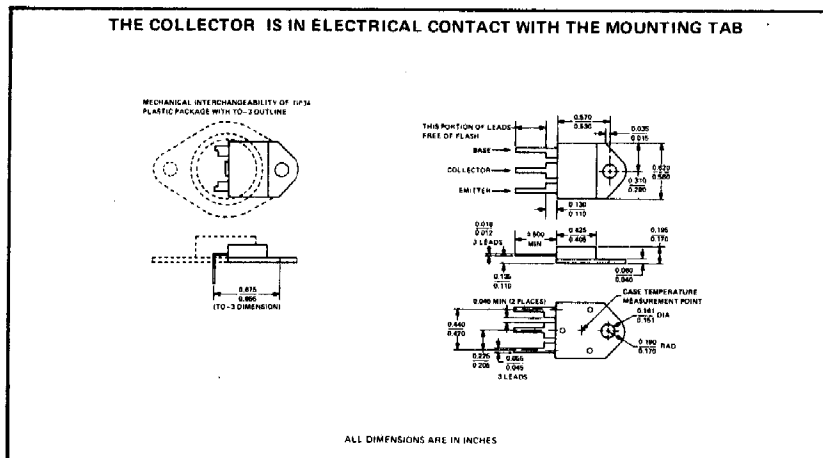


TYPES TIP34, TIP34A, TIP34B, TIP34C
P-N-P SINGLE-DIFFUSED MESA SILICON POWER TRANSISTORS

FOR POWER-AMPLIFIER AND HIGH-SPEED-SWITCHING APPLICATIONS
 DESIGNED FOR COMPLEMENTARY USE WITH TIP33, TIP33A, TIP33B, TIP33C

- 80 W at 25°C Case Temperature
- 10 A Rated Collector Current
- Min f_T of 3 MHz at 10 V, 500 mA

mechanical data



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

| | TIP34 | TIP34A | TIP34B | TIP34C |
|--|--------------------|--------|--------|--------|
| Collector-Base Voltage | -40 V | -60 V | -80 V | -100 V |
| Collector-Emitter Voltage (See Note 1) | -40 V | -60 V | -80 V | -100 V |
| Emitter-Base Voltage | ← -5 V → | | | |
| Continuous Collector Current | ← -10 A → | | | |
| Peak Collector Current (See Note 2) | ← -15 A → | | | |
| Continuous Base Current | ← -3 A → | | | |
| Safe Operating Region at (or below) 25°C Case Temperature | ← See Figure 5 → | | | |
| Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 3) | ← 80 W → | | | |
| Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 4) | ← 3.5 W → | | | |
| Unclamped Inductive Load Energy (See Note 5) | ← 62.5 mJ → | | | |
| Operating Collector Junction Temperature Range | ← -65°C to 150°C → | | | |
| Storage Temperature Range | ← -65°C to 150°C → | | | |
| Lead Temperature 1/8 Inch from Case for 10 Seconds | ← 260°C → | | | |

- NOTES:
1. This value applies when the base-emitter diode is open circuited.
 2. This value applies for $t_W \leq 0.3$ ms, duty cycle $\leq 10\%$.
 3. Derate linearly to 150°C case temperature at the rate of 0.64 W/°C.
 4. Derate linearly to 150°C free-air temperature at the rate of 28 mW/°C.
 5. This rating is based on the capability of the transistor to operate safely in the circuit of Figure 2. $L = 20$ mH, $R_{BB2} = 100 \Omega$, $V_{BB2} = 0$ V, $R_S = 0.1 \Omega$, $V_{CC} = 10$ V. Energy $\approx 1/2 I_C^2 L/2$.



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TYPES TIP34, TIP34A, TIP34B, TIP34C P-N-P SINGLE-DIFFUSED MESA SILICON POWER TRANSISTORS

electrical characteristics at 25°C case temperature

| PARAMETER | TEST CONDITIONS | TIP34 | | TIP34A | | TIP34B | | TIP34C | | UNIT |
|---|--|-------|-----|--------|-----|--------|-----|--------|-----|------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| $V_{(BR)CEO}$ Collector-Emitter Breakdown Voltage | $I_C = -30 \text{ mA}$, $I_B = 0$, See Note 6 | -40 | | -60 | | -80 | | -100 | | V |
| I_{CEO} Collector Cutoff Current | $V_{CE} = -30 \text{ V}$, $I_B = 0$ | -0.7 | | -0.7 | | | | | | mA |
| | $V_{CE} = -60 \text{ V}$, $I_B = 0$ | | | | | -0.7 | | -0.7 | | |
| I_{CES} Collector Cutoff Current | $V_{CE} = -40 \text{ V}$, $V_{BE} = 0$ | -0.4 | | | | | | | | mA |
| | $V_{CE} = -60 \text{ V}$, $V_{BE} = 0$ | | | -0.4 | | | | | | |
| | $V_{CE} = -80 \text{ V}$, $V_{BE} = 0$ | | | | | -0.4 | | | | |
| | $V_{CE} = -100 \text{ V}$, $V_{BE} = 0$ | | | | | | | -0.4 | | |
| I_{EBO} Emitter Cutoff Current | $V_{EB} = -5 \text{ V}$, $I_C = 0$ | -1 | | -1 | | -1 | | -1 | | mA |
| h_{FE} Static Forward Current Transfer Ratio | $V_{CE} = -4 \text{ V}$, $I_C = -1 \text{ A}$, See Notes 6 and 7 | 40 | | 40 | | 40 | | 40 | | |
| | $V_{CE} = -4 \text{ V}$, $I_C = -3 \text{ A}$, See Notes 6 and 7 | 20 | 100 | 20 | 100 | 20 | 100 | 20 | 100 | |
| V_{BE} Base-Emitter Voltage | $V_{CE} = -4 \text{ V}$, $I_C = -3 \text{ A}$, See Notes 6 and 7 | -1.6 | | -1.6 | | -1.6 | | -1.6 | | V |
| | $V_{CE} = -4 \text{ V}$, $I_C = -10 \text{ A}$, See Notes 6 and 7 | -3 | | -3 | | -3 | | -3 | | |
| $V_{CE(sat)}$ Collector-Emitter Saturation Voltage | $I_B = -0.3 \text{ A}$, $I_C = -3 \text{ A}$, See Notes 6 and 7 | -1 | | -1 | | -1 | | -1 | | V |
| | $I_B = -2.5 \text{ A}$, $I_C = -10 \text{ A}$, See Notes 6 and 7 | -4 | | -4 | | -4 | | -4 | | |
| h_{fe} Small-Signal Common-Emitter Forward Current Transfer Ratio | $V_{CE} = -10 \text{ V}$, $I_C = -0.5 \text{ A}$, $f = 1 \text{ kHz}$ | 20 | | 20 | | 20 | | 20 | | |
| $ h_{fe} $ Small-Signal Common-Emitter Forward Current Transfer Ratio | $V_{CE} = -10 \text{ V}$, $I_C = -0.5 \text{ A}$, $f = 1 \text{ MHz}$ | 3 | | 3 | | 3 | | 3 | | |

NOTES: 6. These parameters must be measured using pulse techniques. $t_W = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

7. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts.

thermal characteristics

| PARAMETER | MAX | UNIT |
|---|------|------|
| $R_{\theta JC}$ Junction-to-Case Thermal Resistance | 1.56 | °C/W |
| $R_{\theta JA}$ Junction-to-Free-Air Thermal Resistance | 35.7 | |

switching characteristics at 25°C case temperature

| PARAMETER | TEST CONDITIONS† | TYP | UNIT |
|-------------------------|---|-----|---------------|
| t_{on} Turn-On Time | $I_C = -6 \text{ A}$, $I_{B(1)} = -0.6 \text{ A}$, $I_{B(2)} = 0.6 \text{ A}$, $V_{BE(off)} = 4 \text{ V}$, $R_L = 5 \Omega$, See Figure 1 | 0.4 | μs |
| t_{off} Turn-Off Time | | 0.7 | |

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