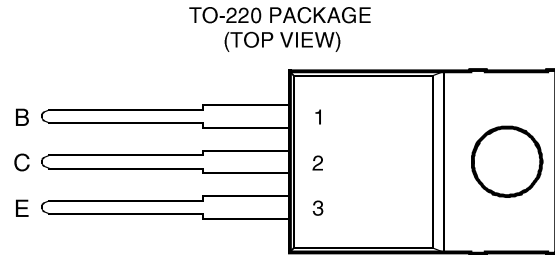


- Designed for Complementary Use with BDT61, BDT61A, BDT61B and BDT61C
- 50 W at 25°C Case Temperature
- 4 A Continuous Collector Current
- Minimum h_{FE} of 750 at 1.5 V, 3 A



Pin 2 is in electrical contact with the mounting base.

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

| RATING | | SYMBOL | VALUE | UNIT |
|--|--------|-----------|-------------|------|
| Collector-base voltage ($I_E = 0$) | BDT60 | V_{CBO} | -60 | V |
| | BDT60A | | -80 | |
| | BDT60B | | -100 | |
| | BDT60C | | -120 | |
| Collector-emitter voltage ($I_B = 0$) | BDT60 | V_{CEO} | -60 | V |
| | BDT60A | | -80 | |
| | BDT60B | | -100 | |
| | BDT60C | | -120 | |
| Emitter-base voltage | | V_{EBO} | -5 | V |
| Continuous collector current | | I_C | -4 | A |
| Continuous base current | | I_B | -0.1 | A |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 1) | | P_{tot} | 50 | W |
| Continuous device dissipation at (or below) 25°C free air temperature (see Note 2) | | P_{tot} | 2 | W |
| Operating junction temperature range | | T_j | -65 to +150 | °C |
| Storage temperature range | | T_{stg} | -65 to +150 | °C |
| Operating free-air temperature range | | T_A | -65 to +150 | °C |

NOTES: 1. Derate linearly to 150°C case temperature at the rate of 0.4 W/°C.
2. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.

BDT60, BDT60A, BDT60B, BDT60C PNP SILICON POWER DARLINGTONS

electrical characteristics at 25°C case temperature (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|--|----------------------------|-----|--|------|
| $V_{(BR)CEO}$ Collector-emitter breakdown voltage | $I_C = -30\text{ mA}$ $I_B = 0$ (see Note 3) BDT60 BDT60A BDT60B BDT60C | -60 -80 -100 -120 | | | V |
| I_{CEO} Collector-emitter cut-off current | $V_{CE} = -30\text{ V}$ $I_B = 0$ $V_{CE} = -40\text{ V}$ $I_B = 0$ $V_{CE} = -50\text{ V}$ $I_B = 0$ $V_{CE} = -60\text{ V}$ $I_B = 0$ BDT60 BDT60A BDT60B BDT60C | | | -0.5 -0.5 -0.5 -0.5 | mA |
| I_{CBO} Collector cut-off current | $V_{CB} = -60\text{ V}$ $I_E = 0$ $V_{CB} = -80\text{ V}$ $I_E = 0$ $V_{CB} = -100\text{ V}$ $I_E = 0$ $V_{CB} = -120\text{ V}$ $I_E = 0$ $V_{CB} = -30\text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -40\text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -50\text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ $V_{CB} = -60\text{ V}$ $I_E = 0$ $T_C = 150^\circ\text{C}$ BDT60 BDT60A BDT60B BDT60C BDT60 BDT60A BDT60B BDT60C | | | -0.2 -0.2 -0.2 -0.2 -2.0 -2.0 -2.0 -2.0 | mA |
| I_{EBO} Emitter cut-off current | $V_{EB} = -5\text{ V}$ $I_C = 0$ | | | -5 | mA |
| h_{FE} Forward current transfer ratio | $V_{CE} = -3\text{ V}$ $I_C = -1.5\text{ A}$ (see Notes 3 and 4) | 750 | | | |
| $V_{CE(sat)}$ Collector-emitter saturation voltage | $I_B = -6\text{ mA}$ $I_C = -1.5\text{ A}$ (see Notes 3 and 4) | | | -2.5 | V |
| $V_{BE(on)}$ Base-emitter voltage | $V_{CE} = -3\text{ V}$ $I_C = -1.5\text{ A}$ (see Notes 3 and 4) | | | -2.5 | V |
| V_{EC} Parallel diode forward voltage | $I_E = -1.5\text{ A}$ $I_B = 0$ | | | -2.0 | V |

NOTES: 3. These parameters must be measured using pulse techniques, $t_p = 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

4. 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 | | | 2.5 | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ Junction to free air thermal resistance | | | 62.5 | $^\circ\text{C/W}$ |

resistive-load-switching characteristics at 25°C case temperature

| PARAMETER | TEST CONDITIONS † | MIN | TYP | MAX | UNIT |
|-------------------------|---|-----|-----|-----|---------------|
| t_{on} Turn-on time | $I_C = -2\text{ A}$ $I_{B(on)} = -8\text{ mA}$ $I_{B(off)} = 8\text{ mA}$ | | 1 | | μs |
| t_{off} Turn-off time | $V_{BE(off)} = 5\text{ V}$ $R_L = 20\ \Omega$ $t_p = 20\ \mu\text{s}$, dc $\leq 2\%$ | | 4.5 | | μs |

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

TYPICAL CHARACTERISTICS

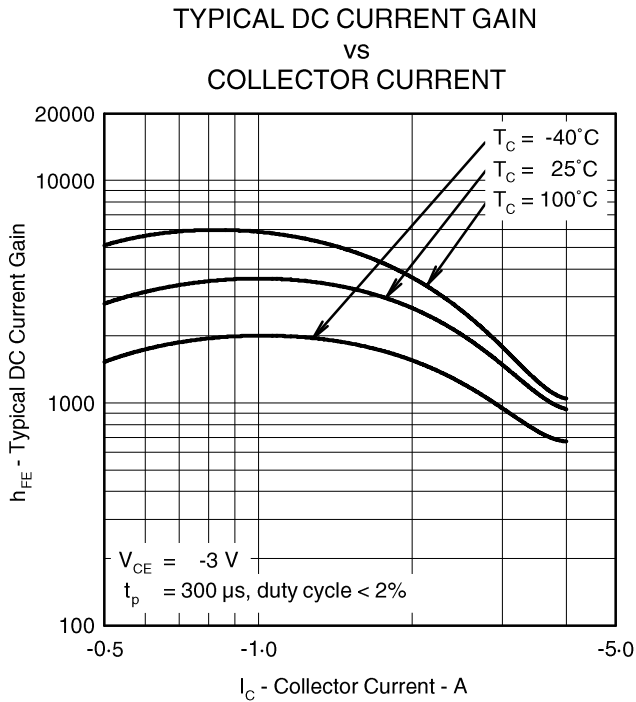


Figure 1.

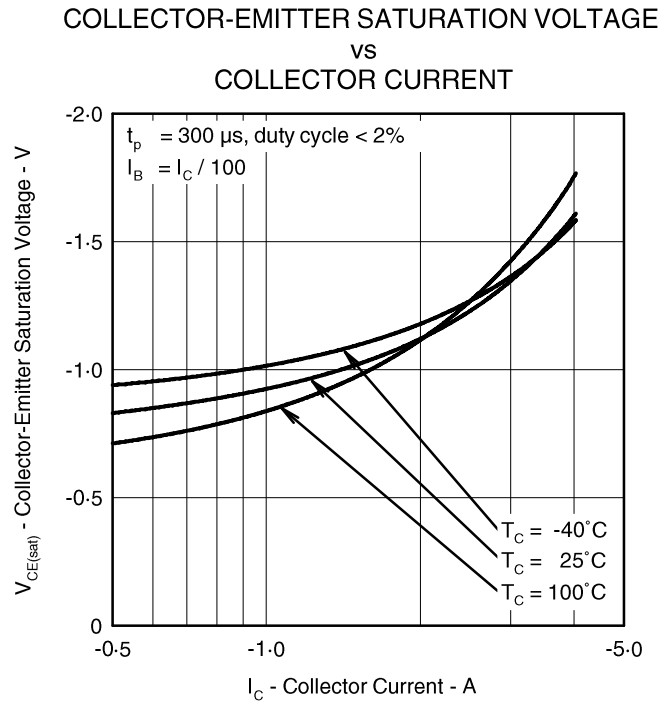


Figure 2.

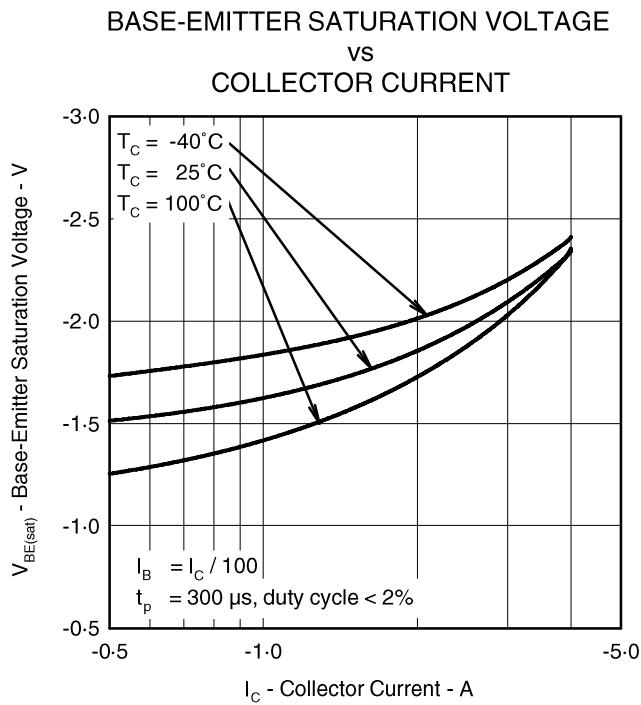


Figure 3.

BDT60, BDT60A, BDT60B, BDT60C PNP SILICON POWER DARLINGTONS

MAXIMUM SAFE OPERATING REGIONS

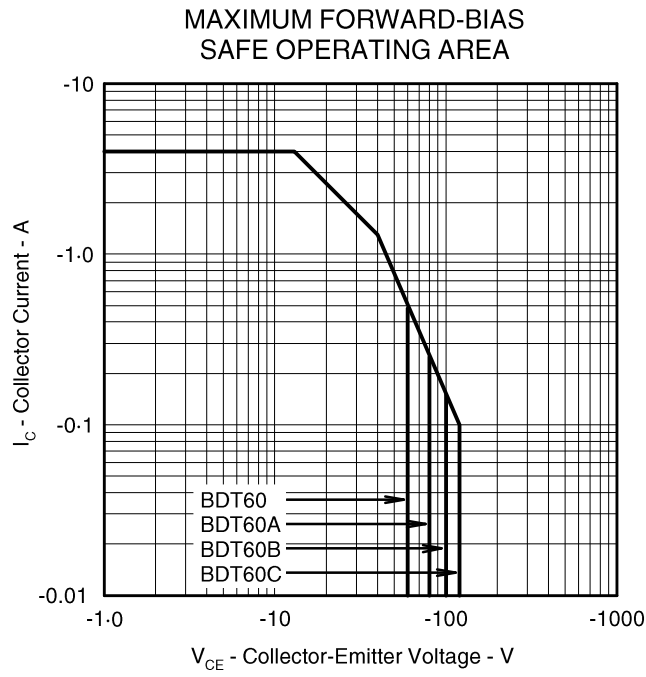


Figure 4.

THERMAL INFORMATION

MAXIMUM POWER DISSIPATION vs CASE TEMPERATURE

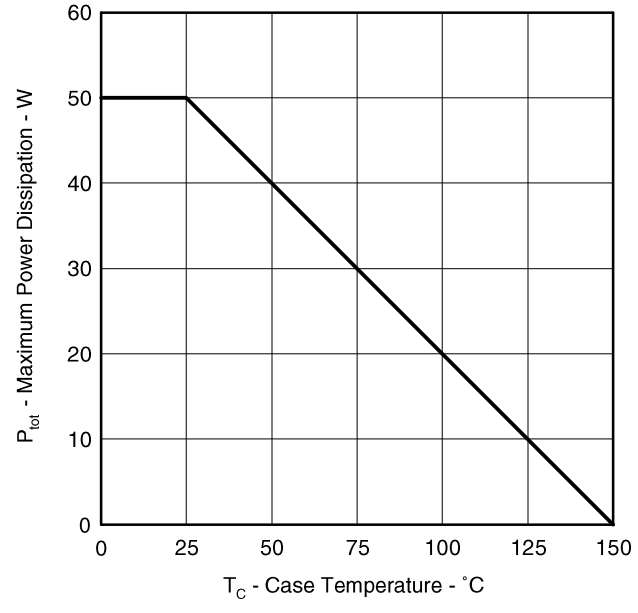


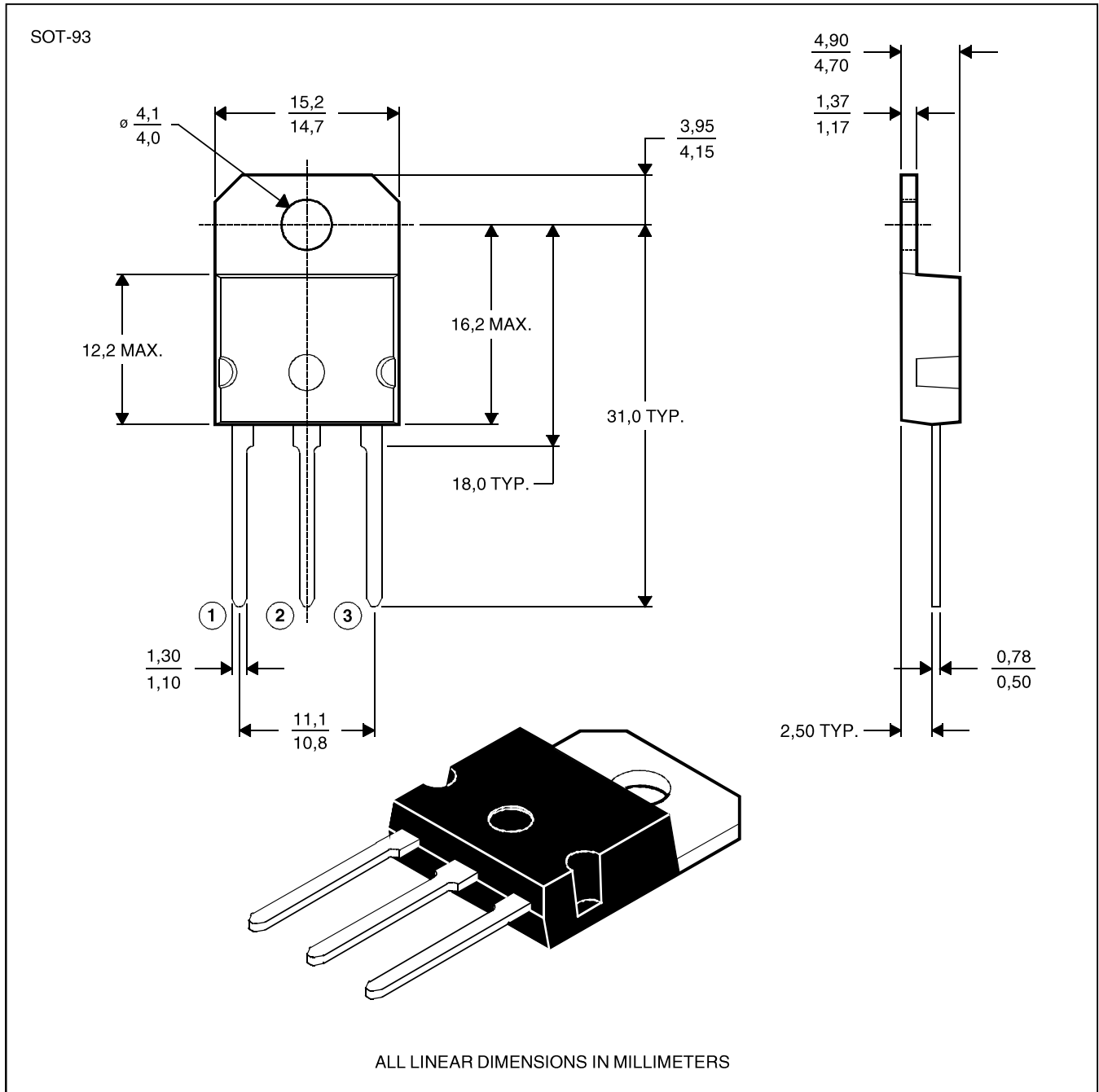
Figure 5.

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.