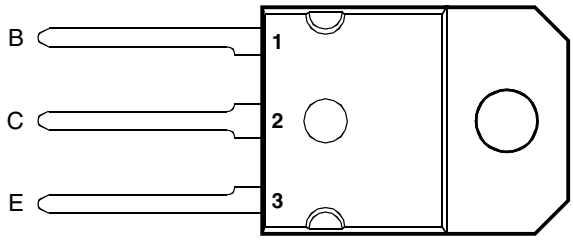
BOURNS®

- **Rugged Triple-Diffused Planar Construction**
- **15 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} = 0 V)	BUV48 BUV48A	V_{CES}	850 1000	V
Collector-emitter voltage (R_{BE} = 10 Ω)	BUV48 BUV48A	V_{CER}	850 1000	V
Collector-emitter voltage (I_B = 0)	BUV48 BUV48A	V_{CEO}	400 450	V
Continuous collector current		I_C	15	A
Peak collector current (see Note 1)		I_{CM}	30	A
Continuous base current		I_B	4	A
Peak base current		I_{BM}	20	A
Non repetitive accidental peak surge current		I_{CSM}	55	A
Continuous device dissipation at (or below) 25°C case temperature		P_{tot}	125	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 $t_p \leq 2$ 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)	BUV48 BUV48A	400 450			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	BUV48 BUV48A BUV48 BUV48A			0.2 0.2 2.0 2.0	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	BUV48 BUV48A BUV48 BUV48A			0.5 0.5 4.0 4.0	mA
I_{EBO}	Emitter cut-off current	V_{EB} = 5 V	I_C = 0					1	mA
V_{EBO}	Emitter-base breakdown voltage	I_E = 50 mA	I_C = 0			7		30	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = 2 A I_B = 3 A I_B = 1.6 A I_B = 2.4 A	I_C = 10 A I_C = 15 A I_C = 8A I_C = 12 A	(see Notes 3 and 4)	BUV48 BUV48 BUV48A BUV48A			1.5 5.0 1.5 5.0	V
$V_{BE(sat)}$	Base-emitter saturation voltage	I_B = 2 A I_B = 1.6 A	I_C = 10 A I_C = 8A	(see Notes 3 and 4)	BUV48 BUV48A			1.6 1.6	V
f_t	Current gain bandwidth product	V_{CE} = 10 V	I_C = 0.5 A	f = 1 MHz			10		MHz
C_{ob}	Output capacitance	V_{CB} = 20 V	I_C = 0	f = 1 MHz			150		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 = 10 A $I_{B(on)}$ = 2 A	V_{CC} = 150 V $I_{B(off)}$ = -2 A	BUV48 (see Figures 1 and 2)			1.0	µs
t_s	Storage time						3.0	µs
t_f	Fall time						0.8	µs
t_{on}	Turn on time	I_C = 8 A $I_{B(on)}$ = 1.6 A	V_{CC} = 150 V $I_{B(off)}$ = -1.6 A	BUV48A (see Figures 1 and 2)			1.0	µs
t_s	Storage time						3.0	µs
t_f	Fall time						0.8	µs

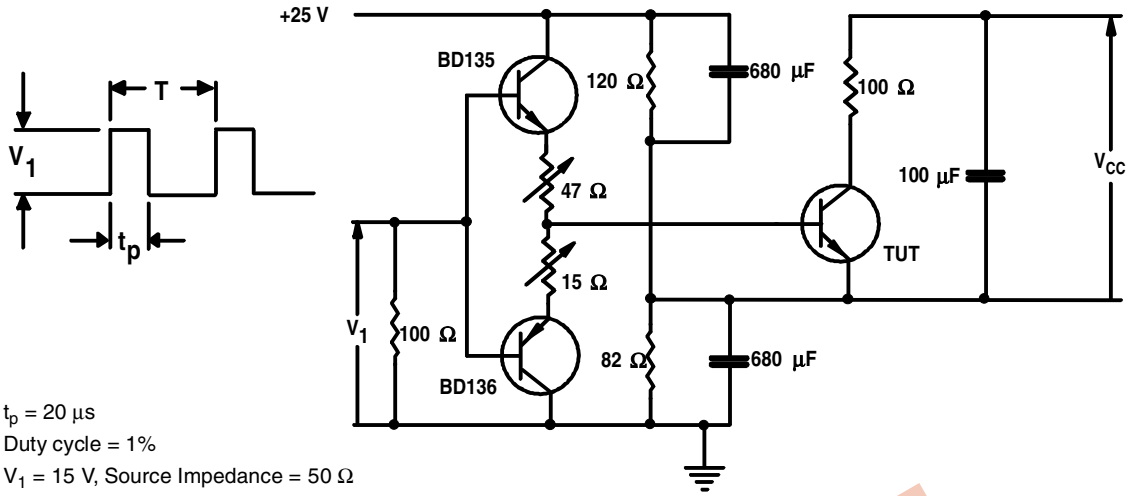
† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

inductive-load-switching characteristics at 100°C case temperature

PARAMETER		TEST CONDITIONS †			MIN	TYP	MAX	UNIT
t_{sv}	Voltage storage time	I_C = 10 A $V_{BE(off)}$ = -5 V	$I_{B(on)}$ = 2 A (see Figures 3 and 4)	BUV48			4.0	µs
t_{fi}	Current fall time						0.4	µs
t_{sv}	Voltage storage time	I_C = 8 A $V_{BE(off)}$ = -5 V	$I_{B(on)}$ = 1.6 A (see Figures 3 and 4)	BUV48A			4.0	µs
t_{fi}	Current fall time						0.4	µs

BOURNS®

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

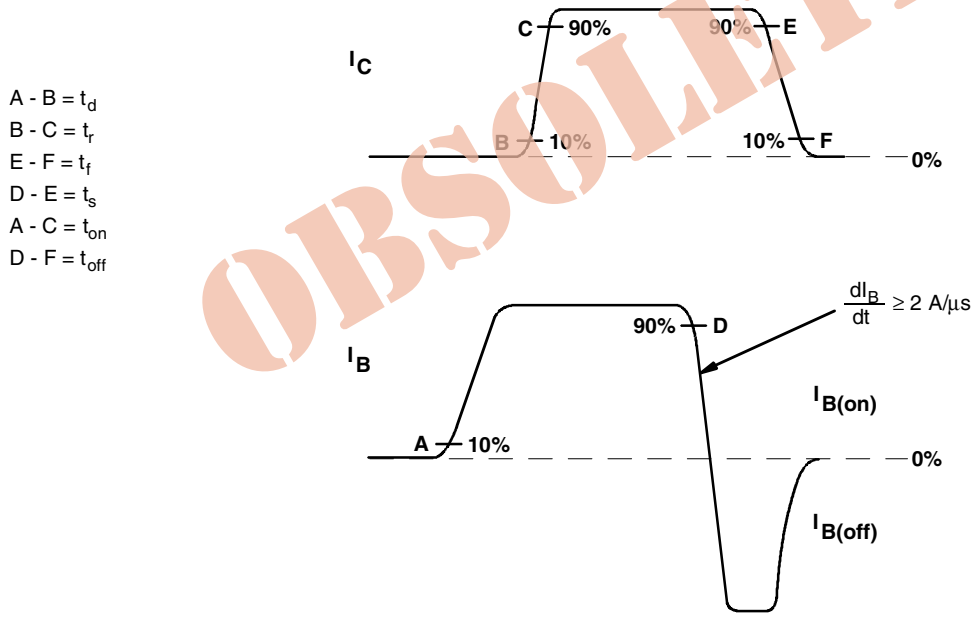


Figure 2. Resistive-Load Switching Waveforms

PARAMETER MEASUREMENT INFORMATION

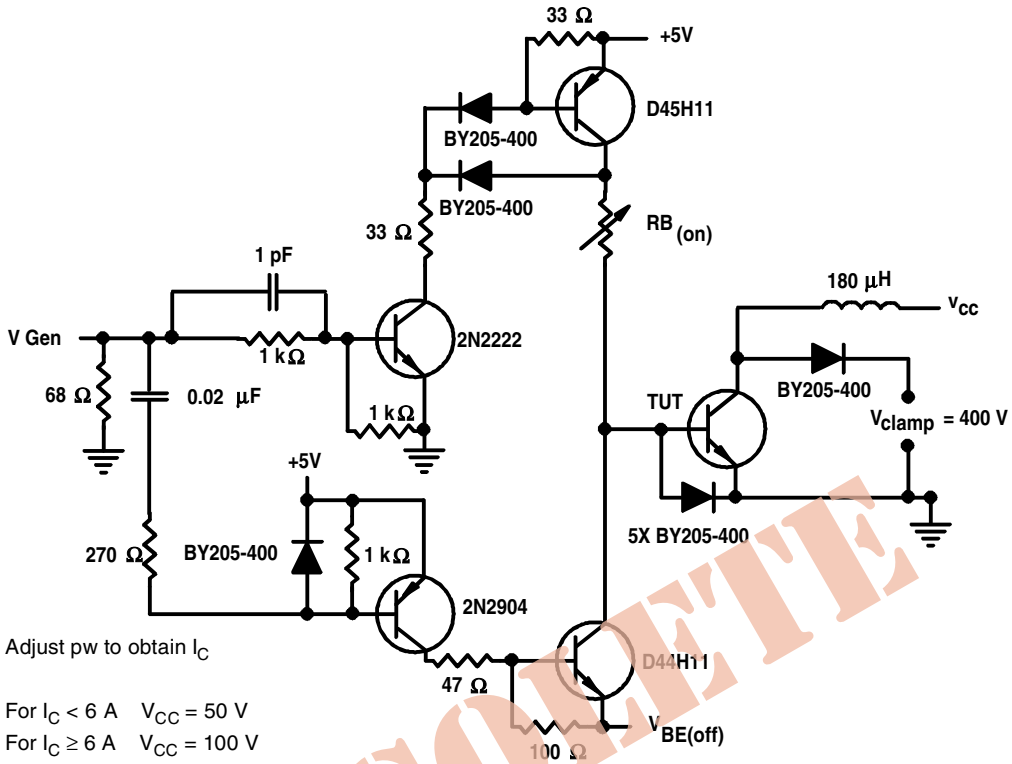
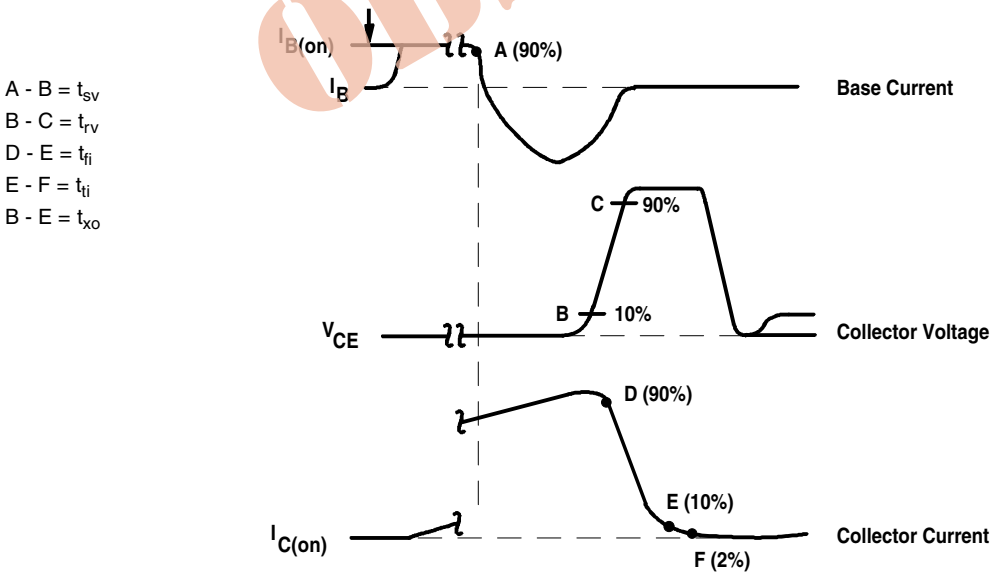


Figure 3. Inductive-Load Switching Test Circuit



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

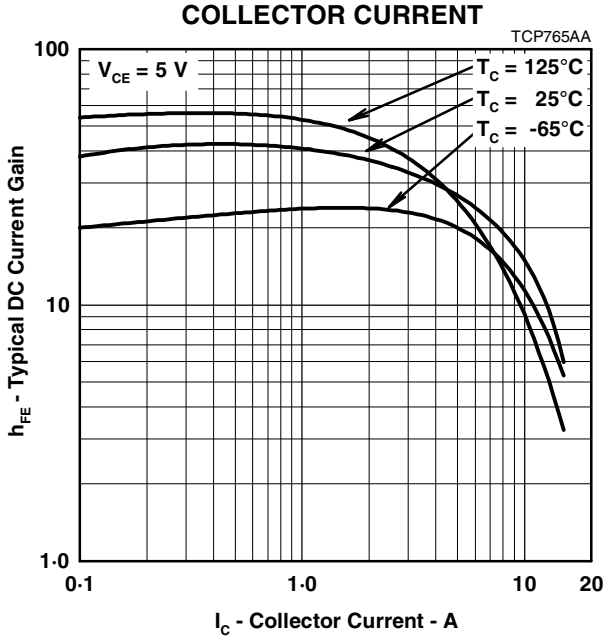


Figure 5.

COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

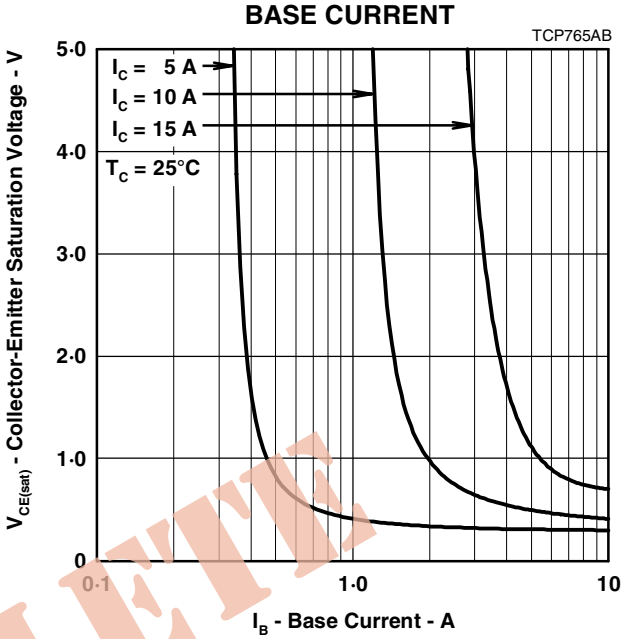


Figure 6.

COLLECTOR-EMITTER SATURATION VOLTAGE vs BASE CURRENT

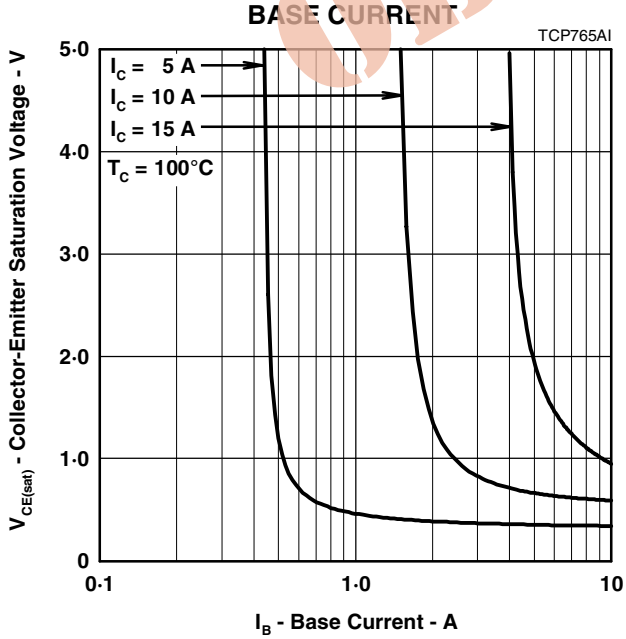


Figure 7.

BASE-EMITTER SATURATION VOLTAGE vs BASE CURRENT

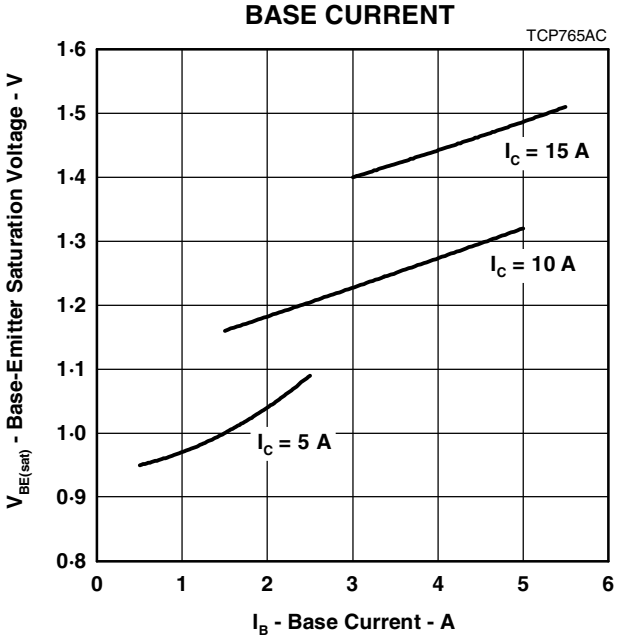


Figure 8.

TYPICAL CHARACTERISTICS

COLLECTOR CUT-OFF CURRENT vs CASE TEMPERATURE

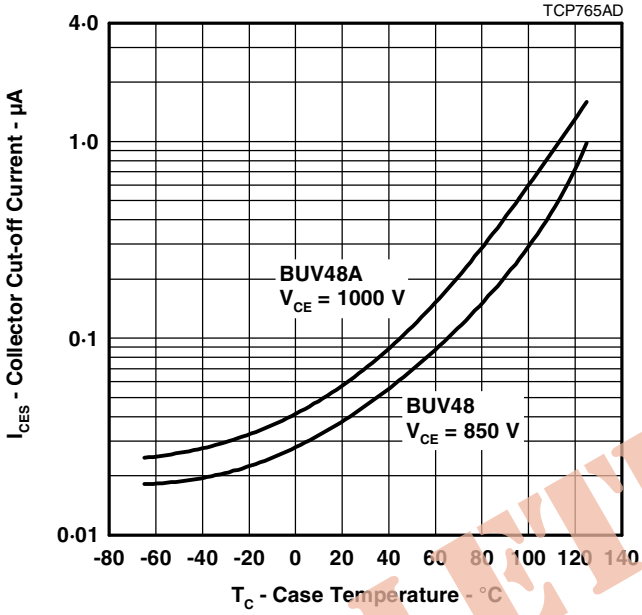


Figure 9.

MAXIMUM SAFE OPERATING REGIONS

MAXIMUM FORWARD-BIAS SAFE OPERATING AREA

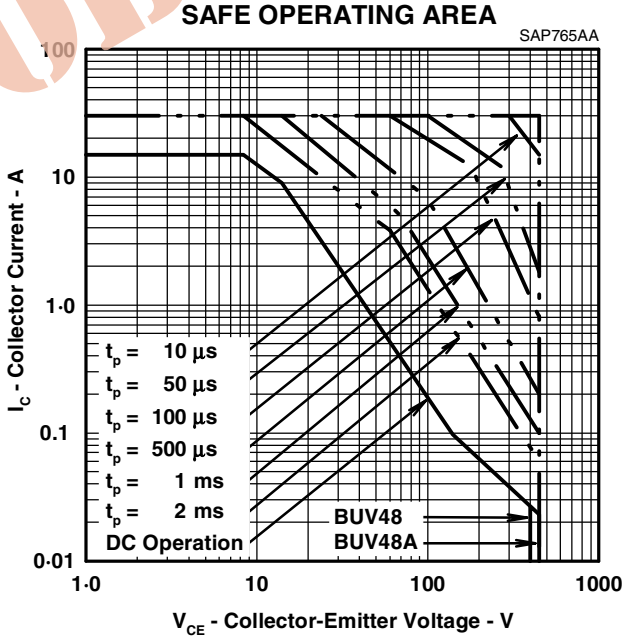


Figure 10.