# BD243, BD243A, BD243B, BD243C NPN SILICON POWER TRANSISTORS

# **BOURNS®**

 Designed for Complementary Use with the BD244 Series

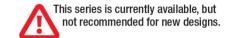
• 65 W at 25°C Case Temperature

■ 6 A Continuous Collector Current

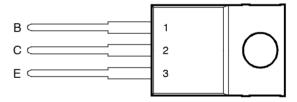
10 A Peak Collector Current

Customer-Specified Selections Available

 "-S" Suffix Added to Part Number Indicates RoHS Compliance\*



#### 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		
	BD243		55		
Collector-emitter voltage ( $R_{BE}$ = 100 $\Omega$ )	BD243A		70	v	
	BD243B	V <sub>CER</sub>	90	V	
	BD243C		115		
	BD243	5	45		
Collector-emitter voltage (I <sub>C</sub> = 30 mA)	BD243A	V	60	V	
	BD243B	$V_{CEO}$	80		
	BD243C		100		
Emitter-base voltage	$V_{EBO}$	5	V		
Continuous collector current	I <sub>C</sub>	6	Α		
Peak collector current (see Note 1)	I <sub>CM</sub>	10	Α		
Continuous base current	I <sub>B</sub>	3	Α		
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)	P <sub>tot</sub>	65	W		
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3	3)	P <sub>tot</sub>	2	W	
Unclamped inductive load energy (see Note 4)		½LI <sub>C</sub> <sup>2</sup>	62.5	mJ	
Operating junction temperature range		T <sub>j</sub>	-65 to +150	°C	
Storage temperature range		T <sub>stg</sub>	-65 to +150	°C	
Lead temperature 3.2 mm from case for 10 seconds		$T_L$	250	°C	

NOTES: 1. This value applies for  $t_p \le 0.3$  ms, duty cycle  $\le 10\%$ .

- 2. Derate linearly to 150°C case temperature at the rate of 0.52 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.

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.



# electrical characteristics at 25°C case temperature

	PARAMETER		TEST CONDITION	ONS	MIN	TYP	MAX	UNIT
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>C</sub> = 30 mA (see Note 5)	I <sub>B</sub> = 0	BD243 BD243A BD243B BD243C	45 60 80 100			V
I <sub>CES</sub>	Collector-emitter cut-off current	$V_{CE} = 55 \text{ V}$ $V_{CE} = 70 \text{ V}$ $V_{CE} = 90 \text{ V}$ $V_{CE} = 115 \text{ V}$	$V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$	BD243 BD243A BD243B BD243C			0.4 0.4 0.4 0.4	mA
I <sub>CEO</sub>	Collector cut-off current	V <sub>CE</sub> = 30 V V <sub>CE</sub> = 60 V	I <sub>B</sub> = 0 I <sub>B</sub> = 0	BD243/243A BD243B/243C			0.7 0.7	mA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> = 5 V	I <sub>C</sub> = 0				1	mA
h <sub>FE</sub>	Forward current transfer ratio	$V_{CE} = 4 V$ $V_{CE} = 4 V$	$I_{\rm C} = 0.3  {\rm A}$ $I_{\rm C} = 3  {\rm A}$	(see Notes 5 and 6)	30 15			
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	I <sub>B</sub> = 1 A	I <sub>C</sub> = 6 A	(see Notes 5 and 6)			1.5	٧
V <sub>BE</sub>	Base-emitter voltage	V <sub>CE</sub> = 4 V	I <sub>C</sub> = 6 A	(see Notes 5 and 6)			2	<b>V</b>
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = 10 V	I <sub>C</sub> = 0.5 A	f = 1 kHz	20			
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = 10 V	I <sub>C</sub> = 0.5 A	f = 1 MHz	3	-		

NOTES: 5. These parameters must be measured using pulse techniques, t<sub>0</sub> = 300 µs, duty cycle ≤ 2%.

# thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
R <sub>0JC</sub> Junction to case thermal resistance			1.92	°C/W
R <sub>0JA</sub> 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 <sub>on</sub>	Turn-on time	I <sub>C</sub> = 1 A	I <sub>B(on)</sub> = 0.1 A	$I_{B(off)} = -0.1 \text{ A}$		0.3		μs
t <sub>off</sub>	Turn-off time	$V_{BE(off)} = -3.7 \text{ V}$	$R_L = 20 \Omega$	$t_p = 20 \ \mu s, \ dc \le 2\%$		1		μs

<sup>&</sup>lt;sup>†</sup> Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

<sup>6.</sup> These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

# **TYPICAL CHARACTERISTICS**

# TYPICAL DC CURRENT GAIN VS COLLECTOR CURRENT $V_{CE} = 4 V$ $V_{CE} = 25^{\circ}C$ $V_{p} = 300 \ \mu s, \ duty \ cycle < 2\%$ 100 1-0 1-0 1-0 10

# Figure 1.

I<sub>c</sub> - Collector Current - A

#### **COLLECTOR-EMITTER SATURATION VOLTAGE**

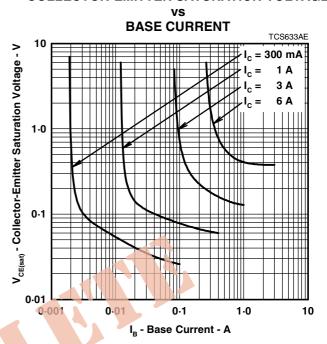
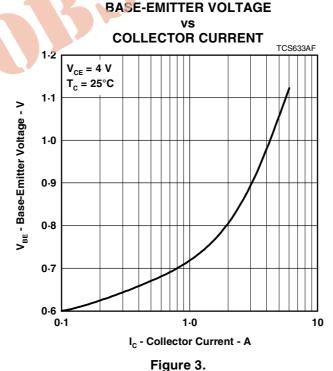
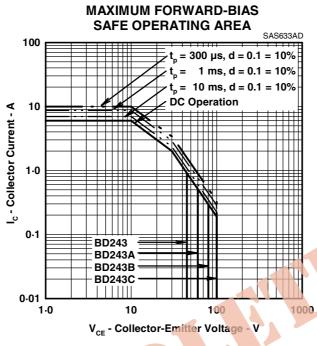


Figure 2.



## PRODUCT INFORMATION

# **MAXIMUM SAFE OPERATING REGIONS**



# Figure 4.

# THERMAL INFORMATION

## MAXIMUM POWER DISSIPATION

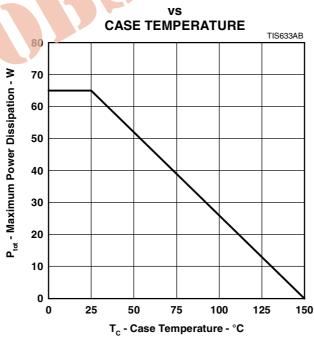


Figure 5.