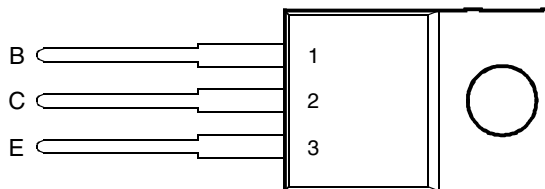




- Designed for Complementary Use with BDX33, BDX33A, BDX33B, BDX33C and BDX33D
- 70 W at 25°C Case Temperature
- 10 A Continuous Collector Current
- Minimum  $h_{FE}$  of 750 at 3V, 3 A

TO-220 PACKAGE  
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDTRACA



This series is currently available, but not recommended for new designs.

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ( $I_E = 0$ )	BDX34	$V_{CBO}$	-45	V
	BDX34A		-60	
	BDX34B		-80	
	BDX34C		-100	
	BDX34D		-120	
Collector-emitter voltage ( $I_B = 0$ )	BDX34	$V_{CEO}$	-45	V
	BDX34A		-60	
	BDX34B		-80	
	BDX34C		-100	
	BDX34D		-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)	BDX34	-45		V
				BDX34A	-60		
				BDX34B	-80		
				BDX34C	-100		
				BDX34D	-120		
$I_{CEO}$ Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$	$I_B = 0$	$T_C = 100^\circ\text{C}$	BDX34		-0.5	mA
				BDX34A		-0.5	
				BDX34B		-0.5	
				BDX34C		-0.5	
				BDX34D		-0.5	
				BDX34		-10	
				BDX34A		-10	
				BDX34B		-10	
				BDX34C		-10	
				BDX34D		-10	
$I_{CBO}$ Collector cut-off current	$V_{CB} = -45 \text{ V}$	$I_E = 0$	$T_C = 100^\circ\text{C}$	BDX34		-1	mA
				BDX34A		-1	
				BDX34B		-1	
				BDX34C		-1	
				BDX34D		-1	
				BDX34		-5	
				BDX34A		-5	
				BDX34B		-5	
				BDX34C		-5	
				BDX34D		-5	
$I_{EBO}$ Emitter cut-off current	$V_{EB} = -5 \text{ V}$	$I_C = 0$				-10	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = -3 \text{ V}$	$I_C = -4 \text{ A}$	(see Notes 3 and 4)	BDX34	750		
				BDX34A	750		
				BDX34B	750		
				BDX34C	750		
				BDX34D	750		
$V_{BE(on)}$ Base-emitter voltage	$V_{CE} = -3 \text{ V}$	$I_C = -4 \text{ A}$	(see Notes 3 and 4)	BDX34		-2.5	V
				BDX34A		-2.5	
				BDX34B		-2.5	
				BDX34C		-2.5	
				BDX34D		-2.5	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -8 \text{ mA}$	$I_C = -4 \text{ A}$	(see Notes 3 and 4)	BDX34		-2.5	V
				BDX34A		-2.5	
				BDX34B		-2.5	
				BDX34C		-2.5	
				BDX34D		-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	$I_C = -3$ A	$I_{B(on)} = -12$ mA	$I_{B(off)} = 12$ mA		1		μs
$t_{off}$ Turn-off time	$V_{BE(off)} = 3.5$ V	$R_L = 10$ Ω	$t_p = 20$ μs, dc ≤ 2%		5		μs

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

**PRODUCT INFORMATION**

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

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN  
VS  
COLLECTOR CURRENT

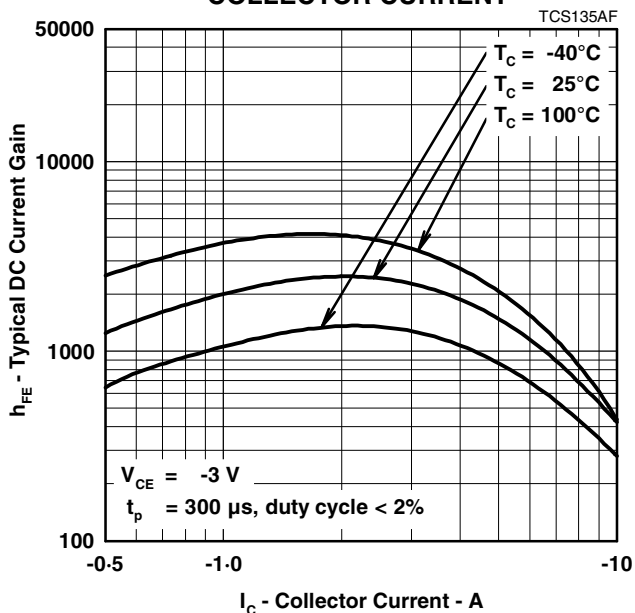


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT

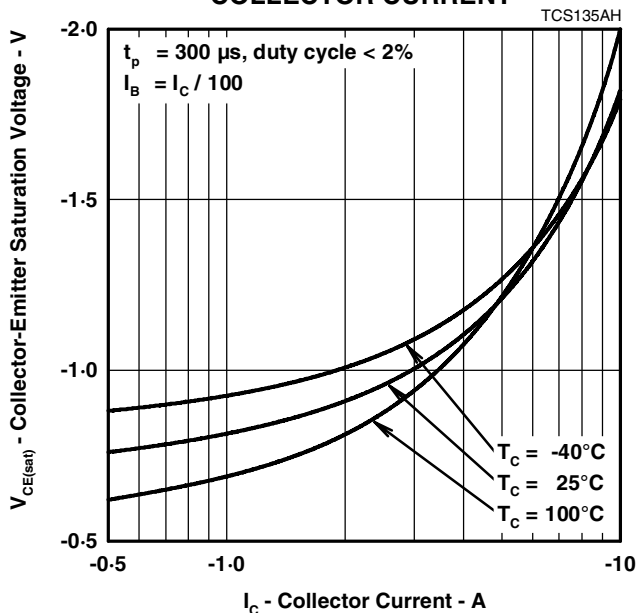


Figure 2.

BASE-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT

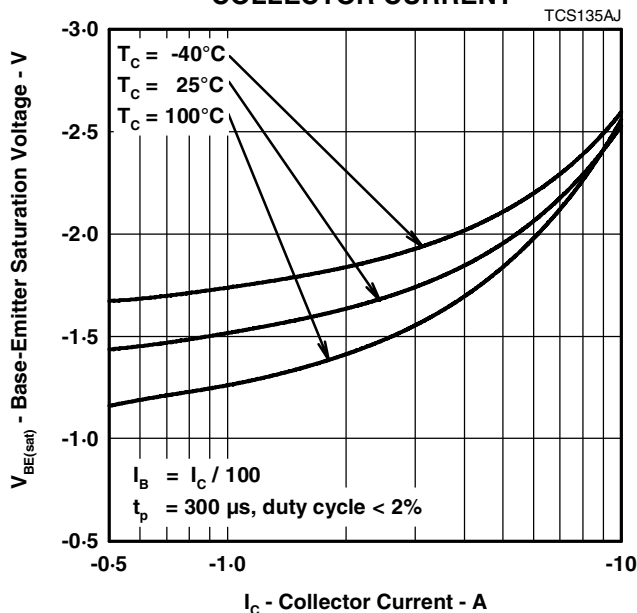
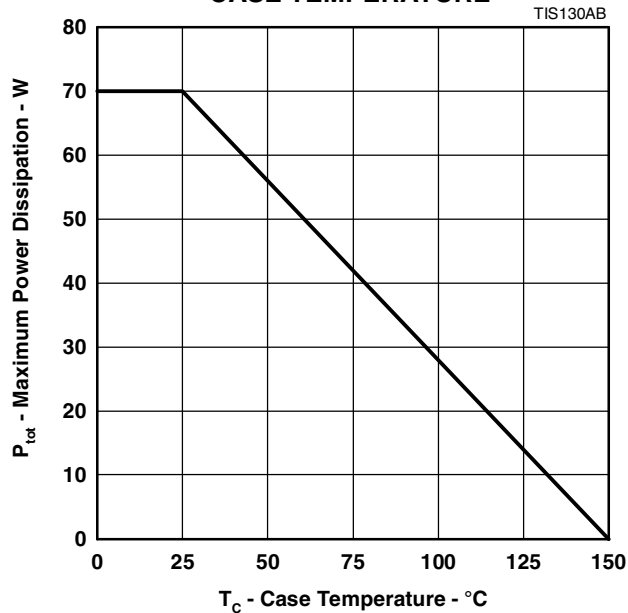


Figure 3.

**PRODUCT INFORMATION**

**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
vs  
CASE TEMPERATURE**



**Figure 4.**

**PRODUCT INFORMATION**