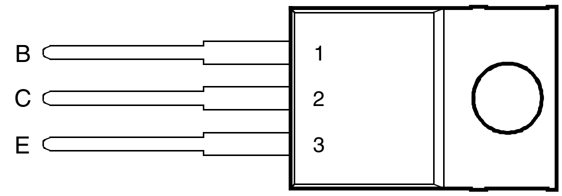
BOURNS®

- **Rugged Triple-Diffused Planar Construction**
- **4 A Continuous Collector Current**
- **Operating Characteristics Fully Guaranteed at 100°C**
- **1200 Volt Blocking Capability**
- **75 W at 25°C Case Temperature**

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



Pin 2 is in electrical contact with the mounting base.
MDTRACA

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage (I_E = 0)	TIPL760B TIPL760C	V_{CBO}	1100 1200	V
Collector-emitter voltage (V_{BE} = 0)	TIPL760B TIPL760C	V_{CES}	1100 1200	V
Collector-emitter voltage (I_B = 0)	TIPL760B TIPL760C	V_{CEO}	500 550	V
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}	75	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%.

MAY 1989 - REVISED SEPTEMBER 2002

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 = 10 mA	L = 25 mH	(see Note 2)	TIPL760B TIPL760C	500 550			V
I_{CES}	Collector-emitter cut-off current	V_{CE} = 1100 V V_{CE} = 1200 V V_{CE} = 1100 V V_{CE} = 1200 V	V_{BE} = 0 V_{BE} = 0 V_{BE} = 0 V_{BE} = 0	 T_C = 100°C T_C = 100°C	TIPL760B TIPL760C TIPL760B TIPL760C			50 50 200 200	µA
I_{CEO}	Collector cut-off current	V_{CE} = 500 V V_{CE} = 550 V	I_B = 0 I_B = 0		TIPL760B TIPL760C			50 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 I_B = 0.6 A I_B = 0.6 A	I_C = 2 A I_C = 3 A I_C = 3 A	 (see Notes 3 and 4) T_C = 100°C				1.0 2.5 5.0	V
$V_{BE(sat)}$	Base-emitter saturation voltage	I_B = 0.4 A I_B = 0.6 A I_B = 0.6 A	I_C = 2 A I_C = 3 A I_C = 3 A	 (see Notes 3 and 4) T_C = 100°C				1.2 1.4 1.3	V
f_t	Current gain bandwidth product	V_{CE} = 10 V	I_C = 0.5 A	f = 1 MHz			12		MHz
C_{ob}	Output capacitance	V_{CB} = 20 V	I_E = 0	f = 0.1 MHz			110		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			1.56	°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 = 3 A $V_{BE(off)}$ = -5 V	$I_{B(on)}$ = 0.6 A	(see Figures 1 and 2)			2.5	µs
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 = 3 A $V_{BE(off)}$ = -5 V	$I_{B(on)}$ = 0.6 A T_C = 100°C	(see Figures 1 and 2)			3	µs
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.

PARAMETER MEASUREMENT INFORMATION

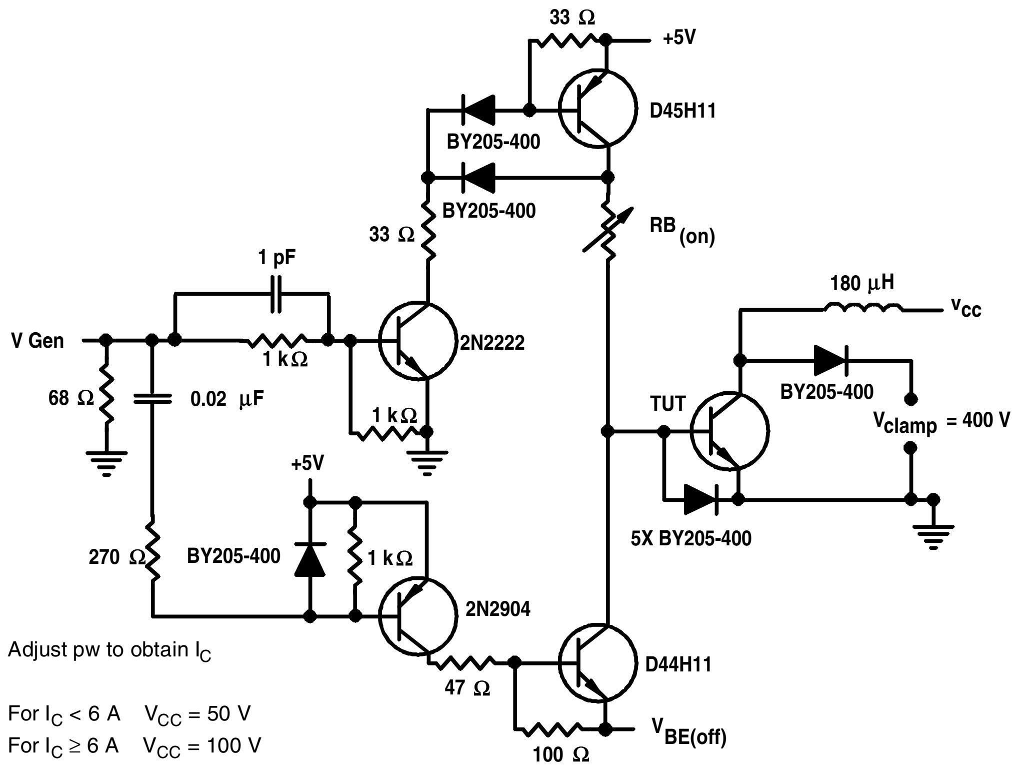
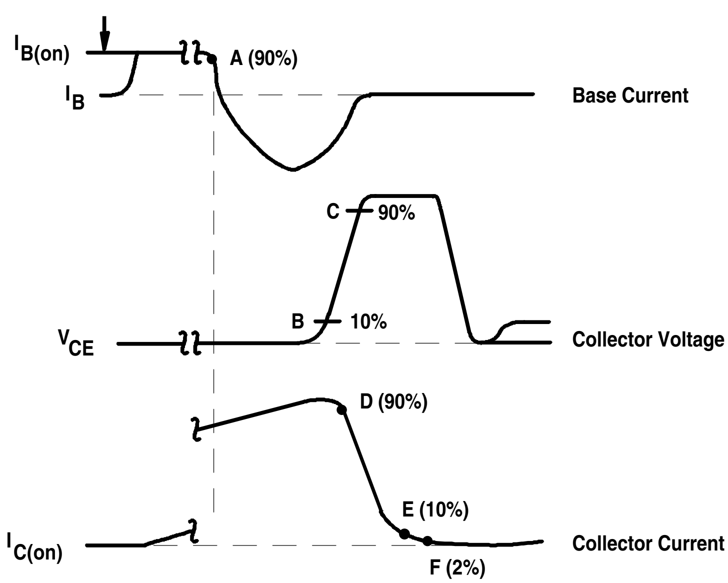


Figure 1. Inductive-Load Switching Test Circuit

A - B = t_{sv}
B - C = t_{rv}
D - E = t_{fi}
E - F = t_{ti}
B - E = t_{xo}



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

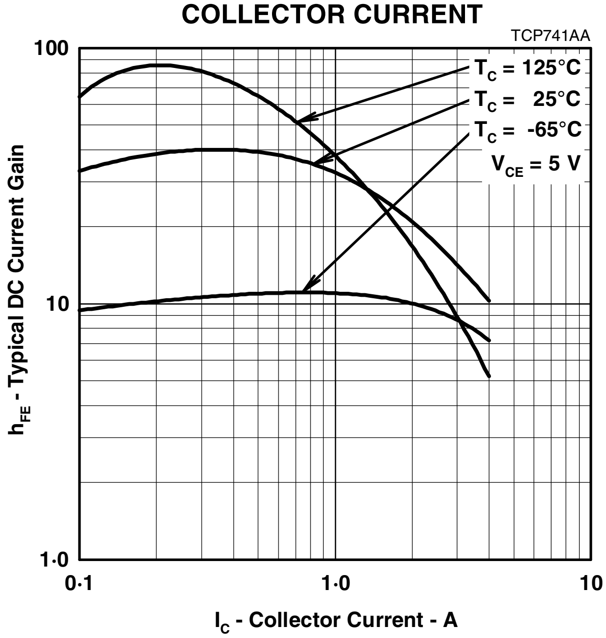


Figure 3.

COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

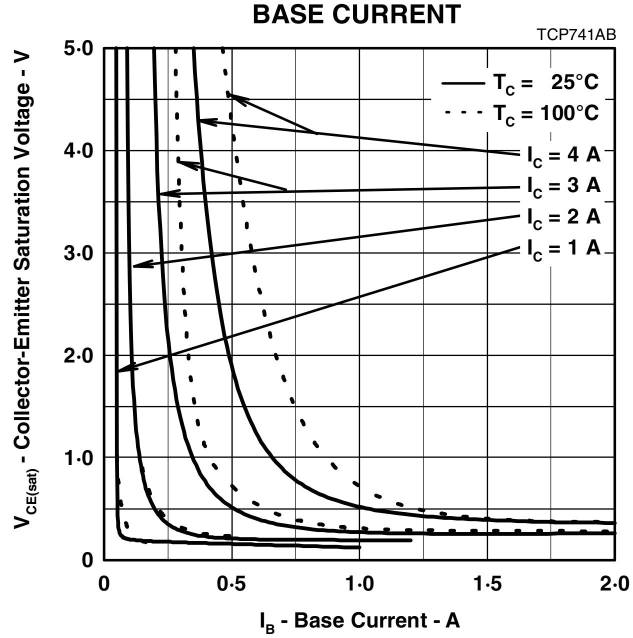


Figure 4.

BASE-EMITTER SATURATION VOLTAGE vs BASE CURRENT

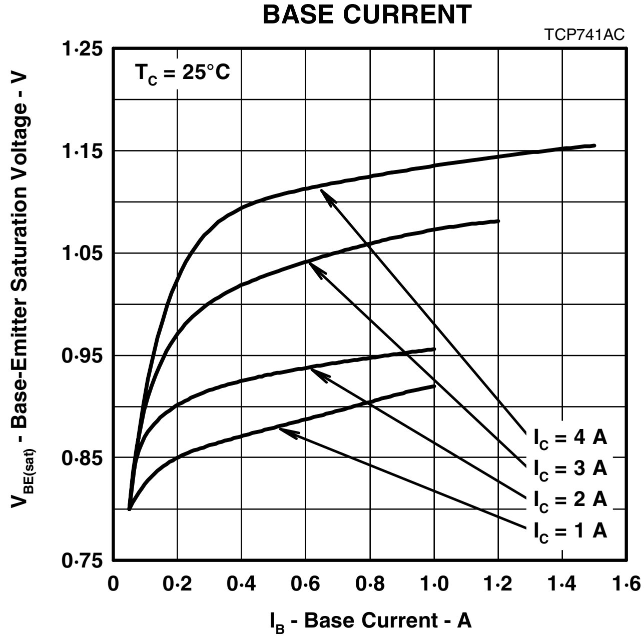


Figure 5.

COLLECTOR CUT-OFF CURRENT vs CASE TEMPERATURE

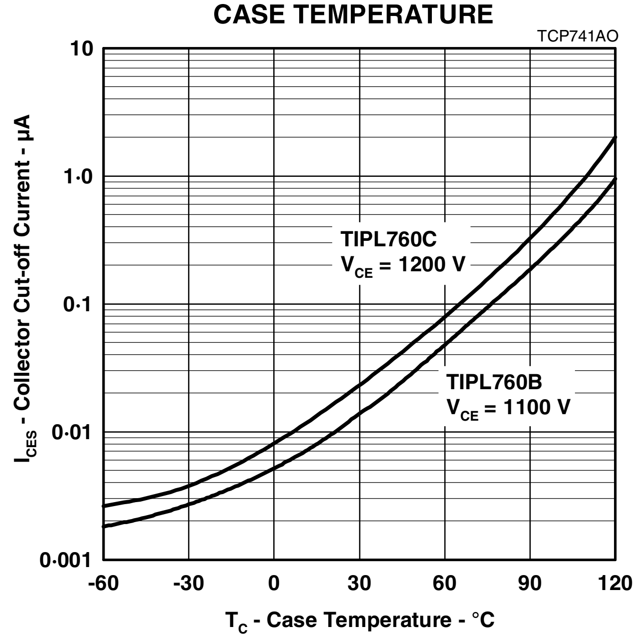


Figure 6.

MAXIMUM SAFE OPERATING REGIONS

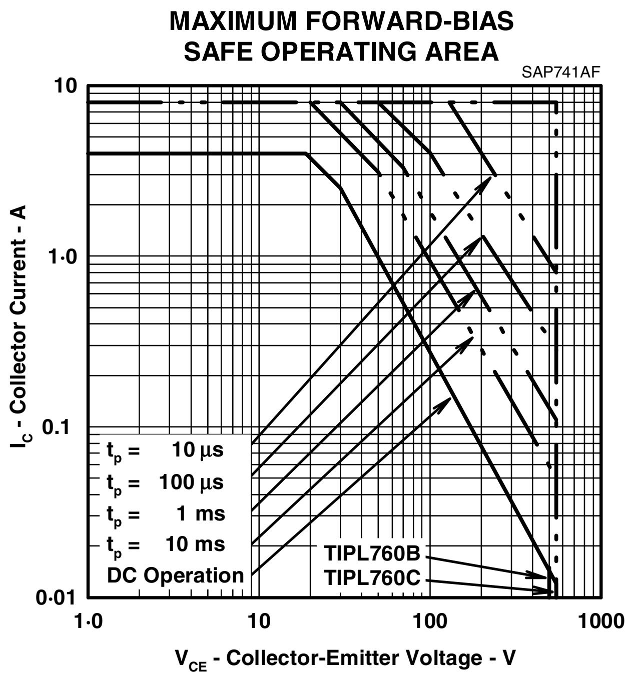


Figure 7.

THERMAL INFORMATION

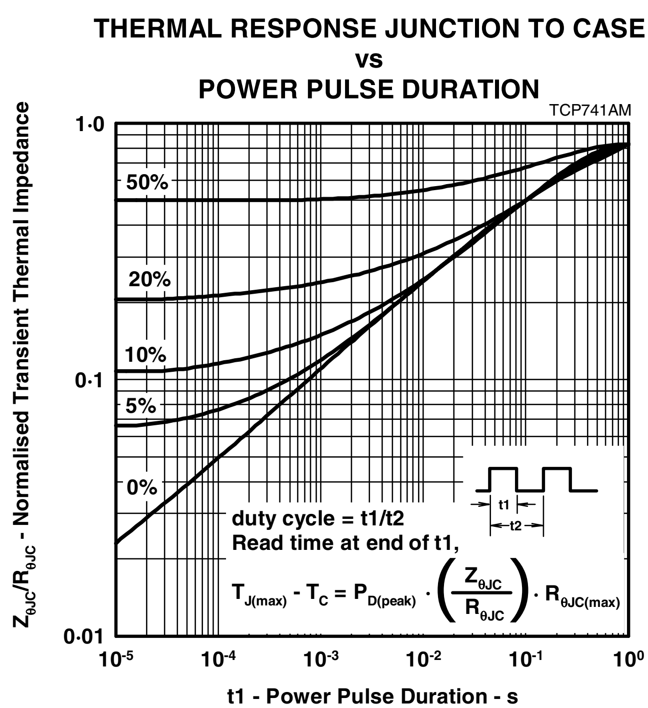


Figure 8.