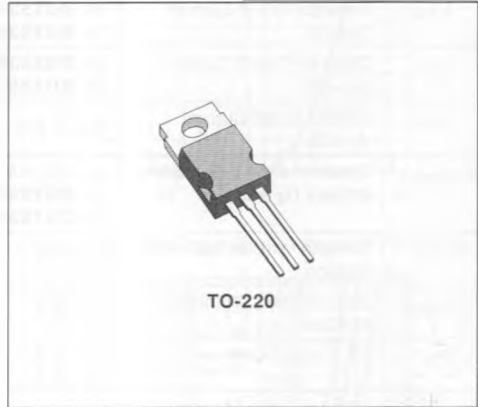
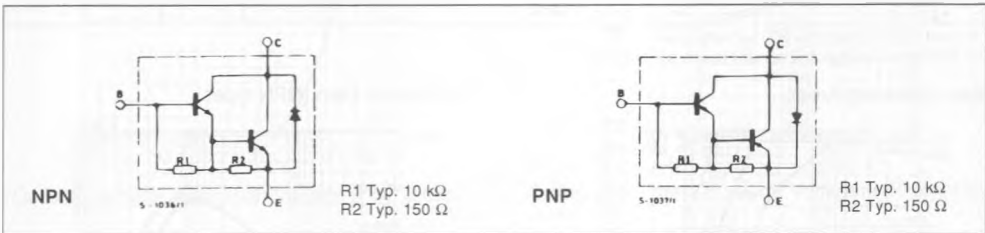


POWER DARLINGTONS
DESCRIPTION

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.


INTERNAL SCHEMATIC DIAGRAMS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value		Unit
			BDX53E BDX54E	BDX53F BDX54F	
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 $T_{case} \leq 25^\circ\text{C}$		60		W
T_{stg}	Storage Temperature		- 65 to 150		$^\circ\text{C}$
T_j	Junction Temperature		150		$^\circ\text{C}$

* For PNP types voltage and current values are negative.

THERMAL DATA

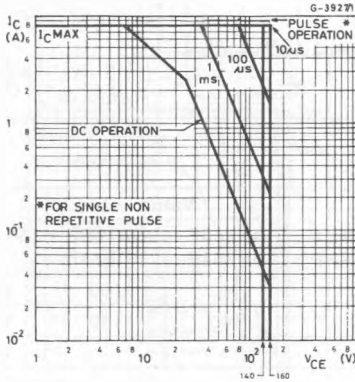
$R_{th j-case}$	Thermal Resistance Junction-case	Max	2.08	°C/W
$R_{th j-amb}$	Thermal Resistance Junction-ambient	Max	70	°C/W

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

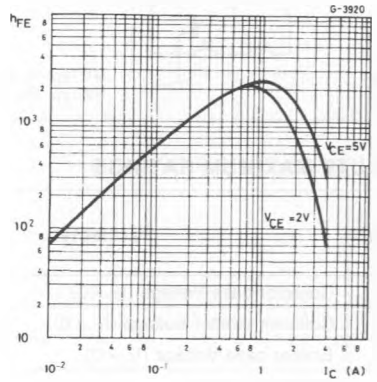
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	for BDX53E/4E $V_{CE} = 70\text{ V}$ for BDX53F/4F $V_{CE} = 80\text{ V}$			0.5 0.5	mA mA
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for BDX53E/4E $V_{CB} = 140\text{ V}$ for BDX53F/4F $V_{CB} = 160\text{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

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

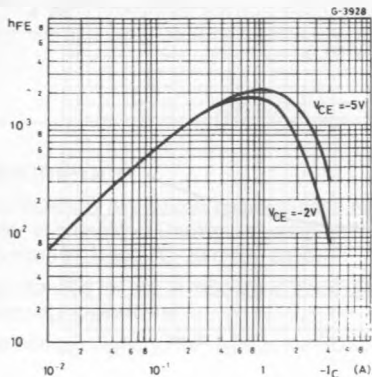
Safe Operating Areas.



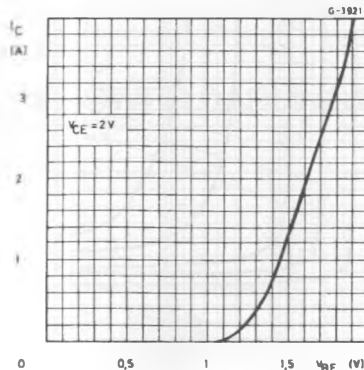
DC Current Gain (NPN types).



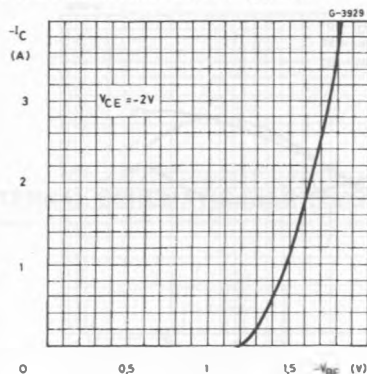
DC Current Gain (PNP types).



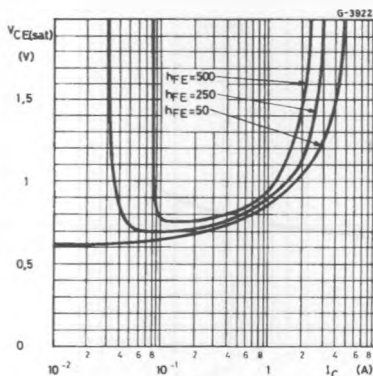
DC Transconductance (NPN types).



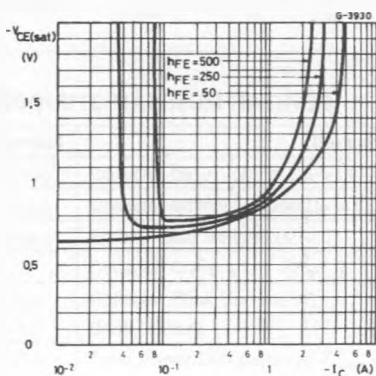
DC Transconductance (PNP types).



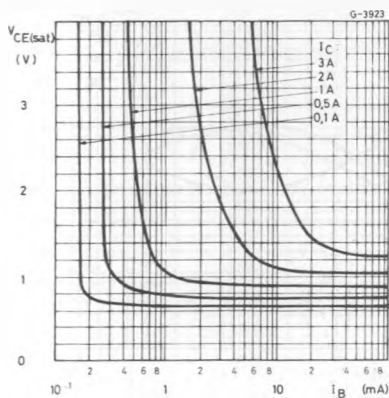
Collector-emitter Saturation Voltage (NPN types).



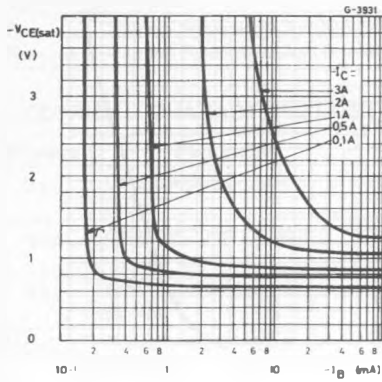
Collector-emitter Saturation Voltage (PNP types).



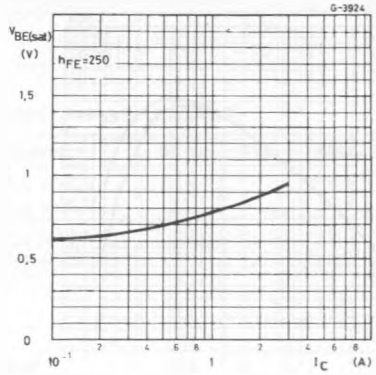
Collector-emitter Saturation Voltage (NPN types).



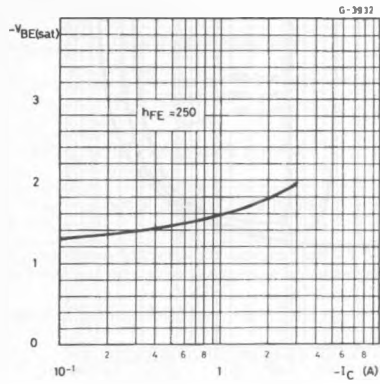
Collector-emitter Saturation Voltage (PNP types).



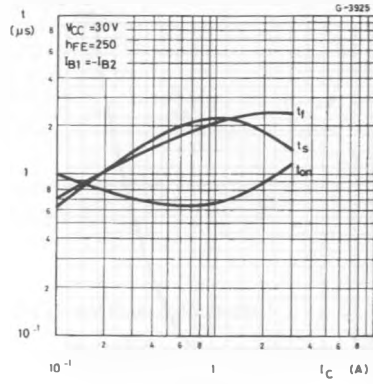
Base-emitter Saturation Voltage (NPN types).



Base-emitter Saturation Voltage (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (NPN types).

