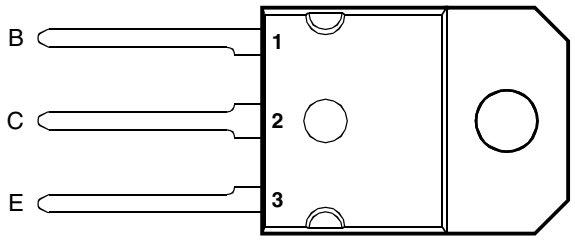
- **Rugged Triple-Diffused Planar Construction**
- **6 A Continuous Collector Current**
- **Operating Characteristics Fully Guaranteed at 100°C**
- **1000 Volt Blocking Capability**
- **120 W at 25°C Case Temperature**

**SOT-93 PACKAGE**
**(TOP VIEW)**




Pin 2 is in electrical contact with the mounting base.

MDTRAAA

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

| RATING | | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Collector-base voltage ($I_E$ = 0) | TIPL762 | $V_{CBO}$ | 850 | V |
| | TIPL762A | | 1000 | |
| Collector-emitter voltage ($V_{BE}$ = 0) | TIPL762 | $V_{CES}$ | 850 | V |
| | TIPL762A | | 1000 | |
| Collector-emitter voltage ($I_B$ = 0) | TIPL762 | $V_{CEO}$ | 400 | V |
| | TIPL762A | | 450 | |
| Emitter-base voltage | | $V_{EBO}$ | 10 | V |
| Continuous collector current | | $I_C$ | 6 | A |
| Peak collector current (see Note 1) | | $I_{CM}$ | 12 | A |
| Continuous device dissipation at (or below) 25°C case temperature | | $P_{tot}$ | 120 | W |
| Operating junction temperature range | | $T_j$ | -65 to +150 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +150 | °C |

NOTE 1: This value applies for $t_p \leq 10$ ms, duty cycle ≤ 2%.

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

| PARAMETER | | TEST CONDITIONS | | | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| $V_{CEO(sus)}$ | Collector-emitter sustaining voltage | $I_C$ = 100 mA | L = 25 mH | (see Note 2) | TIPL762<br>TIPL762A | 400<br>450 | | | V |
| $I_{CES}$ | Collector-emitter cut-off current | $V_{CE}$ = 850 V<br>$V_{CE}$ = 1000 V<br>$V_{CE}$ = 850 V<br>$V_{CE}$ = 1000 V | $V_{BE}$ = 0<br>$V_{BE}$ = 0<br>$V_{BE}$ = 0<br>$V_{BE}$ = 0 | <br><br>$T_C$ = 100°C<br>$T_C$ = 100°C | TIPL762<br>TIPL762A<br>TIPL762<br>TIPL762A | | | 50<br>50<br>200<br>200 | μA |
| $I_{CEO}$ | Collector cut-off current | $V_{CE}$ = 400 V<br>$V_{CE}$ = 450 V | $I_B$ = 0<br>$I_B$ = 0 | | TIPL762<br>TIPL762A | | | 50<br>50 | μA |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$ = 10 V | $I_C$ = 0 | | | | | 1 | mA |
| $h_{FE}$ | Forward current transfer ratio | $V_{CE}$ = 5 V | $I_C$ = 0.5 A | (see Notes 3 and 4) | | 20 | | 60 | |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_B$ = 0.4 A<br>$I_B$ = 0.8 A<br>$I_B$ = 1.2 A<br>$I_B$ = 1.2 A | $I_C$ = 2 A<br>$I_C$ = 4 A<br>$I_C$ = 6 A<br>$I_C$ = 6 A | <br>(see Notes 3 and 4)<br><br>$T_C$ = 100°C | | | | 0.5<br>1.0<br>2.5<br>5.0 | V |
| $V_{BE(sat)}$ | Base-emitter saturation voltage | $I_B$ = 0.4 A<br>$I_B$ = 0.8 A<br>$I_B$ = 1.2 A<br>$I_B$ = 1.2 A | $I_C$ = 2 A<br>$I_C$ = 4 A<br>$I_C$ = 6 A<br>$I_C$ = 6 A | <br>(see Notes 3 and 4)<br><br>$T_C$ = 100°C | | | | 1.1<br>1.3<br>1.5<br>1.4 | V |
| $f_t$ | Current gain bandwidth product | $V_{CE}$ = 10 V | $I_C$ = 0.5 A | f = 1 MHz | | | 6 | | MHz |
| $C_{ob}$ | Output capacitance | $V_{CB}$ = 20 V | $I_E$ = 0 | f = 0.1 MHz | | | 105 | | pF |

NOTES: 2. Inductive loop switching measurement.
3. These parameters must be measured using pulse techniques, $t_p$ = 300 μs, duty cycle ≤ 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 | | | 1.25 | °C/W |

## inductive-load-switching characteristics at 25°C case temperature (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS † | | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $t_{sv}$ | Voltage storage time | $I_C$ = 6 A<br>$V_{BE(off)}$ = -10 V | $I_{B(on)}$ = 1.2 A | (see Figures 1 and 2) | | | 2.5 | μs |
| $t_{rv}$ | Voltage rise time | | | | | | 200 | ns |
| $t_{fi}$ | Current fall time | | | | | | 150 | ns |
| $t_{ti}$ | Current tail time | | | | | | 50 | ns |
| $t_{xo}$ | Cross over time | | | | | | 300 | ns |
| $t_{sv}$ | Voltage storage time | $I_C$ = 6 A<br>$V_{BE(off)}$ = -10 V | $I_{B(on)}$ = 1.2 A<br>$T_C$ = 100°C | (see Figures 1 and 2) | | | 3 | μs |
| $t_{rv}$ | Voltage rise time | | | | | | 300 | ns |
| $t_{fi}$ | Current fall time | | | | | | 150 | ns |
| $t_{ti}$ | Current tail time | | | | | | 50 | ns |
| $t_{xo}$ | Cross over time | | | | | | 500 | ns |

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

## PARAMETER MEASUREMENT INFORMATION

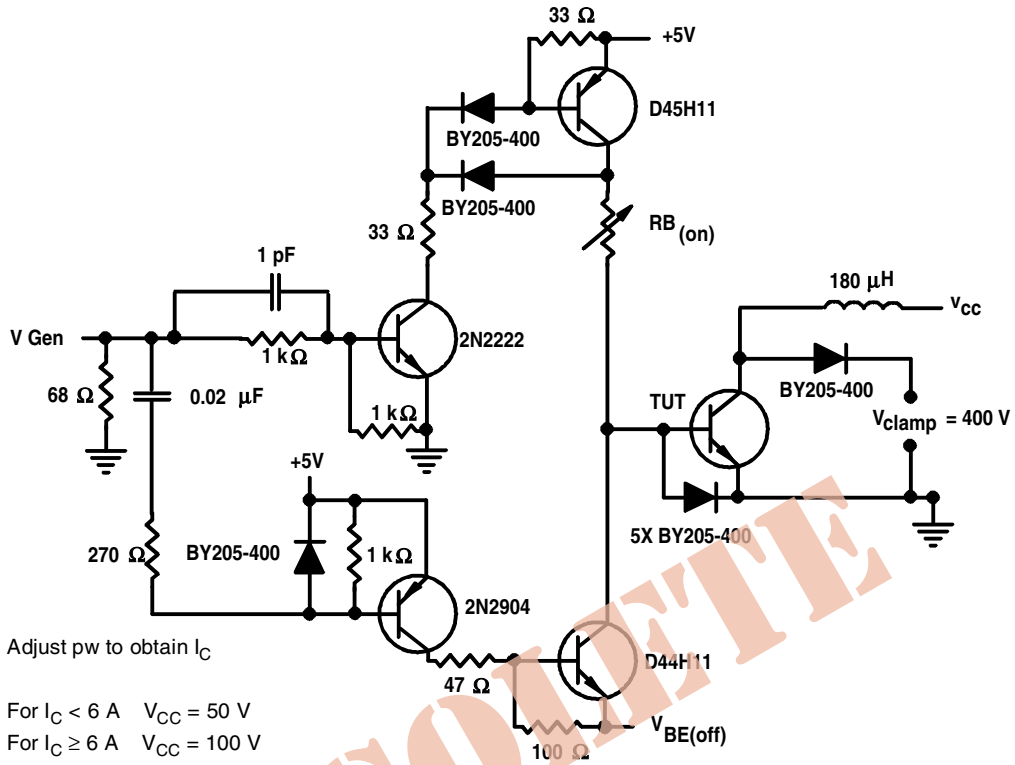
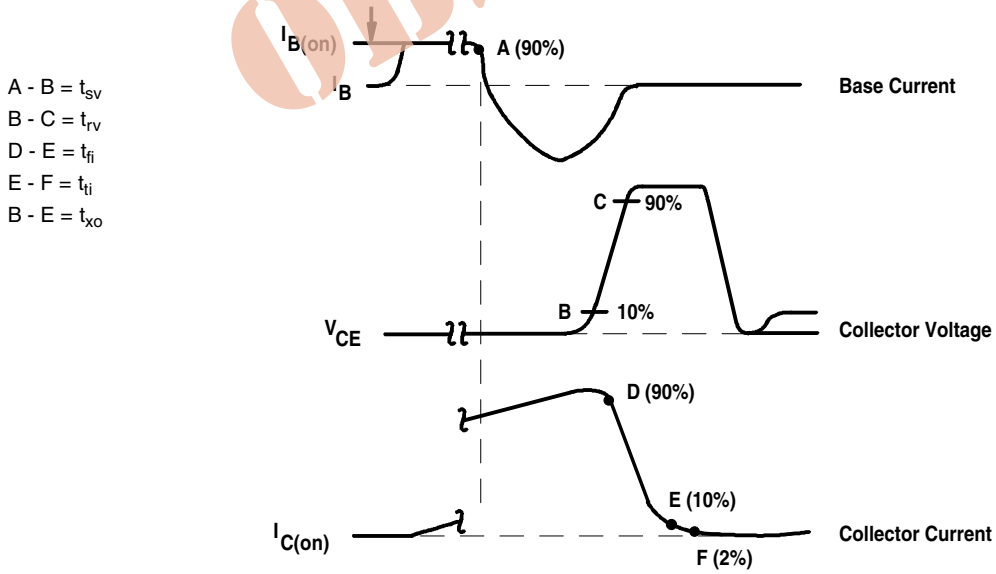



**Figure 1. Inductive-Load Switching Test Circuit**






NOTES: A. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r$ < 15 ns, $R_{in}$ > 10 Ω, $C_{in}$ < 11.5 pF.
B. Resistors must be noninductive types.

**Figure 2. Inductive-Load Switching Waveforms**

## TYPICAL CHARACTERISTICS

### TYPICAL DC CURRENT GAIN vs COLLECTOR CURRENT

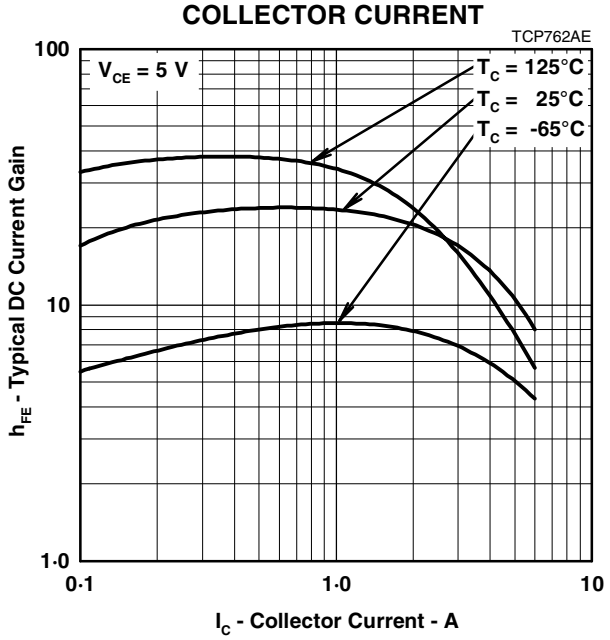



Figure 3.

### COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

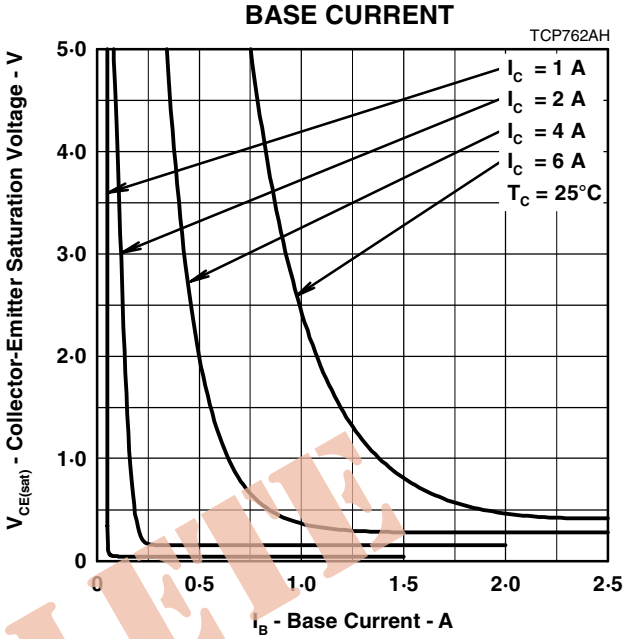



Figure 4.



### COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

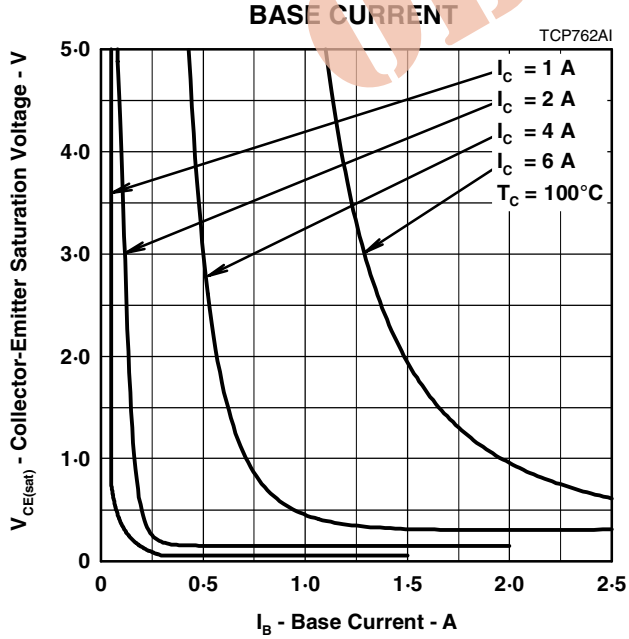



Figure 5.

### BASE-EMITTER SATURATION VOLTAGE vs BASE CURRENT

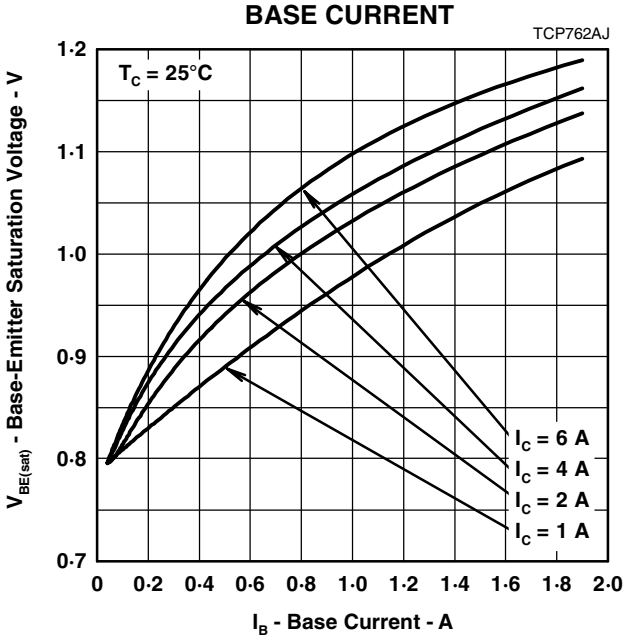



Figure 6.

## TYPICAL CHARACTERISTICS

### COLLECTOR CUT-OFF CURRENT vs CASE TEMPERATURE

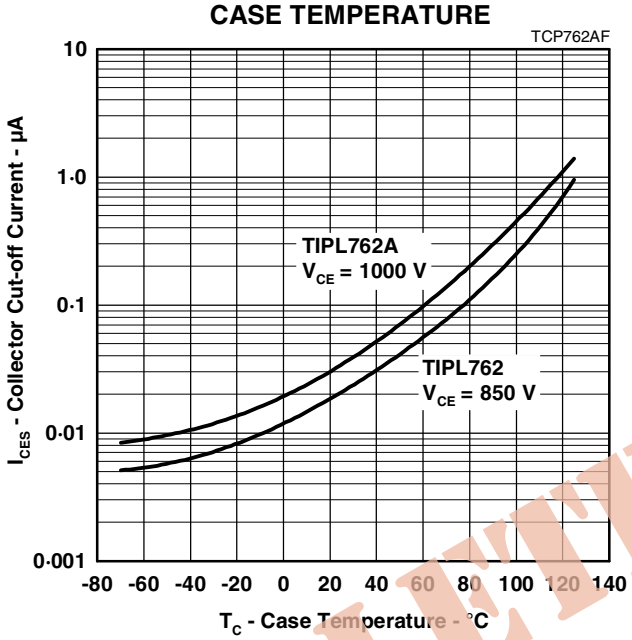



Figure 7.



## MAXIMUM SAFE OPERATING REGIONS

### MAXIMUM FORWARD-BIAS SAFE OPERATING AREA

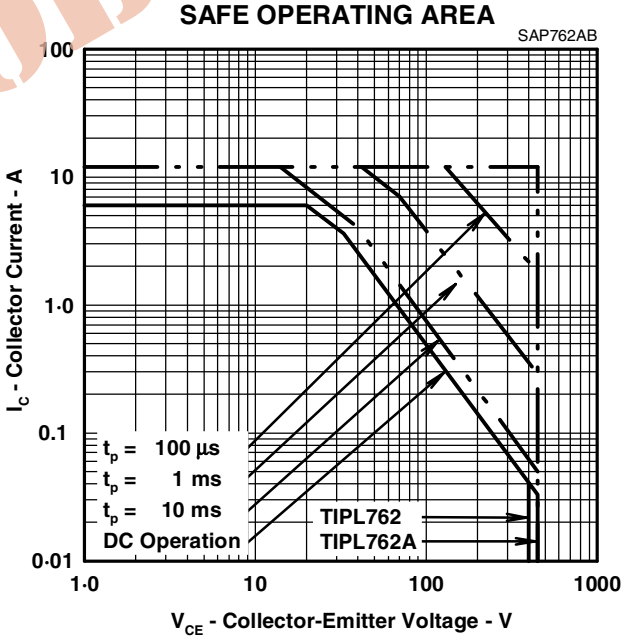



Figure 8.

## THERMAL INFORMATION

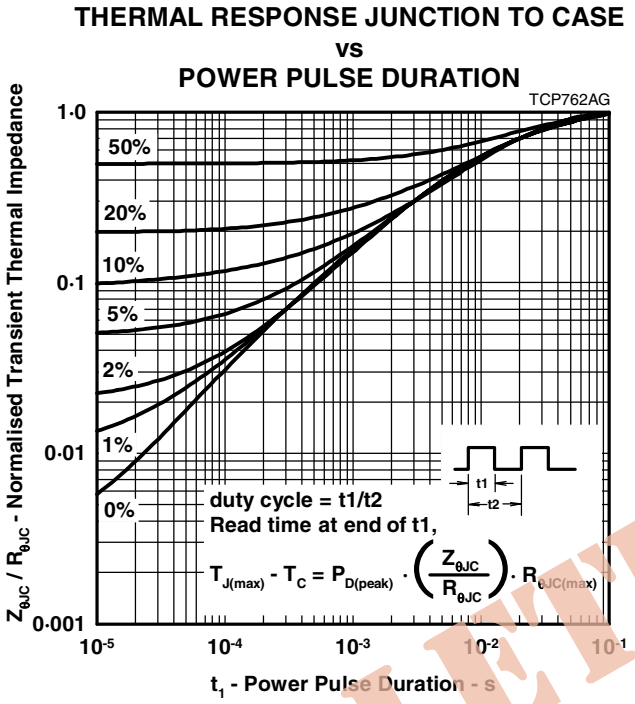



Figure 9.