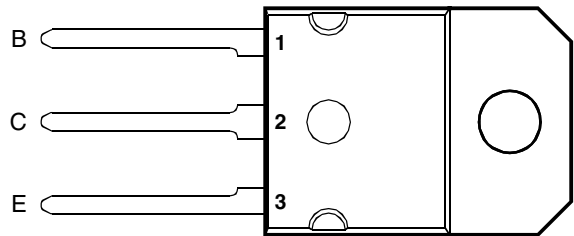


- Rugged Triple-Diffused Planar Construction
- 9 A Continuous Collector Current
- 1000 Volt Blocking Capability

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	V_{CEX}	850	V
	BUV47A		1000	
Collector-emitter voltage ($R_{BE} = 10 \Omega$)	BUV47	V_{CER}	850	V
	BUV47A		1000	
Collector-emitter voltage ($I_B = 0$)	BUV47	V_{CEO}	400	V
	BUV47A		450	
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 $\leq 2\%$.

PRODUCT INFORMATION

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

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
$V_{CE(sus)}$ Collector-emitter sustaining voltage	$I_C = 200\text{ mA}$	$L = 25\text{ mH}$	(see Note 2)	BUV47 400 BUV47A 450			V
$V_{(BR)EBO}$ Base-emitter breakdown voltage	$I_E = 50\text{ mA}$	$I_C = 0$	(see Note 3)			30	V
I_{CES} Collector-emitter cut-off current	$V_{CE} = 850\text{ V}$	$V_{BE} = 0$		BUV47		0.15	mA
	$V_{CE} = 1000\text{ V}$	$V_{BE} = 0$		BUV47A		0.15	
	$V_{CE} = 850\text{ V}$	$V_{BE} = 0$	$T_C = 125^\circ\text{C}$	BUV47		1.5	
	$V_{CE} = 1000\text{ V}$	$V_{BE} = 0$	$T_C = 125^\circ\text{C}$	BUV47A		1.5	
I_{CER} Collector-emitter cut-off current	$V_{CE} = 850\text{ V}$	$R_{BE} = 10\ \Omega$		BUV47		0.4	mA
	$V_{CE} = 1000\text{ V}$	$R_{BE} = 10\ \Omega$		BUV47A		0.4	
	$V_{CE} = 850\text{ V}$	$R_{BE} = 10\ \Omega$	$T_C = 125^\circ\text{C}$	BUV47		3.0	
	$V_{CE} = 1000\text{ V}$	$R_{BE} = 10\ \Omega$	$T_C = 125^\circ\text{C}$	BUV47A		3.0	
I_{EBO} Emitter cut-off current	$V_{EB} = 5\text{ V}$	$I_C = 0$				1	mA
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 1\text{ A}$	$I_C = 5\text{ A}$	(see Notes 3 and 4)			1.5	V
	$I_B = 2.5\text{ A}$	$I_C = 8\text{ A}$				3.0	
$V_{BE(sat)}$ Base-emitter saturation voltage	$I_B = 1\text{ A}$	$I_C = 5\text{ A}$	(see Notes 3 and 4)			1.6	V
f_t Current gain bandwidth product	$V_{CE} = 10\text{ V}$	$I_C = 0.5\text{ A}$	$f = 1\text{ MHz}$		8		MHz
C_{ob} Output capacitance	$V_{CB} = 20\text{ V}$	$I_C = 0$	$f = 0.1\text{ MHz}$		105		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	$^\circ\text{C/W}$

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

PARAMETER	TEST CONDITIONS †			MIN	TYP	MAX	UNIT
t_{on} Turn on time	$I_C = 5\text{ A}$	$I_{B(on)} = 1\text{ A}$	$I_{B(off)} = -1\text{ A}$			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	$I_C = 5\text{ A}$	$I_{B(on)} = 1\text{ A}$	$V_{BE(off)} = -5\text{ V}$			4.0	μs
t_{fi} Current fall time	$T_C = 100^\circ\text{C}$	(see Figures 3 and 4)				0.4	μs

PRODUCT INFORMATION

PARAMETER MEASUREMENT INFORMATION

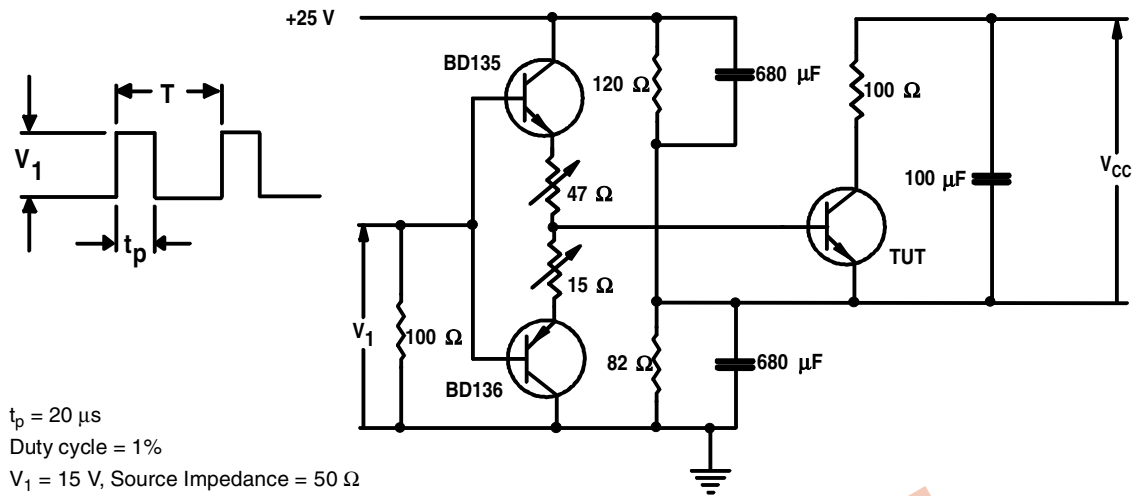


Figure 1. Resistive-Load Switching Test Circuit

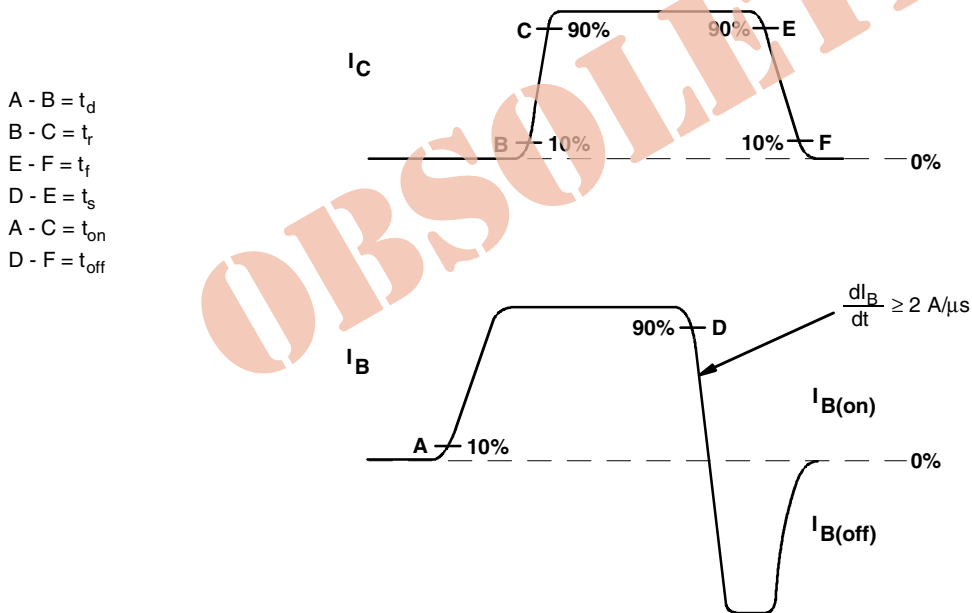


Figure 2. Resistive-Load Switching Waveforms

PRODUCT INFORMATION

PARAMETER MEASUREMENT INFORMATION

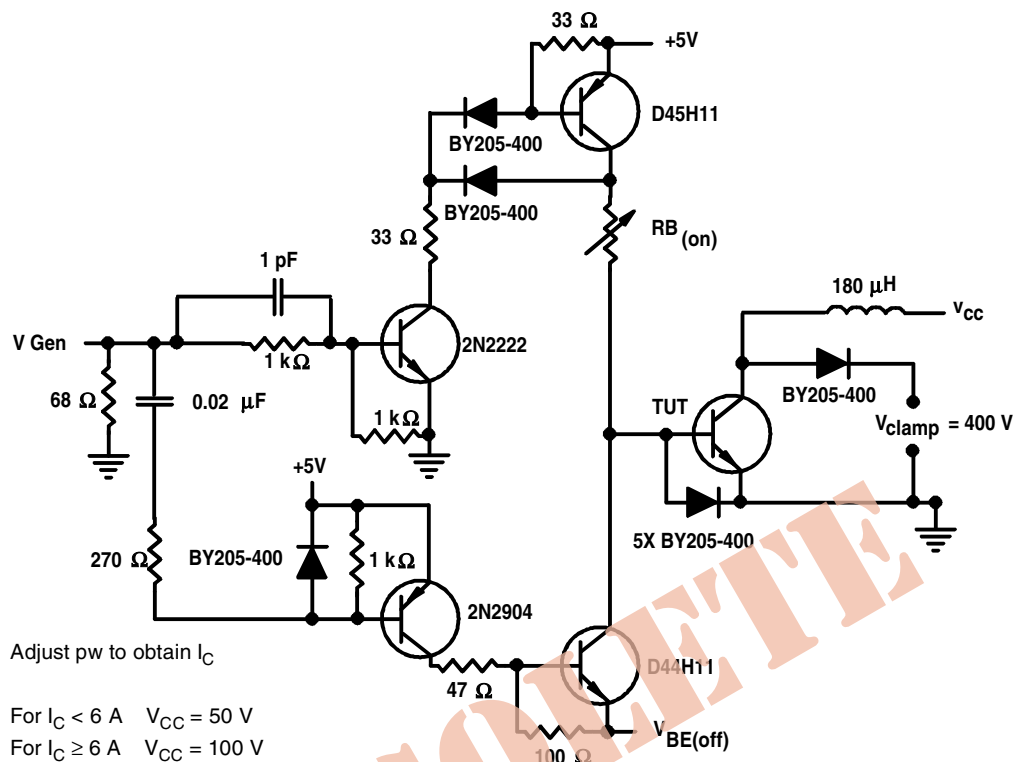
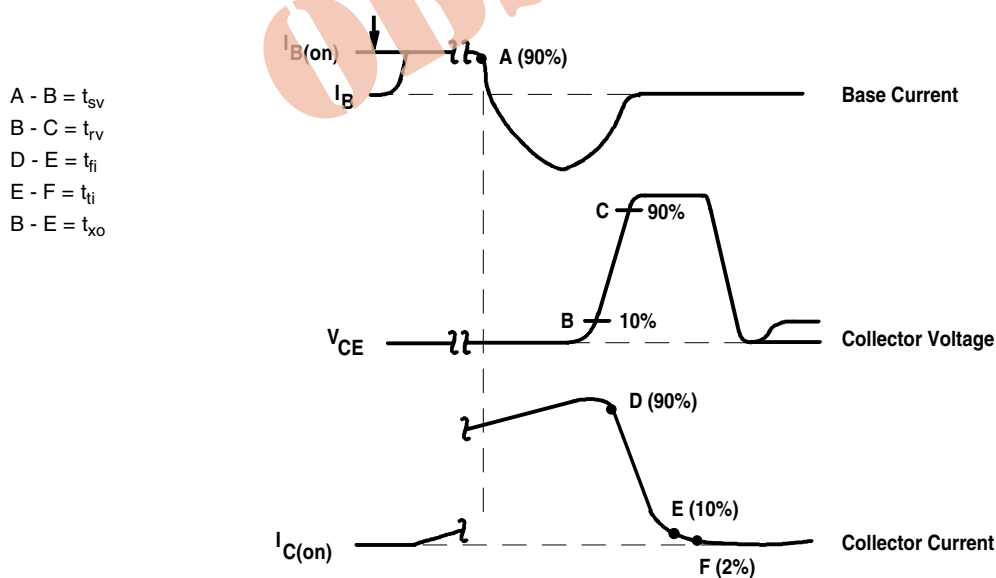


Figure 3. Inductive-Load Switching Test Circuit



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

Figure 4. Inductive-Load Switching Waveforms

PRODUCT INFORMATION

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Specifications are subject to change without notice.

TYPICAL CHARACTERISTICS

**TYPICAL DC CURRENT GAIN
VS
COLLECTOR CURRENT**

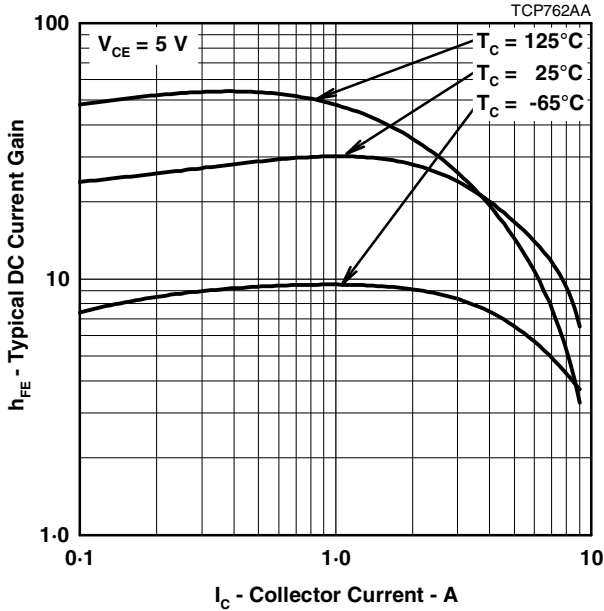


Figure 5.

**COLLECTOR-EMITTER SATURATION VOLTAGE
VS
BASE CURRENT**

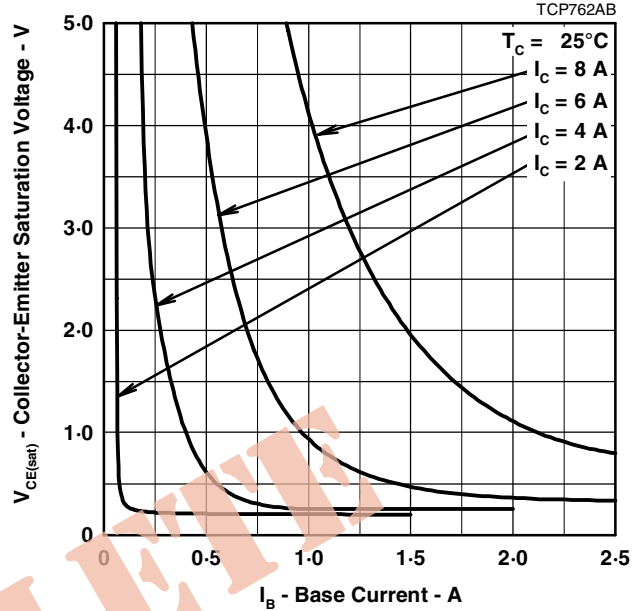


Figure 6.

**COLLECTOR-EMITTER SATURATION VOLTAGE
VS
BASE CURRENT**

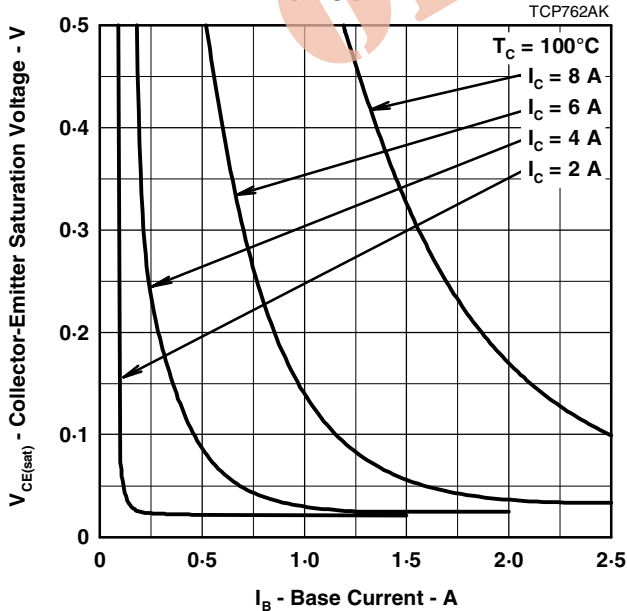


Figure 7.

**COLLECTOR CUT-OFF CURRENT
VS
CASE TEMPERATURE**

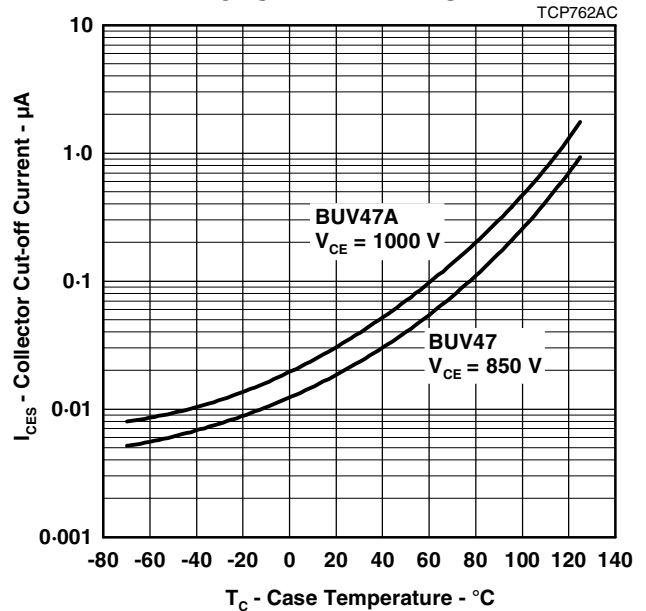


Figure 8.

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MAXIMUM SAFE OPERATING REGIONS

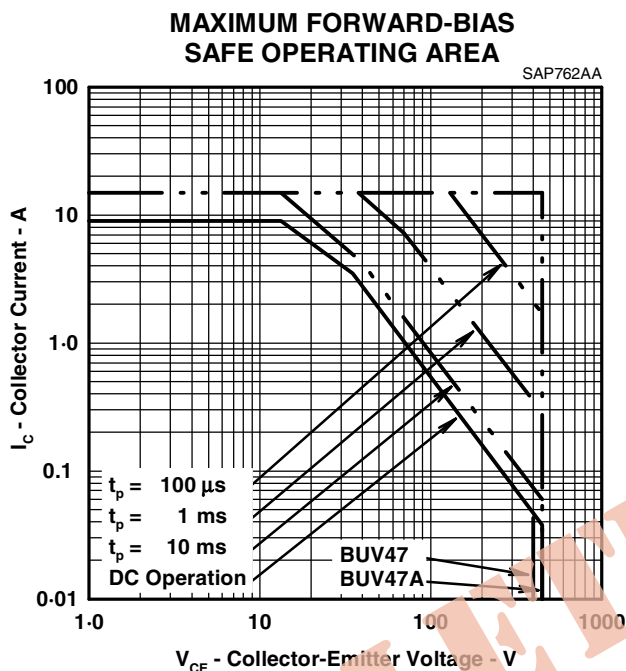


Figure 9.

THERMAL INFORMATION

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

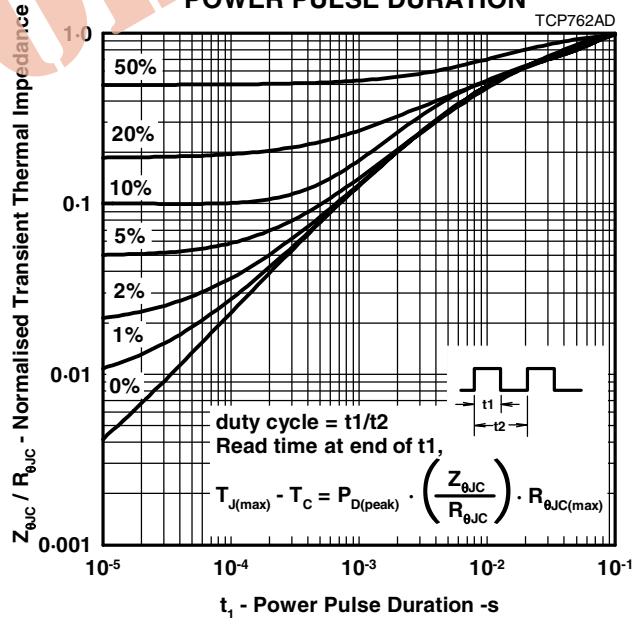


Figure 10.

PRODUCT INFORMATION