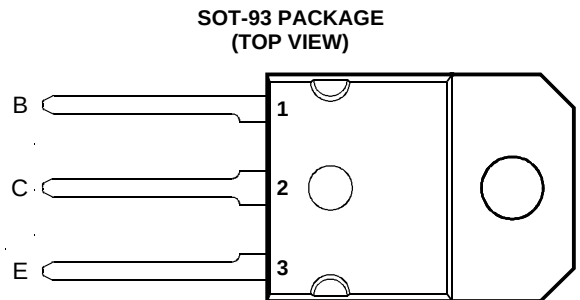


BUV47, BUV47A NPN SILICON POWER TRANSISTORS

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



Pin 2 is in electrical contact with the mounting base.

MDTRAA

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

RATING		SYMBOL	VALUE	UNIT
Collector-emitter voltage ($V_{BE} = -2.5 \text{ V}$)	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 $t_p \leq 5 \text{ ms}$, duty cycle $\leq 2\%$.

PRODUCT INFORMATION

Information is current as of publication date. Products conform to specifications in accordance with the terms of Power Innovations standard warranty. Production processing does not necessarily include testing of all parameters.



BUV47, BUV47A

NPN SILICON POWER TRANSISTORS

AUGUST 1978 - REVISED MARCH 1997

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 BUV47A	400 450			V
$V_{(BR)EBO}$ Base-emitter breakdown voltage	$I_E = 50 \text{ mA}$ $I_C = 0$ (see Note 3)	7		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	$I_C = 5 \text{ A}$ $I_{B(on)} = 1 \text{ A}$ $I_{B(off)} = -1 \text{ A}$ $V_{CC} = 150 \text{ V}$ (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	$I_C = 5 \text{ A}$ $I_{B(on)} = 1 \text{ A}$ $V_{BE(off)} = -5 \text{ V}$ $T_C = 100^\circ\text{C}$ (see Figures 3 and 4)			4.0	μs
t_{fi} Current fall time				0.4	μs

PRODUCT INFORMATION

$t_p = 20 \mu s$
 Duty cycle = 1%
 $V_1 = 15 V$, Source Impedance = 50Ω

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

I_C

I_B

$\frac{dI_B}{dt} \geq 2 \text{ A}/\mu\text{s}$

$I_{B(on)}$

$I_{B(off)}$

PRODUCT INFORMATION

BUV47, BUV47A

NPN SILICON POWER TRANSISTORS

AUGUST 1978 - REVISED MARCH 1997

PARAMETER MEASUREMENT INFORMATION

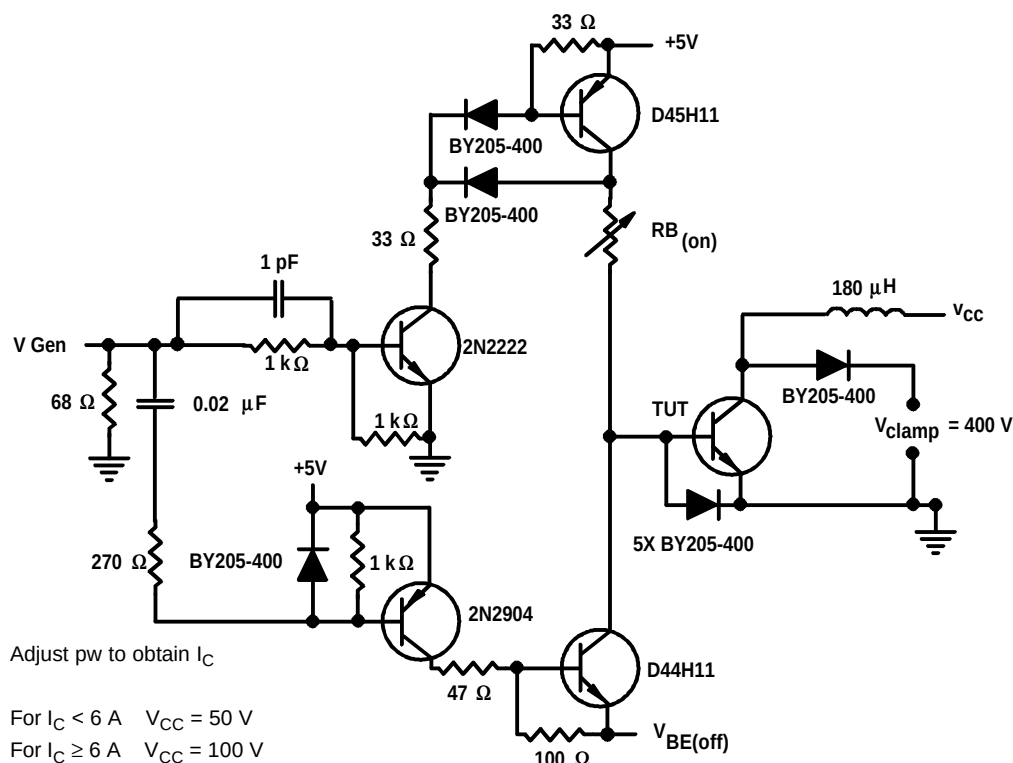
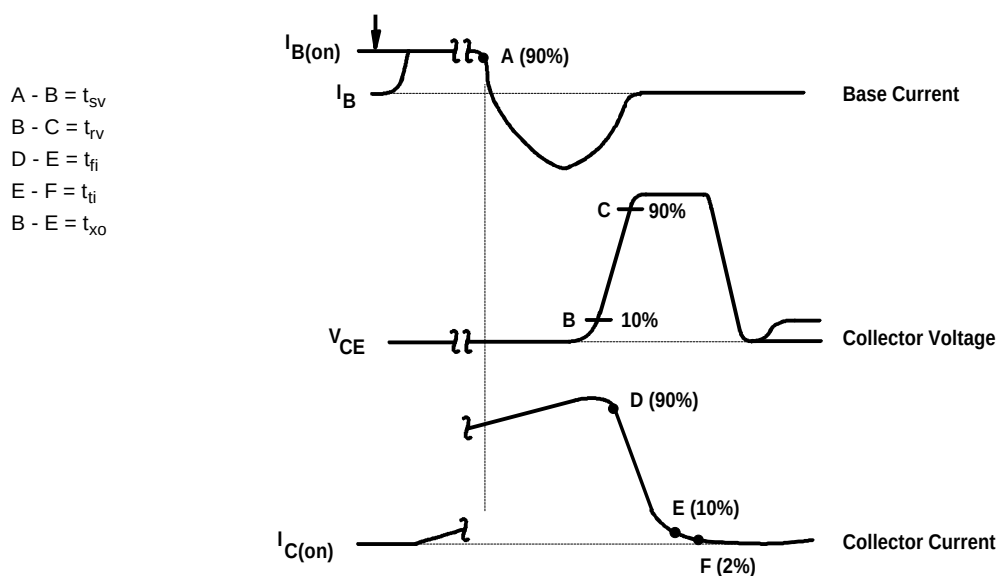


Figure 3. Inductive-Load Switching Test Circuit



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

TYPICAL CHARACTERISTICS

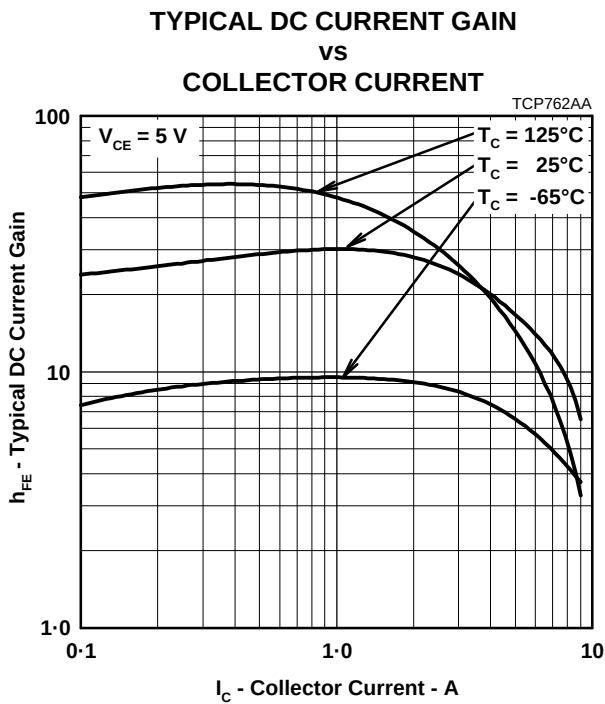


Figure 5.

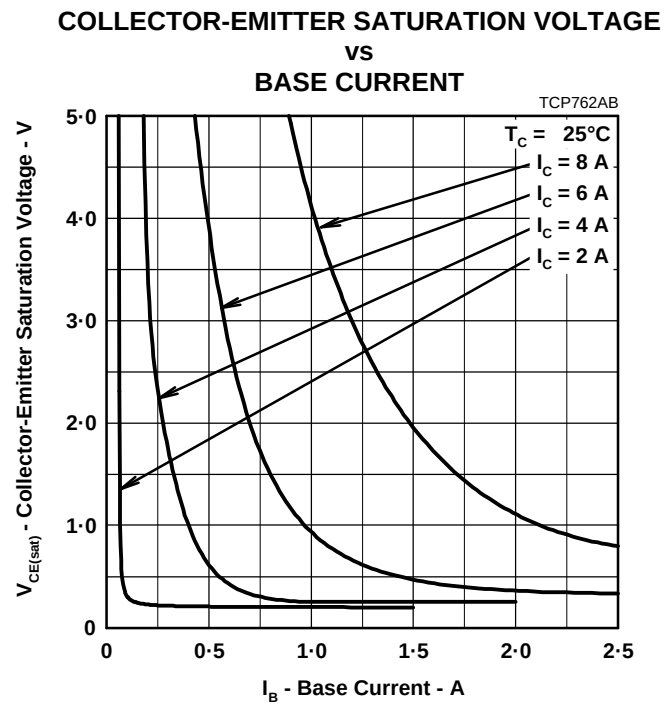


Figure 6.

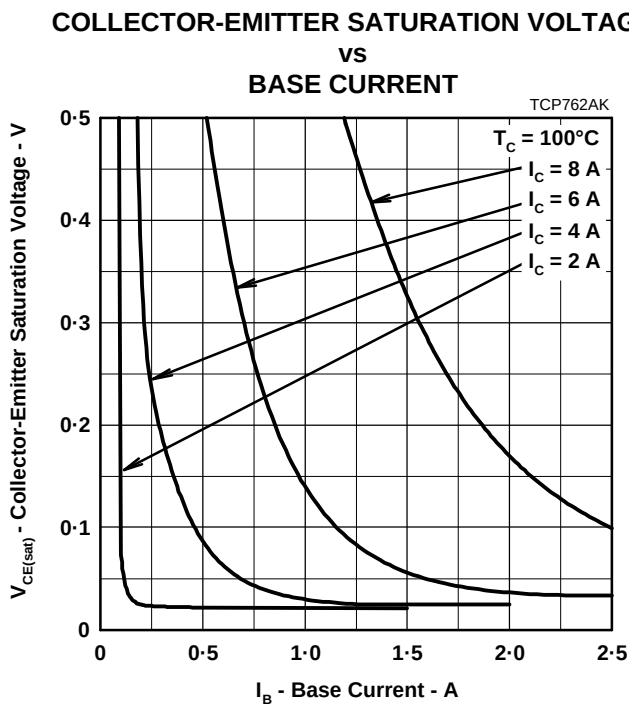


Figure 7.

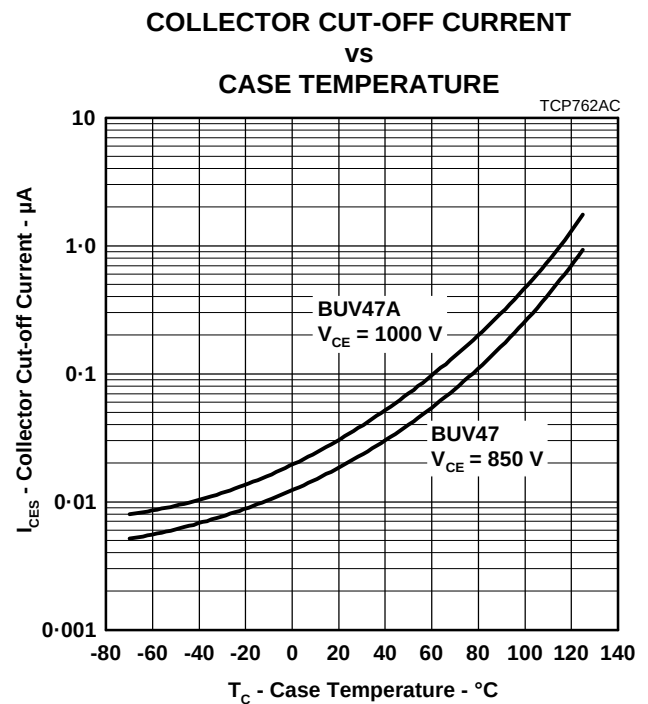


Figure 8.

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MAXIMUM FORWARD-BIAS SAFE OPERATING AREA



THERMAL RESPONSE JUNCTION TO CASE VS POWER PULSE DURATION



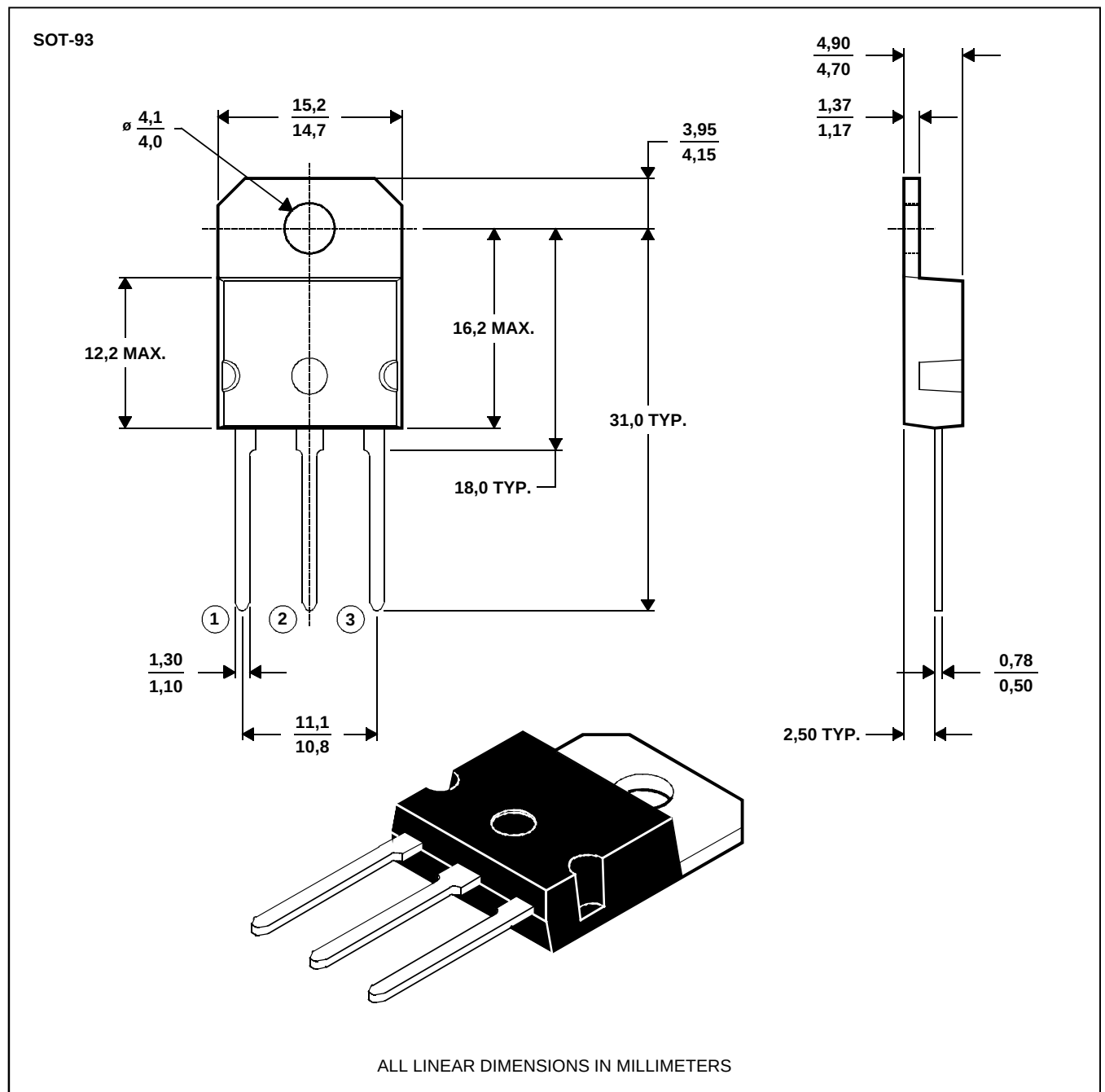
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MECHANICAL DATA

SOT-93

3-pin plastic flange-mount package

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.



NOTE A: The centre pin is in electrical contact with the mounting tab.

MDXXAW

BUV47, BUV47A

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AUGUST 1978 - REVISED MARCH 1997

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