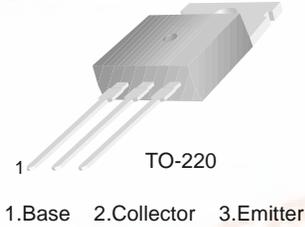


**FAIRCHILD**  
SEMICONDUCTOR™

## BDX33/A/B/C

### Power Linear and Switching Applications

- High Gain General Purpose
- Power Darlington TR
- Complement to BDX34/34A/34B/34C respectively



### NPN Epitaxial Silicon Transistor

**Absolute Maximum Ratings**  $T_C=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Value	Units	
$V_{CBO}$	Collector-Base Voltage	: BDX33	45	V
		: BDX33A	60	V
		: BDX33B	80	V
		: BDX33C	100	V
$V_{CEO}$	Collector-Emitter Voltage	: BDX33	45	V
		: BDX33A	60	V
		: BDX33B	80	V
		: BDX33C	100	V
$I_C$	Collector Current (DC)	10	A	
$I_{CP}$	*Collector Current (Pulse)	15	A	
$I_B$	Base Current	0.25	A	
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	70	W	
$T_J$	Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$	

**Electrical Characteristics**  $T_C=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(sus)}$	* Collector-Emitter Sustaining Voltage : BDX33 : BDX33A : BDX33B : BDX33C	$I_C = 100\text{mA}$ , $I_B = 0$	45 60 80 100			V V V V
$V_{CER(sus)}$	* Collector-Emitter Sustaining Voltage : BDX33 : BDX33A : BDX33B : BDX33C	$I_C = 100\text{mA}$ , $I_B = 0$ $R_{BE} = 100\Omega$	45 60 80 100			V V V V
$V_{CEV(sus)}$	* Collector-Emitter Sustaining Voltage : BDX33 : BDX33A : BDX33B : BDX33C	$I_C = 100\text{mA}$ , $I_B = 0$ $V_{BE} = 1.5\text{V}$	45 60 80 100			V V V V
$I_{CBO}$	Collector Cut-off Current : BDX33 : BDX33A : BDX33B : BDX33C	$V_{CB} = 45\text{V}$ , $I_E = 0$ $V_{CB} = 60\text{V}$ , $I_E = 0$ $V_{CB} = 80\text{V}$ , $I_E = 0$ $V_{CB} = 100\text{V}$ , $I_E = 0$			0.2 0.2 0.2 0.2	mA mA mA mA
$I_{CEO}$	Collector Cut-off Current : BDX33 : BDX33A : BDX33B : BDX33C	$V_{CE} = 22\text{V}$ , $I_B = 0$ $V_{CE} = 30\text{V}$ , $I_B = 0$ $V_{CE} = 40\text{V}$ , $I_B = 0$ $V_{CE} = 50\text{V}$ , $I_B = 0$			0.5 0.5 0.5 0.5	mA mA mA mA
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 5\text{V}$ , $I_C = 0$			5	mA
$h_{FE}$	* DC Current Gain : BDX33/34 : BDX33B/33C	$V_{CE} = 3\text{V}$ , $I_C = 4\text{A}$ $V_{CE} = 3\text{V}$ , $I_C = 3\text{A}$	750 750			
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage : BDX33/33A : BDX33B/33C	$I_C = 4\text{A}$ , $I_B = 8\text{mA}$ $I_C = 3\text{A}$ , $I_B = 6\text{mA}$			2.5 2.5	V V
$V_{BE(on)}$	* Base-Emitter ON Voltage : BDX33/33A : BDX33B/33C	$V_{CE} = 3\text{V}$ , $I_C = 4\text{A}$ $V_{CE} = 3\text{V}$ , $I_C = 3\text{A}$			2.5 2.5	V V
$V_F$	* Parallel Diode Forward Voltage	$I_F = 8\text{A}$			4	V

\* Pulse Test: PW=300 $\mu\text{s}$ , duty Cycle =1.5% Pulse

## Typical Characteristics

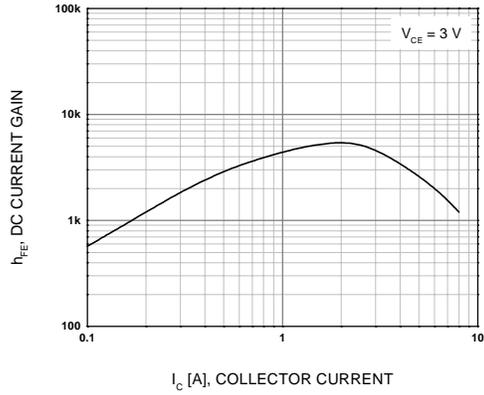


Figure 1. DC Current Gain

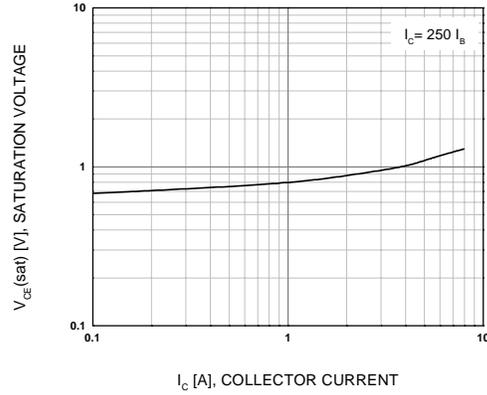


Figure 2. Collector-Emitter Saturation Voltage

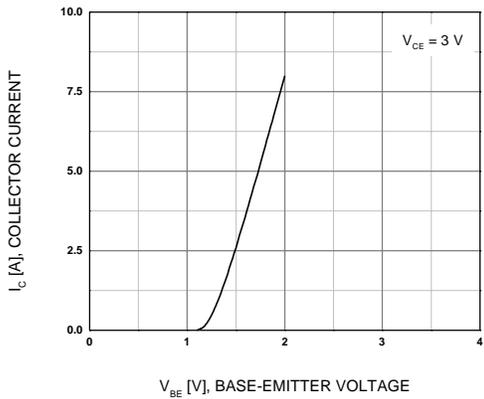


Figure 3. Base-Emitter On Voltage

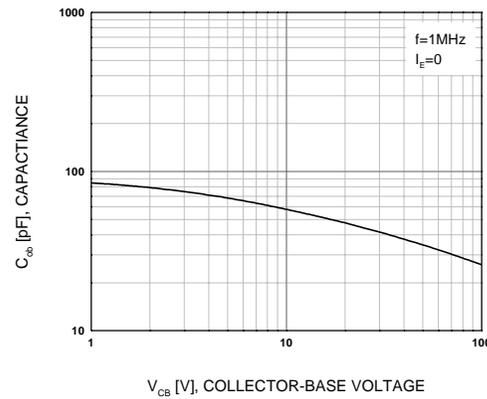


Figure 4. Output Capacitance

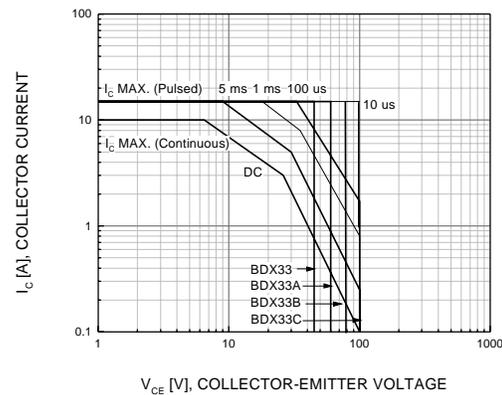


Figure 5. Safe Operating Area

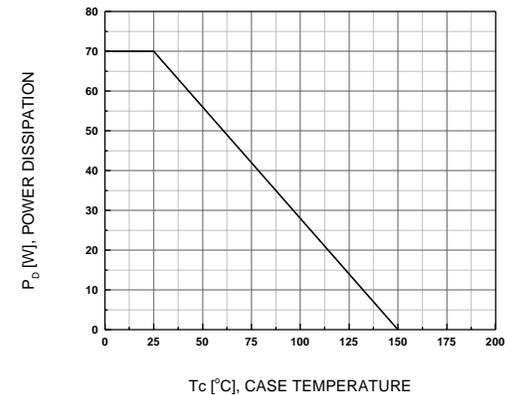


Figure 6. Power Derating



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