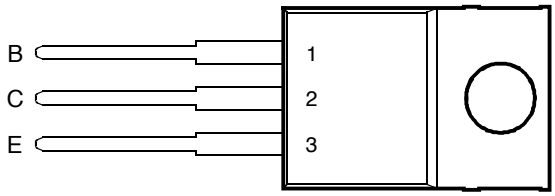
- **Designed for Complementary Use with the BD241 Series**
- **40 W at 25°C Case Temperature**
- **3 A Continuous Collector Current**
- **5 A Peak Collector Current**
- **Customer-Specified Selections Available**

**TO-220 PACKAGE**
**(TOP VIEW)**




Pin 2 is in electrical contact with the mounting base.

MDTRACA

This series is obsolete and not recommended for new designs.

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

| RATING | | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Collector-emitter voltage ($R_{BE}$ = 100 Ω) | BD242<br>BD242A<br>BD242B<br>BD242C | $V_{CER}$ | -55<br>-70<br>-90<br>-115 | V |
| Collector-emitter voltage ($I_C$ = -30 mA) | BD242<br>BD242A<br>BD242B<br>BD242C | $V_{CEO}$ | -45<br>-60<br>-80<br>-100 | V |
| Emitter-base voltage | | $V_{EBO}$ | -5 | V |
| Continuous collector current | | $I_C$ | -3 | A |
| Peak collector current (see Note 1) | | $I_{CM}$ | -5 | A |
| Continuous base current | | $I_B$ | -1 | A |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 2) | | $P_{tot}$ | 40 | 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) | | $½LI_C^2$ | 32 | 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 | | $T_L$ | 250 | °C |

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NOTES: 1. This value applies for $t_p \leq 0.3$ ms, duty cycle ≤ 10%.
2. Derate linearly to 150°C case temperature at the rate of 0.32 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, $I_{B(on)}$ = -0.4 A, $R_{BE}$ = 100 Ω, $V_{BE(off)}$ = 0, $R_S$ = 0.1 Ω, $V_{CC}$ = -20 V.

## electrical characteristics at 25°C case temperature

| PARAMETER | | TEST CONDITIONS | | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage | $I_C$ = -30 mA (see Note 5) | $I_B$ = 0 | BD242 | -45 | | | V |
| | | | | BD242A | -60 | | | |
| | | | | BD242B | -80 | | | |
| | | | | BD242C | -100 | | | |
| $I_{CES}$ | Collector-emitter cut-off current | $V_{CE}$ = -55 V | $V_{BE}$ = 0 | BD242 | | | -0.2 | mA |
| | | $V_{CE}$ = -70 V | $V_{BE}$ = 0 | BD242A | | | -0.2 | |
| | | $V_{CE}$ = -90 V | $V_{BE}$ = 0 | BD242B | | | -0.2 | |
| | | $V_{CE}$ = -115 V | $V_{BE}$ = 0 | BD242C | | | -0.2 | |
| $I_{CEO}$ | Collector cut-off current | $V_{CE}$ = -30 V | $I_B$ = 0 | BD242/242A | | | -0.3 | mA |
| | | $V_{CE}$ = -60 V | $I_B$ = 0 | BD242B/242C | | | -0.3 | |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$ = -5 V | $I_C$ = 0 | | | | -1 | mA |
| $h_{FE}$ | Forward current transfer ratio | $V_{CE}$ = -4 V | $I_C$ = -1 A | (see Notes 5 and 6) | 25 | | | |
| | | $V_{CE}$ = -4 V | $I_C$ = -3 A | | 10 | | | |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_B$ = -0.6 A | $I_C$ = -3 A | (see Notes 5 and 6) | | | -1.2 | V |
| $V_{BE}$ | Base-emitter voltage | $V_{CE}$ = -4 V | $I_C$ = -3 A | (see Notes 5 and 6) | | | -1.8 | V |
| $h_{fe}$ | Small signal forward current transfer ratio | $V_{CE}$ = -10 V | $I_C$ = -0.5 A | f = 1 kHz | 20 | | | |
| $\|h_{fe}\|$ | Small signal forward current transfer ratio | $V_{CE}$ = -10 V | $I_C$ = -0.5 A | f = 1 MHz | 3 | | | |

NOTES: 5. These parameters must be measured using pulse techniques, $t_p$ = 300 µs, duty cycle ≤ 2%.
6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

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## thermal characteristics

| PARAMETER | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Junction to case thermal resistance | | | 3.125 | °C/W |
| $R_{\theta JA}$ | Junction to free air thermal resistance | | | 62.5 | °C/W |

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

| PARAMETER | | TEST CONDITIONS † | | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $t_{on}$ | Turn-on time | $I_C$ = -1 A | $I_{B(on)}$ = -0.1 A | $I_{B(off)}$ = 0.1 A | | 0.2 | | µs |
| $t_{off}$ | Turn-off time | $V_{BE(off)}$ = 3.7 V | $R_L$ = 20 Ω | $t_p$ = 20 µs, dc ≤ 2% | | 0.3 | | µs |

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

## TYPICAL CHARACTERISTICS

### TYPICAL DC CURRENT GAIN vs COLLECTOR CURRENT

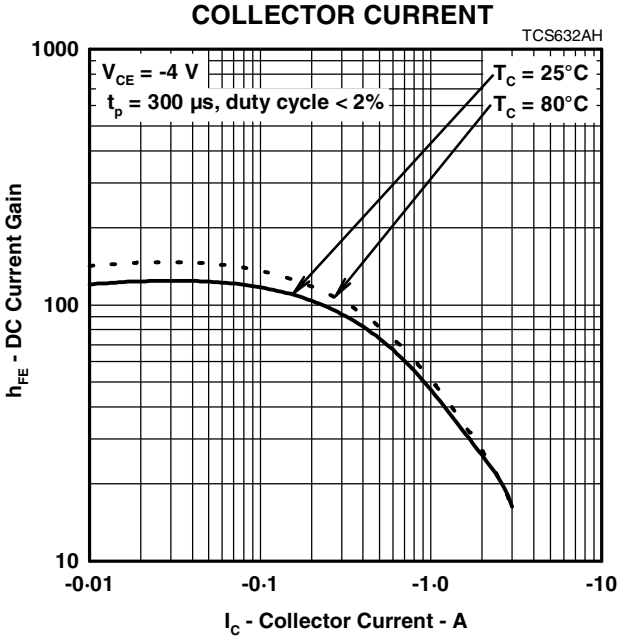



Figure 1.

### COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

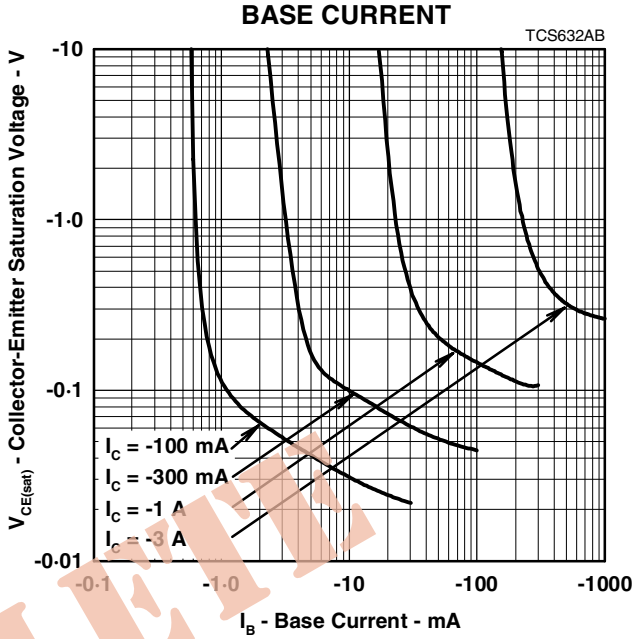



Figure 2.

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### BASE-EMITTER VOLTAGE vs COLLECTOR CURRENT

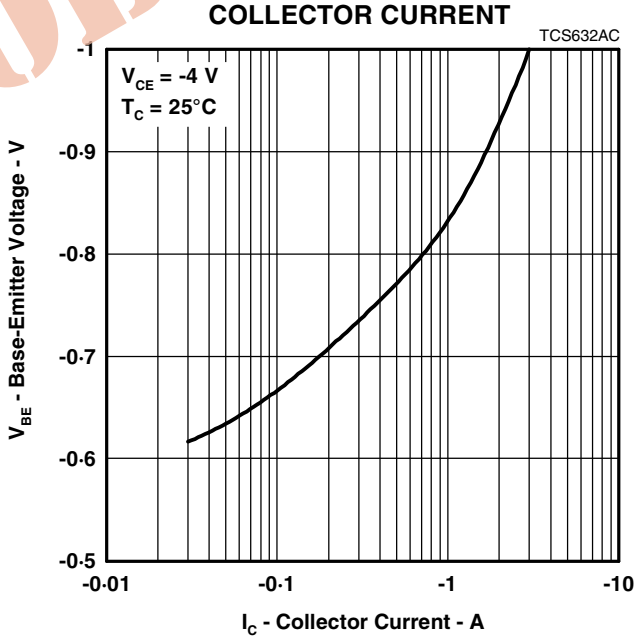



Figure 3.

## MAXIMUM SAFE OPERATING REGIONS

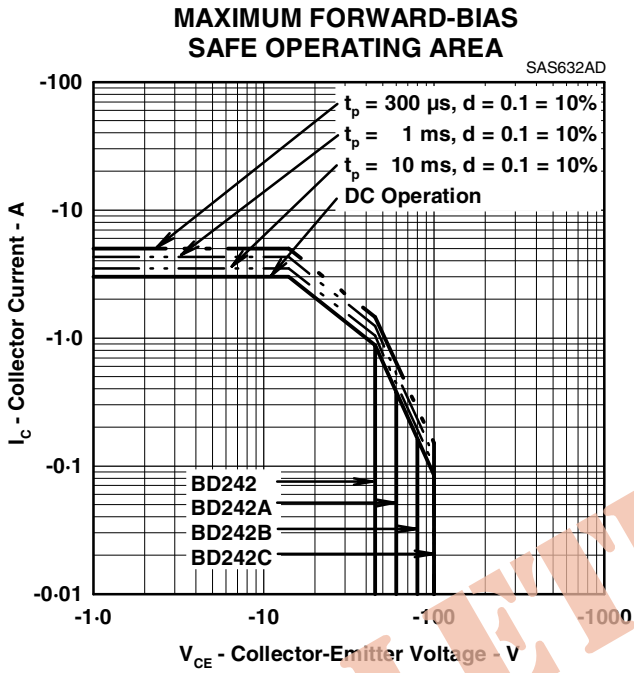



Figure 4.

## THERMAL INFORMATION

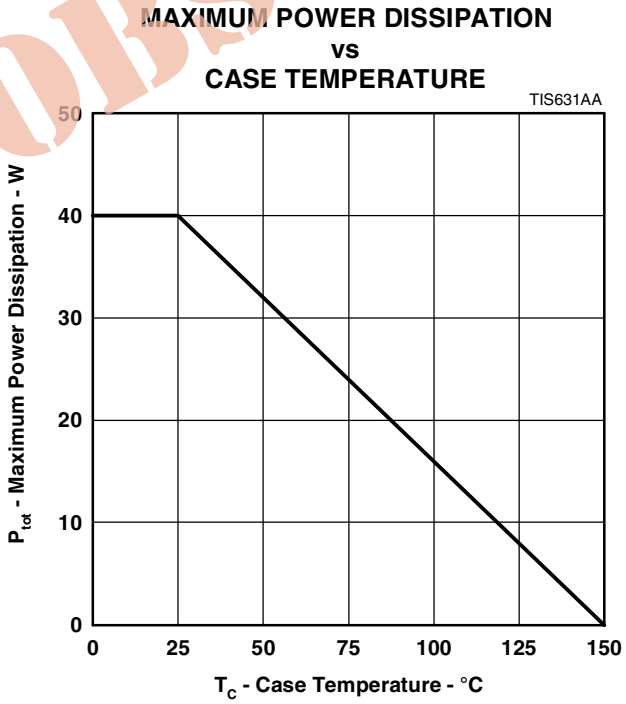



Figure 5.

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