SGS-THOMSON MICROELECTRONICS

BDX33A/33B/33C
BDX34A/34B/34C

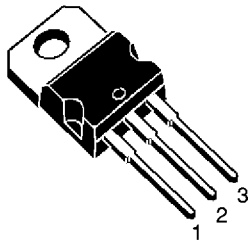
COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- DBX33B, BDX33C, BDX34B AND BDX34C ARE SGS-THOMSON PREFERRED SALESTYPES

DESCRIPTION

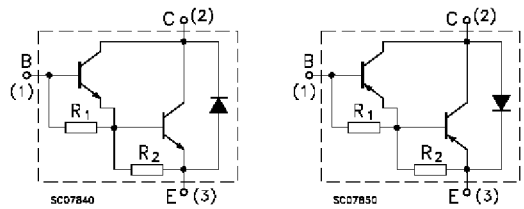
The BDX33B, BDX33B and BDX33C are silicon epitaxial-base NPN power transistors in monolithic Darlington configuration and are mounted in Jedec TO-220 plastic package. They are intented for use in power linear and switching applications.

The complementary PNP types are the BDX34A, BDX34B and BDX34C respectively.



TO-220

INTERNAL SCHEMATIC DIAGRAM



R_1 Typ. = 10 KΩ R_2 Typ. = 150 Ω

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value			Unit
		NPN	BDX33A	BDX33B	BDX33C	
		PNP	BDX34A	BDX34B	BDX34C	
V_{CBO}	Collector-Base Voltage (I_E = 0)		60	80	100	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		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 Dissipation at $T_c \leq 25\ ^{o}C$		70			W
T_{stg}	Storage Temperature		-65 to 150			^{o}C
T_j	Max. Operating Junction Temperature		150			^{o}C

For PNP types voltage and current values are negative.

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	1.78	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **BDX33A/34A**	V_{CB} = 60 V			0.2	mA
		for **BDX33B/34B**	V_{CB} = 80 V			0.2	mA
		for **BDX33C/34C**	V_{CB} = 100V			0.2	mA
		T_{case} = 100 °C					
		for **BDX33A/34A**	V_{CB} = 60 V			5	mA
		for **BDX33B/34B**	V_{CB} = 80 V			5	mA
		for **BDX33C/34C**	V_{CB} = 100 V			5	mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	for **BDX33A/34A**	V_{CB} = 30 V			0.5	mA
		for **BDX33B/34B**	V_{CB} = 40 V			0.5	mA
		for **BDX33C/34C**	V_{CB} = 50V			0.5	mA
		T_{case} = 100 °C					
		for **BDX33A/34A**	V_{CB} = 30 V			10	mA
		for **BDX33B/34B**	V_{CB} = 40 V			10	mA
		for **BDX33C/34C**	V_{CB} = 50 V			10	mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V				5	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA	for **BDX33A/34A**	60			V
			for **BDX33B/34B**	80			V
			for **BDX33C/34C**	100			V
$V_{CER(sus)}$*	Collector-emitter Sustaining Voltage (I_B=0 R_{BE} =100 Ω)	I_C = 100 mA	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}=-1.5V)	I_C = 100 mA	for **BDX33A/34A**	60			V
			for **BDX33B/34B**	80			V
			for **BDX33C/34C**	100			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	for **BDX33A/34A**					
		I_C = 4 A	I_B = 8 mA			2.5	V
		for **BDX33B/33C/34B/34C**					
		I_C = 3 A	I_B = 6 mA			2.5	V
V_{BE}*	Base-emitter Voltage	for **BDX33A/34A**					
		I_C = 4 A	V_{CE} = 3 V			2.5	V
		for **BDX33B/33C/34B/34C**					
		I_C = 3 A	V_{CE} = 3 V			2.5	V
h_{FE}*	DC Current Gain	for **BDX33A/34A**					
		I_C = 4 A	V_{CE} = 3 V	750			V
		for **BDX33B/33C/34B/34C**					
		I_C = 3 A	V_{CE} = 3 V	750			V
V_F*	Parallel-Diode Forward Voltage	I_F = 8 A				4	V
h_{fe}	Small Signal Current Gain	I_C = 1 A	V_{CE} = 5 V	100			
		f = 1MHz					

* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %
For PNP types voltage and current values are negative.

TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151