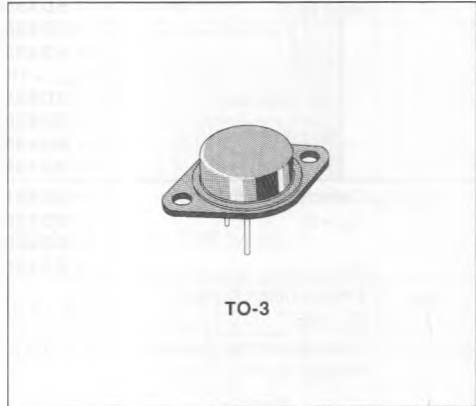


## POWER DARLINGTONS

### DESCRIPTION

The BDX 85, BDX 85A, BDX 85B and BDX 85C are silicon epitaxial-base NPN power transistors in monolithic Darlington configuration and are mounted in Jedec TO-3 metal case. They are intended for use in power linear and switching applications.

The complementary PNP types are the BDX 86, BDX 86A, BDX 86B and BDX 86C respectively.



### INTERNAL SCHEMATIC DIAGRAMS



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value				Unit
			BDX85 BDX86	BDX85A BDX86A	BDX85B BDX86B	BDX85C BDX86C	
$V_{CBO}$	Collector-base Voltage ( $I_E = 0$ )		45	60	80	100	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )		45	60	80	100	V
$V_{EBO}$	Emitter-base Voltage ( $I_C = 0$ )		5				V
$I_C$	Collector Current		10				A
$I_{CM}$	Collector Peak Current (repetitive)		15				A
$I_B$	Base Current		0.1				A
$P_{Tot}$	Total Power Dissipation at $T_{case} \leq 25^\circ\text{C}$		100				W
$T_{stg}$	Storage Temperature		- 65 to 200				$^\circ\text{C}$
$T_J$	Junction Temperature		200				$^\circ\text{C}$

\* For PNP types voltage and current values are negative.

**THERMAL DATA**

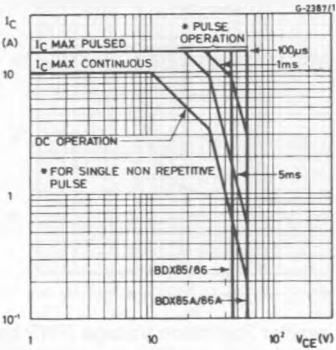
$R_{th(j-case)}$	Thermal Resistance Junction-case	Max	1.75	°C/W
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**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

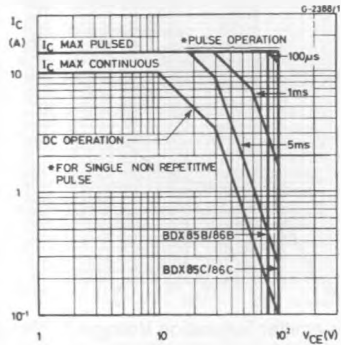
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	for <b>BDX85/86</b> $V_{CB} = 45\text{ V}$			500	$\mu\text{A}$
		for <b>BDX85A/86A</b> $V_{CB} = 60\text{ V}$			500	$\mu\text{A}$
		for <b>BDX85B/86B</b> $V_{CB} = 80\text{ V}$			500	$\mu\text{A}$
		for <b>BDX85C/86C</b> $V_{CB} = 100\text{ V}$			500	$\mu\text{A}$
		$T_{case} = 150\text{ °C}$				
		for <b>BDX85/86</b> $V_{CB} = 45\text{ V}$			5	$\text{mA}$
		for <b>BDX85A/86A</b> $V_{CB} = 60\text{ V}$			5	$\text{mA}$
		for <b>BDX85B/86B</b> $V_{CB} = 80\text{ V}$			5	$\text{mA}$
		for <b>BDX85C/86C</b> $V_{CB} = 100\text{ V}$			5	$\text{mA}$
$I_{CEO}$	Collector Cutoff Current ( $I_B = 0$ )	for <b>BDX85/86</b> $V_{CE} = 22\text{ V}$			1	$\text{mA}$
		for <b>BDX85A/86A</b> $V_{CE} = 30\text{ V}$			1	$\text{mA}$
		for <b>BDX85B/86B</b> $V_{CE} = 40\text{ V}$			1	$\text{mA}$
		for <b>BDX85C/86C</b> $V_{CE} = 50\text{ V}$			1	$\text{mA}$
$I_{EBO}$	Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			2	$\text{mA}$
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100\text{ mA}$	for <b>BDX85/86</b>	45		$\text{V}$
			for <b>BDX85A/86A</b>	60		$\text{V}$
			for <b>BDX85B/86B</b>	80		$\text{V}$
			for <b>BDX85C/86C</b>	100		$\text{V}$
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 4\text{ A}$	$I_B = 16\text{ mA}$		2	$\text{V}$
		$I_C = 8\text{ A}$	$I_B = 40\text{ mA}$		4	$\text{V}$
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 8\text{ A}$	$I_B = 80\text{ mA}$		4	$\text{V}$
$V_{BE}^*$	Base-emitter Voltage	$I_C = 4\text{ A}$	$V_{CE} = 3\text{ V}$		2.8	$\text{V}$
$h_{FE}^*$	DC Current Gain	$I_C = 3\text{ A}$	$V_{CE} = 3\text{ V}$	1000		
		$I_C = 4\text{ A}$	$V_{CE} = 3\text{ V}$	750		18000
		$I_C = 8\text{ A}$	$V_{CE} = 4\text{ V}$	200		
$V_F$	Parallel-diode Forward Voltage	$I_F = 3\text{ A}$				1.8
		$I_F = 8\text{ A}$			2.5	$\text{V}$
$h_{fe}$	Small Signal Current Gain	$I_C = 3\text{ A}$ $f = 1\text{ MHz}$	$V_{CE} = 3\text{ V}$		10	

\* Pulsed : pulse duration = 300 ms, duty cycle = 1.5 %.  
For PNP type voltage and current values are negative.

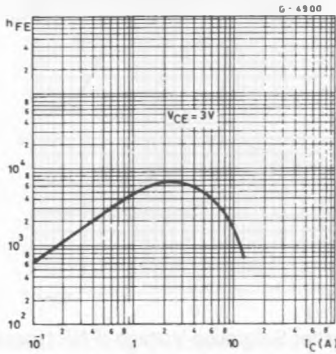
Safe Operating Areas (for BDX85, BDX85A, BDX86, BDX86A).



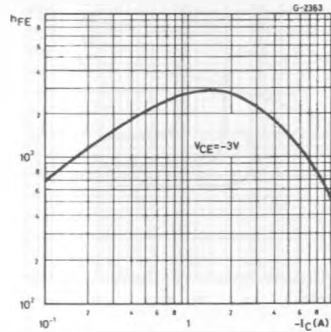
Safe Operating Areas (for BDX85B, BDX85C, BDX86B, BDX86C).



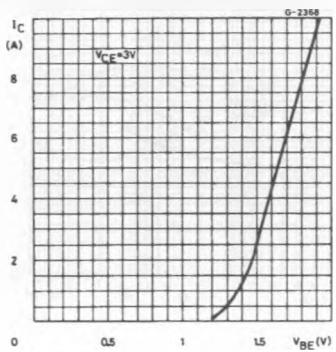
DC Current Gain (NPN types).



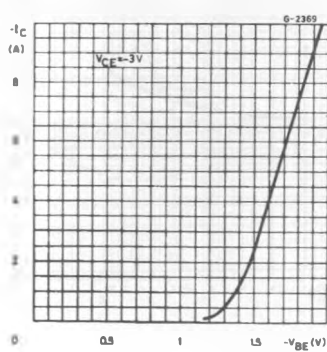
DC Current Gain (PNP types).



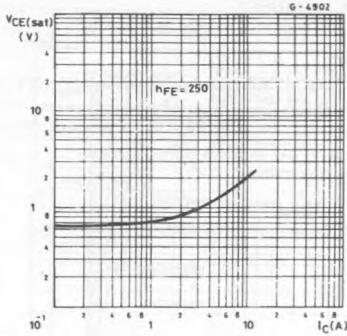
DC Transconductance (NPN types).



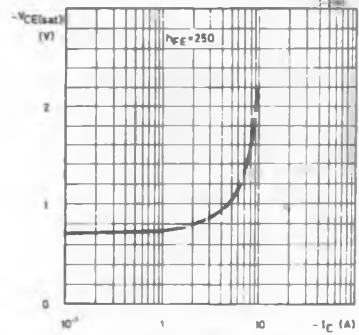
DC Transconductance (PNP types).



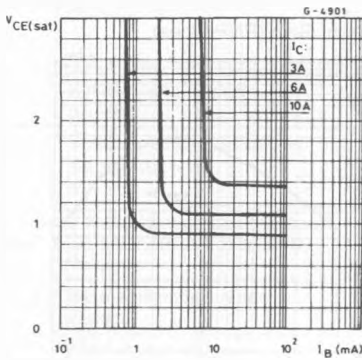
Collector-emitter Saturation Voltage (NPN types).



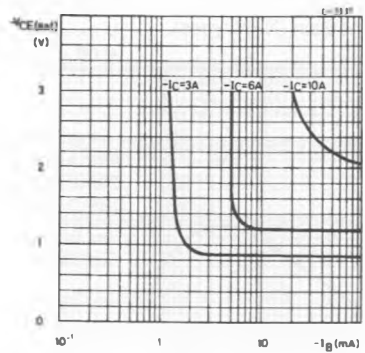
Collector-emitter Saturation Voltage (PNP types).



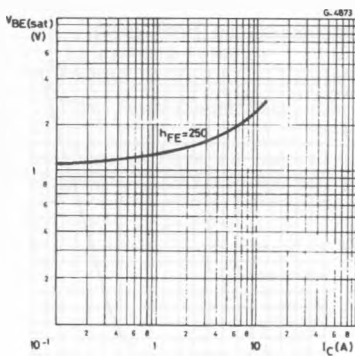
Collector-emitter Saturation Voltage (NPN types).



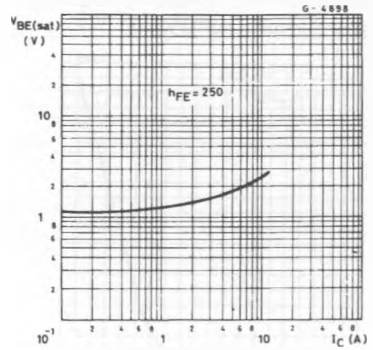
Collector-emitter Saturation Voltage (PNP types).



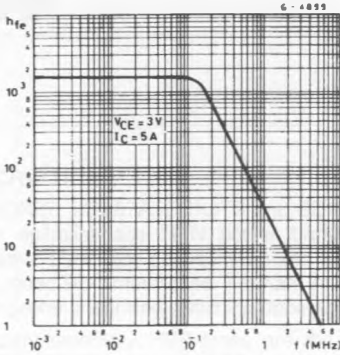
Base-emitter Saturation Voltage (NPN types).



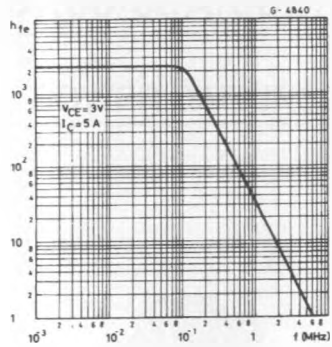
Base-emitter Saturation Voltage (PNP types).



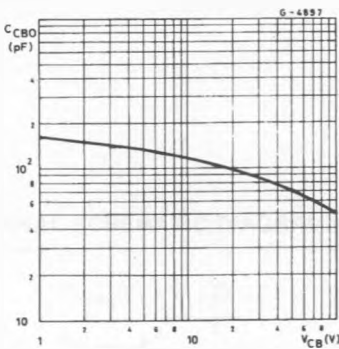
Small Signal Current Gain (NPN types).



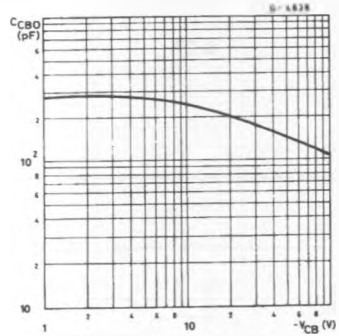
Small Signal Current Gain (PNP types).



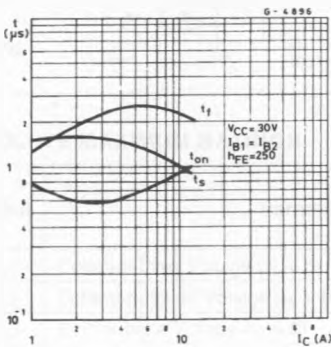
Collector-base Capacitance (NPN types).



Collector-base Capacitance (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).

