SGS-THOMSON
MICROELECTRONICS

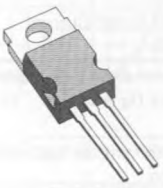
BDX53E/BDX53F
BDX54E/BDX54F

POWER DARLINGTONS

DESCRIPTION

The BDX53E, BDX53F are silicon epitaxial base NPN transistors in monolithic Darlington configuration and are mounted in Jedec TO-220 plastic package. They are intended for use in power linear and switching applications.

The complementary PNP types are the BDX54E and BDX54F respectively.



TO-220

INTERNAL SCHEMATIC DIAGRAMS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value BDX53E BDX54E	Value BDX53F BDX54F	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)		140	160	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)		140	160	V
V_{EBO}	Emitter-base Voltage (I_C = 0)		5		V
I_C	Collector Current		8		A
I_{CM}	Collector Peak Current		12		A
I_B	Base Current		0.2		A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C		60		W
T_{stg}	Storage Temperature		– 65 to 150		°C
T_j	Junction Temperature		150		°C

* For PNP types voltage and current values are negative.

THERMAL DATA

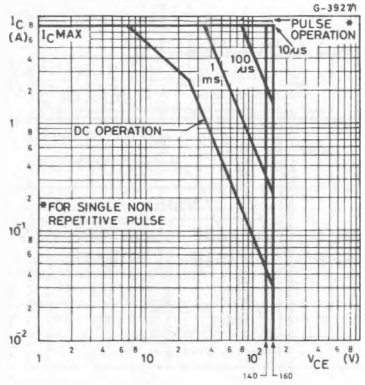
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	2.08	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	70	°C/W

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

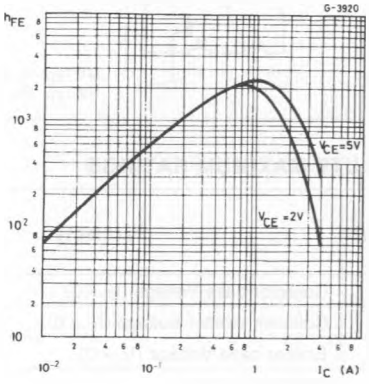
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current (I_B = 0)	for **BDX53E/4E** V_{CE} = 70 V for **BDX53F/4F** V_{CE} = 80 V			0.5 0.5	mA mA
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BDX53E/4E** V_{CB} = 140 V for **BDX53F/4F** V_{CB} = 160 V			0.2 0.2	mA mA
I_{EBO}	Emitter Cutoff Current (I_E = 0)	V_{EB} = 5 V			5	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 50 mA for **BDX53E/BDX54E** for **BDX53F/BDX54F**	 140 160			 V V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 2 A I_B = 10 mA			2	V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 2 A I_B = 10 mA			2.5	V
h_{FE}*	DC Current Gain	I_C = 2 A V_{CE} = 5 V I_C = 3 A V_{CE} = 5 V	500 150			
V_F*	Parellel Diode Forward Voltage	I_F = 2 A			2.5	V
h_{fe}	Small Signal Current Gain	I_C = 0.5 A V_{CE} = 2 V f = 1 MHz		20		

* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.
For PNP types voltage and current values are negative.

Safe Operating Areas.



DC Current Gain (NPN types).



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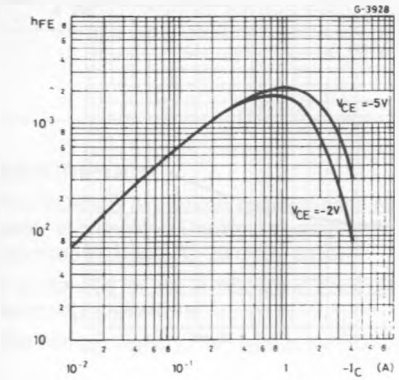
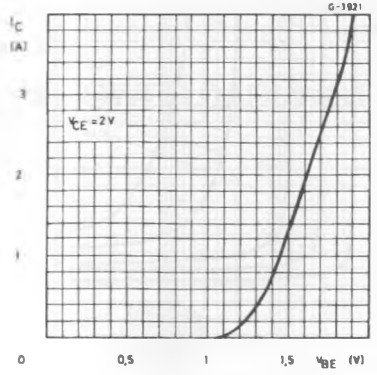


DC Transconductance (NPN types).



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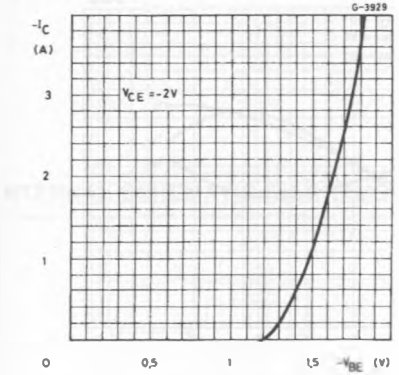
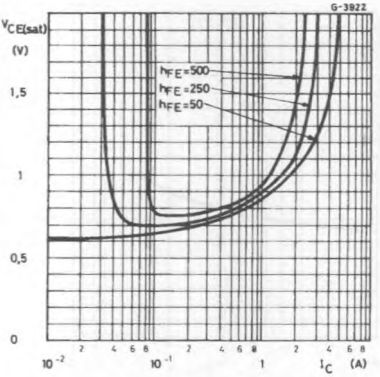


Collector-emitter Saturation Voltage (NPN types).



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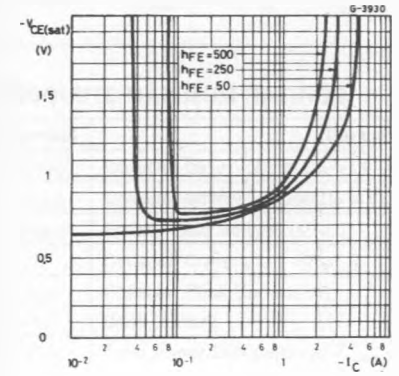

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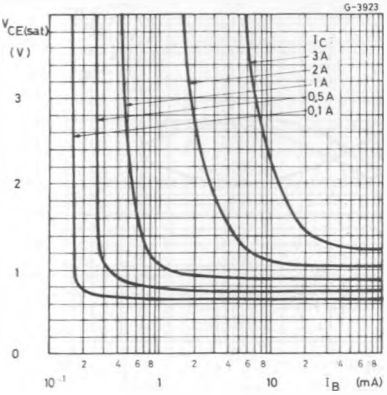

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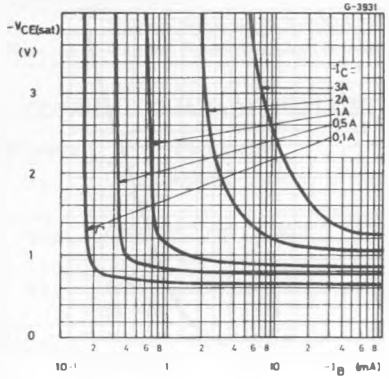
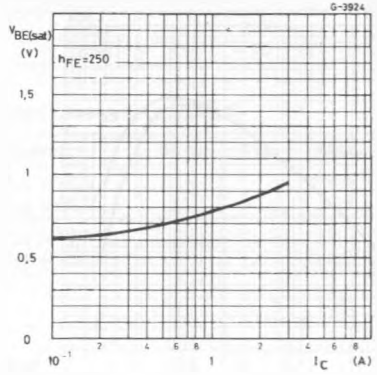


Base-emitter Saturation Voltage (NPN types).



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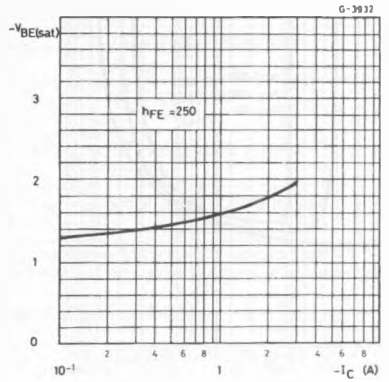
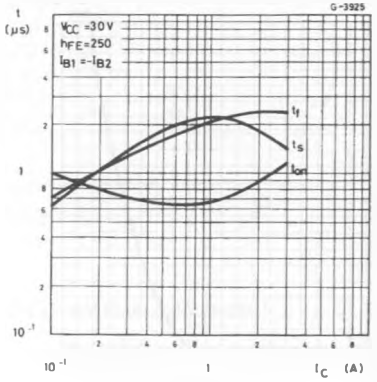


Saturated Switching Characteristics (NPN types).



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