BDX53S
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EPITAXIAL-BASE NPN/PNP

MEDIUM POWER DARLINGTON

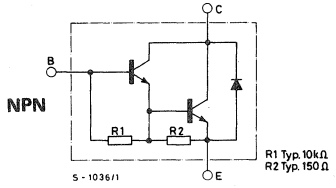
The BDX53S is a silicon epitaxial-base NPN transistor in monolithic Darlington configuration and is mounted in Jedec TO-39 metal case.
It is intended for use in medium in power linear and switching applications.
The complementary PNP type is the BDX54S

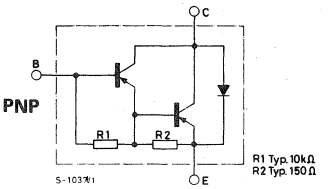
ABSOLUTE MAXIMUM RATINGS

V_{CBO}	Collector-base voltage ($I_E = 0$)	150	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	150	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
I_C	Collector current	6	A
I_{CM}	Collector peak current	10	A
I_B	Base current	0.2	A
P_{tot}	Total power dissipation at $T_{case} \leq 25°C$	15	W
	$T_{amb} \leq 25°C$	1	W
T_{stg}	Storage temperature	-65 to 200	°C
T_j	Junction temperature	200	°C

For PNP type voltage and current values are negative

INTERNAL SCHEMATIC DIAGRAMS

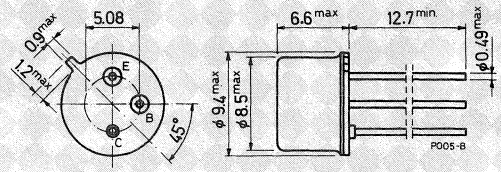




MECHANICAL DATA

Dimensions in mm

Collector connected to case



TO-39

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	11.66	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	175	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified)

	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current ($I_E = 0$)	$V_{CB} = 150V$			0.2	mA
		$T_{case} = 125°C$ $V_{CB} = 150V$			2	mA
I_{CEO}	Collector cutoff current ($I_B = 0$)	$V_{CE} = 75V$			0.2	mA
I_{EBO}	Emitter cutoff current ($I_C = 0$)	$V_{EB} = 5V$			5	mA
$V_{CEO\ (sus)}$*	Collector-emitter sustaining voltage ($I_B = 0$)	$I_C = 50$ mA	150			V
$V_{CE\ (sat)}$*	Collector-emitter saturation voltage	$I_C = 2A$ $I_B = 8mA$			2	V
$V_{BE\ (sat)}$*	Base-emitter saturation voltage	$I_C = 2A$ $I_B = 8mA$			2.5	V
h_{FE}*	DC current gain	$I_C = 100mA$ $V_{CE} = 5V$	100			—
		$I_C = 2A$ $V_{CE} = 5V$	500			—
V_F*	Parallel diode forward voltage	$I_F = 2A$			2.5	V
h_{fe}	Small signal currente gain	$I_C = 0.5A$ $V_{CE} = 2V$ $f = 1MHz$	20			—

* Pulsed: pulse duration = 300 μs, duty cycle = 1%

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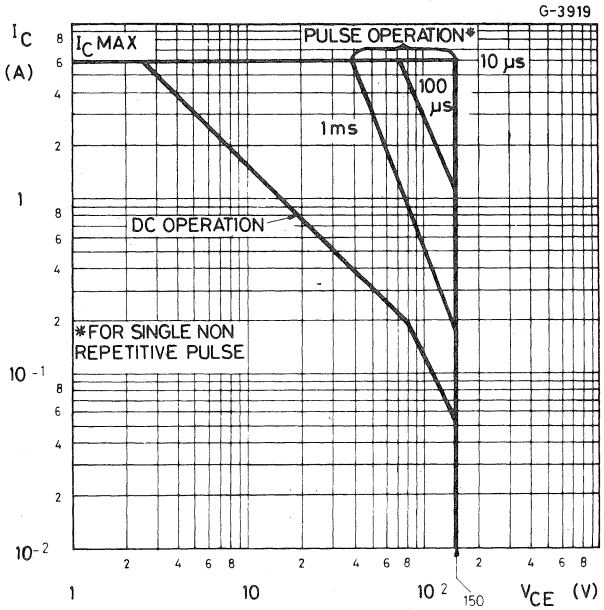
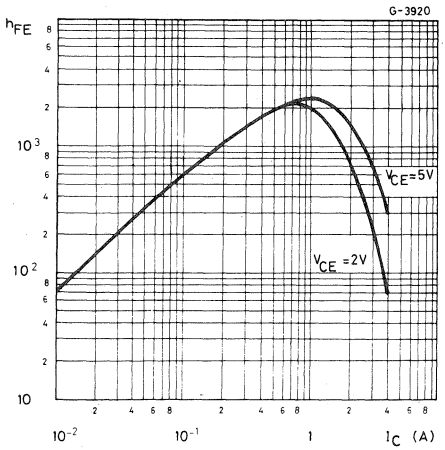
Safe operating area



DC current gain (BDX53S)



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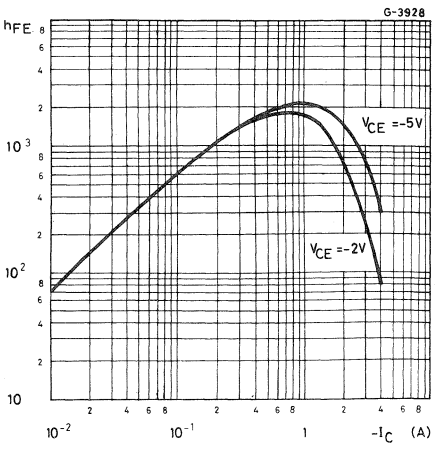
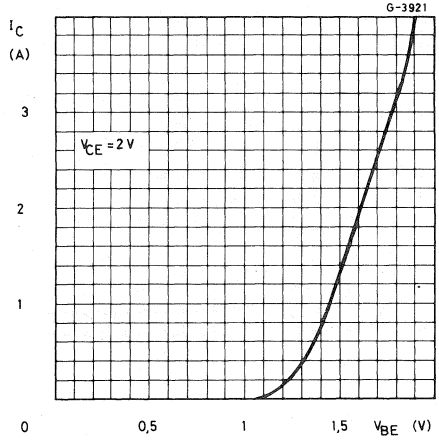


DC transconductance (BDX53S)



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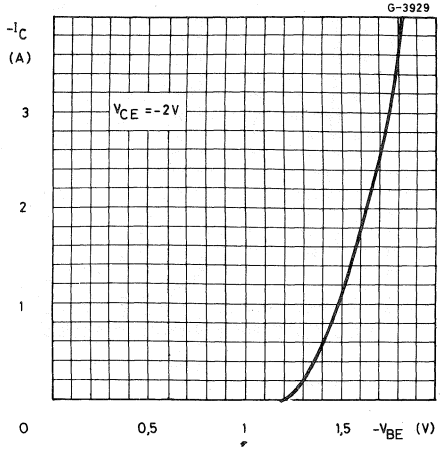
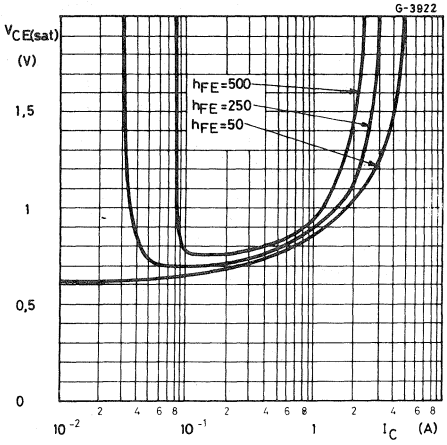


Collector-emitter saturation voltage (BDX53S)



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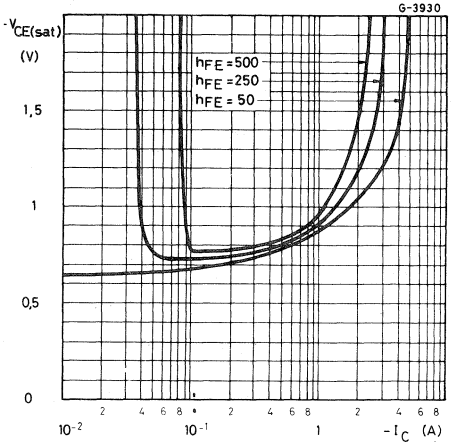

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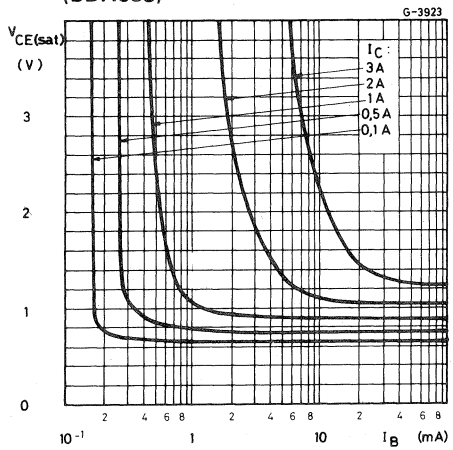

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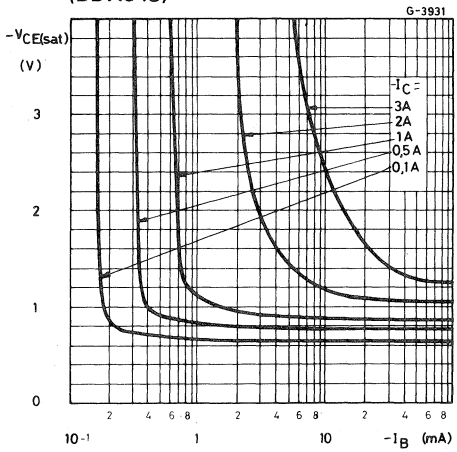
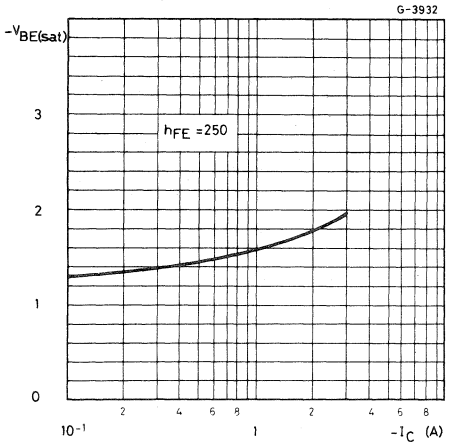


Base-emitter saturation voltage (BDX53S)



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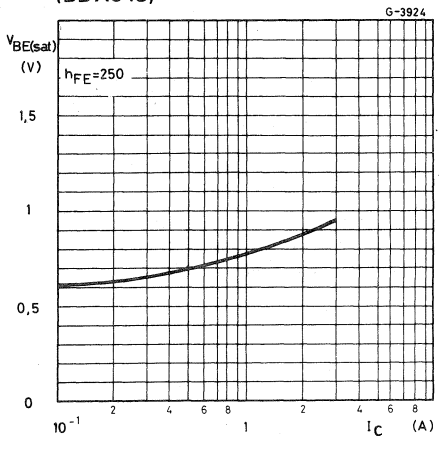
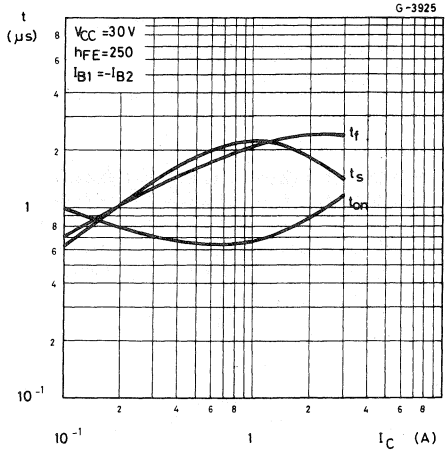


Saturated switching characteristics (BDX53S)



Saturated switching characteristics (BDX54S)