



NPN BDX33 – BDX33A – BDX33B – BDX33C
PNP BDX34 – BDX34A – BDX34B – BDX34C

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.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit	
V_{CEO}	Collector-Emitter Voltage	BDX33 BDX34	45	V	
		BDX33A BDX34A	60		
		BDX33B BDX34B	80		
		BDX33C BDX34C	100		
V_{CEV}	Collector-Emitter Voltage	$I_B=0$	BDX33 BDX34	45	V
			BDX33A BDX34A	60	
			BDX33B BDX34B	80	
			BDX33C BDX34C	100	

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Symbol	Ratings		Value	Unit
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	Watts W/°C
T_J	Junction Temperature		-65 to +150	°C
T_S	Storage Temperature			



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THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit	
R_{thJ-c}	Thermal Resistance, Junction to Case	BDX33	1.78	°C/W
		BDX33A		
		BDX33B		
		BDX33C		
		BDX34		
		BDX34A		
		BDX34B		
		BDX34C		

ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit	
$V_{CEO(SUS)}$	Collector-Emitter Breakdown Voltage (*)	$I_C=100\text{ mA}$	BDX33 BDX34	45	-	-	V
			BDX33A BDX34A	60	-	-	
			BDX33B BDX34B	80	-	-	
			BDX33C BDX34C	100	-	-	
$V_{CER(SUS)}$	Collector-Emitter Sustaining Voltage (*)	$I_B=100\text{ mA}, R_{BE}=100\Omega$	BDX33 BDX34	45	-	-	V
			BDX33A BDX34A	60	-	-	
			BDX33B BDX34B	80	-	-	
			BDX33C BDX34C	100	-	-	



NPN BDX33 – BDX33A – BDX33B – BDX33C
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Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit		
$V_{CEV(SUS)}$	Collector-Emitter Sustaining Voltage (*)	$I_C=100\text{ mA}, V_{BE}=-1.5\text{ V}$	BDX33 BDX34	45	-	-	V	
			BDX33A BDX34A	60	-	-		
			BDX33B BDX34B	80	-	-		
			BDX33C BDX34C	100	-	-		
I_{CEO}	Collector Cutoff Current	$T_{CASE}=25^\circ\text{C}$	$V_{CB}=22\text{V}$	BDX33 BDX34	-	-	0.5	mA
			$V_{CB}=30\text{V}$	BDX33A BDX34A	-	-		
			$V_{CB}=40\text{V}$	BDX33B BDX34B	-	-		
			$V_{CB}=50\text{V}$	BDX33C BDX34C	-	-		
		$T_{CASE}=100^\circ\text{C}$	$V_{CB}=22\text{V}$	BDX33 BDX34	-	-	10	
			$V_{CB}=30\text{V}$	BDX33A BDX34A	-	-		
			$V_{CB}=40\text{V}$	BDX33B BDX34B	-	-		
			$V_{CB}=50\text{V}$	BDX33C BDX34C	-	-		
I_{EBO}	Emitter Cutoff Current	$V_{BE}=-5\text{ V}$	BDX33	-	-	5.0	mA	
			BDX33A					
			BDX33B					
			BDX33C					
			BDX34					
			BDX34A					
			BDX34B BDX34C					
I_{CBO}	Collector-Base Cutoff Current	$T_{CASE}=25^\circ\text{C}$	$V_{CBO}=-45\text{ V}$	BDX33 BDX34	-	-	0.2	mA
			$V_{CBO}=-60\text{ V}$	BDX33A BDX34A	-	-		
			$V_{CBO}=-80\text{ V}$	BDX33B BDX34B	-	-		
			$V_{CBO}=100\text{ V}$	BDX33C BDX34C	-	-		

**NPN BDX33 – BDX33A – BDX33B – BDX33C
PNP BDX34 – BDX34A – BDX34B – BDX34C**

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit	
I_{CBO}	Collector-Base Cutoff Current	$V_{CBO}=45\text{ V}$	BDX33 BDX34	-	-	5	mA
		$V_{CBO}=60\text{ V}$	BDX33A BDX34A	-	-		
		$V_{CBO}=80\text{ V}$	BDX33B BDX34B	-	-		
		$V_{CBO}=100\text{ V}$	BDX33C BDX34C	-	-		
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C=4.0\text{ A}, I_B=8.0\text{ mA}$	BDX33 BDX33A BDX34 BDX34A	-	-	2.5	V
		$I_C=3.0\text{ A}, I_B=6.0\text{ mA}$	BDX33B BDX33C BDX34B BDX34C	-	-	2.5	
V_F	Forward Voltage (pulse method)	$I_F=8\text{ A}$	BDX33 BDX33A BDX33B BDX33C BDX34 BDX34A BDX34B BDX34C	-	-	4.0	V
V_{BE}	Base-Emitter Voltage (*)	$I_C=4.0\text{ A}, V_{CE}=3.0\text{ V}$	BDX33 BDX33A BDX34 BDX34A	-	-	2.5	V
		$I_C=3.0\text{ A}, V_{CE}=3.0\text{ V}$	BDX33B BDX33C BDX34B BDX34C	-	-	2.5	
h_{FE}	DC Current Gain (*)	$V_{CE}=3.0\text{ V}, I_C=4.0\text{ A}$	BDX33 BDX33A BDX34 BDX34A	750	-	-	-
		$V_{CE}=3.0\text{ V}, I_C=3.0\text{ A}$	BDX33B BDX33C BDX34B BDX34C	750	-	-	

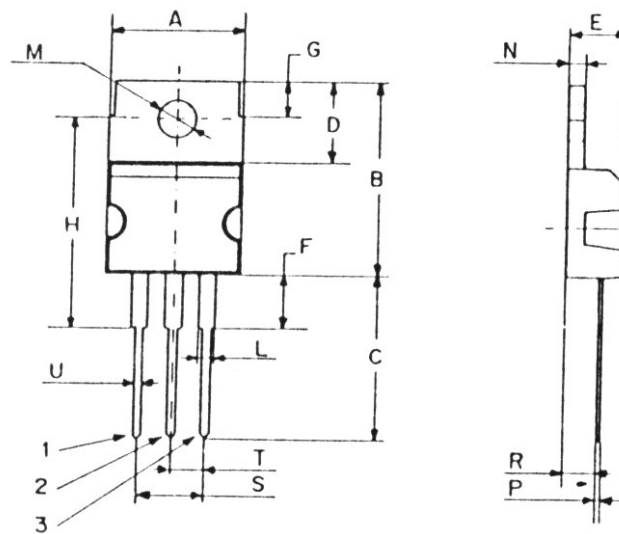
(*) Pulse Width $\approx 300\ \mu\text{s}$, Duty Cycle $\angle 2.0\%$

(1) collector-Emitter voltage limited et $V_{CEci} = V_{\text{rated}}$ by an auxiliary circuit

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MECHANICAL DATA CASE TO-220

DIMENSIONS		
	mm	inches
A	9,86	0,39
B	15,73	0,62
C	13,37	0,52
D	6,67	0,26
E	4,44	0,17
F	4,21	0,16
G	2,99	0,11
H	17,21	0,68
L	1,29	0,05
M	3,6	0,14
N	1,36	0,05
P	0,46	0,02
R	2,1	0,08
S	5	0,19
T	2,52	0,098
U	0,79	0,03



Pin 1 :	base
Pin 2 :	Collector
Pin 3 :	emitter