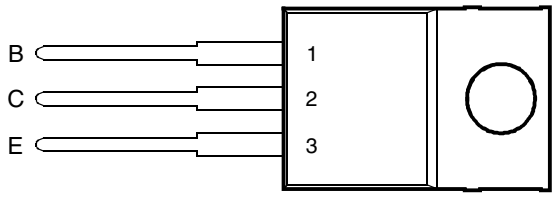
BOURNS®

- **40 W at 25°C Case Temperature**
- **2 A Continuous Collector Current**
- **3 A Peak Collector Current**
- **Typical t_f = 200 ns at 25°C**

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)	V_{CBO}	1000	V
Collector-emitter voltage (V_{BE} = 0)	V_{CES}	1000	V
Collector-emitter voltage (I_B = 0)	V_{CEO}	450	V
Continuous collector current	I_C	2	A
Peak collector current (see Note 1)	I_{CM}	3	A
Continuous device dissipation at (or below) 25°C case temperature	P_{tot}	40	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 $\leq 2\%$.

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 = 0.1 A	L = 25 mH	(see Note 2)	450			V
I_{CES}	Collector-emitter cut-off current	V_{CE} = 1000 V V_{CE} = 1000 V	V_{BE} = 0 V_{BE} = 0	 T_C = 125°C			0.2 1	mA
I_{EBO}	Emitter cut-off current	V_{EB} = 5 V	I_C = 0				1	mA
h_{FE}	Forward current transfer ratio	V_{CE} = 5 V	I_C = 0.1 A	(see Notes 3 and 4)		35		
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = 0.03 A I_B = 0.2 A	I_C = 0.3 A I_C = 1 A	(see Notes 3 and 4)			0.8 1	V
$V_{BE(sat)}$	Base-emitter saturation voltage	I_B = 0.2 A	I_C = 1 A	(see Notes 3 and 4)			1.1	V
f_t	Current gain bandwidth product	V_{CE} = 10 V	I_C = 0.2 A			12		MHz
C_{ob}	Output capacitance	V_{CB} = 20 V	I_E = 0	f = 0.1 MHz		60		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.
5. To obtain f_t the [h_{FE}] response is extrapolated at the rate of -6 dB per octave from f = 1 MHz to the frequency at which [h_{FE}] = 1.

thermal characteristics

PARAMETER		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to case thermal resistance			2.5	°C/W

resistive-load-switching characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS †			MIN	TYP	MAX	UNIT
t_{on}	Turn on time	I_C = 1 A V_{CC} = 250 V	$I_{B(on)}$ = 0.2 A (see Figures 1 and 2)	$I_{B(off)}$ = -0.4 A		0.25	0.5	µs
t_s	Storage time					1.8		µs
t_f	Fall time					0.2		µs
t_f	Fall time	I_C = 1 A V_{CC} = 250 V	$I_{B(on)}$ = 0.2 A T_C = 95°C	$I_{B(off)}$ = -0.4 A			0.4	µs

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

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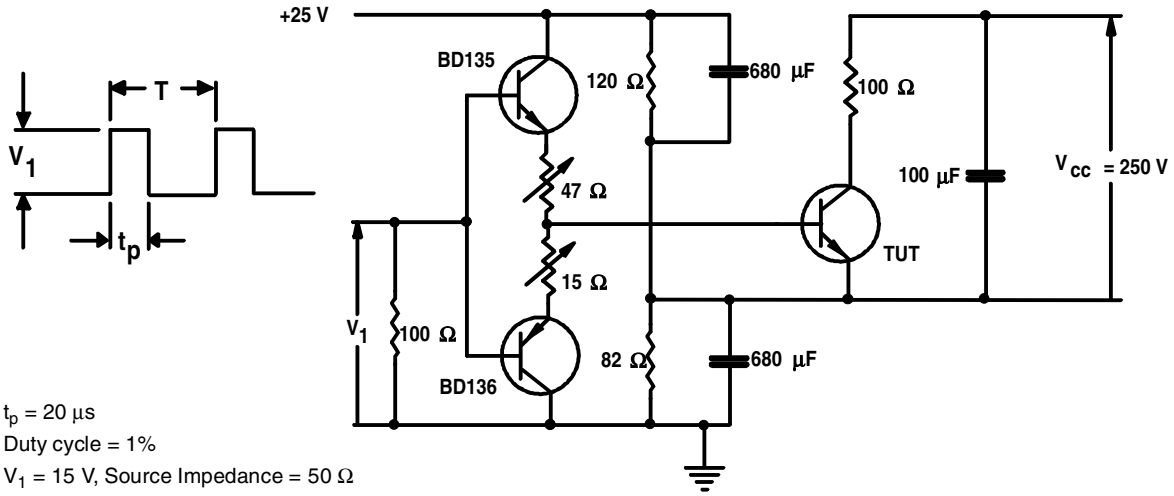
PARAMETER MEASUREMENT INFORMATION



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

Figure 1. Resistive-Load Switching Test Circuit

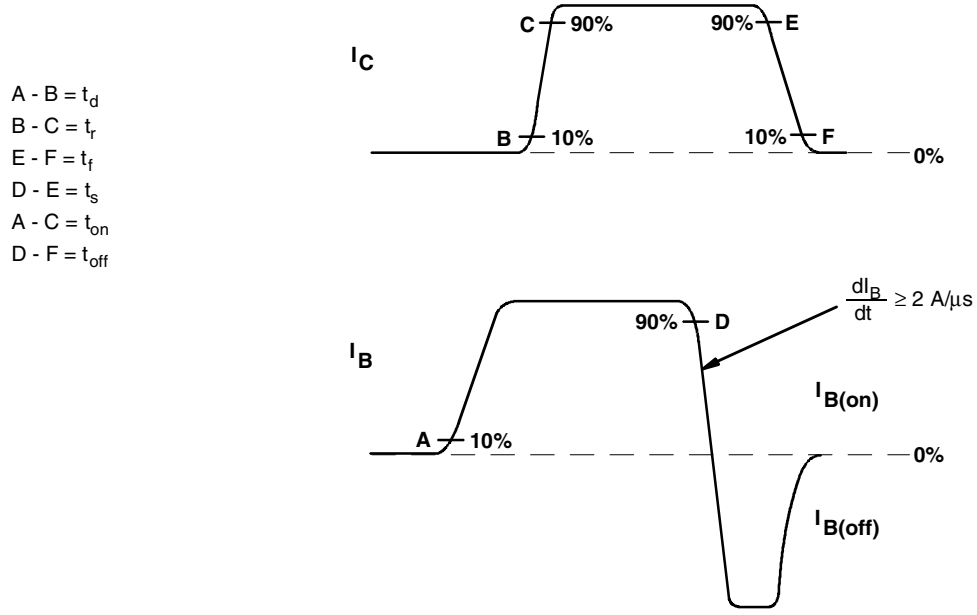


Figure 2. Resistive-Load Switching Waveforms

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN vs COLLECTOR CURRENT

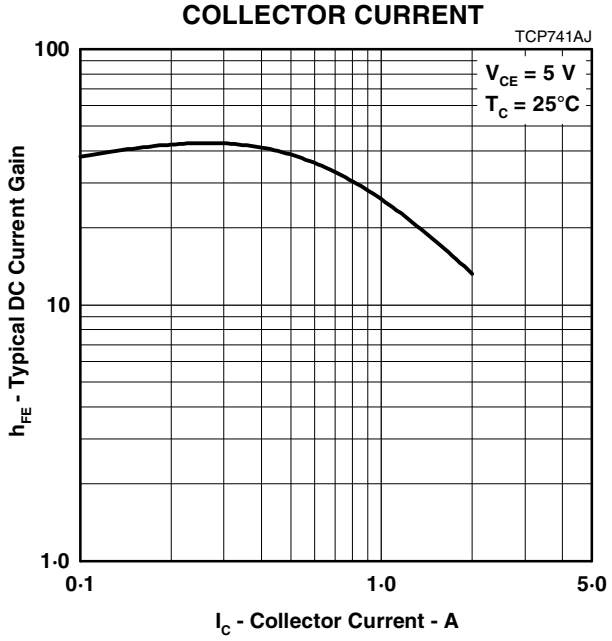


Figure 3.

COLLECTOR CUT-OFF CURRENT vs CASE TEMPERATURE

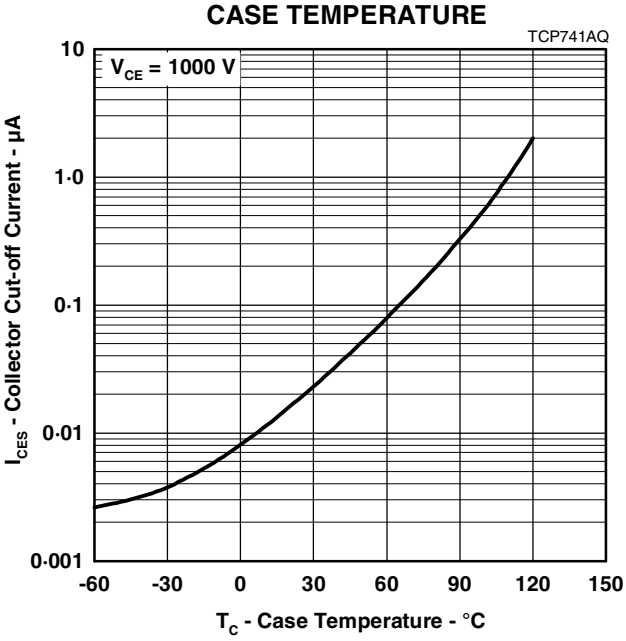


Figure 4.

MAXIMUM SAFE OPERATING REGIONS

MAXIMUM FORWARD-BIAS SAFE OPERATING AREA

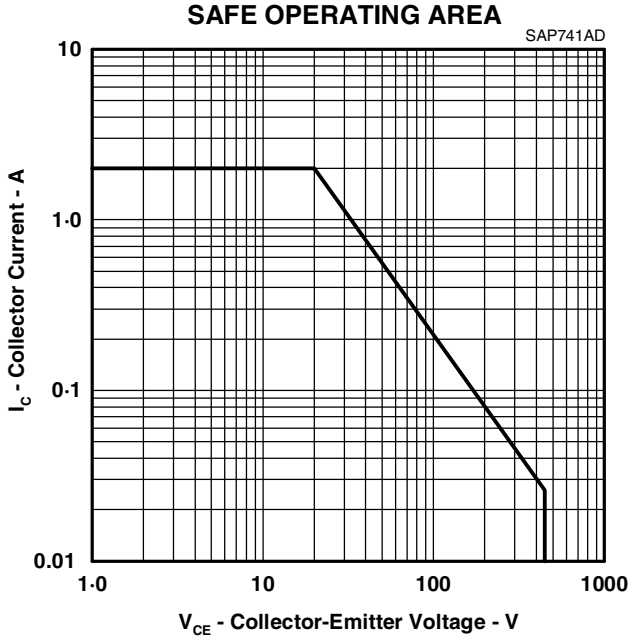


Figure 5.

THERMAL INFORMATION

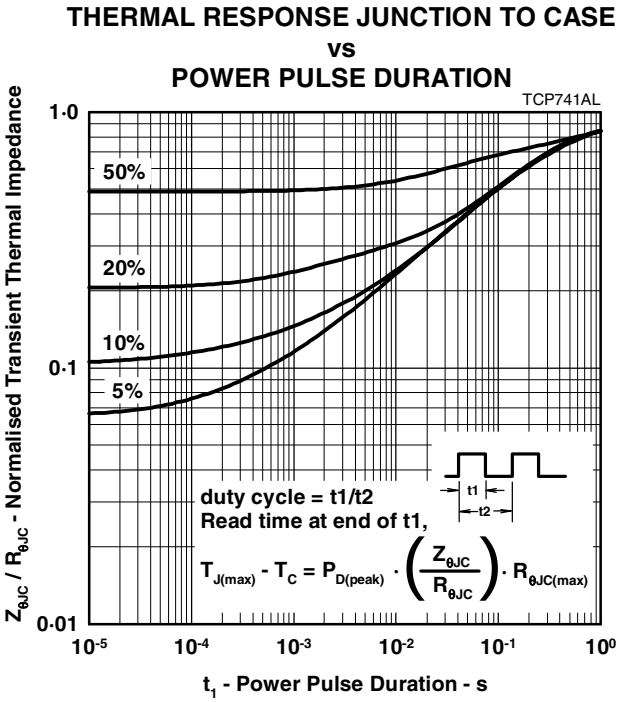
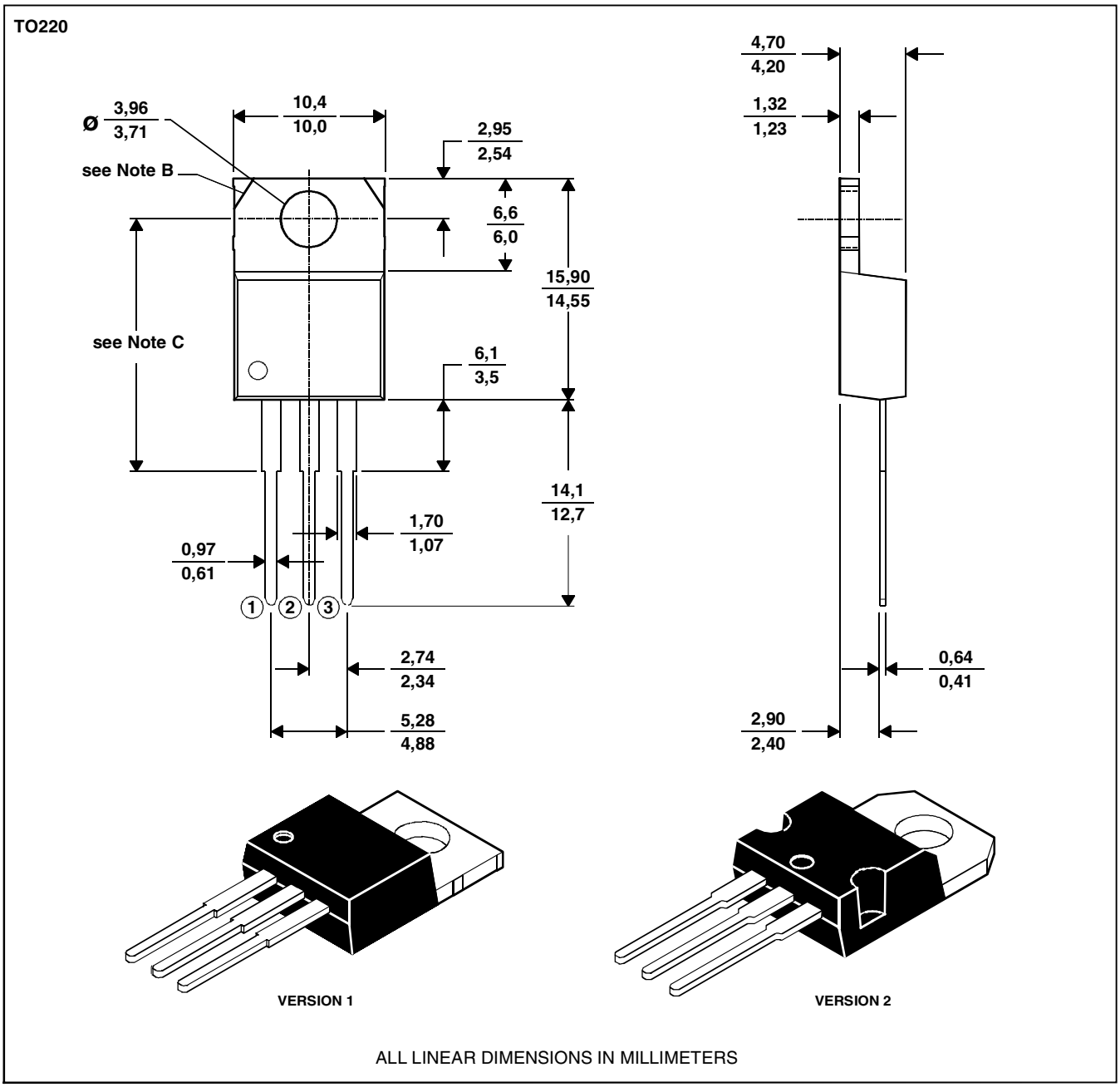


Figure 6.

MECHANICAL DATA

TO-220
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.



NOTES: A. The centre pin is in electrical contact with the mounting tab.
B. Mounting tab corner profile according to package version.
C. Typical fixing hole centre stand off height according to package version.
Version 1, 18.0 mm. Version 2, 17.6 mm.

MDXXBE