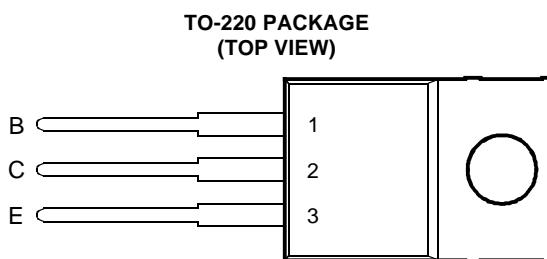


BDX53, BDX53A, BDX53B, BDX53C NPN SILICON POWER DARLINGTONS

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- Designed for Complementary Use with BDX54, BDX54A, BDX54B and BDX54C
- 60 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Minimum h_{FE} of 750 at 3 V, 3 A



MDTRACA

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ($I_E = 0$)	BDX53	V_{CBO}	45	V
	BDX53A		60	
	BDX53B		80	
	BDX53C		100	
Collector-emitter voltage ($I_B = 0$)	BDX53	V_{CEO}	45	V
	BDX53A		60	
	BDX53B		80	
	BDX53C		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

Information is current as of publication date. Products conform to specifications in accordance with the terms of Power Innovations standard warranty. Production processing does not necessarily include testing of all parameters.

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BDX53, BDX53A, BDX53B, BDX53C NPN SILICON POWER DARLINGTONS

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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)	BDX53 BDX53A BDX53B BDX53C	45 60 80 100		V
I_{CEO}	Collector-emitter cut-off current	$V_{CE} = 30 \text{ V}$	$I_B = 0$		BDX53		0.5	
		$V_{CE} = 30 \text{ V}$	$I_B = 0$		BDX53A		0.5	mA
		$V_{CE} = 40 \text{ V}$	$I_B = 0$		BDX53B		0.5	
		$V_{CE} = 50 \text{ V}$	$I_B = 0$		BDX53C		0.5	
I_{CBO}	Collector cut-off current	$V_{CB} = 45 \text{ V}$	$I_E = 0$		BDX53		0.2	
		$V_{CB} = 60 \text{ V}$	$I_E = 0$		BDX53A		0.2	mA
		$V_{CB} = 80 \text{ V}$	$I_E = 0$		BDX53B		0.2	
		$V_{CB} = 100 \text{ V}$	$I_E = 0$		BDX53C		0.2	
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
$R_{\theta JC}$				2.08 °C/W
$R_{\theta JA}$				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	$V_{BE(off)} = -4.5 \text{ V}$	$R_L = 10 \Omega$	$t_p = 20 \mu\text{s}$, dc $\leq 2\%$		5		μs

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

TYPICAL CHARACTERISTICS

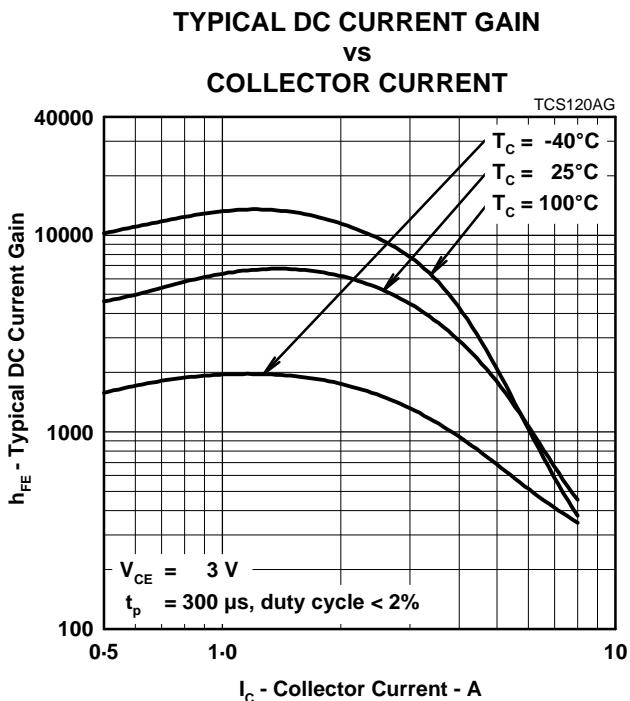


Figure 1.

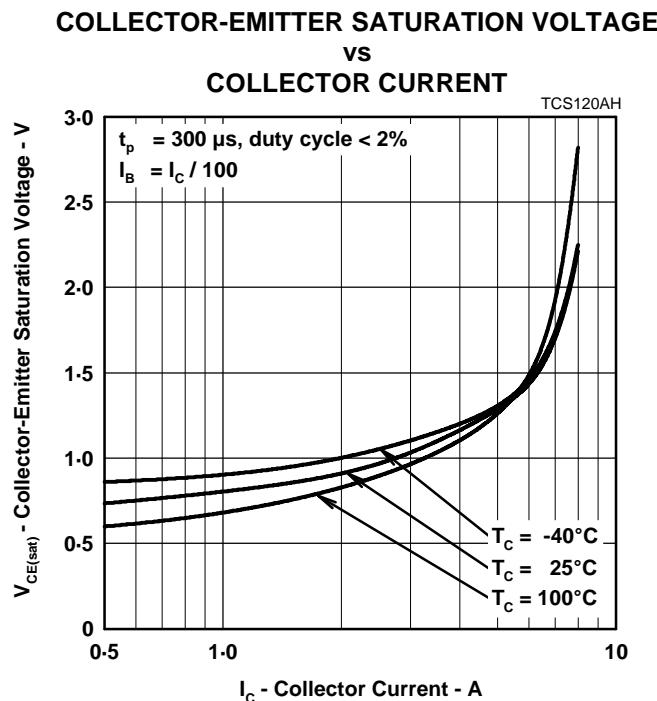


Figure 2.

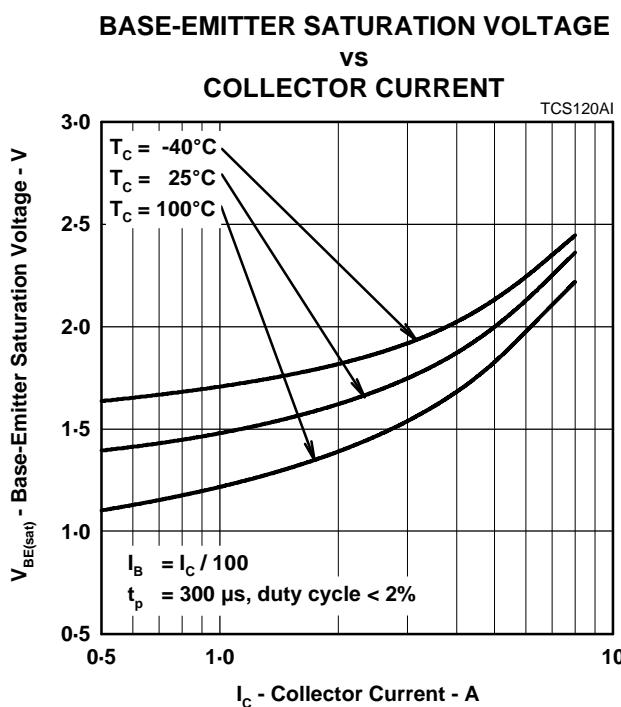


Figure 3.

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MAXIMUM SAFE OPERATING REGIONS

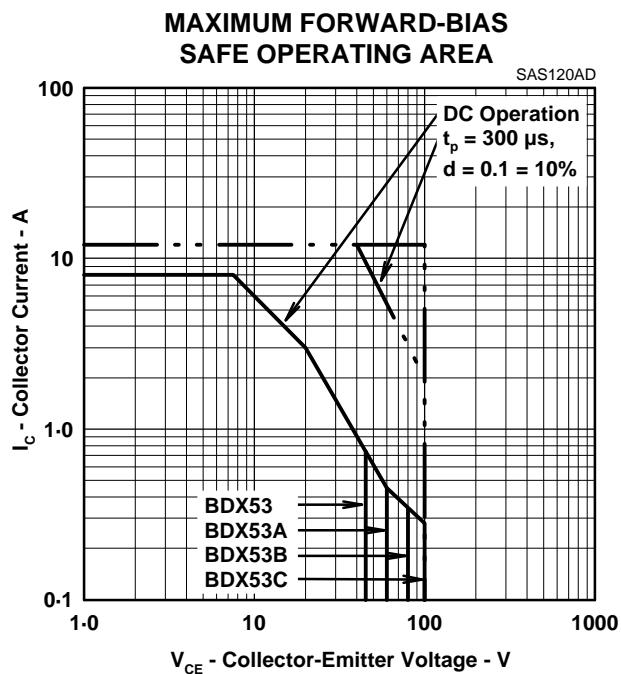


Figure 4.

THERMAL INFORMATION

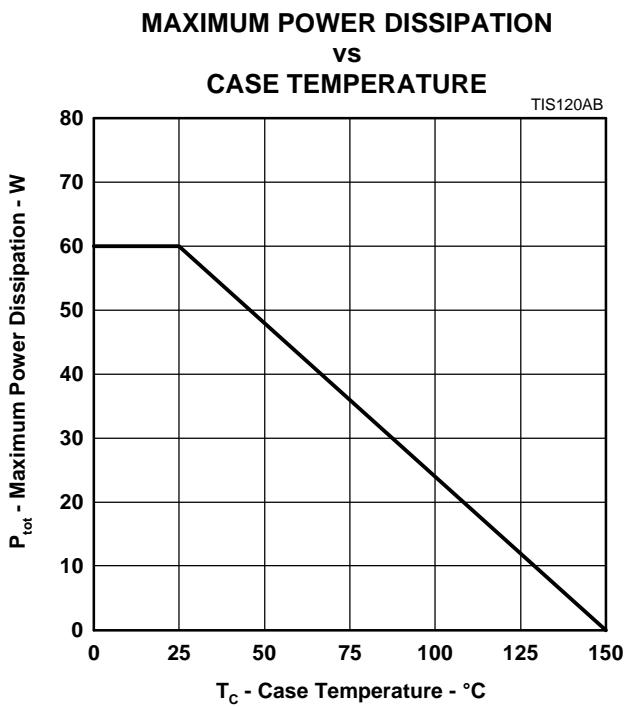


Figure 5.

PRODUCT INFORMATION

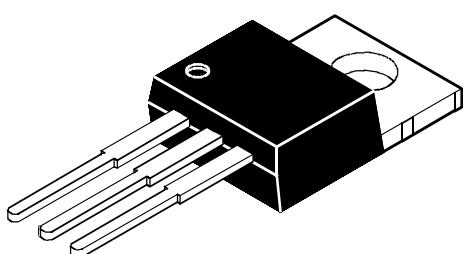
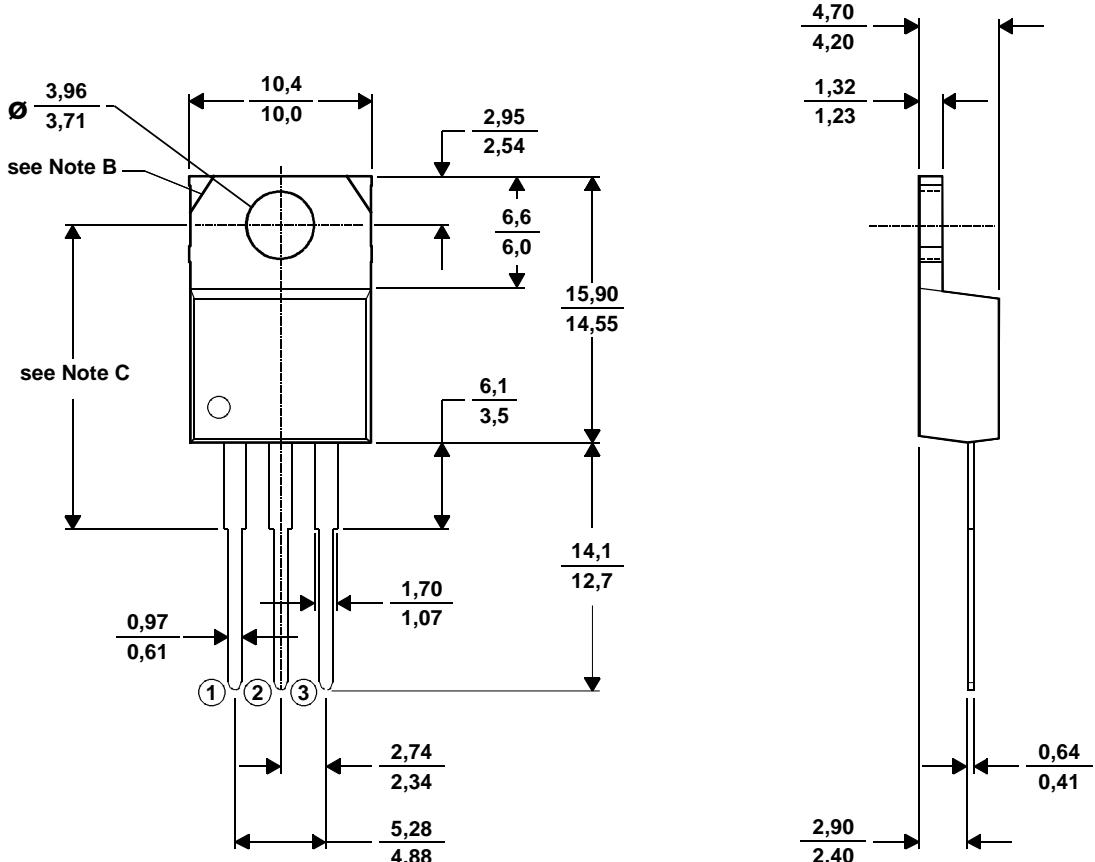
MECHANICAL DATA

TO-220

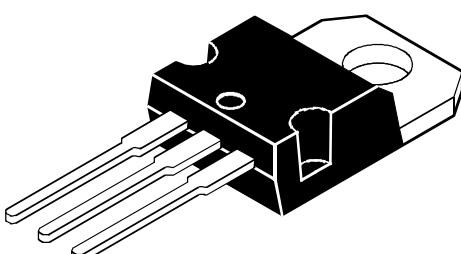
3-pin plastic flange-mount package

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.

TO220



VERSION 1



VERSION 2

ALL LINEAR DIMENSIONS IN MILLIMETERS

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

MDXXBE

BDX53, BDX53A, BDX53B, BDX53C NPN SILICON POWER DARLINGTONS

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