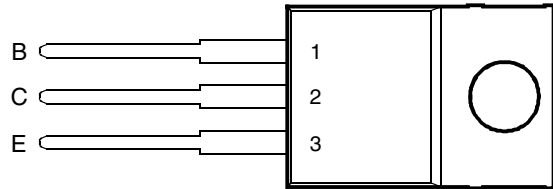




- Designed for Complementary Use with the BD744 Series
- 90 W at 25°C Case Temperature
- 15 A Continuous Collector Current
- 20 A Peak Collector Current
- Customer-Specified Selections Available

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 ( $I_E = 0$ )	BD743	$V_{CBO}$	50	V
	BD743A		70	
	BD743B		90	
	BD743C		110	
Collector-emitter voltage ( $I_B = 0$ )	BD743	$V_{CEO}$	45	V
	BD743A		60	
	BD743B		80	
	BD743C		100	
Emitter-base voltage		$V_{EBO}$	5	V
Continuous collector current		$I_C$	15	A
Peak collector current (see Note 1)		$I_{CM}$	20	A
Continuous base current		$I_B$	5	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		$P_{tot}$	90	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		$P_{tot}$	2	W
Unclamped inductive load energy (see Note 4)		$\frac{1}{2}LI_C^2$	90	mJ
Operating free air temperature range		$T_A$	-65 to +150	°C
Operating junction temperature range		$T_j$	-65 to +150	°C
Storage temperature range		$T_{stg}$	-65 to +150	°C
Lead temperature 3.2 mm from case for 10 seconds		$T_L$	250	°C

- NOTES: 1. This value applies for  $t_p \leq 0.3$  ms, duty cycle  $\leq 10\%$ .  
 2. Derate linearly to 150°C case temperature at the rate of 0.72 W/°C.  
 3. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.  
 4. This rating is based on the capability of the transistor to operate safely in a circuit of:  $L = 20$  mH,  $I_{B(on)} = 0.4$  A,  $R_{BE} = 100 \Omega$ ,  $V_{BE(off)} = 0$ ,  $R_S = 0.1 \Omega$ ,  $V_{CC} = 20$  V.

**PRODUCT INFORMATION**

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

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = 30 \text{ mA}$	$I_B = 0$	(see Note 5)	BD743			V
				BD743A			
				BD743B			
				BD743C			
$I_{CBO}$ Collector cut-off current	$V_{CE} = 50 \text{ V}$ $V_{CE} = 70 \text{ V}$ $V_{CE} = 90 \text{ V}$ $V_{CE} = 110 \text{ V}$	$V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$		BD743		0.1	mA
				BD743A		0.1	
				BD743B		0.1	
				BD743C		0.1	
				BD743		5	
				BD743A		5	
				BD743B		5	
				BD743C		5	
$I_{CEO}$ Collector cut-off current	$V_{CE} = 30 \text{ V}$ $V_{CE} = 60 \text{ V}$	$I_B = 0$ $I_B = 0$		BD743/743A		0.1	mA
				BD743B/743C		0.1	
$I_{EBO}$ Emitter cut-off current	$V_{EB} = 5 \text{ V}$	$I_C = 0$				0.5	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = 4 \text{ V}$	$I_C = 1 \text{ A}$ $I_C = 5 \text{ A}$ $I_C = 15 \text{ A}$	(see Notes 5 and 6)		40		150
					20		
					5		
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 0.5 \text{ A}$ $I_B = 5 \text{ A}$	$I_C = 5 \text{ A}$ $I_C = 15 \text{ A}$	(see Notes 5 and 6)			1	V
						3	
$V_{BE}$ Base-emitter voltage	$V_{CE} = 4 \text{ V}$ $V_{CE} = 4 \text{ V}$	$I_C = 5 \text{ A}$ $I_C = 15 \text{ A}$	(see Notes 5 and 6)			1	V
						3	
$h_{fe}$ Small signal forward current transfer ratio	$V_{CE} = 10 \text{ V}$	$I_C = 1 \text{ A}$	$f = 1 \text{ kHz}$		25		
$ h_{fe} $ Small signal forward current transfer ratio	$V_{CE} = 10 \text{ V}$	$I_C = 1 \text{ A}$	$f = 1 \text{ MHz}$		5		

NOTES: 5. These parameters must be measured using pulse techniques,  $t_p = 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

6. 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			1.4	°C/W
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	°C/W

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

PARAMETER	TEST CONDITIONS †			MIN	TYP	MAX	UNIT
$t_d$ Delay time	$I_C = 5 \text{ A}$ $V_{BE(off)} = -4.2 \text{ V}$	$I_{B(on)} = 0.5 \text{ A}$ $R_L = 6 \Omega$	$I_{B(off)} = -0.5 \text{ A}$ $t_p = 20 \mu\text{s}$ , $dc \leq 2\%$		20		ns
$t_r$ Rise time					350		ns
$t_s$ Storage time					500		ns
$t_f$ Fall time					400		ns

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

TYPICAL CHARACTERISTICS

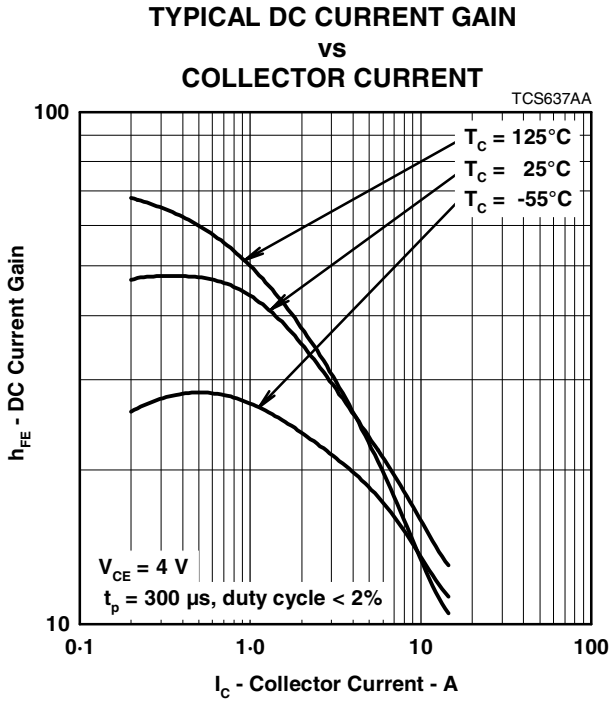


Figure 1.

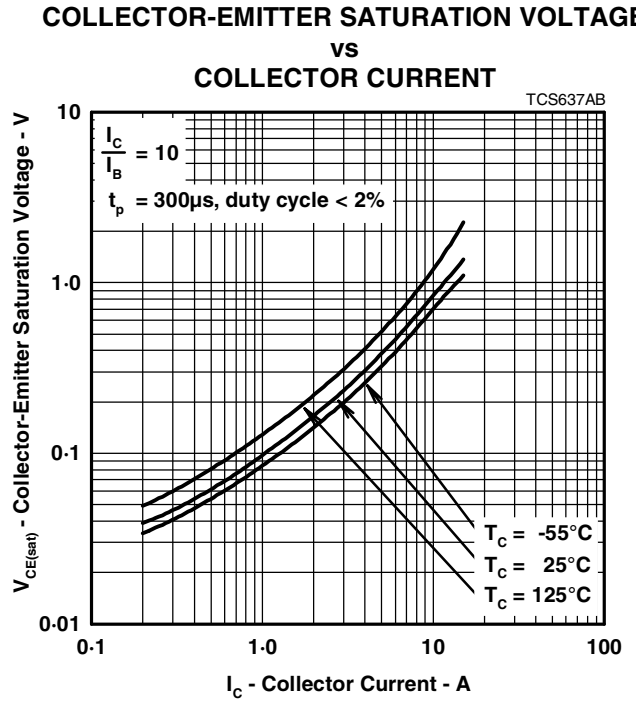


Figure 2.

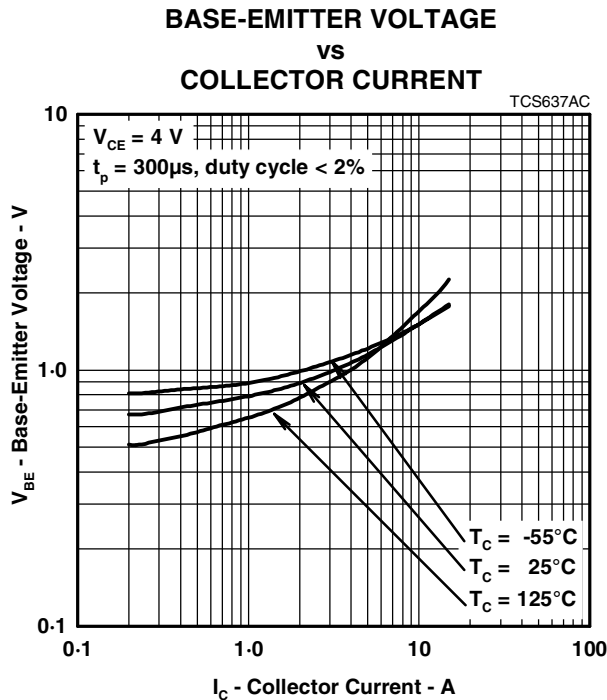


Figure 3.

**PRODUCT INFORMATION**

**MAXIMUM SAFE OPERATING REGIONS**

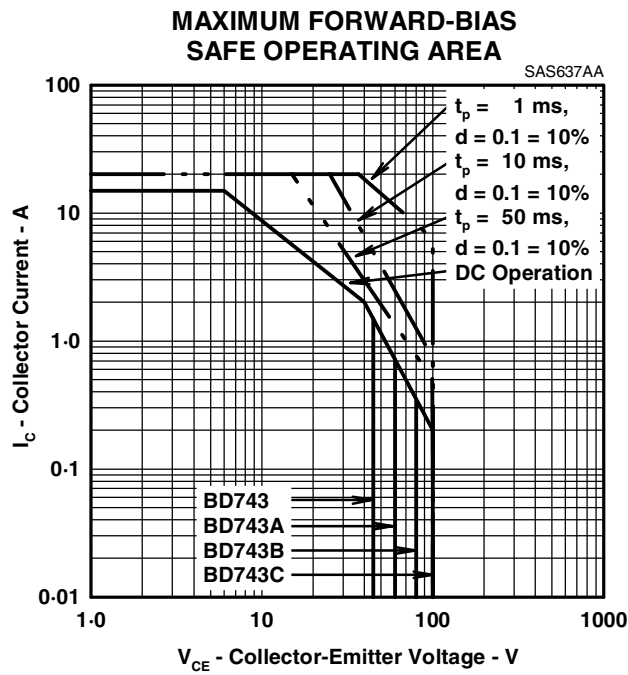


Figure 4.

**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
VS  
CASE TEMPERATURE**

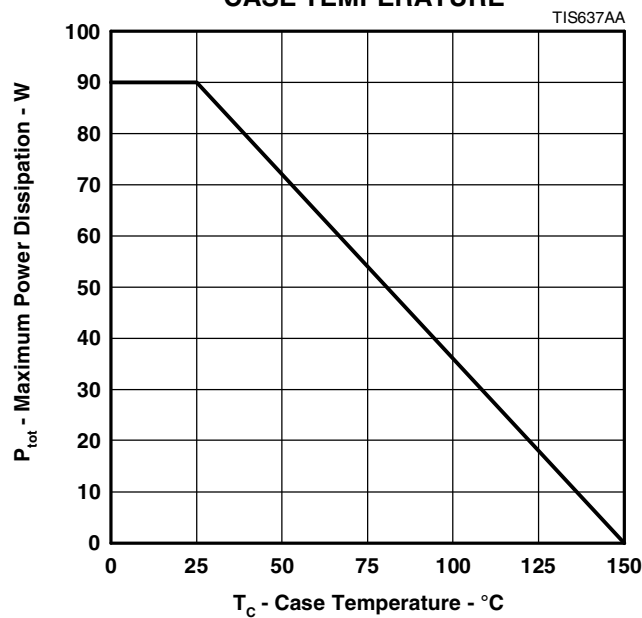


Figure 5.

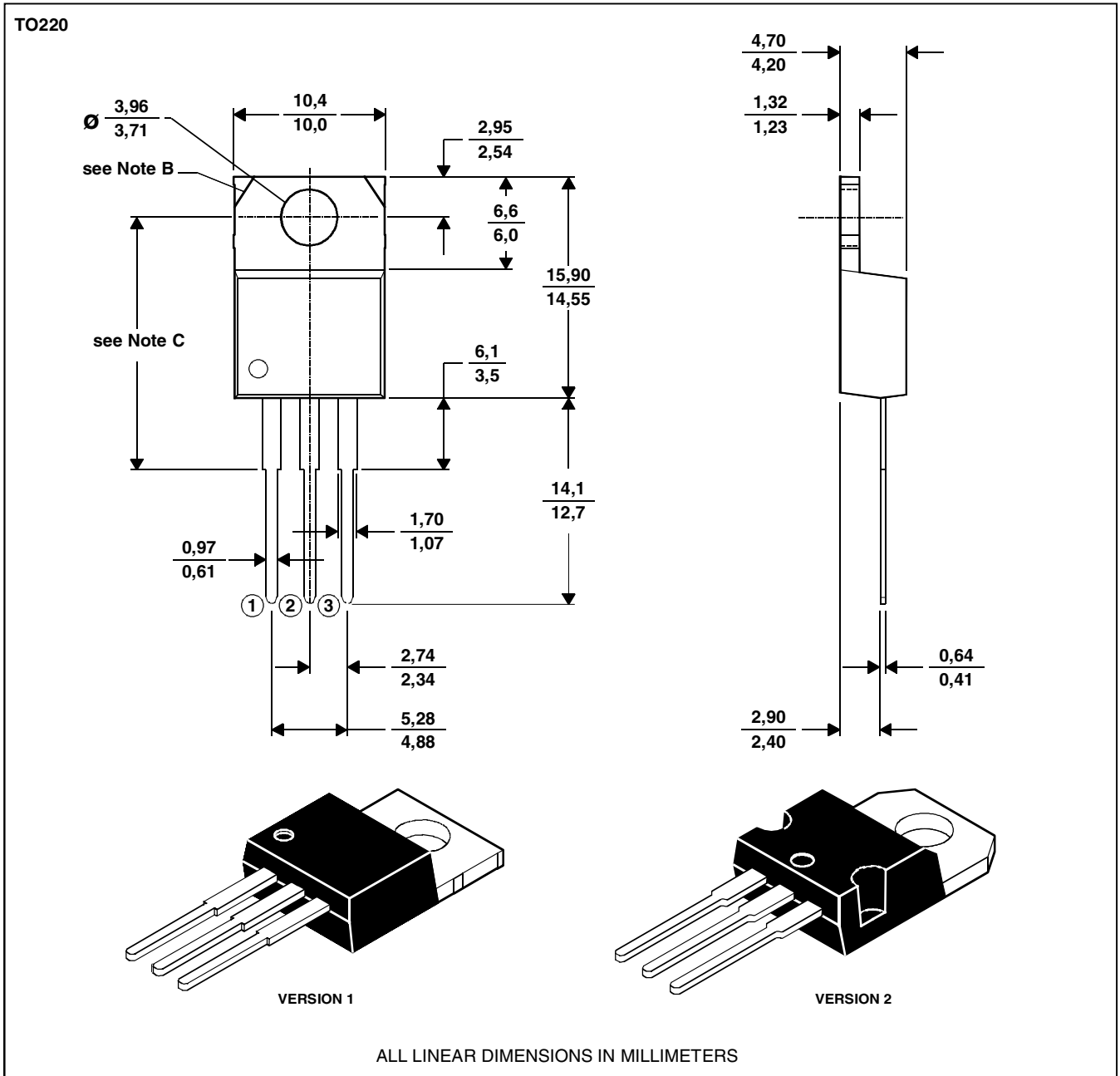
**PRODUCT INFORMATION**

**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

**PRODUCT INFORMATION**

AUGUST 1978 - REVISED SEPTEMBER 2002  
 Specifications are subject to change without notice.