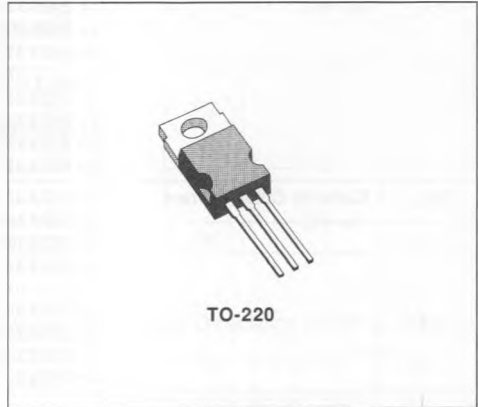




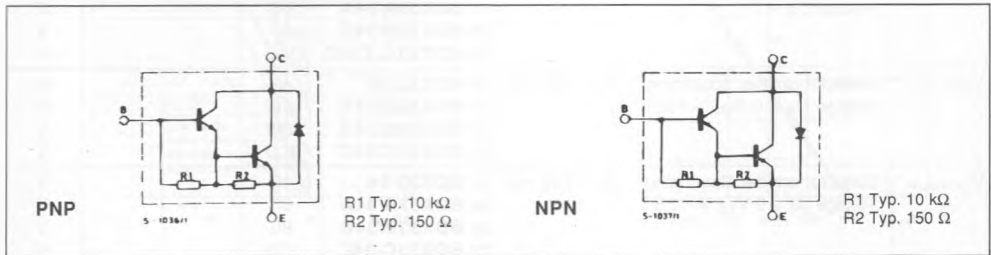
HIGH GAIN GENERAL PURPOSE

DESCRIPTION

The BDX33, BDX33A, BDX33B and BDX33C 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. This complementary PNP types are the BDX34, BDX34A, BDX34B and BDX34C respectively.



INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN *PNP	Value				Unit
			BDX33 BDX34	BDX33A BDX34A	BDX33B BDX34B	BDX33C BDX34C	
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
I_C	Collector Current		10				A
I_{CM}	Collector Peak Current		15				A
I_B	Base Current		0.25				A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25^\circ C$		70				W
T_{stg}	Storage Temperature		- 65 to 150				$^\circ C$
T_j	Junction Temperature		150				$^\circ C$

* For PNP types voltage and current values are negative.

THERMAL DATA

$R_{th(j-case)}$	Thermal Resistance Junction-case	Max	1.78	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

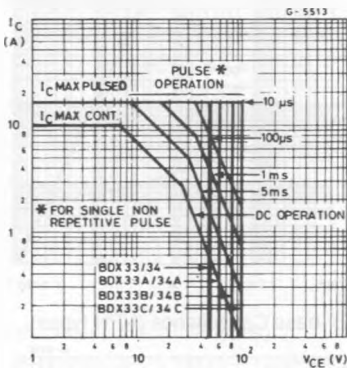
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for BDX33/34 $V_{CB} = 45\text{ V}$ for BDX33A/34A $V_{CB} = 60\text{ V}$ for BDX33B/34B $V_{CB} = 80\text{ V}$ for BDX33C/X34C $V_{CB} = 100\text{ V}$ $T_{case} = 100\text{ °C}$ for BDX33/34 $V_{CB} = 45\text{ V}$ for BDX33A/34A $V_{CB} = 60\text{ V}$ for BDX33B/34B $V_{CB} = 80\text{ V}$ for BDX33C/X34C $V_{CB} = 100\text{ V}$			0.2 0.2 0.2 0.2 5 5 5 5	mA mA mA mA mA mA mA mA
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	for BDX33/34 $V_{CB} = 22\text{ V}$ for BDX33A/34A $V_{CB} = 30\text{ V}$ for BDX33B/34B $V_{CB} = 40\text{ V}$ for BDX33C/X34C $V_{CB} = 50\text{ V}$ $T_{case} = 100\text{ °C}$ for BDX33/34 $V_{CB} = 22\text{ V}$ for BDX33A/34A $V_{CB} = 30\text{ V}$ for BDX33B/34B $V_{CB} = 40\text{ V}$ for BDX33C/X34C $V_{CB} = 50\text{ V}$			0.5 0.5 0.5 0.5 10 10 10 10	mA mA mA mA mA mA mA mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			5	mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage ($I_B = 0$)	$I_C = 100\text{ mA}$ for BDX33/34 for BDX33A/34A for BDX33B/34B for BDX33C/X34C	45 60 80 100			V V V V
$V_{CER(sus)}^*$	Collector-emitter Sustaining Voltage ($I_B = 0$ $R_{BE} = 100\ \Omega$)	$I_C = 100\text{ mA}$ for BDX33/34 for BDX33A/34A for BDX33B/34B for BDX33C/34C	45 60 80 100			V V V V
$V_{CEV(sus)}^*$	Collector-emitter Sustaining Voltage ($I_B = 0$ $V_{BE} = -1.5\text{ V}$)	$I_C = 100\text{ mA}$ for BDX33/34 for BDX33A/34A for BDX33B/34B for BDX33C/34C	45 60 80 100			V V V V

ELECTRICAL CHARACTERISTICS (continued)

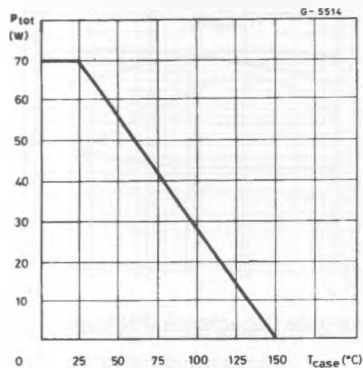
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$ *	Collector-emitter Saturation Voltage	for BDX33/33A/34/34A $I_C = 4\text{ A}$ $I_B = 8\text{ mA}$ for BDX33B/33C/34B/34C $I_C = 3\text{ A}$ $I_B = 6\text{ mA}$			2.5	V
V_{BE} *	Base-emitter Voltage	for BDX33/33A/34/34A $I_C = 4\text{ A}$ $V_{CE} = 3\text{ V}$ for BDX33B/33C/34B/34C $I_C = 3\text{ A}$ $V_{CE} = 3\text{ V}$			2.5	V
h_{FE} *	DC Current Gain	for BDX33/33A/34/34A $I_C = 4\text{ A}$ $V_{CE} = 3\text{ V}$ for BDX33B/33C/34B/34C $I_C = 3\text{ A}$ $V_{CE} = 3\text{ V}$	750			
V_F *	Parallel-diode Forward Voltage	$I_F = 8\text{ A}$			4	V
h_{fe}	Small Signal Current Gain	$I_C = 1\text{ A}$ $V_{CE} = 5\text{ V}$ $f = 1\text{ KHz}$	100			

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

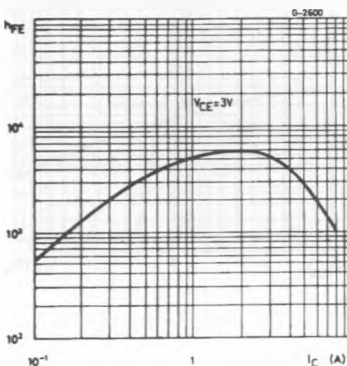
Safe Operating Areas.



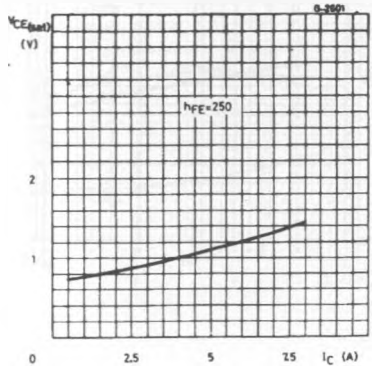
Case Temperature Dissipation Derating Curve.



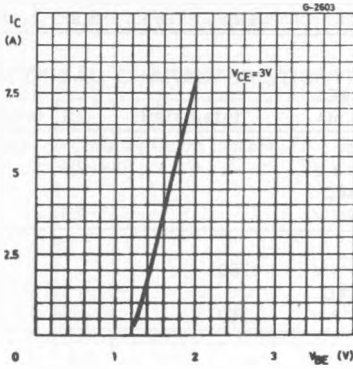
DC Current Gain (NPN types).



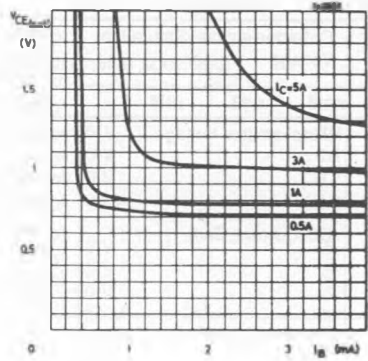
Collector-emitter Saturation Voltage (NPN types).



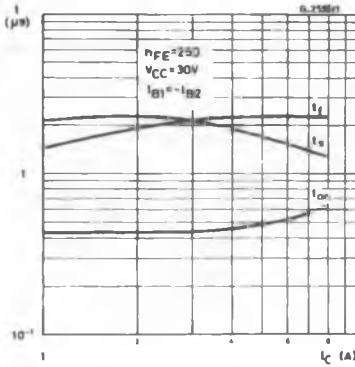
DC Transconductance (NPN types).



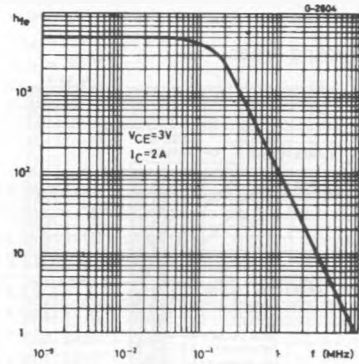
Collector-emitter Saturation Voltage (NPN types).



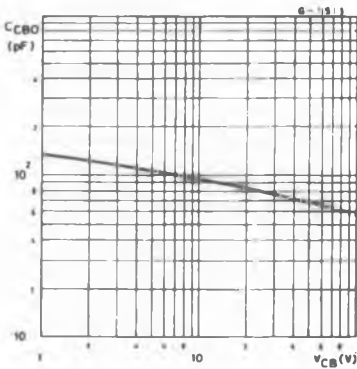
Saturated Switching Characteristics (NPN types).



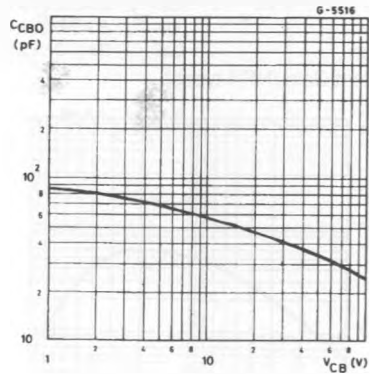
Small Signal Current Gain (NPN types).



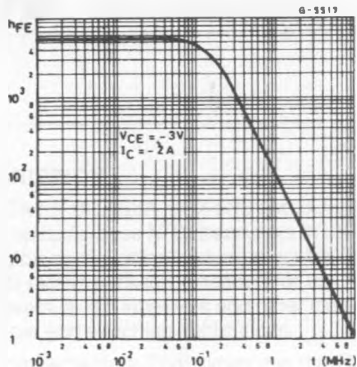
Collector-base Capacitance (PNP types).



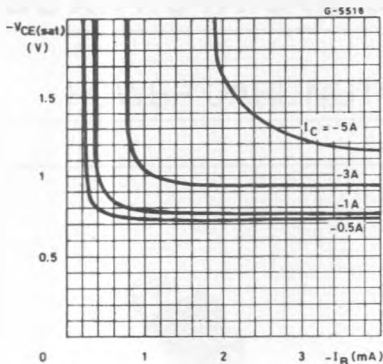
Collector-base Capacitance (NPN types).



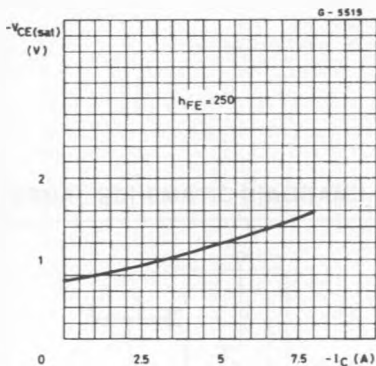
Small Signal Current Gain (PNP types).



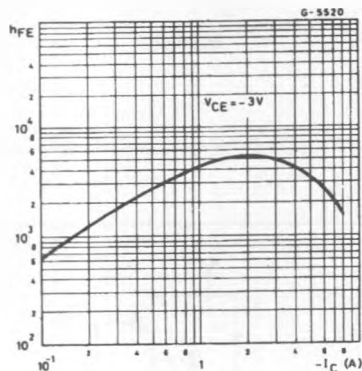
Collector-emitter Saturation Voltage (PNP types).



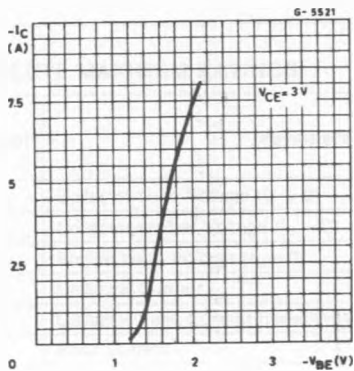
Collector-emitter Saturation Voltage (PNP types).



DC Current Gain (PNP types).



DC Transconductance (PNP types).



Saturated Switching Characteristics (PNP types).

