



NPN BDX33 – BDX33A – BDX33B – BDX33C

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

The BDX33B, BDX33B and BDX33C are silicon epitaxial-base NPN power 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 BDX34A, BDX34B and BDX34C respectively. Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit	
V_{CE0}	Collector-Emitter Voltage	$I_B=0$	BDX33	45	V
			BDX33A	60	
			BDX33B	80	
			BDX33C	100	
V_{CBO}	Collector-Base Voltage	$I_E=0$	BDX33	45	V
			BDX33A	60	
			BDX33B	80	
			BDX33C	100	
I_C	Collector Current	$I_{C(RMS)}$	10	A	
		I_{CM}	15		
I_B	Base Current		0.25	A	
P_T	Power Dissipation	@ $T_C = 25^\circ$	70	W	
T_J	Junction Temperature		-65 to +150	$^\circ C$	
T_S	Storage Temperature				

THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
R_{thJ-C}	Thermal Resistance, Junction to Case	1.78	$^\circ C/W$



NPN BDX33 – BDX33A – BDX33B – BDX33C

ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit	
$V_{CE0(SUS)}$	Collector-Emitter Breakdown Voltage (*)	$I_C=100\text{ mA}$	BDX33	45	-	-	V
			BDX33A	60	-	-	
			BDX33B	80	-	-	
			BDX33C	100	-	-	
$V_{CER(SUS)}$	Collector-Emitter Sustaining Voltage (*)	$I_B=100\text{ mA}$, $R_{BE}=100\Omega$	BDX33	45	-	-	V
			BDX33A	60	-	-	
			BDX33B	80	-	-	
			BDX33C	100	-	-	
$V_{CEV(SUS)}$	Collector-Emitter Sustaining Voltage (*)	$I_C=100\text{ mA}$ $V_{BE}=-1.5\text{ V}$	BDX33	45	-	-	V
			BDX33A	60	-	-	
			BDX33B	80	-	-	
			BDX33C	100	-	-	
I_{CEO}	Collector Cutoff Current	$V_{CB}=22\text{ V}$	BDX33	-	-	0.5	mA
		$V_{CB}=30\text{ V}$	BDX33A	-	-		
		$V_{CB}=40\text{ V}$	BDX33B	-	-		
		$V_{CB}=50\text{ V}$	BDX33C	-	-	10	
		$V_{CB}=22\text{ V}, T_C=100^\circ\text{C}$	BDX33	-	-		
		$V_{CB}=30\text{ V}, T_C=100^\circ\text{C}$	BDX33A	-	-		
		$V_{CB}=40\text{ V}, T_C=100^\circ\text{C}$	BDX33B	-	-		
$V_{CB}=50\text{ V}, T_C=100^\circ\text{C}$	BDX33C	-	-				
I_{EBO}	Emitter Cutoff Current	$V_{BE}=-5\text{ V}$	BDX33	-	-	5.0	mA
			BDX33A				
			BDX33B				
			BDX33C				
			BDX33				
			BDX33A				
			BDX33B				
BDX33C							
I_{CBO}	Collector-Base Cutoff Current	$V_{CBO}=45\text{ V}$	BDX33	-	-	0.2	mA
		$V_{CBO}=60\text{ V}$	BDX33A	-	-		
		$V_{CBO}=80\text{ V}$	BDX33B	-	-		
		$V_{CBO}=100\text{ V}$	BDX33C	-	-		



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ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

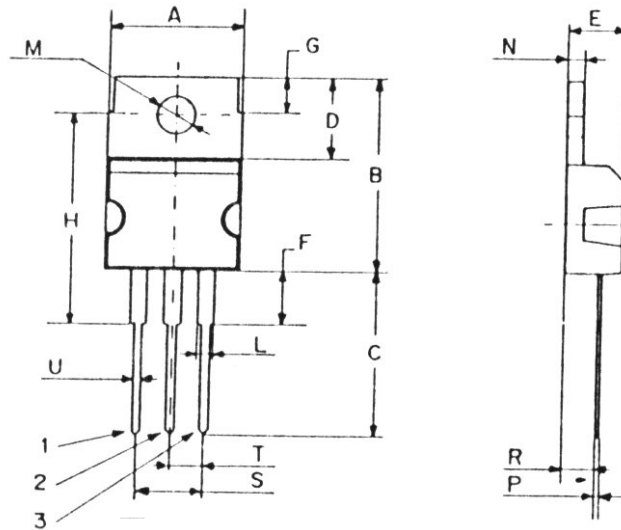
Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit	
I_{CBO}	Collector-Base Cutoff Current	$V_{CBO}=45\text{ V}$ $T_C=100^\circ\text{C}$	BDX33	-	-	5	mA
		$V_{CBO}=60\text{ V}$ $T_C=100^\circ\text{C}$	BDX33A	-	-		
		$V_{CBO}=80\text{ V}$ $T_C=100^\circ\text{C}$	BDX33B	-	-		
		$V_{CBO}=100\text{ V}$ $T_C=100^\circ\text{C}$	BDX33C	-	-		
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C=4.0\text{ A}, I_B=8.0\text{ mA}$	BDX33	-	-	2.5	V
			BDX33A				
			BDX33B				
			BDX33C				
		$I_C=3.0\text{ A}, I_B=6.0\text{ mA}$	BDX33	-	-	2.5	
			BDX33A				
			BDX33B				
			BDX33C				
V_F	Forward Voltage (pulse method)	$I_F=8\text{ A}$	BDX33	-	-	4.0	V
			BDX33A				
			BDX33B				
			BDX33C				
V_{BE}	Base-Emitter Voltage (*)	$I_C=4.0\text{ A}, V_{CE}=3.0\text{ V}$	BDX33	-	-	2.5	V
			BDX33A				
		$I_C=3.0\text{ A}, V_{CE}=3.0\text{ V}$	BDX33B	-	-	2.5	
			BDX33C				
h_{FE}	DC Current Gain (*)	$V_{CE}=3.0\text{ V}, I_C=4.0\text{ A}$	BDX33	750	-	-	-
			BDX33A				
		$V_{CE}=3.0\text{ V}, I_C=3.0\text{ A}$	BDX33B	750	-	-	
			BDX33C				

(*) Pulse Width $\approx 300\ \mu\text{s}$, Duty Cycle $\angle 2.0\%$

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MECHANICAL DATA CASE TO-220

DIMENSIONS (mm)		
	Min.	Max.
A	9,90	10,30
B	15,65	15,90
C	13,20	13,40
D	6,45	6,65
E	4,30	4,50
F	2,70	3,15
G	2,60	3,00
H	15,75	17,15
L	1,15	1,40
M	3,50	3,70
N	-	1,37
P	0,46	0,55
R	2,50	2,70
S	4,98	5,08
T	2,49	2,54
U	0,70	0,90



Pin 1 :	Base
Pin 2 :	Collector
Pin 3 :	Emitter
Case :	Collector

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