

BDX 53
BDX 53A
BDX 53B
BDX 53C

SILICON EPITAXIAL-BASE NPN

PRELIMINARY DATA

POWER DARLINGTONS

The BDX 53, BDX 53A, BDX 53B and BDX 53C are silicon epitaxial-base NPN transistors in monolithic Darlington configuration in Jedec TO-220 A plastic package, intended for use in hammer drivers, audio amplifiers and other medium power linear and switching applications.

The complementary PNP types are respectively the BDX 54, BDX 54A, BDX 54B and BDX 54C.

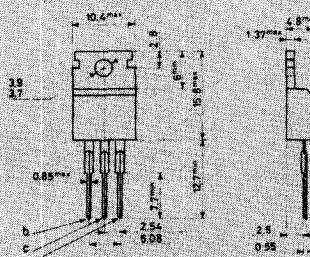
ABSOLUTE MAXIMUM RATINGS

		BDX 53	BDX 53A	BDX 53B	BDX 53C
V_{CBO}	Collector-base voltage ($I_E = 0$)	45 V	60 V	80 V	100 V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	45 V	60 V	80 V	100 V
V_{EBO}	Emitter-base voltage ($I_C = 0$)		5 V		
I_C	Collector current			8 A	
I_{CM}	Collector peak current (repetitive)			12 A	
I_B	Base current			0.2 A	
P_{tot}	Total power dissipation at $T_{case} \leq 25^\circ\text{C}$			60 W	
T_{stg}	Storage temperature			-55 to 150 °C	
T_J	Junction temperature			150 °C	

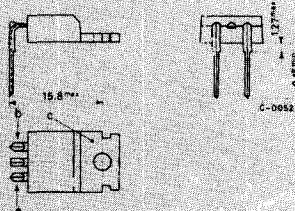
MECHANICAL DATA

Dimensions in mm

Collector connected to tab



TO-220 AB



TO-220 AA

BDX 53
BDX 53A
BDX 53B
BDX 53C

THERMAL DATA

$R_{th\ j-case}$	Thermal resistance junction-case	max 2.08	$^{\circ}\text{C}/\text{W}$
$R_{th\ j-amb}$	Thermal resistance junction-ambient	max 70	$^{\circ}\text{C}/\text{W}$

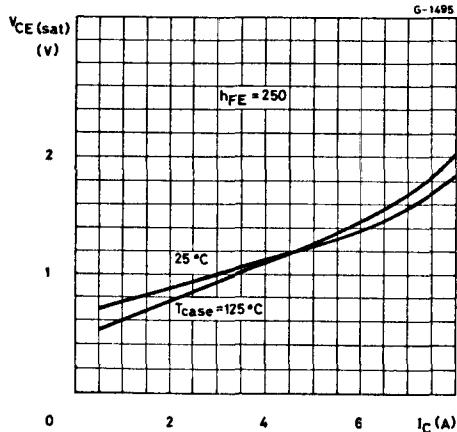
ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Test conditions	Min.	Typ.	Max.	Unit	
I_{CEO}	Collector cutoff current ($I_E = 0$)	for BDX 53 for BDX 53A for BDX 53B for BDX 53C	$V_{CB} = 45\text{V}$ $V_{CB} = 60\text{V}$ $V_{CB} = 80\text{V}$ $V_{CB} = 100\text{V}$	200 200 200 200	μA μA μA μA	
I_{CEO}	Collector cutoff current ($I_B = 0$)	for BDX 53 for BDX 53A for BDX 53B for BDX 53C	$V_{CE} = 22\text{V}$ $V_{CE} = 30\text{V}$ $V_{CE} = 40\text{V}$ $V_{CE} = 50\text{V}$	500 500 500 500	μA μA μA μA	
I_{EBO}	Emitter cutoff current ($I_C = 0$)		$V_{EB} = 5\text{V}$		2 mA	
$V_{CEO(sus)}$ *	Collector-emitter sustaining voltage ($I_B = 0$)		$I_C = 100\text{ mA}$	for BDX 53 for BDX 53A for BDX 53B for BDX 53C	45 60 80 100	V
$V_{CE(sat)}$ *	Collector-emitter saturation voltage	$I_C = 3\text{A}$	$I_B = 12\text{ mA}$		2	V
$V_{BE(sat)}$ *	Base-emitter saturation voltage	$I_C = 3\text{A}$	$I_B = 12\text{ mA}$		2.5	V
h_{FE} *	DC current gain	$I_C = 3\text{A}$	$V_{CE} = 3\text{V}$	750		—
V_F	Parallel-diode forward voltage	$I_F = 3\text{A}$ $I_F = 8\text{A}$			1.8 2.5	V V

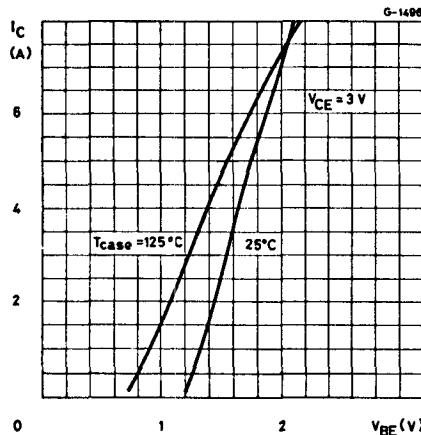
* Pulsed: pulse duration = 300 μs , duty cycle = 1.5%

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BDX 53A
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BDX 53C

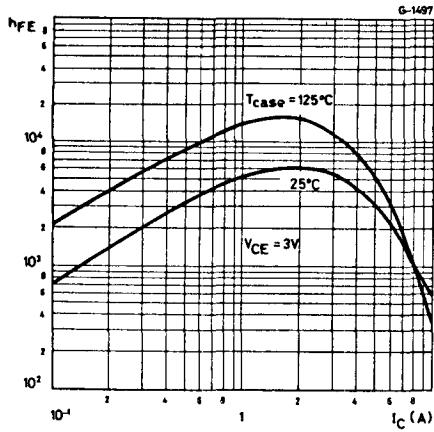
Typical collector-emitter saturation voltage



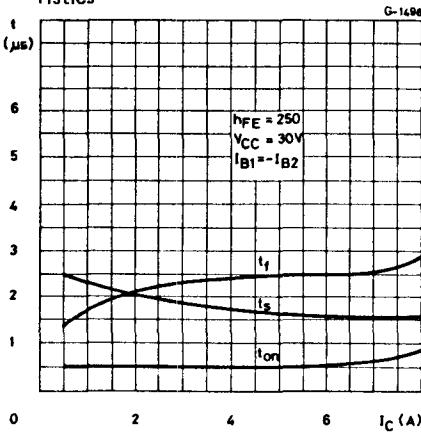
Typical DC transconductance



Typical DC current gain

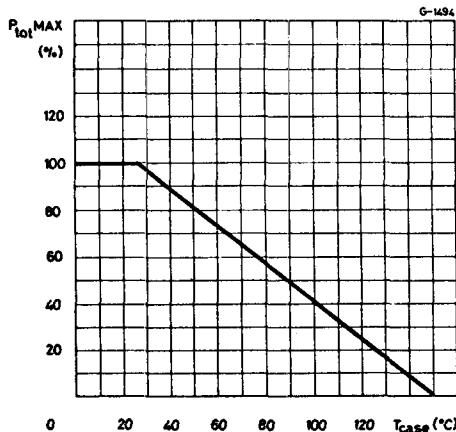


Typical saturated switching characteristics

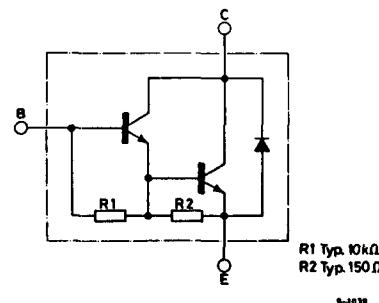


BDX 53
BDX 53A
BDX 53B
BDX 53C

Power rating chart



Internal circuit diagram



BDX 53
BDX 53A
BDX 53B
BDX 53C

Mounting arrangement for VERSAWATT transistors

