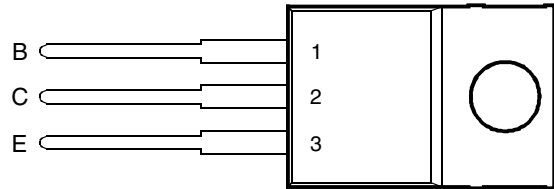




- Designed for Complementary Use with BDX53, BDX53A, BDX53B and BDX53C
- 60 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Minimum  $h_{FE}$  of 750 at 3V, 3 A

TO-220 PACKAGE  
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ( $I_E = 0$ )	BDX54	$V_{CBO}$	-45	V
	BDX54A		-60	
	BDX54B		-80	
	BDX54C		-100	
Collector-emitter voltage ( $I_B = 0$ )	BDX54	$V_{CEO}$	-45	V
	BDX54A		-60	
	BDX54B		-80	
	BDX54C		-100	
Emitter-base voltage		$V_{EBO}$	-5	V
Continuous collector current		$I_C$	-8	A
Continuous base current		$I_B$	-0.2	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 1)		$P_{tot}$	60	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 2)		$P_{tot}$	2	W
Operating junction temperature range		$T_j$	-65 to +150	°C
Operating 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 0.48 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)	BDX54 BDX54A BDX54B BDX54C	-45 -60 -80 -100		V
$I_{CEO}$ Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -40 \text{ V}$ $I_B = 0$ $V_{CE} = -50 \text{ V}$ $I_B = 0$	BDX54 BDX54A BDX54B BDX54C		-0.5 -0.5 -0.5 -0.5	mA
$I_{CBO}$ Collector cut-off current	$V_{CB} = -45 \text{ V}$ $I_E = 0$ $V_{CB} = -60 \text{ V}$ $I_E = 0$ $V_{CB} = -80 \text{ V}$ $I_E = 0$ $V_{CB} = -100 \text{ V}$ $I_E = 0$	BDX54 BDX54A BDX54B BDX54C		-0.2 -0.2 -0.2 -0.2	mA
$I_{EBO}$ Emitter cut-off current	$V_{EB} = -5 \text{ V}$ $I_C = 0$			-2	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = -3 \text{ V}$ $I_C = -3 \text{ A}$ (see Notes 3 and 4)	750			
$V_{BE(sat)}$ Base-emitter saturation voltage	$I_B = -12 \text{ mA}$ $I_C = -3 \text{ A}$ (see Notes 3 and 4)			-2.5	V
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -12 \text{ mA}$ $I_C = -3 \text{ A}$ (see Notes 3 and 4)			-2	V
$V_{EC}$ Parallel diode forward voltage	$I_E = -3 \text{ A}$ $I_B = 0$			-2.5	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.

**thermal characteristics**

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$ Junction to case thermal resistance			2.08	°C/W
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	°C/W

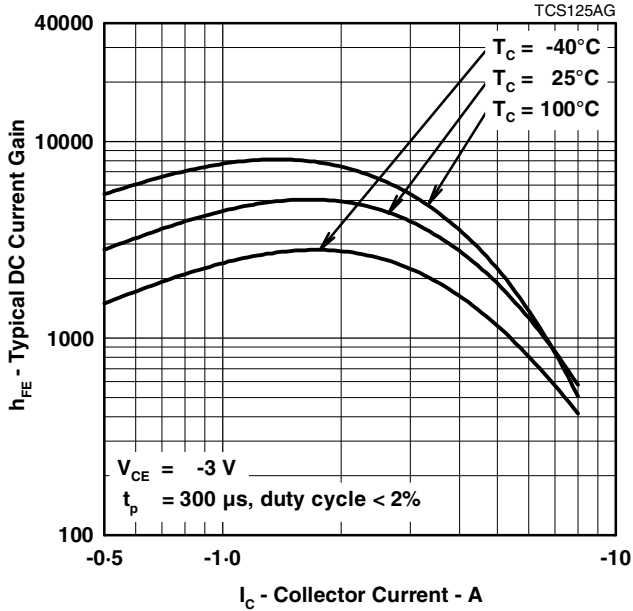
**resistive-load-switching characteristics at 25°C case temperature**

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		$\mu\text{s}$
$t_{off}$ Turn-off time	$V_{BE(off)} = 4.2 \text{ V}$ $R_L = 10 \Omega$ $t_p = 20 \mu\text{s}$ , dc $\leq 2\%$		5		$\mu\text{s}$

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

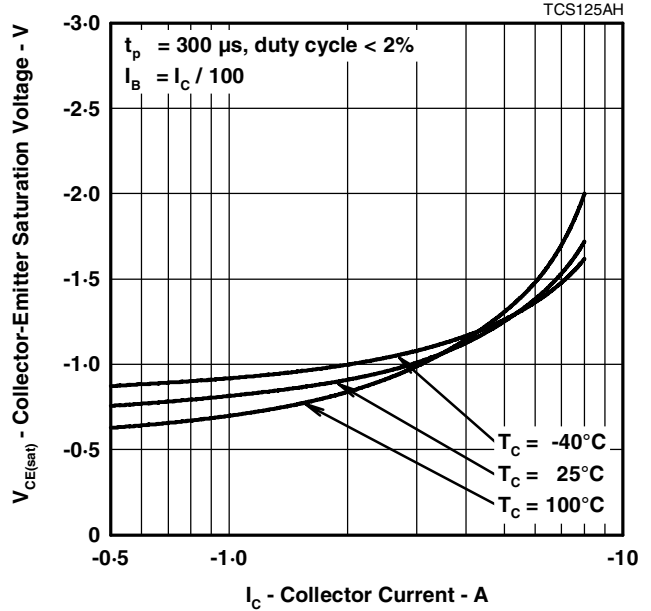
**TYPICAL CHARACTERISTICS**

**TYPICAL DC CURRENT GAIN  
VS  
COLLECTOR CURRENT**



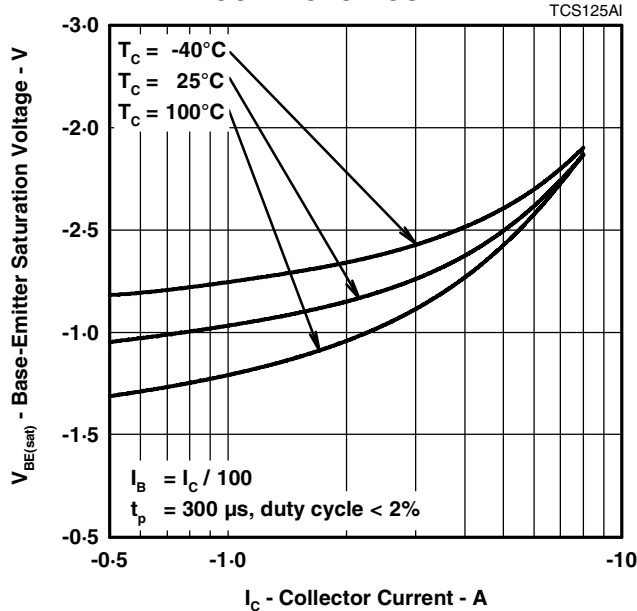
**Figure 1.**

**COLLECTOR-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT**



**Figure 2.**

**BASE-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT**



**Figure 3.**

**PRODUCT INFORMATION**

**MAXIMUM SAFE OPERATING REGIONS**

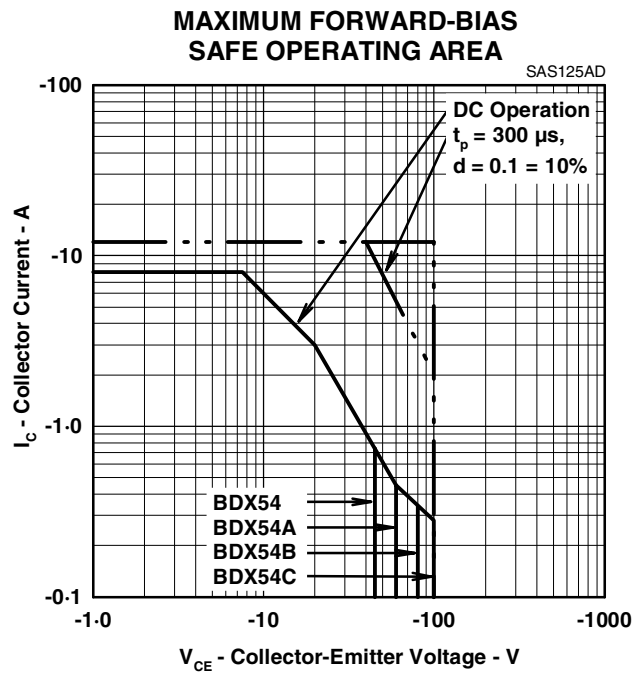


Figure 4.

**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
vs  
CASE TEMPERATURE**

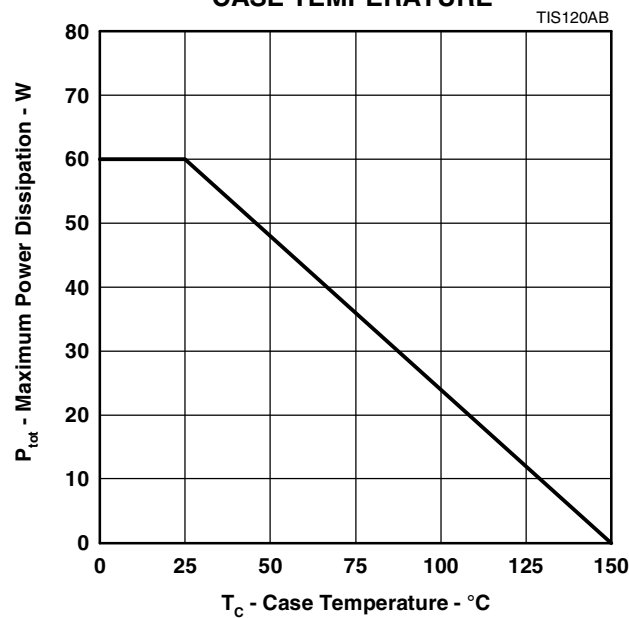


Figure 5.

**PRODUCT INFORMATION**