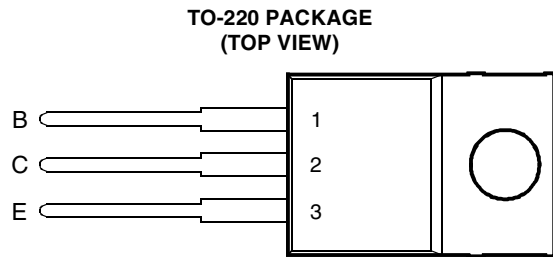


- Designed for Complementary Use with BDX34, BDX34A, BDX34B, BDX34C and BDX34D
- 70 W at 25°C Case Temperature
- 10 A Continuous Collector Current
- Minimum h_{FE} of 750 at 3V, 3 A



Pin 2 is in electrical contact with the mounting base.

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ($I_E = 0$)	BDX33	V_{CBO}	45	V
	BDX33A		60	
	BDX33B		80	
	BDX33C		100	
	BDX33D		120	
Collector-emitter voltage ($I_B = 0$)	BDX33	V_{CEO}	45	V
	BDX33A		60	
	BDX33B		80	
	BDX33C		100	
	BDX33D		120	
Emitter-base voltage		V_{EBO}	5	V
Continuous collector current		I_C	10	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_J	-65 to +150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Operating free-air temperature range		T_A	-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

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)	BDX33	45		V
				BDX33A	60		
				BDX33B	80		
				BDX33C	100		
				BDX33D	120		
I_{CEO} Collector-emitter cut-off current	$V_{CE} = 30 \text{ V}$	$I_B = 0$		BDX33		0.5	mA
	$V_{CE} = 30 \text{ V}$	$I_B = 0$		BDX33A		0.5	
	$V_{CE} = 40 \text{ V}$	$I_B = 0$		BDX33B		0.5	
	$V_{CE} = 50 \text{ V}$	$I_B = 0$		BDX33C		0.5	
	$V_{CE} = 60 \text{ V}$	$I_B = 0$		BDX33D		0.5	
	$V_{CE} = 30 \text{ V}$	$I_B = 0$	$T_C = 100^\circ\text{C}$	BDX33		10	
	$V_{CE} = 30 \text{ V}$	$I_B = 0$	$T_C = 100^\circ\text{C}$	BDX33A		10	
	$V_{CE} = 40 \text{ V}$	$I_B = 0$	$T_C = 100^\circ\text{C}$	BDX33B		10	
	$V_{CE} = 50 \text{ V}$	$I_B = 0$	$T_C = 100^\circ\text{C}$	BDX33C		10	
	$V_{CE} = 60 \text{ V}$	$I_B = 0$	$T_C = 100^\circ\text{C}$	BDX33D		10	
I_{CBO} Collector cut-off current	$V_{CB} = 45 \text{ V}$	$I_E = 0$		BDX33		1	mA
	$V_{CB} = 60 \text{ V}$	$I_E = 0$		BDX33A		1	
	$V_{CB} = 80 \text{ V}$	$I_E = 0$		BDX33B		1	
	$V_{CB} = 100 \text{ V}$	$I_E = 0$		BDX33C		1	
	$V_{CB} = 120 \text{ V}$	$I_E = 0$		BDX33D		1	
	$V_{CB} = 45 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BDX33		5	
	$V_{CB} = 60 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BDX33A		5	
	$V_{CB} = 80 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BDX33B		5	
	$V_{CB} = 100 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BDX33C		5	
	$V_{CB} = 120 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BDX33D		5	
I_{EBO} Emitter cut-off current	$V_{EB} = 5 \text{ V}$	$I_C = 0$				10	mA
h_{FE} Forward current transfer ratio	$V_{CE} = 3 \text{ V}$	$I_C = 4 \text{ A}$		BDX33	750		
	$V_{CE} = 3 \text{ V}$	$I_C = 4 \text{ A}$		BDX33A	750		
	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$	(see Notes 3 and 4)	BDX33B	750		
	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$		BDX33C	750		
	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$		BDX33D	750		
$V_{BE(on)}$ Base-emitter voltage	$V_{CE} = 3 \text{ V}$	$I_C = 4 \text{ A}$		BDX33		2.5	V
	$V_{CE} = 3 \text{ V}$	$I_C = 4 \text{ A}$		BDX33A		2.5	
	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$	(see Notes 3 and 4)	BDX33B		2.5	
	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$		BDX33C		2.5	
	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$		BDX33D		2.5	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 8 \text{ mA}$	$I_C = 4 \text{ A}$		BDX33		2.5	V
	$I_B = 8 \text{ mA}$	$I_C = 4 \text{ A}$		BDX33A		2.5	
	$I_B = 6 \text{ mA}$	$I_C = 3 \text{ A}$	(see Notes 3 and 4)	BDX33B		2.5	
	$I_B = 6 \text{ mA}$	$I_C = 3 \text{ A}$		BDX33C		2.5	
	$I_B = 6 \text{ mA}$	$I_C = 3 \text{ A}$		BDX33D		2.5	
V_{EC} Parallel diode forward voltage	$I_E = 8 \text{ A}$	$I_B = 0$				4	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.

PRODUCT INFORMATION

**thermal characteristics**

PARAMETER		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to case thermal resistance			1.78	°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		μs
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		μs

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

PRODUCT INFORMATION

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TYPICAL CHARACTERISTICS

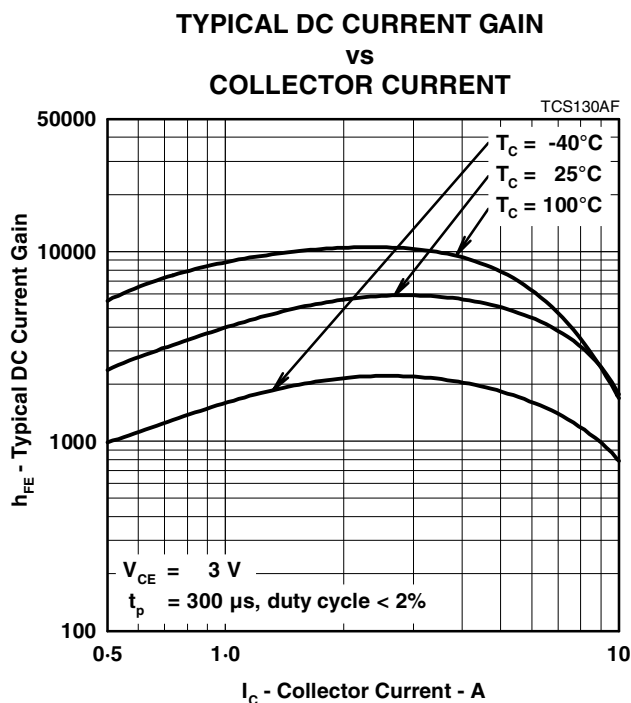


Figure 1.

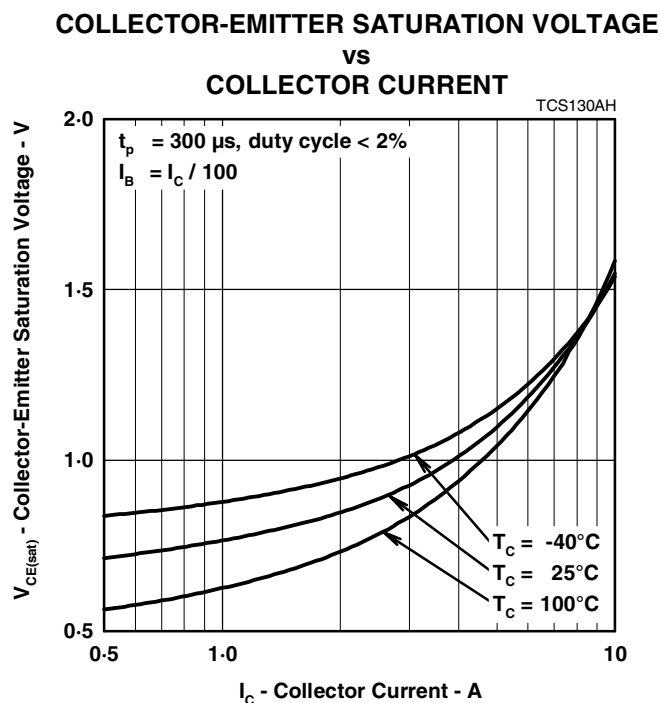


Figure 2.

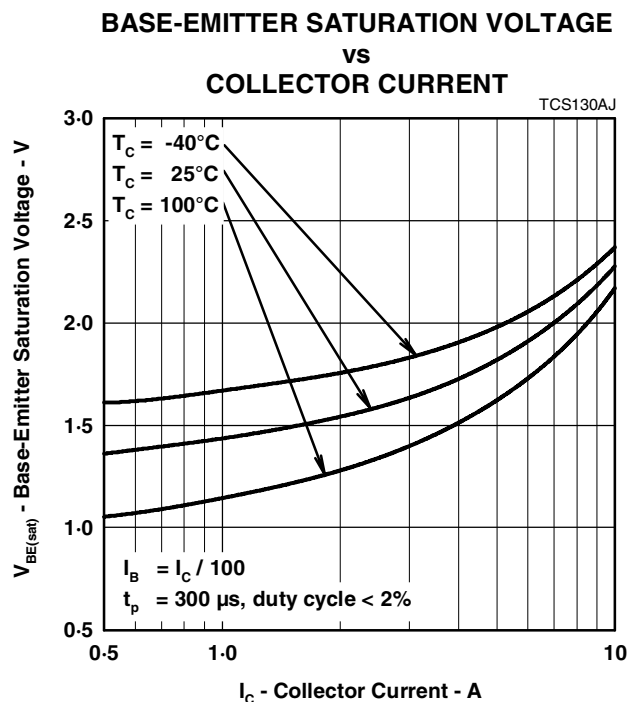


Figure 3.

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THERMAL INFORMATION

**MAXIMUM POWER DISSIPATION
vs
CASE TEMPERATURE**

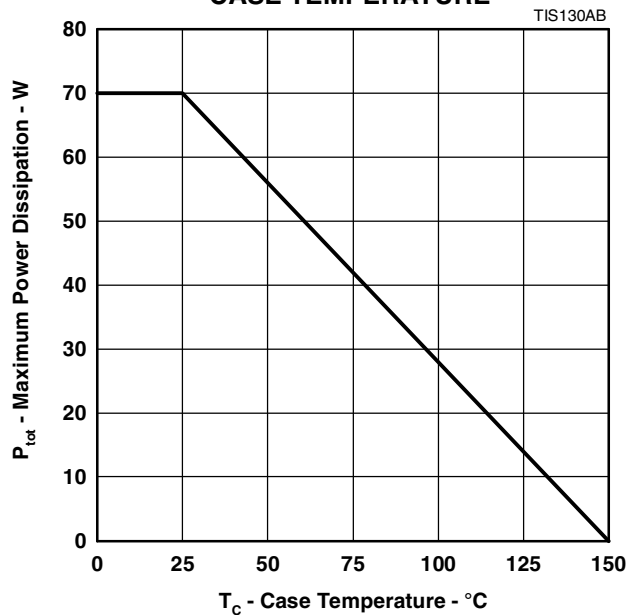


Figure 4.

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