}$, $V_{CE} = 4\text{V}$) | h_{FE} | 20 15 | — | — 75 | — |
| Collector-Emitter Saturation Voltage ($I_C = -1\text{A}$, $I_B = -125\text{mA}$) | $V_{CE(\text{sat})}$ | — | — | -0.7 | V |
| Base-Emitter Voltage ($I_C = -1\text{A}$, $V_{CE} = -4\text{V}$) | $V_{BE(\text{on})}$ | — | — | -1.3 | V |

switching characteristics

| | | | | | | |
|---------------|--|-----------|---|-----|---|---------------|
| Turn-on Time | $R_L = 30\Omega$, $I_C = -1\text{A}$ $I_{B1} = I_{B2} = 0.1\text{A}$ | t_{on} | — | 0.3 | — | μs |
| Turn-off Time | $V_{BE(\text{off})} = 4.3\text{V}$ | t_{off} | — | 1 | — | |

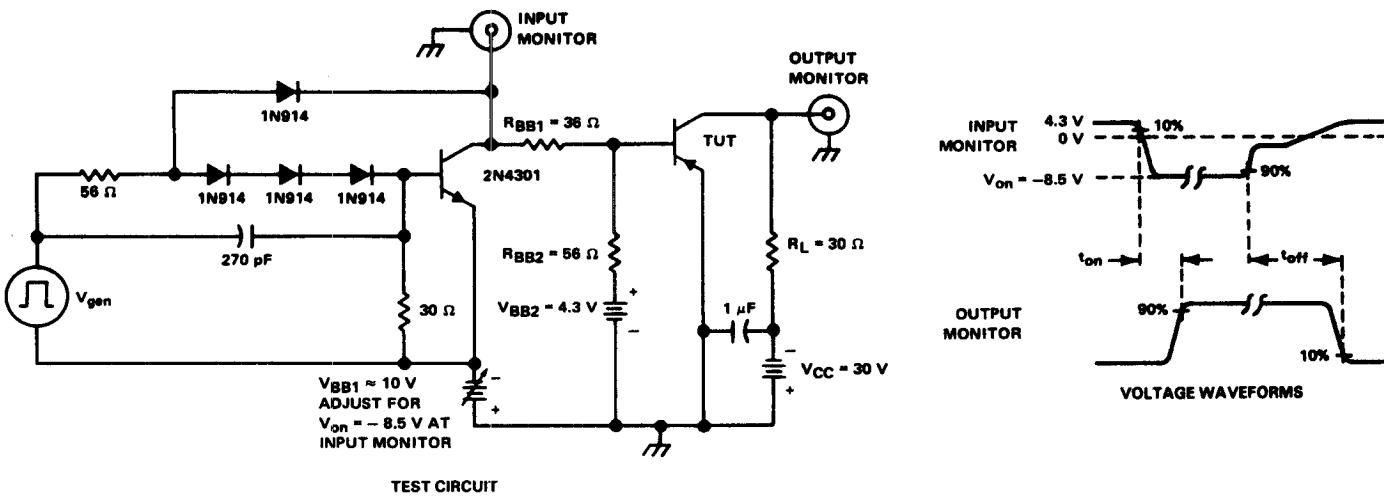


FIGURE 1. RESISTIVE-LOAD SWITCHING

**STATIC FORWARD CURRENT TRANSFER RATIO
VS
COLLECTOR CURRENT**

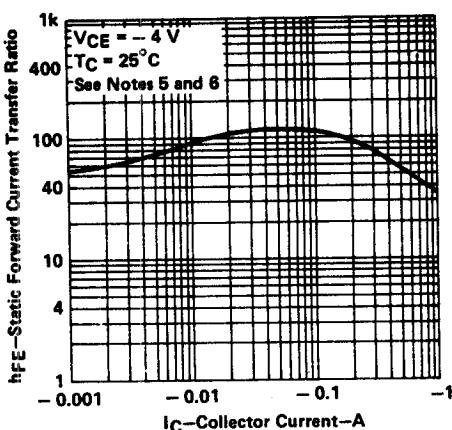


FIGURE 2. TYPICAL CHARACTERISTICS

NOTES: 5. These parameters must be measured using pulse techniques, $t_w = 300\text{ }\mu\text{s}$, duty cycle $< 2\%$.
6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts.

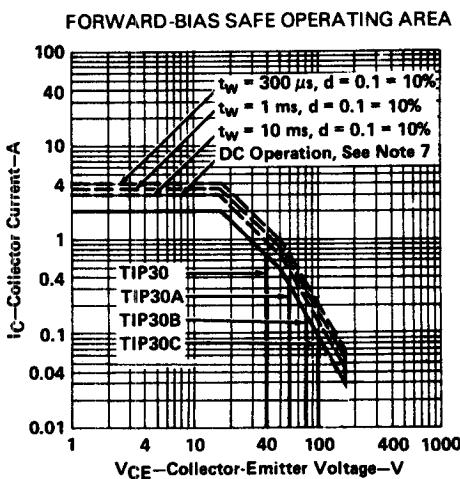


FIGURE 3 MAXIMUM SAFE OPERATING AREA

NOTE 7: This combination of maximum voltage and current values may be achieved only when switching from saturation to cutoff with a clamped inductive load.

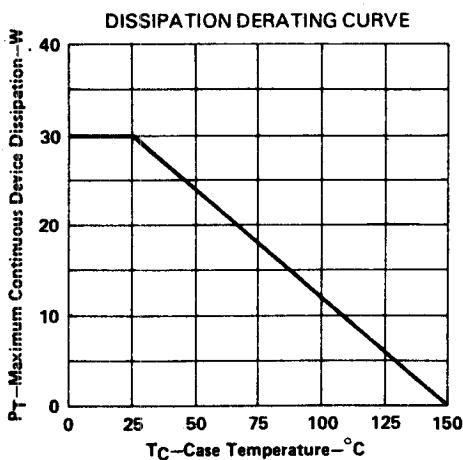


FIGURE 4 THERMAL INFORMATION