

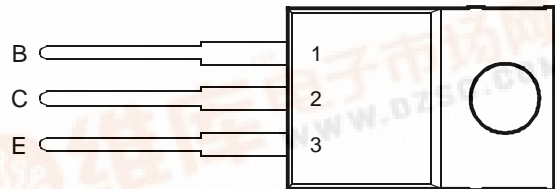
**BD896A, BD898A, BD900A  
PNP SILICON POWER DARLINGTONS**

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AUGUST 1993 - REVISED MARCH 1997

- **Designed for Complementary Use with BD895A, BD897A and BD899A**
- **70 W at 25°C Case Temperature**
- **8 A Continuous Collector Current**
- **Minimum  $h_{FE}$  of 750 at 3V, 3A**

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 ( $I_E = 0$ )	BD896A	$V_{CBO}$	-45	V
	BD898A		-60	
	BD900A		-80	
Collector-emitter voltage ( $I_B = 0$ )	BD896A	$V_{CEO}$	-45	V
	BD898A		-60	
	BD900A		-80	
Emitter-base voltage		$V_{EBO}$	-5	V
Continuous collector current		$I_C$	-8	A
Continuous base current		$I_B$	-0.3	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 1)		$P_{tot}$	70	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 2)		$P_{tot}$	2	W
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

NOTES: 1. Derate linearly to 150°C case temperature at the rate of 0.56 W/°C.  
2. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.



# BD896A, BD898A, BD900A

## PNP SILICON POWER DARLINGTONS

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = -100 \text{ mA}$ $I_B = 0$ (see Note 3)	BD896A BD898A BD900A	-45 -60 -80		V
$I_{CEO}$ Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -40 \text{ V}$ $I_B = 0$	BD896A BD898A BD900A		-0.5 -0.5 -0.5	mA
$I_{CBO}$ Collector cut-off current	$V_{CB} = -45 \text{ V}$ $I_E = 0$ $V_{CB} = -60 \text{ V}$ $I_E = 0$ $V_{CB} = -80 \text{ V}$ $I_E = 0$ $V_{CB} = -45 \text{ V}$ $I_E = 0$ $T_C = 100^\circ\text{C}$ $V_{CB} = -60 \text{ V}$ $I_E = 0$ $T_C = 100^\circ\text{C}$ $V_{CB} = -80 \text{ V}$ $I_E = 0$ $T_C = 100^\circ\text{C}$	BD896A BD898A BD900A BD896A BD898A BD900A		-0.2 -0.2 -0.2 -2 -2 -2	mA
$I_{EBO}$ Emitter cut-off current	$V_{EB} = -5 \text{ V}$ $I_C = 0$ (see Notes 3 and 4)			-2	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = -3 \text{ V}$ $I_C = -4 \text{ A}$ (see Notes 3 and 4)		750		
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -16 \text{ mA}$ $I_C = -4 \text{ A}$ (see Notes 3 and 4)			-2.8	V
$V_{BE(on)}$ Base-emitter voltage	$V_{CE} = -3 \text{ V}$ $I_C = -4 \text{ A}$ (see Notes 3 and 4)			-2.5	V
$V_{EC}$ Parallel diode forward voltage	$I_E = -8 \text{ A}$ $I_B = 0$			-3.5	V

NOTES: 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			1.79	°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
$t_{on}$ Turn-on time	$I_C = -3 \text{ A}$ $I_{B(on)} = -12 \text{ mA}$ $I_{B(off)} = 12 \text{ mA}$		1		$\mu\text{s}$
$t_{off}$ Turn-off time	$V_{BE(off)} = 3.5 \text{ V}$ $R_L = 10 \Omega$ $t_p = 20 \mu\text{s}$ , dc $\leq 2\%$		5		$\mu\text{s}$

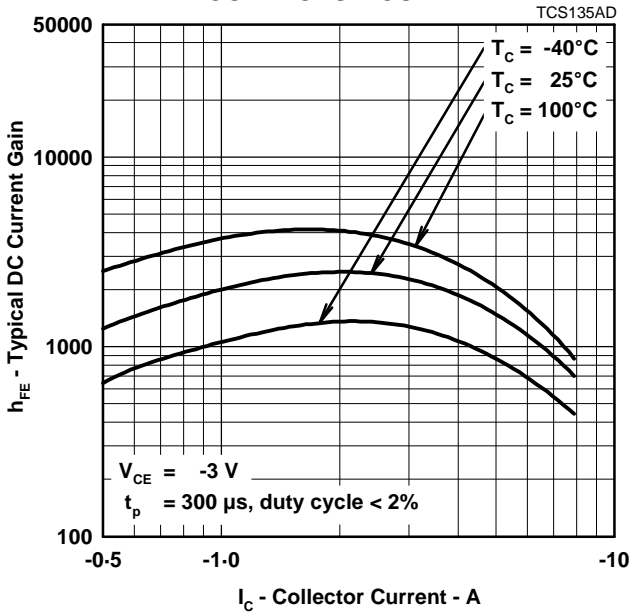
† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

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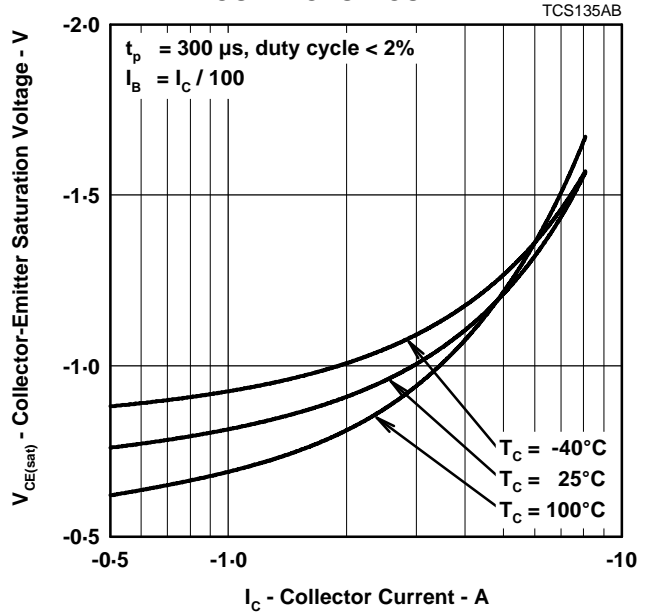
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## TYPICAL CHARACTERISTICS

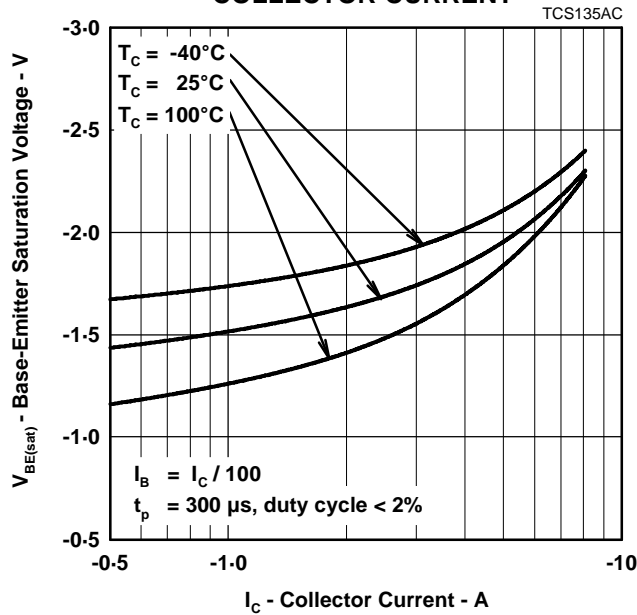
**TYPICAL DC CURRENT GAIN  
VS  
COLLECTOR CURRENT**



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



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



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## MAXIMUM SAFE OPERATING REGIONS

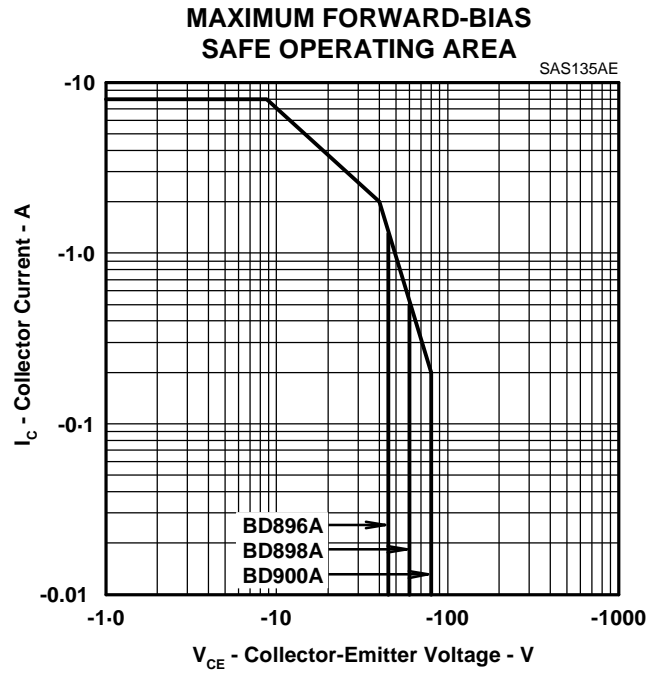


Figure 4.

## THERMAL INFORMATION

### MAXIMUM POWER DISSIPATION vs CASE TEMPERATURE

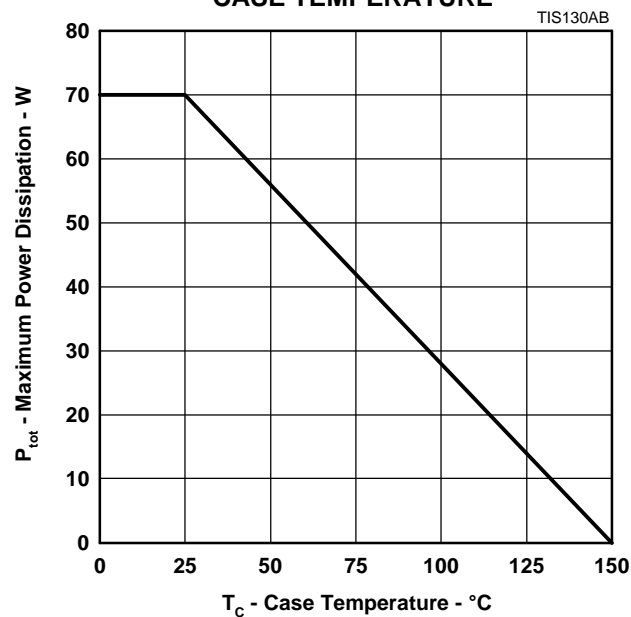


Figure 5.

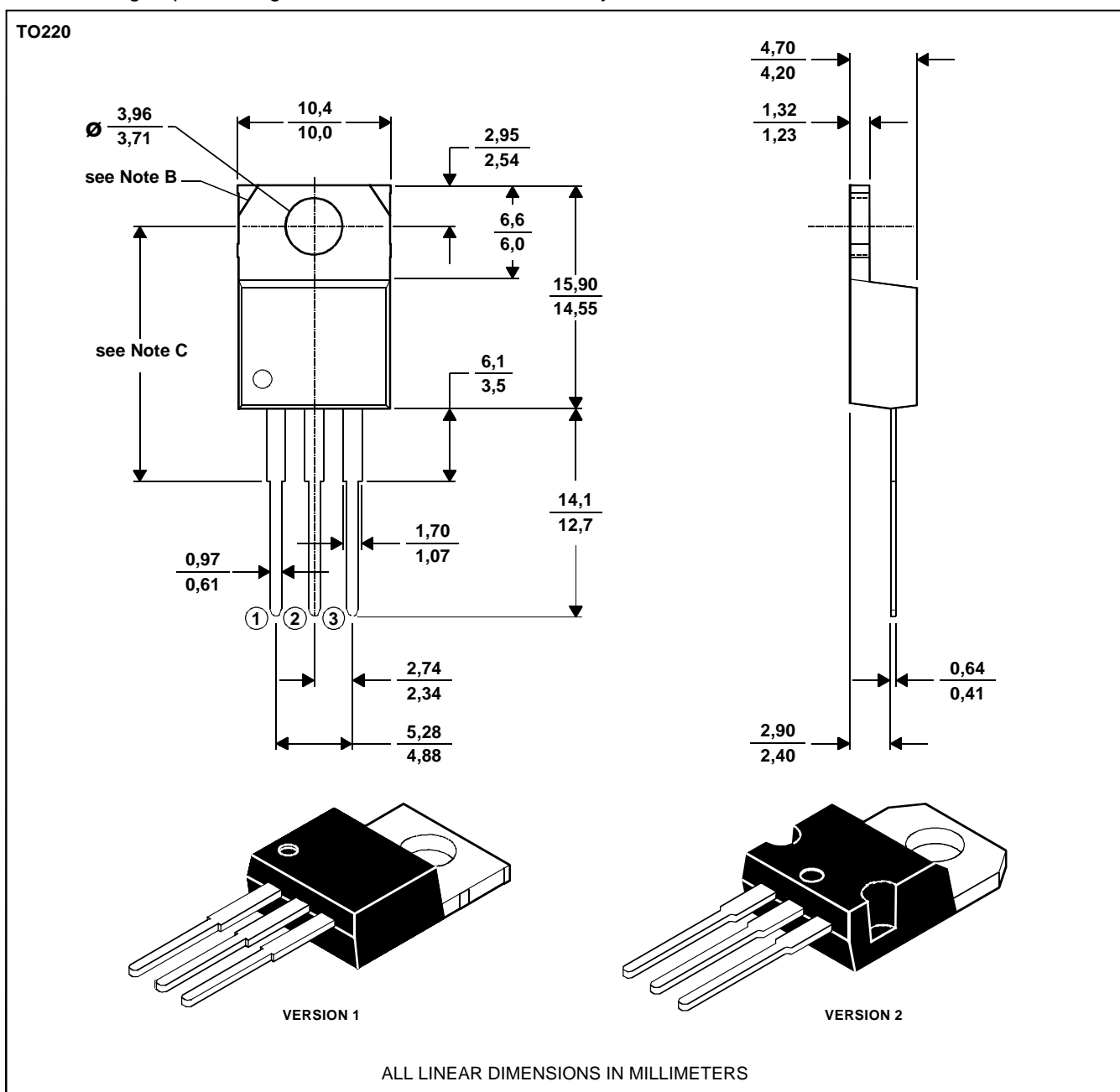
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## MECHANICAL DATA

### 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

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