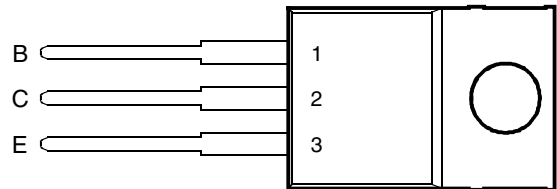


# BD895, BD897, BD899, BD901 NPN SILICON POWER DARLINGTONS



- Designed for Complementary Use with BD896, BD898, BD900 and BD902
- 70 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- 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



This series is obsolete and not recommended for new designs.

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ( $I_E = 0$ )	BD895	$V_{CB0}$	45	V
	BD897		60	
	BD899		80	
	BD901		100	
Collector-emitter voltage ( $I_B = 0$ )	BD895	$V_{CE0}$	45	V
	BD897		60	
	BD899		80	
	BD901		100	
Base-emitter 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.

## PRODUCT INFORMATION

AUGUST 1993 - REVISED SEPTEMBER 2002  
Specifications are subject to change without notice.

**BD895, BD897, BD899, BD901**  
**NPN SILICON POWER DARLINGTONS**



**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)	BD895 45 BD897 60 BD899 80 BD901 100			V
$I_{CEO}$ Collector-emitter cut-off current	$V_{CE} = 30 \text{ V}$	$I_B = 0$		BD895 BD897 BD899 BD901		0.5 0.5 0.5 0.5	mA
$I_{CBO}$ Collector cut-off current	$V_{CB} = 45 \text{ V}$	$I_E = 0$		BD895		0.2	mA
	$V_{CB} = 60 \text{ V}$	$I_E = 0$		BD897		0.2	
	$V_{CB} = 80 \text{ V}$	$I_E = 0$		BD899		0.2	
	$V_{CB} = 100 \text{ V}$	$I_E = 0$		BD901		0.2	
	$V_{CB} = 45 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BD895		2	
	$V_{CB} = 60 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BD897		2	
	$V_{CB} = 80 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BD899		2	
$V_{CB} = 100 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BD901		2		
$I_{EBO}$ 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	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$	(see Notes 3 and 4)	750			
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 12 \text{ mA}$	$I_C = 3 \text{ A}$	(see Notes 3 and 4)			2.5	V
$V_{BE(on)}$ Base-emitter voltage	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$	(see Notes 3 and 4)			2.5	V
$V_F$ Parallel diode forward voltage	$I_F = 8 \text{ A}$					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	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	$^\circ\text{C}/\text{W}$

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

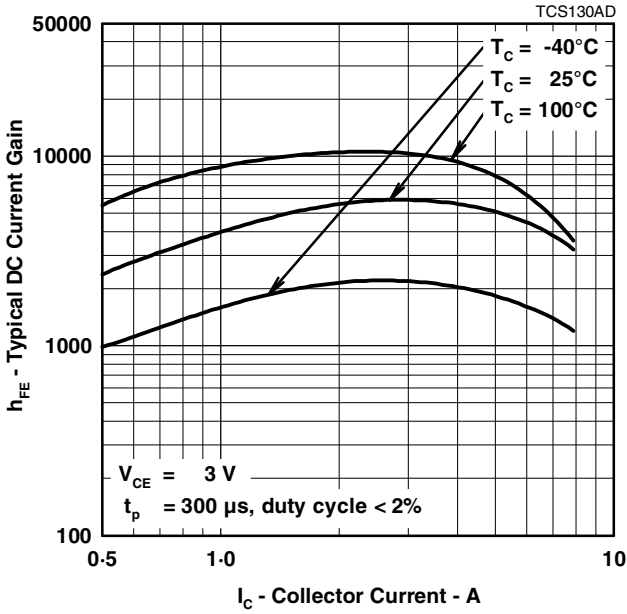
PARAMETER	TEST CONDITIONS †			MIN	TYP	MAX	UNIT
$t_{on}$ Turn-on time	$I_C = 3 \text{ A}$	$I_{B(on)} = 12 \text{ mA}$	$I_{B(off)} = -12 \text{ mA}$		1		$\mu\text{s}$
$t_{off}$ Turn-off time	$V_{BE(off)} = -3.5 \text{ V}$	$R_L = 10 \Omega$	$t_p = 20 \mu\text{s}$ , dc $\leq 2\%$		5		$\mu\text{s}$

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

**PRODUCT INFORMATION**

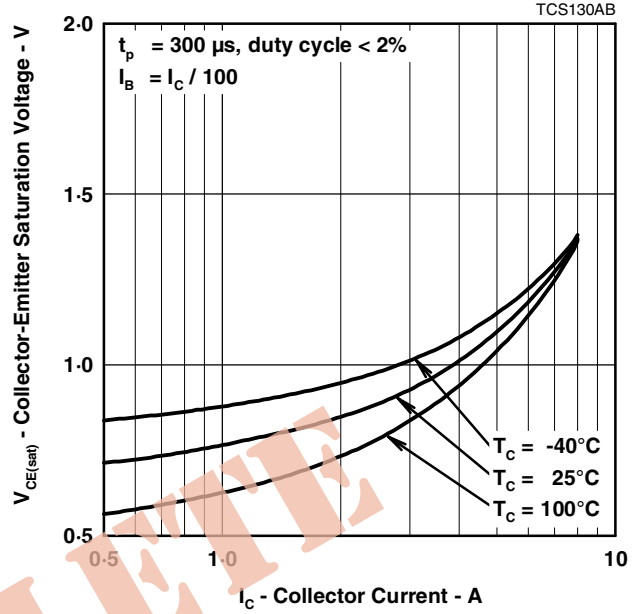
**TYPICAL CHARACTERISTICS**

**TYPICAL DC CURRENT GAIN  
vs  
COLLECTOR CURRENT**



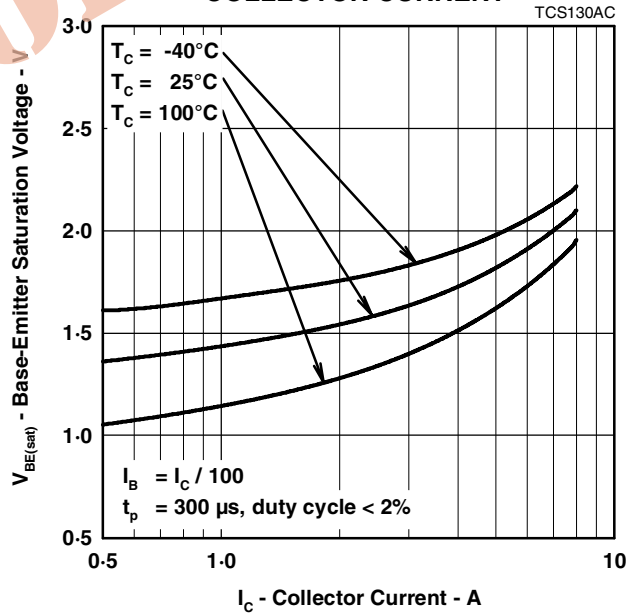
**Figure 1.**

**COLLECTOR-EMITTER SATURATION VOLTAGE  
vs  
COLLECTOR CURRENT**



**Figure 2.**

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



**Figure 3.**

**PRODUCT INFORMATION**

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**MAXIMUM SAFE OPERATING REGIONS**

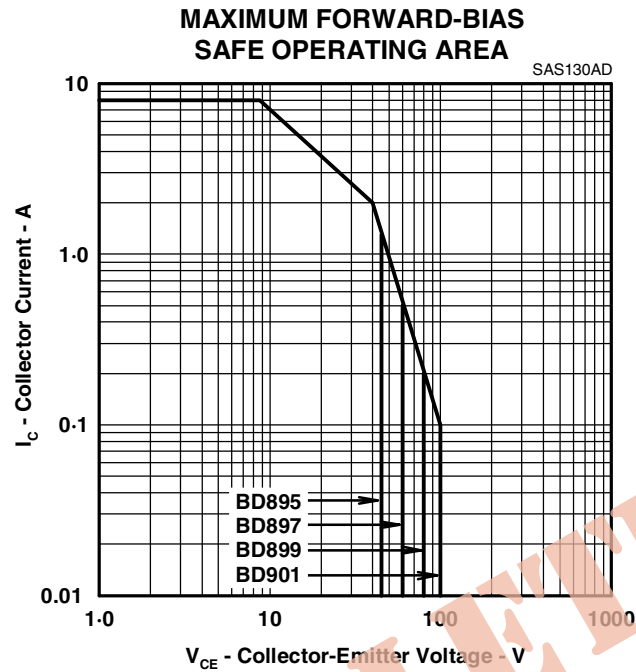


Figure 4.

**THERMAL INFORMATION**

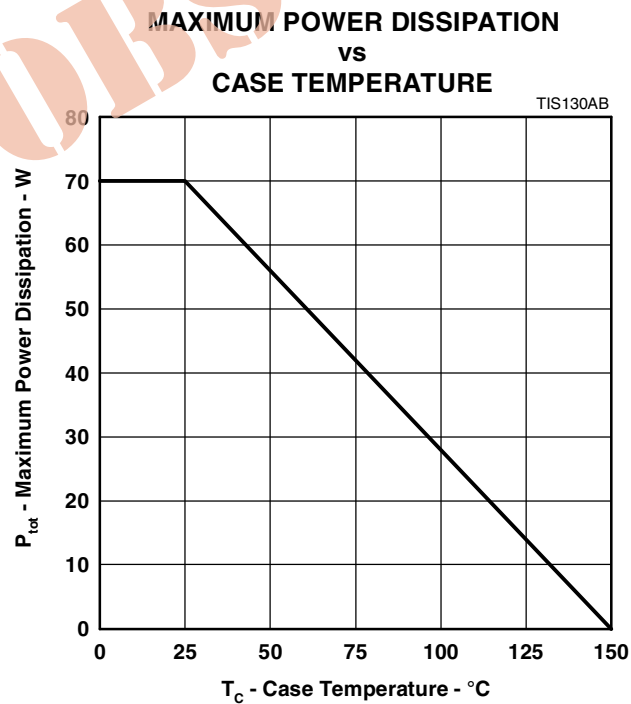


Figure 5.

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