

DARLINGTON COMPLEMENTARY SILICON POWER TRANSISTORS

..designed for general-purpose amplifier and low speed switching applications

FEATURES:

* Collector-Emitter Sustaining Voltage-

- $V_{CE(sus)}$ = 45 V (Min) - BDX33,BDX34
- = 60 V (Min) - BDX33A,BDX34A
- = 80 V (Min) - BDX33B,BDX34B
- = 100 V (Min) - BDX33C,BDX34C

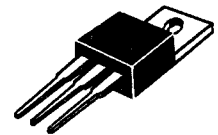
* Monolithic Construction with Built-in Base-Emitter Shunt Resistor

NPN	PNP
BDX33	BDX34
BDX33A	BDX34A
BDX33B	BDX34B
BDX33C	BDX34C

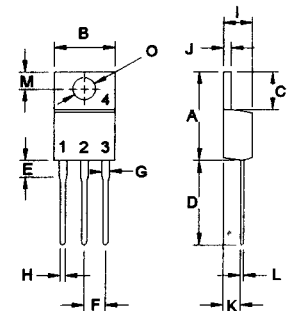
10 AMPERE
DARLINGTON
COMPLEMENTARY SILICON
POWER TRANSISTORS
45-100 VOLTS
70 WATTS

MAXIMUM RATINGS

Characteristic	Symbol	BDX33 BDX34	BDX33A BDX34A	BDX33B BDX34B	BDX33C BDX34C	Unit
Collector-Emitter Voltage	V_{CEO}	45	60	80	100	V
Collector-Base Voltage	V_{CBO}	45	60	80	100	V
Emitter-Base Voltage	V_{EBO}	5.0				V
Collector Current - Continuous	I_C	10				A
Peak	I_{CM}	15				
Base Current	I_B	0.25				A
Total Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	70			0.56	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150				$^\circ C$



TO-220



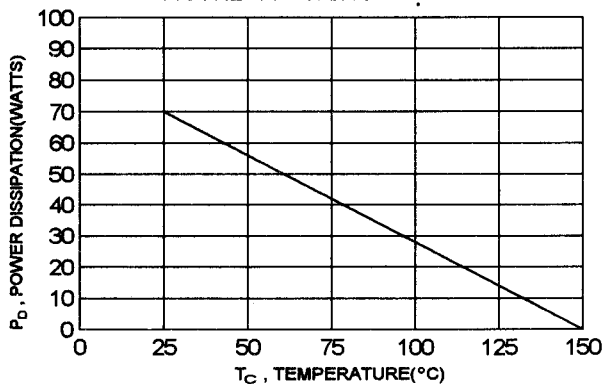
PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.78	$^\circ C/W$

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

FIGURE -1 POWER DERATING



ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

OFF CHARACTERISTICS

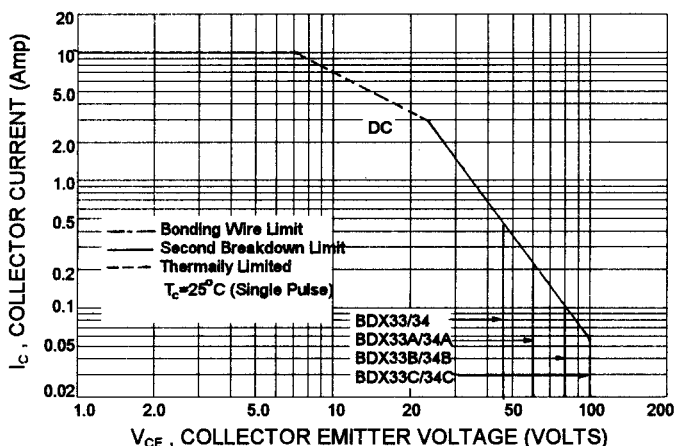
Collector-Emitter Sustaining Voltage(1) ($I_C = 100\text{ mA}$, $I_B = 0$)	BDX33, BDX34 BDX33A, BDX34A BDX33B, BDX34B BDX33C, BDX34C	$V_{CE(sus)}$	45 60 80 100	V
Collector Cutoff Current ($V_{CE} = 22\text{ V}$, $I_B = 0$) ($V_{CE} = 30\text{ V}$, $I_B = 0$) ($V_{CE} = 40\text{ V}$, $I_B = 0$) ($V_{CE} = 50\text{ V}$, $I_B = 0$)	BDX33, BDX34 BDX33A, BDX34A BDX33B, BDX34B BDX33C, BDX34C	I_{CEO}		0.5 0.5 0.5 0.5 mA
Collector-Base Cutoff Current ($V_{CB} = \text{Rated } V_{CB}$, $I_E = 0$)		I_{CBO}		200 uA
Emitter-Base Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)		I_{EBO}		10 mA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 4.0\text{ A}$, $V_{CE} = 3.0\text{ V}$) ($I_C = 3.0\text{ A}$, $V_{CE} = 3.0\text{ V}$)	BDX33/33A/34/34A BDX33B/33C/34B/34C	hFE	750 750	
Collector-Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 8.0\text{ mA}$) ($I_C = 3.0\text{ A}$, $I_B = 6.0\text{ mA}$)	BDX33/33A/34/34A BDX33B/33C/34B/34C	$V_{CE(sat)}$		2.5 2.5 V
Base-Emitter On Voltage ($I_C = 4.0\text{ A}$, $V_{CE} = 3.0\text{ V}$) ($I_C = 3.0\text{ A}$, $V_{CE} = 3.0\text{ V}$)	BDX33/33A/34/34A BDX33B/33C/34B/34C	$V_{BE(on)}$		2.5 2.5 V

(1) Pulse Test: Pulse Width = 300 us, Duty Cycle $\leq 2.0\%$

FIG-2 SAFE OPERATING AREA



There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of FIG-2 is base on $T_{J(PK)} = 150^\circ\text{C}$; T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} < 150^\circ\text{C}$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.