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BD245C-S

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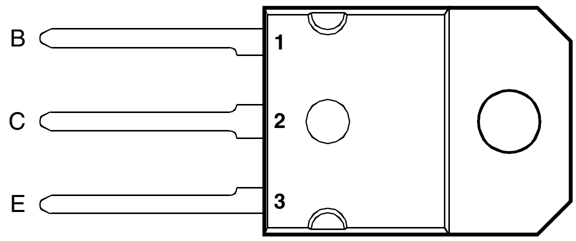
BD245, BD245A, BD245B, BD245C
NPN SILICON POWER TRANSISTORS

- Designed for Complementary Use with the BD246 Series
- 80 W at 25°C Case Temperature
- 10 A Continuous Collector Current
- 15 A Peak Collector Current
- Customer-Specified Selections Available

SOT-93 PACKAGE (TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDTRAAA

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

RATING		SYMBOL	VALUE	UNIT
Collector-emitter voltage (R_{BE} = 100 Ω)	BD245	V_{CER}	55	V
	BD245A		70	
	BD245B		90	
	BD245C		115	
Collector-emitter voltage (I_C = 30 mA)	BD245	V_{CEO}	45	V
	BD245A		60	
	BD245B		80	
	BD245C		100	
Emitter-base voltage		V_{EBO}	5	V
Continuous collector current		I_C	10	A
Peak collector current (see Note 1)		I_{CM}	15	A
Continuous base current		I_B	3	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		P_{tot}	80	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		P_{tot}	3	W
Unclamped inductive load energy (see Note 4)		$½LI_C^2$	62.5	mJ
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 ≤ 10%.
2. Derate linearly to 150°C case temperature at the rate of 0.64 W/°C.
3. Derate linearly to 150°C free air temperature at the rate of 24 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 Ω, $V_{BE(off)}$ = 0, R_S = 0.1 Ω, V_{CC} = 20 V.

BD245, BD245A, BD245B, BD245C
NPN SILICON POWER TRANSISTORS

BOURNS®

electrical characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C = 30 mA (see Note 5)	$I_B = 0$	BD245	45			V
				BD245A	60			
				BD245B	80			
				BD245C	100			
I_{CES}	Collector-emitter cut-off current	V_{CE} = 55 V	$V_{BE} = 0$	BD245			0.4	mA
		V_{CE} = 70 V	$V_{BE} = 0$	BD245A			0.4	
		V_{CE} = 90 V	$V_{BE} = 0$	BD245B			0.4	
		V_{CE} = 115 V	$V_{BE} = 0$	BD245C			0.4	
I_{CEO}	Collector cut-off current	V_{CE} = 30 V	$I_B = 0$	BD245/245A			0.7	mA
		V_{CE} = 60 V	$I_B = 0$	BD245B/245C			0.7	
I_{EBO}	Emitter cut-off current	V_{EB} = 5 V	$I_C = 0$				1	mA
h_{FE}	Forward current transfer ratio	V_{CE} = 4 V	I_C = 1 A	(see Notes 5 and 6)	40			
		V_{CE} = 4 V	I_C = 3 A		20			
		V_{CE} = 4 V	I_C = 10 A		4			
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = 0.3 A	I_C = 3 A	(see Notes 5 and 6)			1	V
		I_B = 2.5 A	I_C = 10 A				4	
V_{BE}	Base-emitter voltage	V_{CE} = 4 V	I_C = 3 A	(see Notes 5 and 6)			1.6	V
		V_{CE} = 4 V	I_C = 10 A				3	
h_{fe}	Small signal forward current transfer ratio	V_{CE} = 10 V	I_C = 0.5 A	f = 1 kHz	20			
$\|h_{fe}\|$	Small signal forward current transfer ratio	V_{CE} = 10 V	I_C = 0.5 A	f = 1 MHz	3			

NOTES: 5. These parameters must be measured using pulse techniques, t_p = 300 µs, duty cycle ≤ 2%.
6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

thermal characteristics

PARAMETER		MIN	TYP	MAX	UNIT
$R_{θJC}$	Junction to case thermal resistance			1.56	°C/W
$R_{θJA}$	Junction to free air thermal resistance			42	°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 = 1 A	$I_{B(on)}$ = 0.1 A	$I_{B(off)}$ = -0.1 A		0.3		µs
t_{off}	Turn-off time	$V_{BE(off)}$ = -3.7 V	R_L = 20 Ω	t_p = 20 µs, dc ≤ 2%		1		µs

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

TYPICAL CHARACTERISTICS

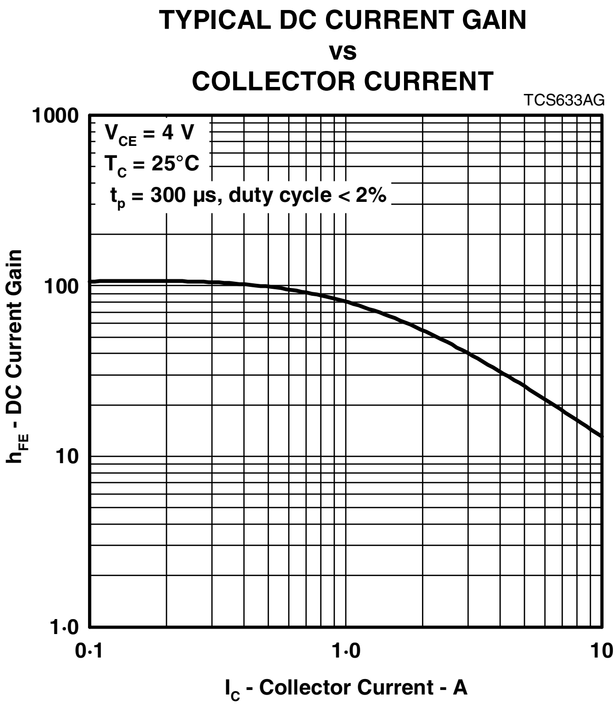


Figure 1.

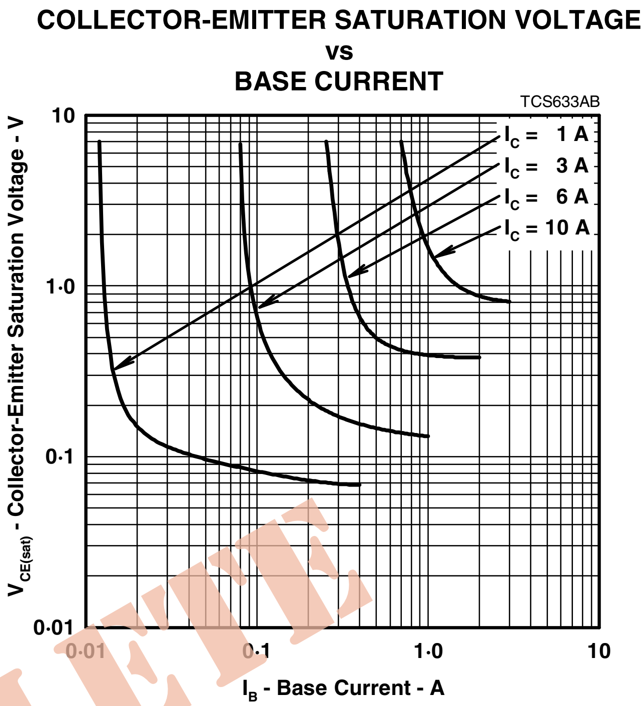


Figure 2.

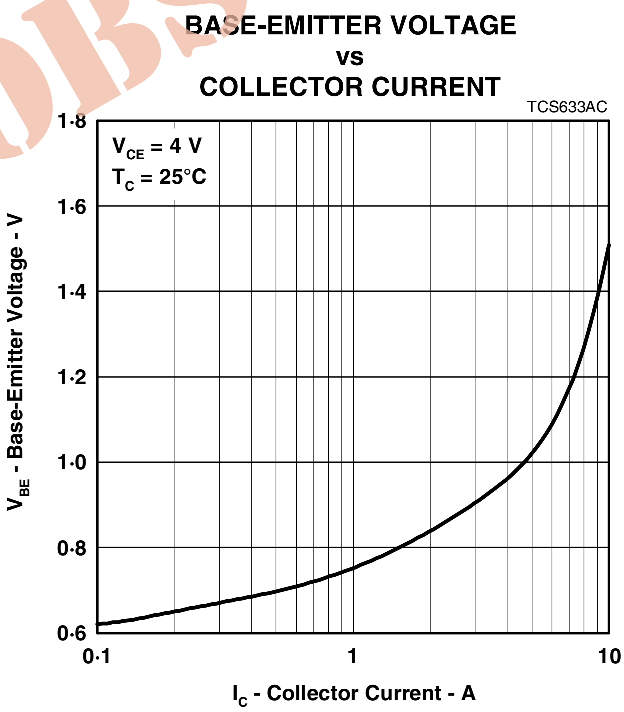


Figure 3.

MAXIMUM SAFE OPERATING REGIONS

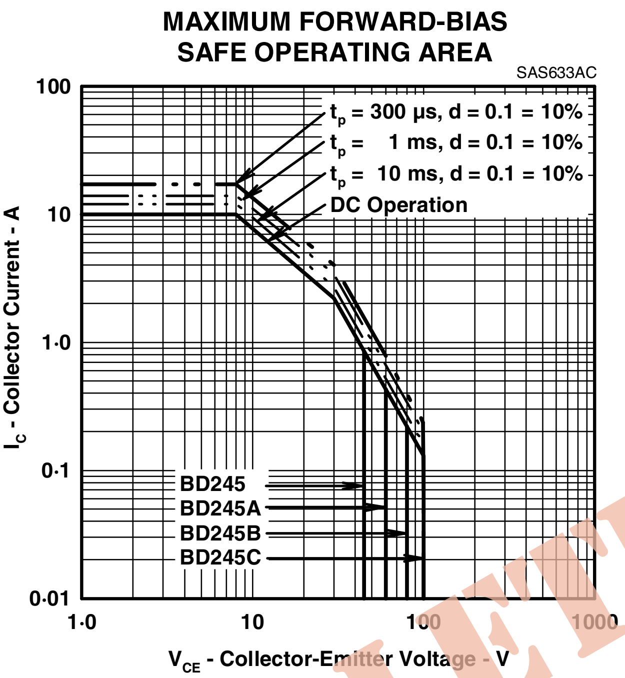


Figure 4.

THERMAL INFORMATION

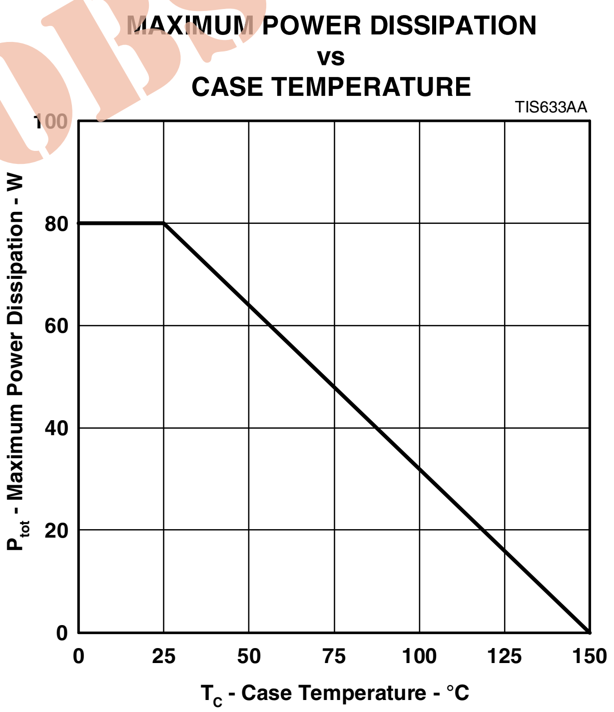


Figure 5.