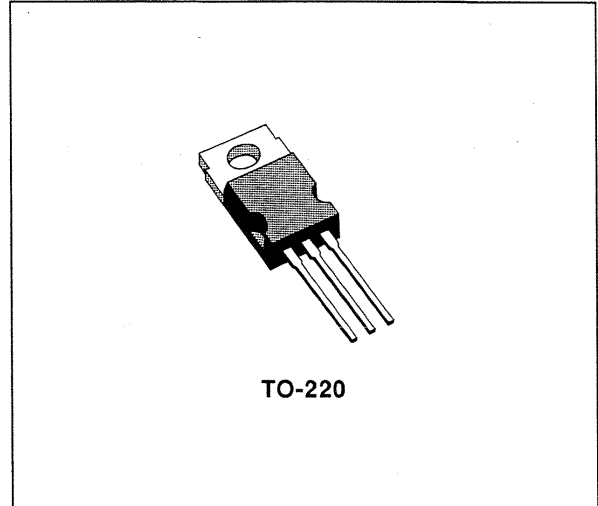




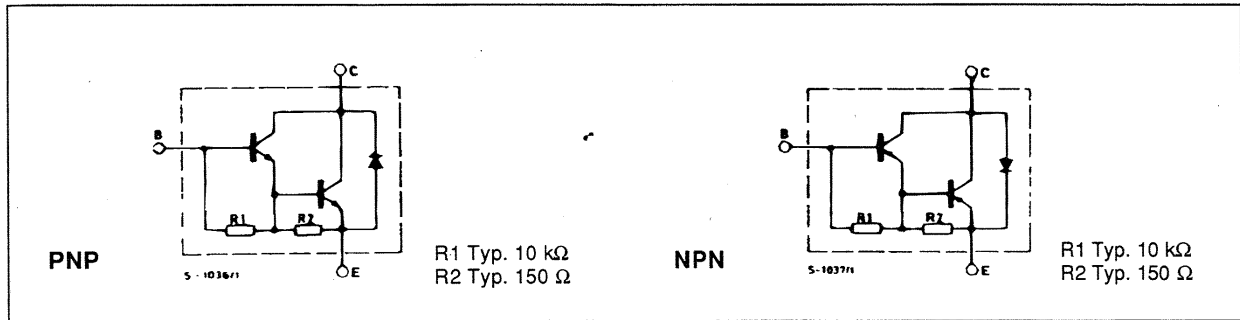
HIGH GAIN GENERAL PURPOSE

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} ≤ 25 °C		70				W
T _{stg}	Storage Temperature		- 65 to 150				°C
T _j	Junction Temperature		150				°C

* For PNP types voltage and current values are negative.

BDX33/33A/33B/33C-BDX34/34A/34B/34C

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)

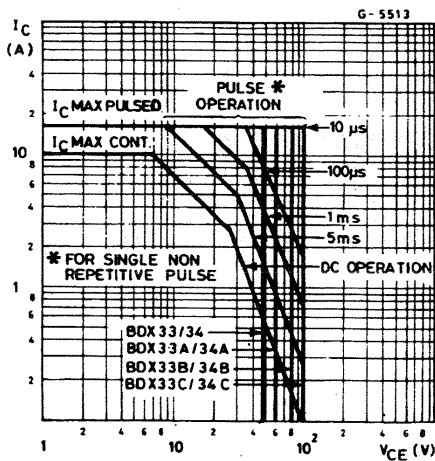
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for BDX33/34 $V_{CB} = 45\text{ V}$			0.2	mA
		for BDX33A/34A $V_{CB} = 60\text{ V}$			0.2	mA
		for BDX33B/34B $V_{CB} = 80\text{ V}$			0.2	mA
		for BDX33C/X34C $V_{CB} = 100\text{ V}$			0.2	mA
		$T_{case}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

ELECTRICAL CHARACTERISTICS (continued)

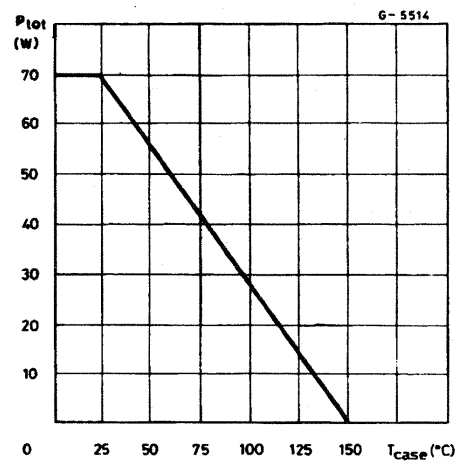
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$ *	Collector-emitter Saturation Voltage	for BDX33/33A/34/34A $I_C = 4 \text{ A}$ $I_B = 8 \text{ mA}$ for BDX33B/33C/34B/34C $I_C = 3 \text{ A}$ $I_B = 6 \text{ mA}$			2.5	V
V_{BE} *	Base-emitter Voltage	for BDX33/33A/34/34A $I_C = 4 \text{ A}$ $V_{CE} = 3 \text{ V}$ 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.

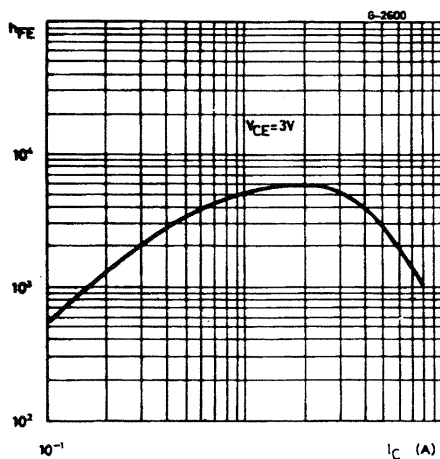
Safe Operating Areas.



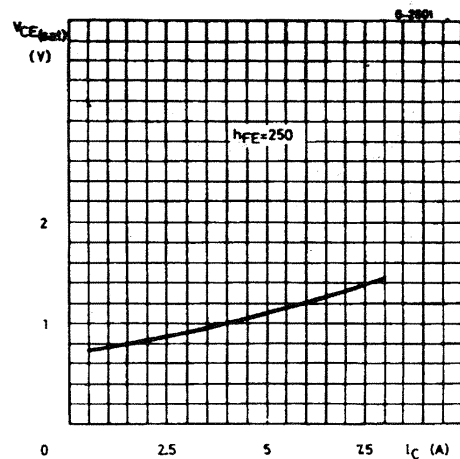
Case Temperature Dissipation Derating Curve.



DC Current Gain (NPN types).

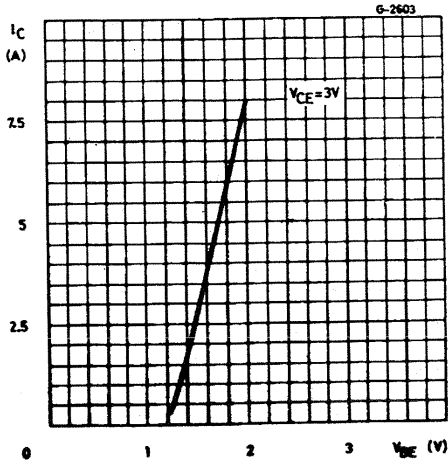


Collector-emitter Saturation Voltage (NPN types).

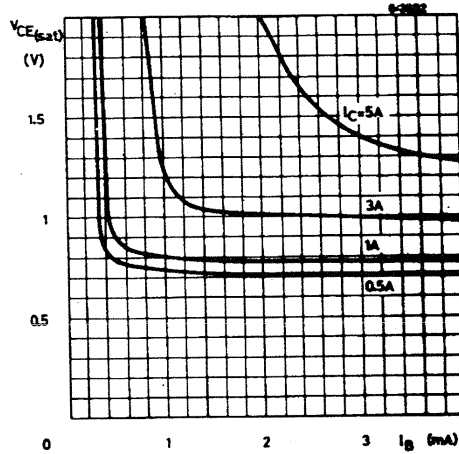


BDX33/33A/33B/33C-BDX34/34A/34B/34C

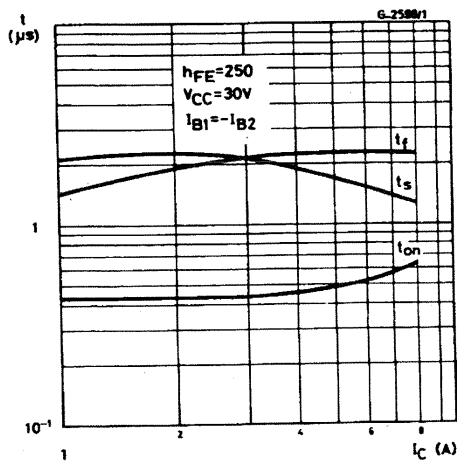
DC Transconductance (NPN types).



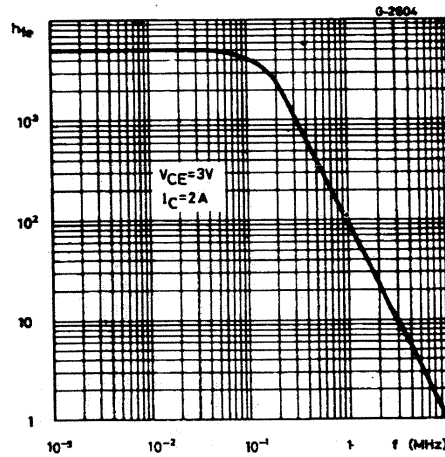
Collector-emitter Saturation Voltage (NPN types).



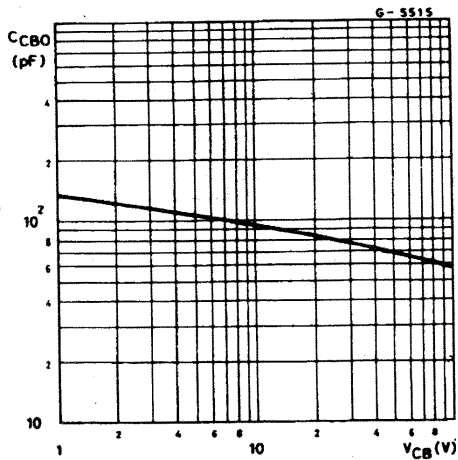
Saturated Switching Characteristics (NPN types).



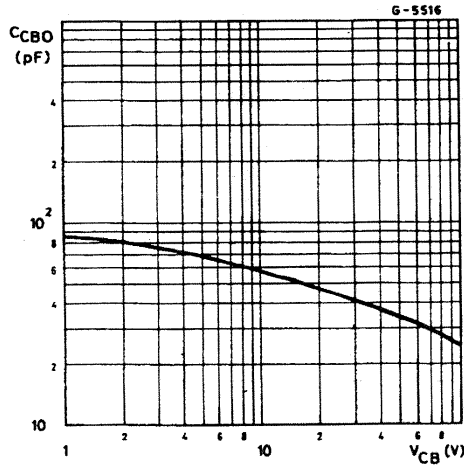
Small Signal Current Gain (NPN types).



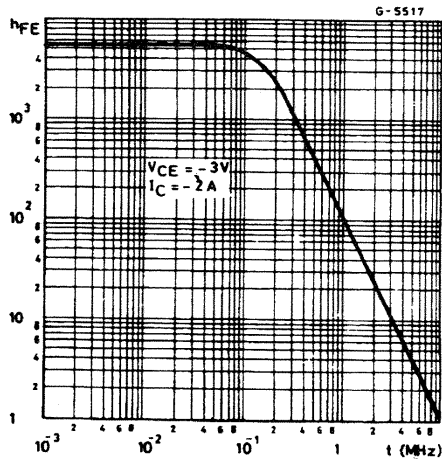
Collector-base Capacitance (PNP types).



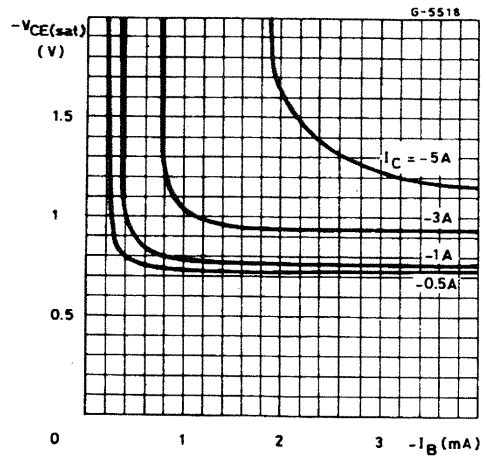
Collector-base Capacitance (NPN types).



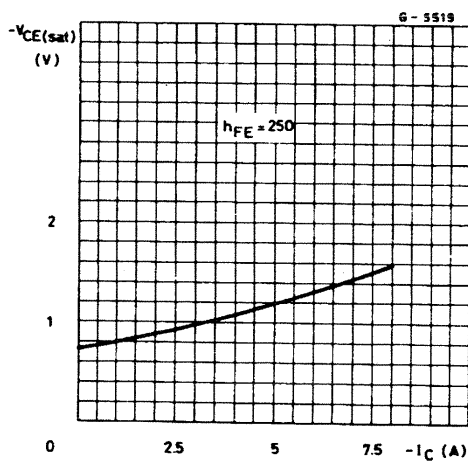
Small Signal Current Gain (PNP types).



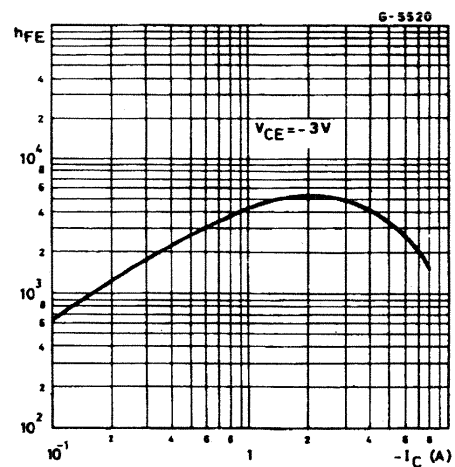
Collector-emitter Saturation Voltage (PNP types).



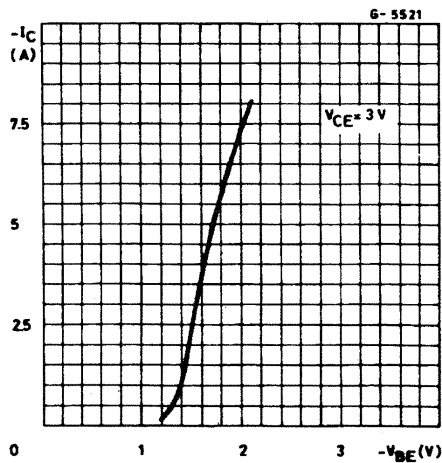
Collector-emitter Saturation Voltage (PNP types).



DC Current Gain (PNP types).



DC Transconductance (PNP types).



Saturated Switching Characteristics (PNP types).

