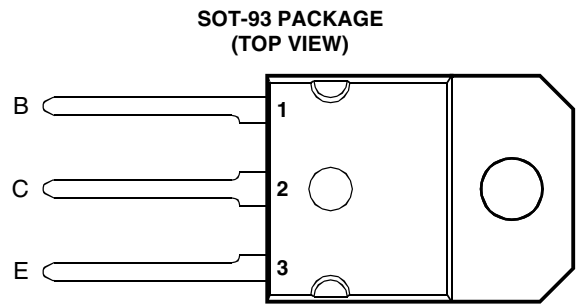


- Rugged Triple-Diffused Planar Construction
- 4 A Continuous Collector Current
- Operating Characteristics Fully Guaranteed at 100°C
- 1000 Volt Blocking Capability
- 100 W at 25°C Case Temperature



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 ( $I_E = 0$ )                              | TIPL761  | $V_{CBO}$ | 850         | V    |
|                                                                   | TIPL761A |           | 1000        |      |
| Collector-emitter voltage ( $V_{BE} = 0$ )                        | TIPL761  | $V_{CES}$ | 850         | V    |
|                                                                   | TIPL761A |           | 1000        |      |
| Collector-emitter voltage ( $I_B = 0$ )                           | TIPL761  | $V_{CEO}$ | 400         | V    |
|                                                                   | TIPL761A |           | 450         |      |
| Emitter-base voltage                                              |          | $V_{EBO}$ | 10          | V    |
| Continuous collector current                                      |          | $I_C$     | 4           | A    |
| Peak collector current (see Note 1)                               |          | $I_{CM}$  | 8           | A    |
| Continuous device dissipation at (or below) 25°C case temperature |          | $P_{tot}$ | 100         | 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  $\leq 2\%$ .

**PRODUCT INFORMATION**

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

| PARAMETER                                          | TEST CONDITIONS                                                                                                                                                                                                                                          | MIN        | TYP | MAX                    | UNIT          |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|------------------------|---------------|
| $V_{CE(sus)}$ Collector-emitter sustaining voltage | $I_C = 10 \text{ mA}$ $L = 25 \text{ mH}$ (see Note 2) TIPL761<br>TIPL761A                                                                                                                                                                               | 400<br>450 |     |                        | V             |
| $I_{CES}$ Collector-emitter cut-off current        | $V_{CE} = 850 \text{ V}$ $V_{BE} = 0$ TIPL761<br>$V_{CE} = 1000 \text{ V}$ $V_{BE} = 0$ TIPL761A<br>$V_{CE} = 850 \text{ V}$ $V_{BE} = 0$ $T_C = 100^\circ\text{C}$ TIPL761<br>$V_{CE} = 1000 \text{ V}$ $V_{BE} = 0$ $T_C = 100^\circ\text{C}$ TIPL761A |            |     | 50<br>50<br>200<br>200 | $\mu\text{A}$ |
| $I_{CEO}$ Collector cut-off current                | $V_{CE} = 400 \text{ V}$ $I_B = 0$ TIPL761<br>$V_{CE} = 450 \text{ V}$ $I_B = 0$ TIPL761A                                                                                                                                                                |            |     | 50<br>50               | $\mu\text{A}$ |
| $I_{EBO}$ Emitter cut-off current                  | $V_{EB} = 10 \text{ V}$ $I_C = 0$                                                                                                                                                                                                                        |            |     | 1                      | mA            |
| $h_{FE}$ Forward current transfer ratio            | $V_{CE} = 5 \text{ V}$ $I_C = 0.5 \text{ A}$ (see Notes 3 and 4)                                                                                                                                                                                         | 20         |     | 60                     |               |
| $V_{CE(sat)}$ Collector-emitter saturation voltage | $I_B = 0.5 \text{ A}$ $I_C = 2.5 \text{ A}$<br>$I_B = 0.8 \text{ A}$ $I_C = 4 \text{ A}$ (see Notes 3 and 4)<br>$I_B = 0.8 \text{ A}$ $I_C = 4 \text{ A}$ $T_C = 100^\circ\text{C}$                                                                      |            |     | 1.0<br>2.5<br>5.0      | V             |
| $V_{BE(sat)}$ Base-emitter saturation voltage      | $I_B = 0.5 \text{ A}$ $I_C = 2.5 \text{ A}$<br>$I_B = 0.8 \text{ A}$ $I_C = 4 \text{ A}$ (see Notes 3 and 4)<br>$I_B = 0.8 \text{ A}$ $I_C = 4 \text{ A}$ $T_C = 100^\circ\text{C}$                                                                      |            |     | 1.2<br>1.4<br>1.3      | V             |
| $f_t$ Current gain bandwidth product               | $V_{CE} = 10 \text{ V}$ $I_C = 0.5 \text{ A}$ $f = 1 \text{ MHz}$                                                                                                                                                                                        |            | 12  |                        | MHz           |
| $C_{ob}$ Output capacitance                        | $V_{CB} = 20 \text{ V}$ $I_E = 0$ $f = 0.1 \text{ MHz}$                                                                                                                                                                                                  |            | 110 |                        | pF            |

NOTES: 2. Inductive loop switching measurement.

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 |     |     | 1.25 | $^\circ\text{C/W}$ |

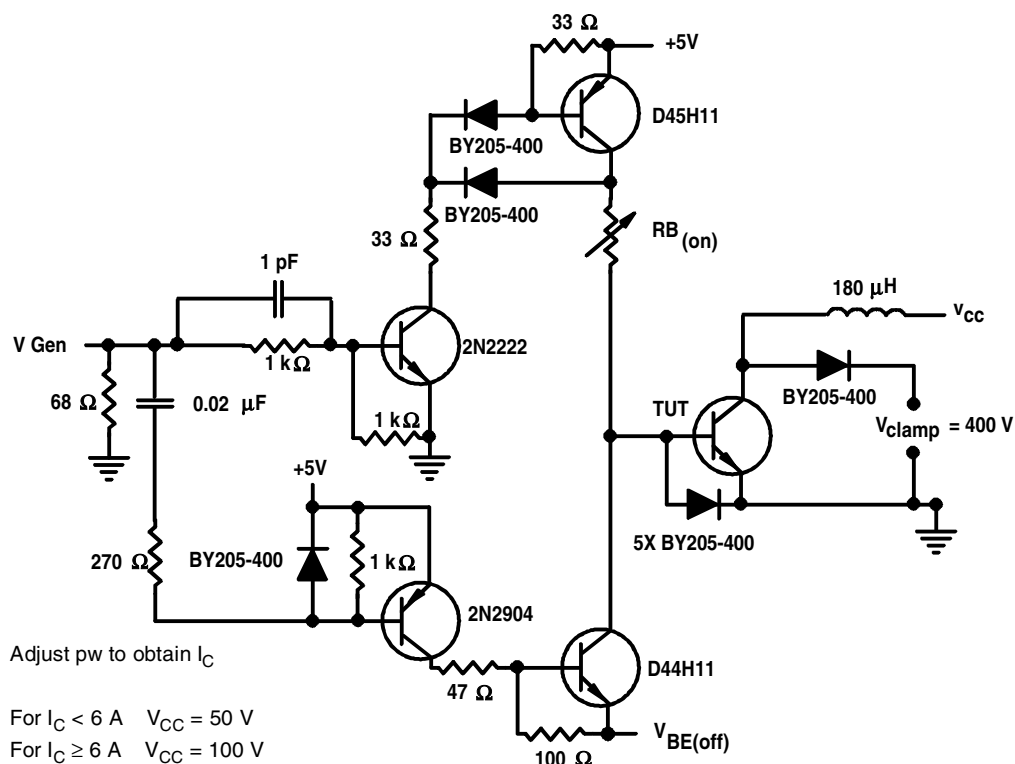
**inductive-load-switching characteristics at 25°C case temperature (unless otherwise noted)**

| PARAMETER                     | TEST CONDITIONS †                                                                                                            | MIN | TYP | MAX | UNIT          |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|---------------|
| $t_{sv}$ Voltage storage time | $I_C = 4 \text{ A}$ $V_{BE(off)} = -5 \text{ V}$ $I_{B(on)} = 0.8 \text{ A}$ (see Figures 1 and 2)                           |     |     | 2.5 | $\mu\text{s}$ |
| $t_{rv}$ Voltage rise time    |                                                                                                                              |     |     | 300 | ns            |
| $t_{fi}$ Current fall time    |                                                                                                                              |     |     | 250 | ns            |
| $t_{ti}$ Current tail time    |                                                                                                                              |     |     | 150 | ns            |
| $t_{xo}$ Cross over time      |                                                                                                                              |     |     | 400 | ns            |
| $t_{sv}$ Voltage storage time | $I_C = 4 \text{ A}$ $V_{BE(off)} = -5 \text{ V}$ $I_{B(on)} = 0.8 \text{ A}$ $T_C = 100^\circ\text{C}$ (see Figures 1 and 2) |     |     | 3   | $\mu\text{s}$ |
| $t_{rv}$ Voltage rise time    |                                                                                                                              |     |     | 500 | ns            |
| $t_{fi}$ Current fall time    |                                                                                                                              |     |     | 250 | ns            |
| $t_{ti}$ Current tail time    |                                                                                                                              |     |     | 150 | ns            |
| $t_{xo}$ Cross over time      |                                                                                                                              |     |     | 750 | ns            |

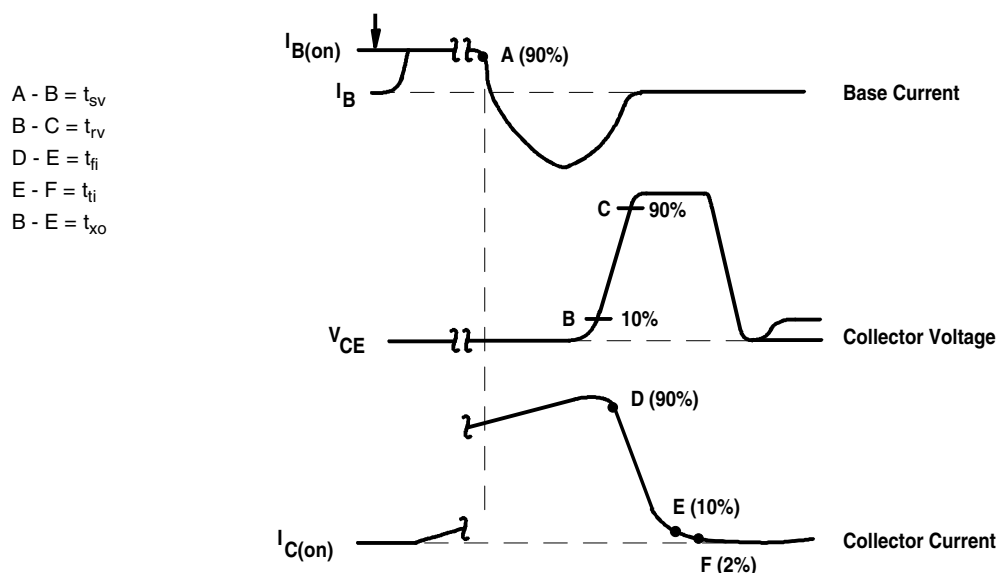
† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

**PRODUCT INFORMATION**

**PARAMETER MEASUREMENT INFORMATION**



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



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

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

**PRODUCT INFORMATION**

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TYPICAL CHARACTERISTICS

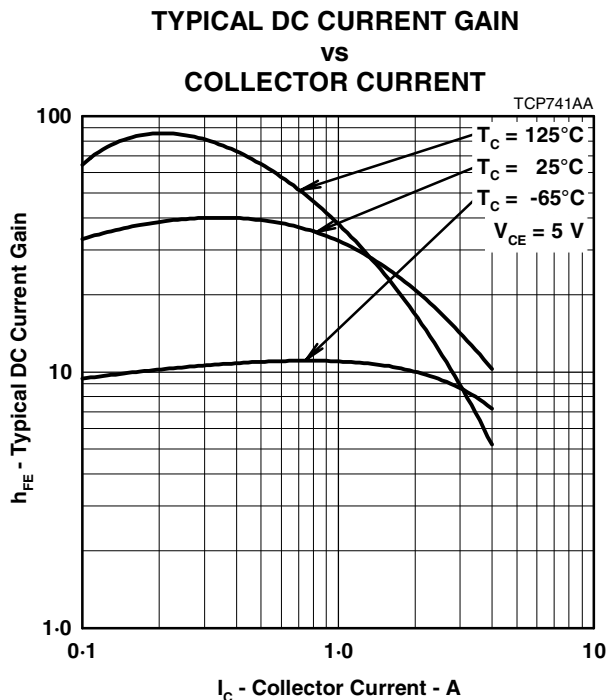


Figure 3.

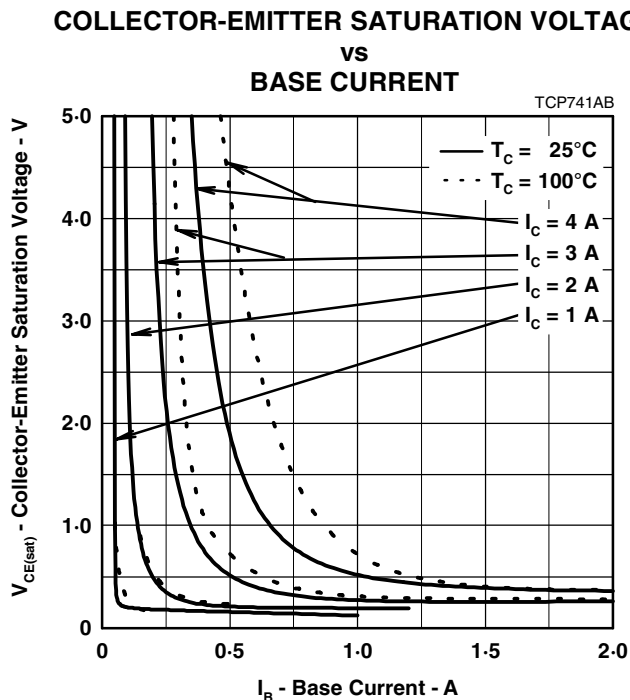


Figure 4.

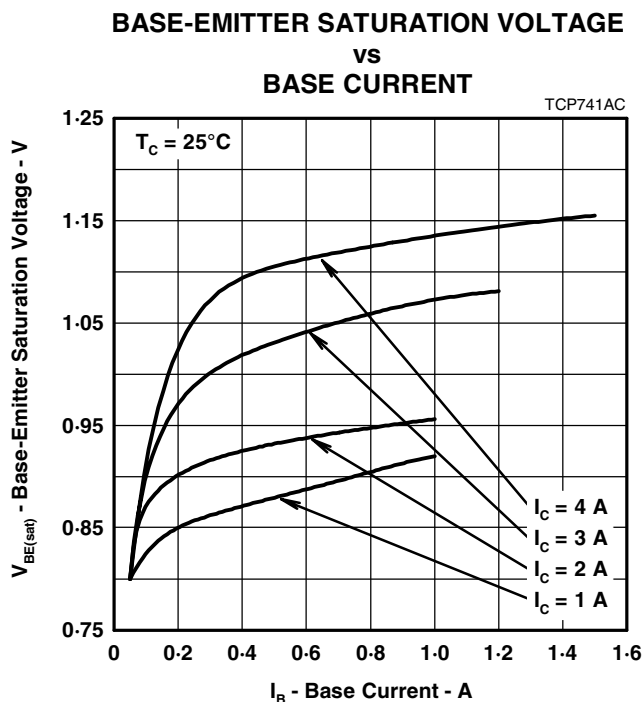


Figure 5.

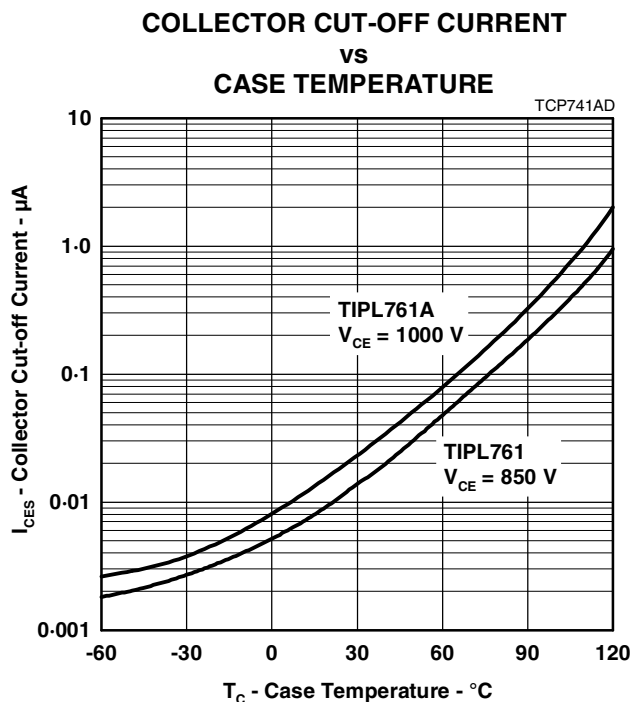


Figure 6.

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**MAXIMUM SAFE OPERATING REGIONS**

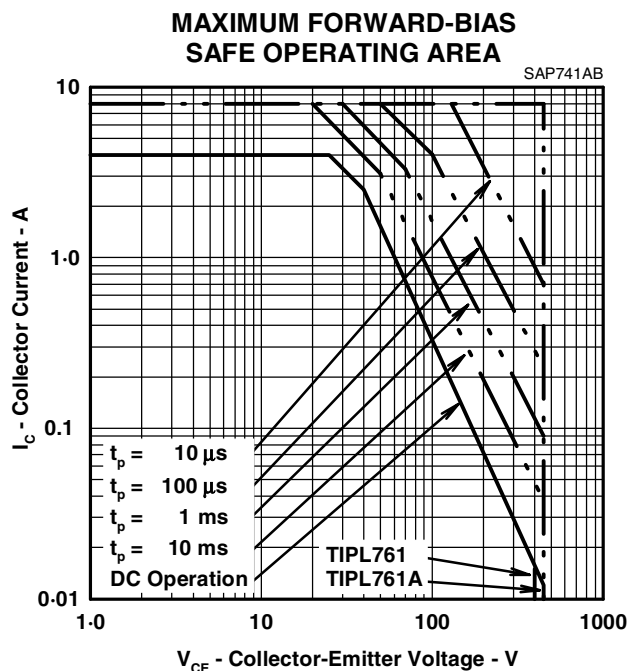


Figure 7.

**THERMAL INFORMATION**

**THERMAL RESPONSE JUNCTION TO CASE  
vs  
POWER PULSE DURATION**

TCP741AE

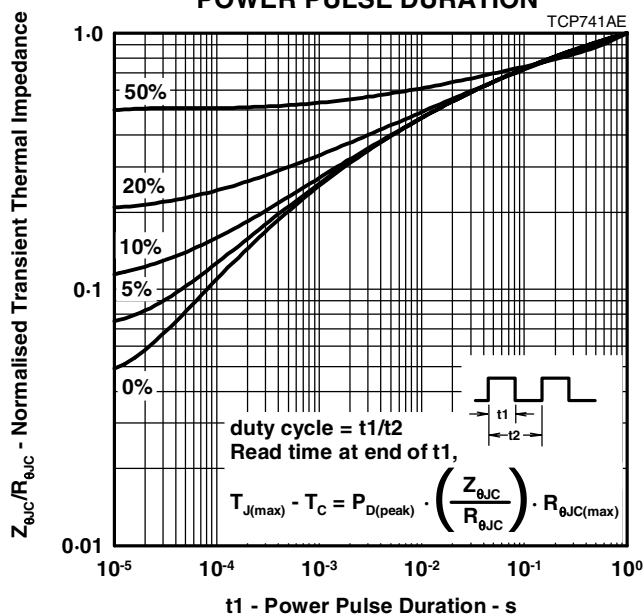


Figure 8.

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