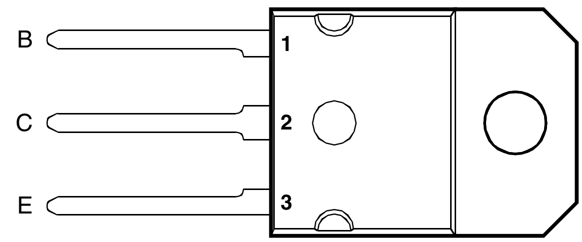
BOURNS®

- **Rugged Triple-Diffused Planar Construction**
- **9 A Continuous Collector Current**
- **1000 Volt Blocking Capability**

**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-emitter voltage (V_{BE} = -2.5 V)	BUV47 BUV47A	V_{CEX}	850 1000	V
Collector-emitter voltage (R_{BE} = 10 Ω)	BUV47 BUV47A	V_{CER}	850 1000	V
Collector-emitter voltage (I_B = 0)	BUV47 BUV47A	V_{CEO}	400 450	V
Continuous collector current		I_C	9	A
Peak collector current (see Note 1)		I_{CM}	15	A
Continuous base current		I_B	3	A
Peak base current		I_{BM}	6	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 $t_p \leq 5$ 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 = 200 mA	L = 25 mH	(see Note 2)	BUV47 BUV47A	400 450			V
$V_{(BR)EBO}$	Base-emitter breakdown voltage	I_E = 50 mA	I_C = 0	(see Note 3)		7		30	V
I_{CES}	Collector-emitter cut-off current	V_{CE} = 850 V V_{CE} = 1000 V V_{CE} = 850 V V_{CE} = 1000 V	V_{BE} = 0 V_{BE} = 0 V_{BE} = 0 V_{BE} = 0	 T_C = 125°C T_C = 125°C	BUV47 BUV47A BUV47 BUV47A			0.15 0.15 1.5 1.5	mA
I_{CER}	Collector-emitter cut-off current	V_{CE} = 850 V V_{CE} = 1000 V V_{CE} = 850 V V_{CE} = 1000 V	R_{BE} = 10 Ω R_{BE} = 10 Ω R_{BE} = 10 Ω R_{BE} = 10 Ω	 T_C = 125°C T_C = 125°C	BUV47 BUV47A BUV47 BUV47A			0.4 0.4 3.0 3.0	mA
I_{EBO}	Emitter cut-off current	V_{EB} = 5 V	I_C = 0					1	mA
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = 1 A I_B = 2.5 A	I_C = 5A I_C = 8A	(see Notes 3 and 4)				1.5 3.0	V
$V_{BE(sat)}$	Base-emitter saturation voltage	I_B = 1 A	I_C = 5A	(see Notes 3 and 4)				1.6	V
f_t	Current gain bandwidth product	V_{CE} = 10 V	I_C = 0.5 A	f = 1 MHz			8		MHz
C_{ob}	Output capacitance	V_{CB} = 20 V	I_C = 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	°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 = 5 A, $I_{B(on)}$ = 1 A, $I_{B(off)}$ = -1 A, V_{CC} = 150 V (see Figures 1 and 2)			1.0	µs
t_s	Storage time				3.0	µs
t_f	Fall time				0.8	µs

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

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 = 5 A, $I_{B(on)}$ = 1 A, $V_{BE(off)}$ = -5 V, T_C = 100°C (see Figures 3 and 4)			4.0	µs
t_{fi}	Current fall time				0.4	µs

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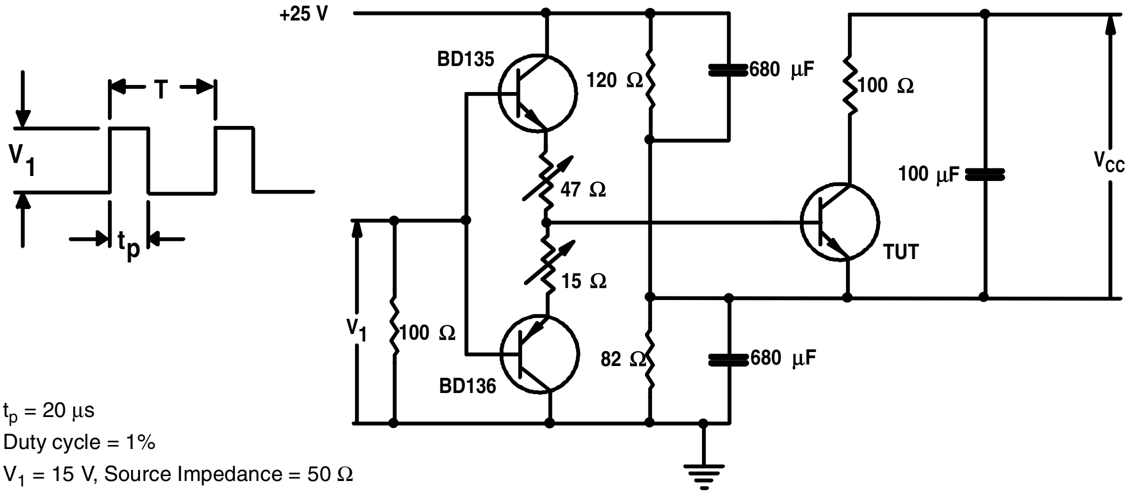
PARAMETER MEASUREMENT INFORMATION



t_p = 20 µs
Duty cycle = 1%
V_1 = 15 V, Source Impedance = 50 Ω

Figure 1. Resistive-Load Switching Test Circuit

A - B = t_d
B - C = t_r
E - F = t_f
D - E = t_s
A - C = t_{on}
D - F = t_{off}

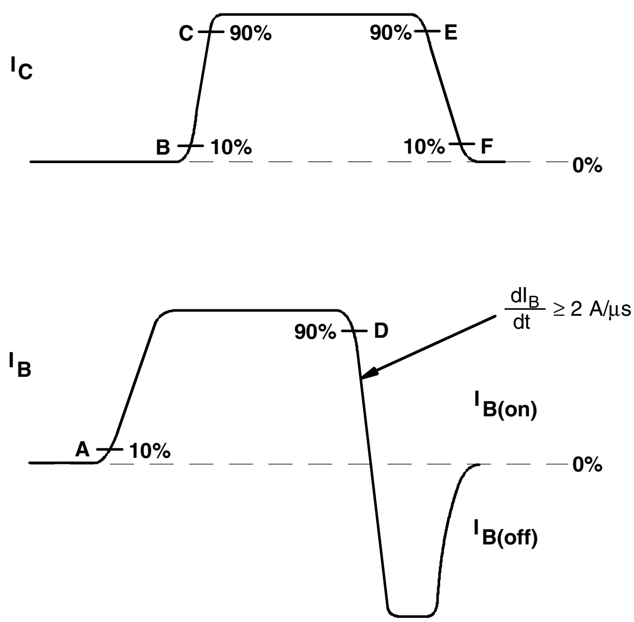


Figure 2. Resistive-Load Switching Waveforms

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PARAMETER MEASUREMENT INFORMATION

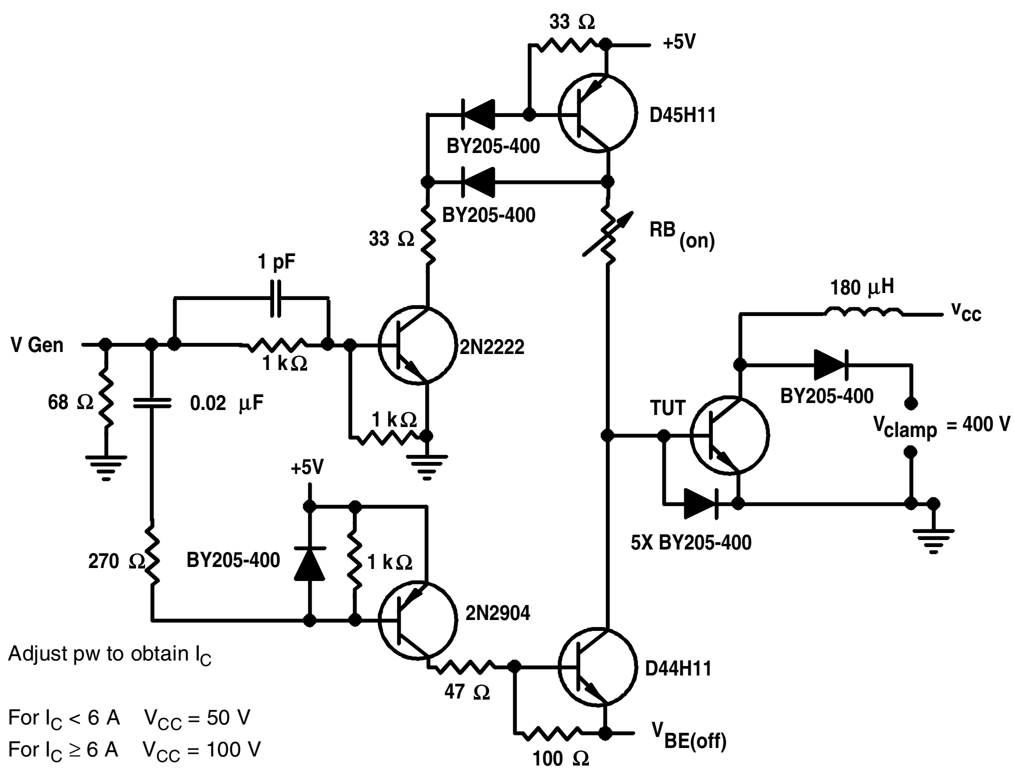
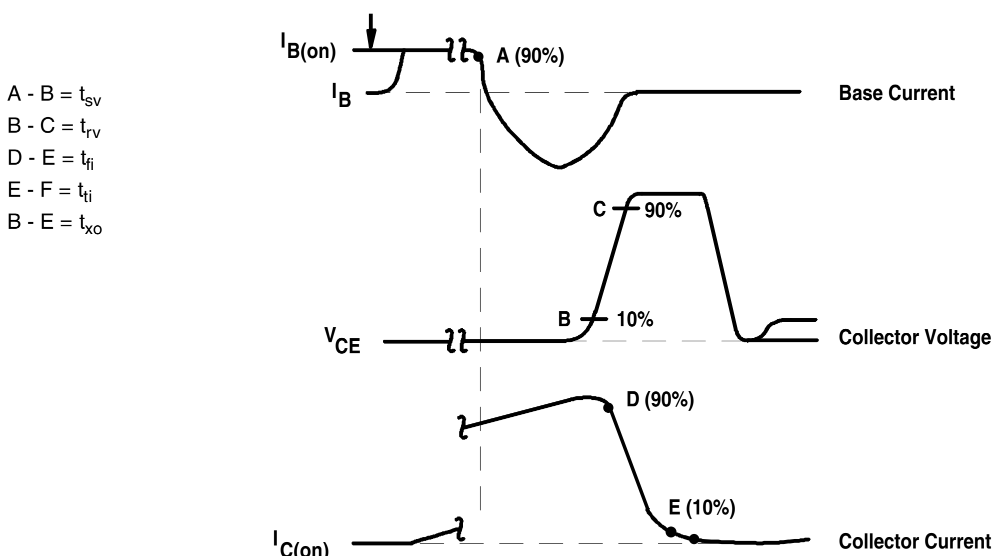


Figure 3. Inductive-Load Switching Test Circuit



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 4. Inductive-Load Switching Waveforms

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN vs COLLECTOR CURRENT

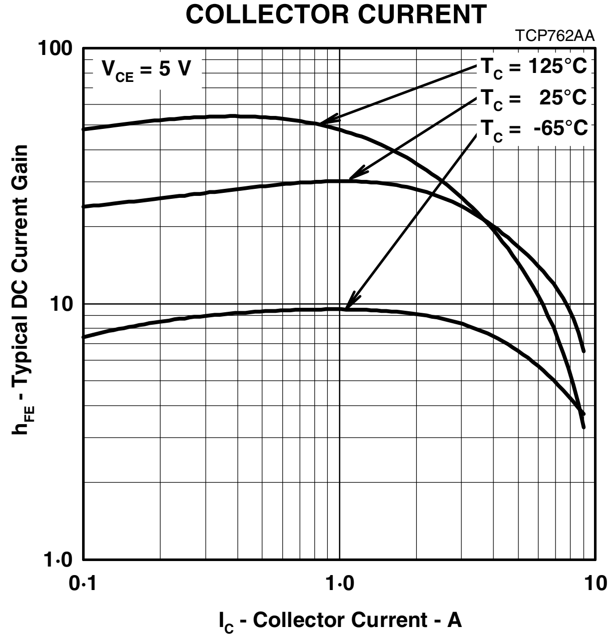


Figure 5.

COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

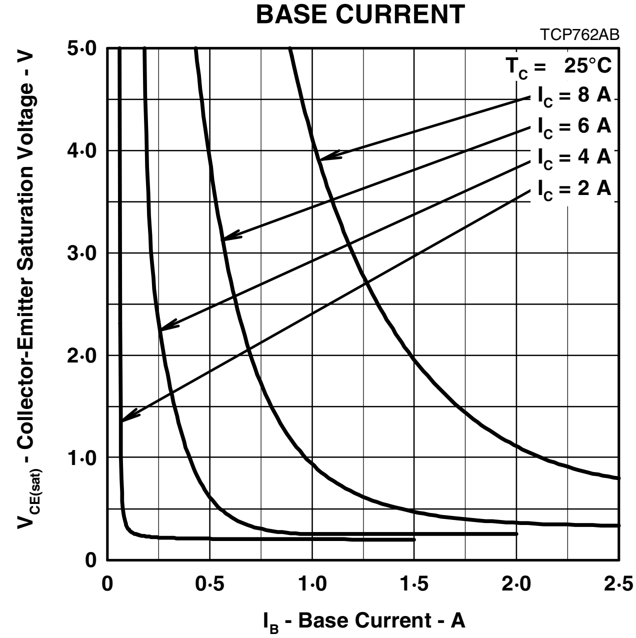


Figure 6.

COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

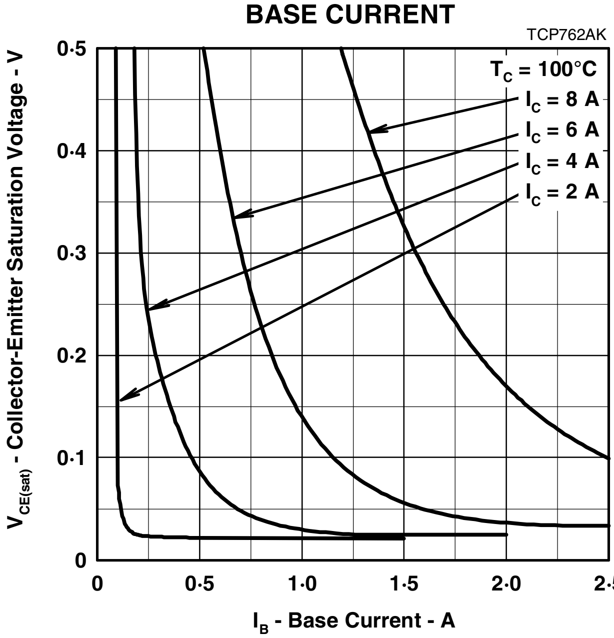


Figure 7.

COLLECTOR CUT-OFF CURRENT vs CASE TEMPERATURE

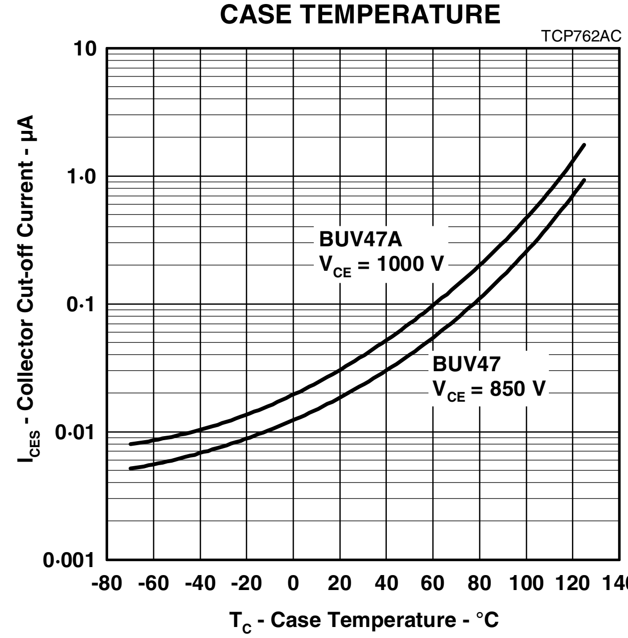


Figure 8.

MAXIMUM SAFE OPERATING REGIONS

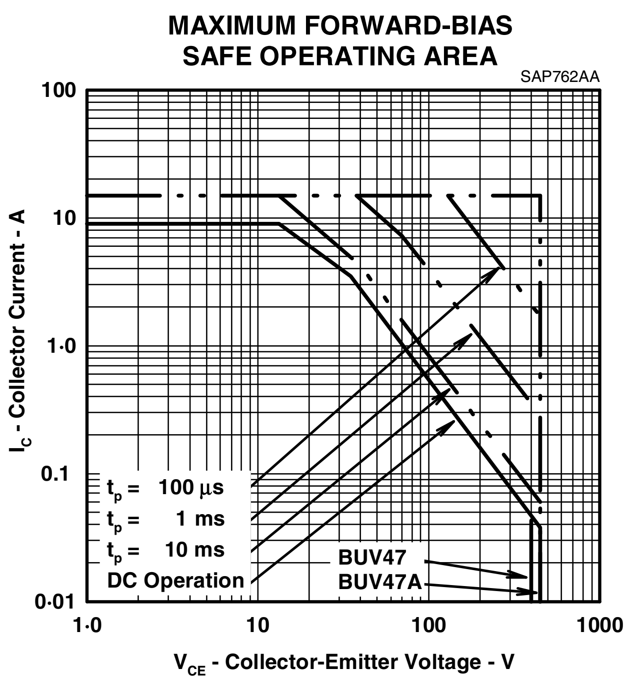


Figure 9.

THERMAL INFORMATION

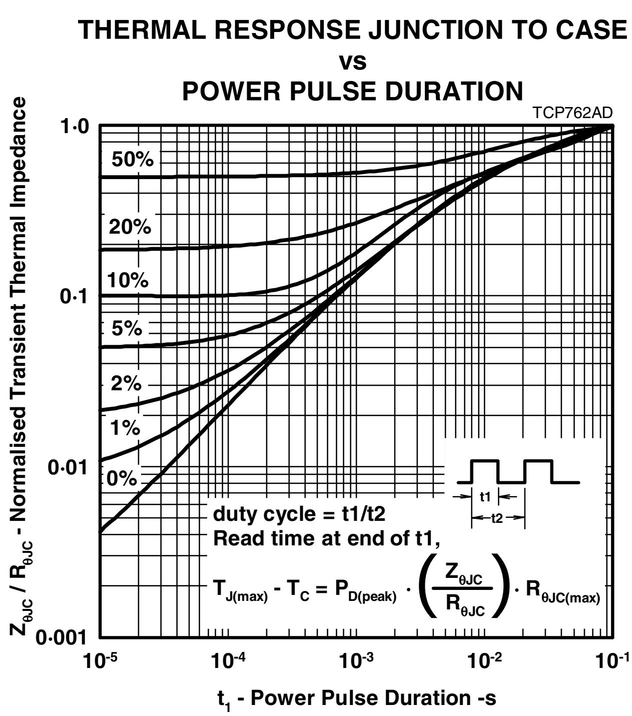


Figure 10.