

- Designed for Complementary Use with BDX53, BDX53A, BDX53B and BDX53C
- 60 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Minimum h<sub>FE</sub> of 750 at 3V, 3 A

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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		
	BDX54		-45		
Collector-base voltage (I <sub>E</sub> = 0)	BDX54A	W	-60	V	
	BDX54B	V <sub>CBO</sub>	-80	V	
	BDX54C		-100		
	BDX54		-45		
Collector-emitter voltage (I <sub>B</sub> = 0)	BDX54A	W	-60	V	
	BDX54B	V <sub>CEO</sub>	-80		
	BDX54C		-100		
Emitter-base voltage	V <sub>EBO</sub>	-5	V		
Continuous collector current	I <sub>C</sub>	-8	Α		
Continuous base current	I <sub>B</sub>	-0.2	Α		
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	P <sub>tot</sub>	2	W		
Operating junction temperature range	T <sub>j</sub>	-65 to +150	°C		
Operating temperature range	T <sub>stg</sub>	-65 to +150	°C		
Operating free-air temperature range	T <sub>A</sub>	-65 to +150	°C		

NOTES: 1. Derate linearly to 150°C case temperature at the rate of 0.48 W/°C.

<sup>2.</sup> Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.



### electrical characteristics at 25°C case temperature (unless otherwise noted)

	PARAMETER		TEST	CONDITIONS		MIN	TYP	MAX	UNIT
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>C</sub> = -100 mA	I <sub>B</sub> = 0	(see Note 3)	BDX54 BDX54A BDX54B BDX54C	-45 -60 -80 -100			V
I <sub>CEO</sub>	Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$ $V_{CE} = -30 \text{ V}$ $V_{CE} = -40 \text{ V}$ $V_{CE} = -50 \text{ V}$	$I_{B} = 0$ $I_{B} = 0$ $I_{B} = 0$ $I_{B} = 0$		BDX54 BDX54A BDX54B BDX54C			-0.5 -0.5 -0.5 -0.5	mA
I <sub>CBO</sub>	Collector cut-off current	$V_{CB} = -45 \text{ V}$ $V_{CB} = -60 \text{ V}$ $V_{CB} = -80 \text{ V}$ $V_{CB} = -100 \text{ V}$	$I_{E} = 0$ $I_{E} = 0$ $I_{E} = 0$ $I_{E} = 0$		BDX54 BDX54A BDX54B BDX54C			-0.2 -0.2 -0.2 -0.2	mA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> = -5 V	I <sub>C</sub> = 0					-2	mA
h <sub>FE</sub>	Forward current transfer ratio	V <sub>CE</sub> = -3 V	I <sub>C</sub> = -3 A	(see Notes 3 and 4)		750			
V <sub>BE(sat)</sub>	Base-emitter saturation voltage	I <sub>B</sub> = -12 mA	I <sub>C</sub> = -3 A	(see Notes 3 and 4)				-2.5	V
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	I <sub>B</sub> = -12 mA	I <sub>C</sub> = -3 A	(see Notes 3 and 4)				-2	V
V <sub>EC</sub>	Parallel diode forward voltage	I <sub>E</sub> = -3 A	I <sub>B</sub> = 0					-2.5	V

NOTES: 3. These parameters must be measured using pulse techniques,  $t_p$  = 300  $\mu$ s, duty cycle  $\leq$  2%.

#### thermal characteristics

PARAMETER			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

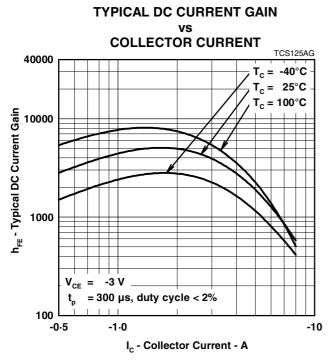
#### resistive-load-switching characteristics at 25°C case temperature

	PARAMETER	TEST CONDITIONS †				TYP	MAX	UNIT
t <sub>on</sub>	Turn-on time	I <sub>C</sub> = -3 A	$I_{B(on)} = -12 \text{ mA}$	$I_{B(off)} = 12 \text{ mA}$		1		μs
t <sub>off</sub>	Turn-off time	$V_{BE(off)} = 4.2 V$	$R_L = 10 \Omega$	$t_p=20~\mu s,~dc \leq 2\%$		5		μs

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

<sup>4.</sup> These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

#### **TYPICAL CHARACTERISTICS**



## COLLECTOR-EMITTER SATURATION VOLTAGE

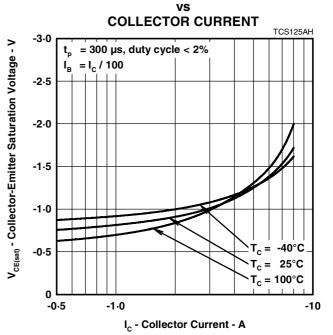
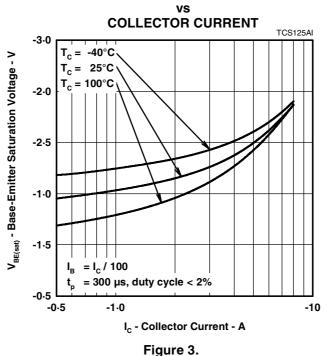


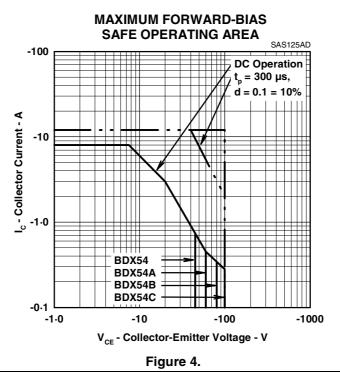
Figure 1.

Figure 2.

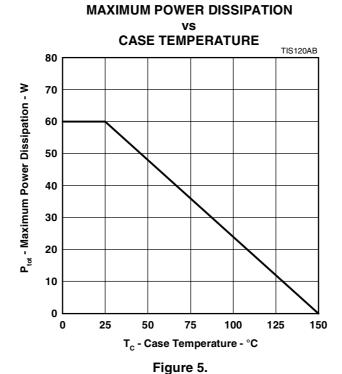
#### **BASE-EMITTER SATURATION VOLTAGE**



#### **MAXIMUM SAFE OPERATING REGIONS**



## THERMAL INFORMATION



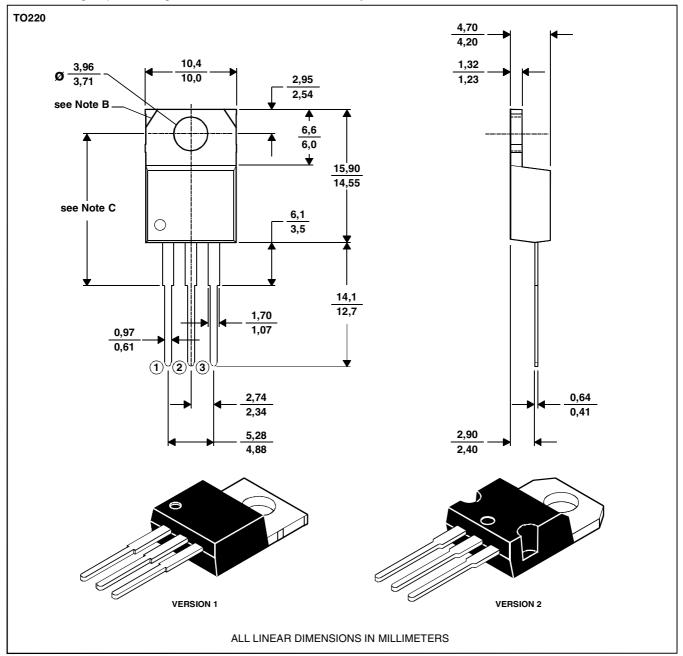
PRODUCT INFORMATION

#### **MECHANICAL DATA**

#### TO-220

### 3-pin plastic flange-mount package

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.



NOTES: A. The centre pin is in electrical contact with the mounting tab.

- B. Mounting  $\dot{\text{ab}}$  corner profile according to package version.
- C. Typical fixing hole centre stand off height according to package version.

Version 1, 18.0 mm. Version 2, 17.6 mm.

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