

8961726 TEXAS INSTR (OPTO)

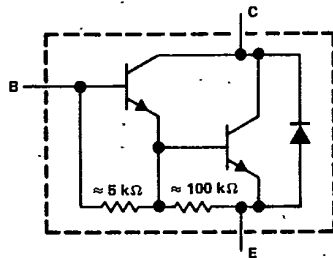
62C 36599 D

**BD895, BD895A, BD897, BD897A,
BD899, BD899A, BD901**
N-P-N SILICON POWER DARLINGTONS
REVISED OCTOBER 1984

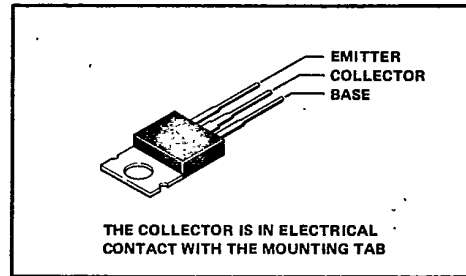
T-33-29

- 70 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Min hFE of 750 at 3 A or 4 A
- Designed for Power Amplifier and High-Speed Switching Applications

device schematic



TO-220AB PACKAGE



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

	BD895 BD895A	BD897 BD897A	BD899 BD899A	BD901
Collector-base voltage	45 V	60 V	80 V	100 V
Collector-emitter voltage (I _B = 0)	45 V	60 V	80 V	100 V
Emitter-base voltage	5 V			
Continuous collector current	8 A			
Continuous base current	0.3 A			
Continuous device dissipation at (or below) 25°C case temperature (see Note 1)	70 W			
Continuous device dissipation at (or below) 25°C free-air temperature (see Note 2)	2 W			
Operating free-air temperature range	- 65°C to 150°C			
Operating collector junction and storage temperature range	- 65°C 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.



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**BD895, BD895A, BD897, BD897A,
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electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS	BD895, BD895A			BD897, BD897A			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
V _{(BR)CEO}	I _C = 100 mA, I _B = 0, See Note 3	45			60			V
I _{CEO}	V _{CE} = 30 V, I _B = 0	500			500			μA
I _{CBO}	V _{CB} = 45 V, I _E = 0	200						μA
	V _{CB} = 60 V, I _E = 0				200			μA
	V _{CB} = 45 V, I _E = 0, T _C = 100°C	2						mA
	V _{CB} = 60 V, I _E = 0, T _C = 100°C				2			mA
I _{EBO}	V _{EB} = 5 V, I _C = 0	2			2			mA
h _{FE}	V _{CE} = 3 V, I _C = 3 A, See Notes 3 and 4	BD895, BD897		750		750		
	V _{CE} = 3 V, I _C = 4 A, See Notes 3 and 4	BD895A, BD897A		750		750		
V _{BE(on)}	V _{CE} = 3 V, I _C = 3 A, See Notes 3 and 4	BD895, BD897		2.5		2.5		V
	V _{CE} = 3 V, I _C = 4 A, See Notes 3 and 4	BD895A, BD897A		2.5		2.5		
V _{CE(sat)}	I _C = 3 A, I _B = 12 mA, See Notes 3 and 4	BD895, BD897		2.5		2.5		V
	I _C = 4 A, I _B = 16 mA, See Notes 3 and 4	BD895A, BD897A		2.8		2.8		
V _F	I _F = 8 A	3.5			3.5			V

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

PARAMETER	TEST CONDITIONS	BD899, BD899A			BD901			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
V _{(BR)CEO}	I _C = 100 mA, I _B = 0, See Note 3	80			100			V
I _{CEO}	V _{CE} = 40 V, I _B = 0	500						μA
	V _{CE} = 50 V, I _B = 0				500			
I _{CBO}	V _{CB} = 80 V, I _E = 0	200						μA
	V _{CB} = 100 V, I _E = 0				200			
	V _{CB} = 80 V, I _E = 0, T _C = 100°C	2						mA
	V _{CB} = 100 V, I _E = 0, T _C = 100°C				2			
I _{EBO}	V _{EB} = 5 V, I _C = 0	2			2			mA
h _{FE}	V _{CE} = 3 V, I _C = 3 A, See Notes 3 and 4	BD899, BD901		750		750		
	V _{CE} = 3 V, I _C = 4 A, See Notes 3 and 4	BD899A		750				
V _{BE(on)}	V _{CE} = 3 V, I _C = 3 A, See Notes 3 and 4	BD899, BD901		2.5		2.5		V
	V _{CE} = 3 V, I _C = 4 A, See Notes 3 and 4	BD899A		2.5		2.5		
V _{CE(sat)}	I _C = 3 A, I _B = 12 mA, See Notes 3 and 4	BD899, BD901		2.5		2.5		V
	I _C = 4 A, I _B = 16 mA, See Notes 3 and 4	BD899A		2.8		2.8		
V _F	I _F = 8 A	3.5			3.5			V

- NOTES: 3. These parameters must be measured using pulse techniques, t_w = 300 μs, duty cycle ≤ 2%.
 4. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts and located within 3,2 mm (0.125 inch) from the device body.

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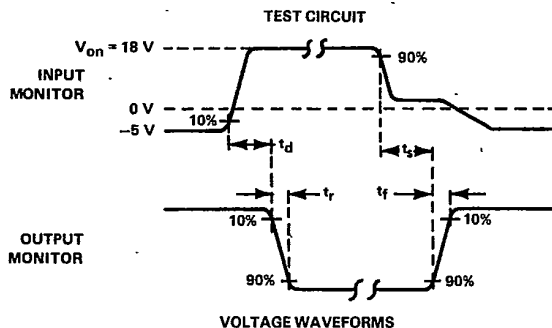
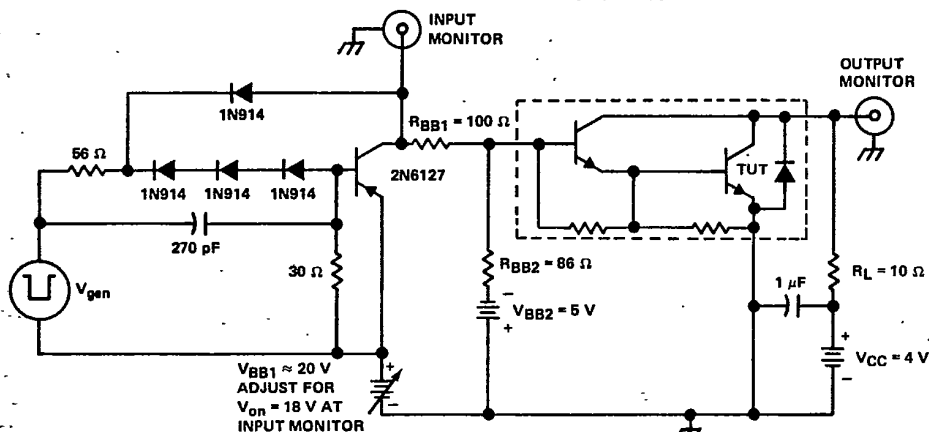
thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$			1.79	°C/W
$R_{\theta JA}$			62.5	

resistive-load switching characteristics

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
t_{on}	$I_C = 3 A,$	$I_{B1} = 12 mA,$	$I_{B2} = -12 mA,$		1		μs
t_{off}	$V_{BE(off)} = -3.5 V,$	$R_L = 10 \Omega,$	See Figure 1		5		

PARAMETER MEASUREMENT INFORMATION



VOLTAGE WAVEFORMS

- NOTES:
- V_{gen} is a -30-V pulse into a 50 Ω termination.
 - The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15 ns,$ $t_f \leq 15 ns,$ $Z_{out} = 50 \Omega,$ $t_w = 20 \mu s,$ duty cycle $\leq 2\%$.
 - Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15 ns,$ $R_{in} \geq 10 M\Omega,$ $C_{in} \leq 11.5 pF.$
 - Resistors must be noninductive types.
 - The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1. RESISTIVE-LOAD SWITCHING



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TYPICAL CHARACTERISTICS

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STATIC FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

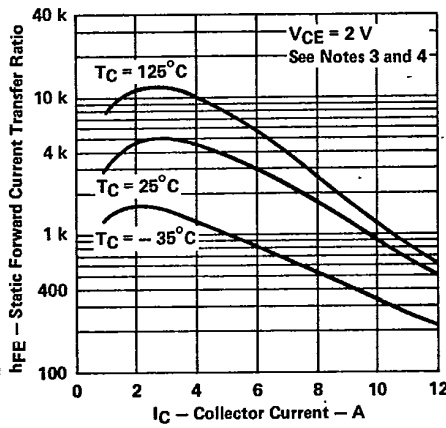


FIGURE 2

STATIC FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

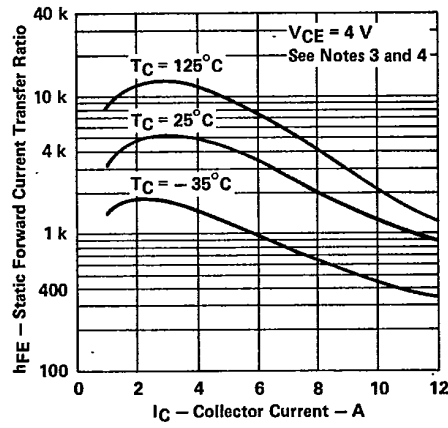


FIGURE 3

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
COLLECTOR CURRENT

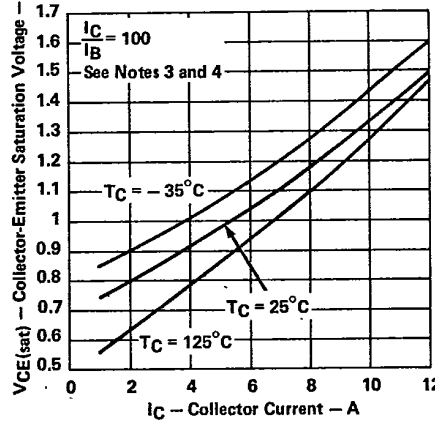


FIGURE 4

BASE-EMITTER VOLTAGE
vs
COLLECTOR CURRENT

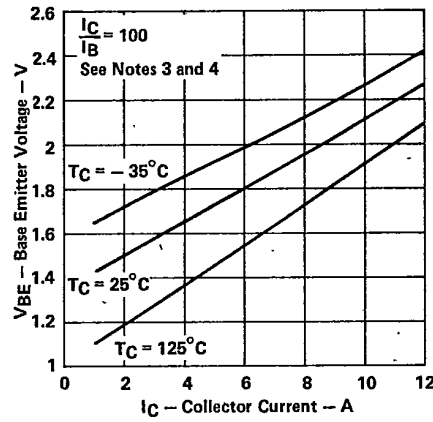


FIGURE 5

- NOTES: 3. These parameters must be measured using pulse techniques, $t_w = 300 \mu s$, duty cycle $\leq 2\%$.
4. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts and located within 3.2 mm (0.125 inch) from the device body.



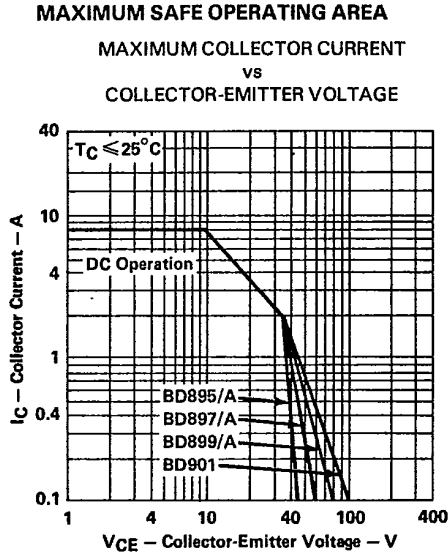
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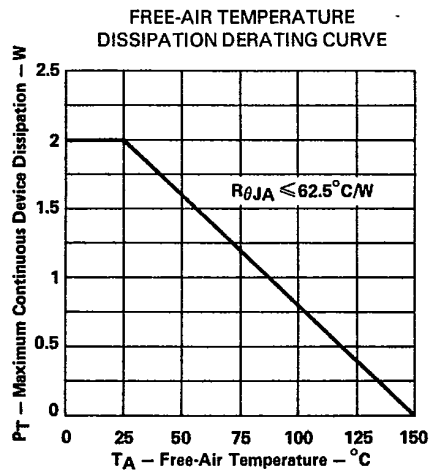
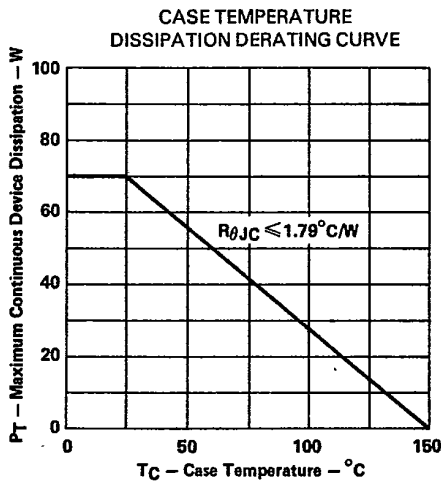
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THERMAL INFORMATION



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