

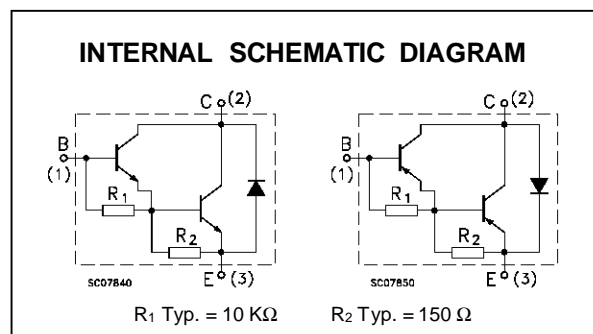
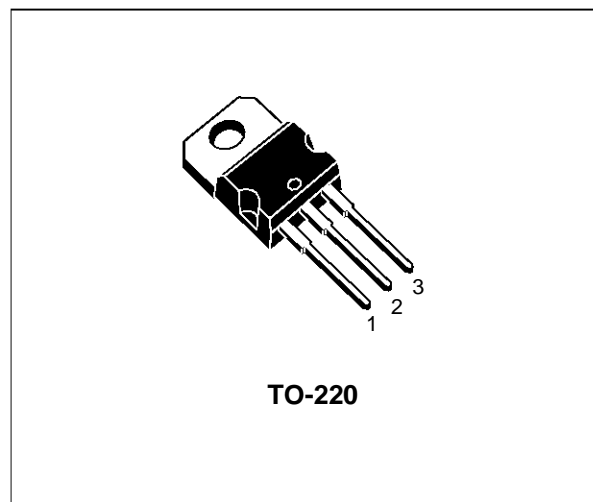
**COMPLEMENTARY SILICON POWER  
DARLINGTON TRANSISTORS**

- BDX33B, 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 intended for use in power linear and switching applications.

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



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value			Unit	
		NPN	BDX33A	BDX33B		BDX33C
V <sub>CBO</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)		60	80	100	V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)		60	80	100	V
I <sub>C</sub>	Collector Current			10		A
I <sub>CM</sub>	Collector Peak Current			15		A
I <sub>B</sub>	Base Current			0.25		A
P <sub>tot</sub>	Total Dissipation at T <sub>c</sub> ≤ 25 °C			70		W
T <sub>stg</sub>	Storage Temperature			-65 to 150		°C
T <sub>j</sub>	Max. Operating Junction Temperature			150		°C

For PNP types voltage and current values are negative.

## BDX33A/33B/33C/34A/34B/34C

### THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	1.78	°C/W
-----------------------	----------------------------------	------	------

### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

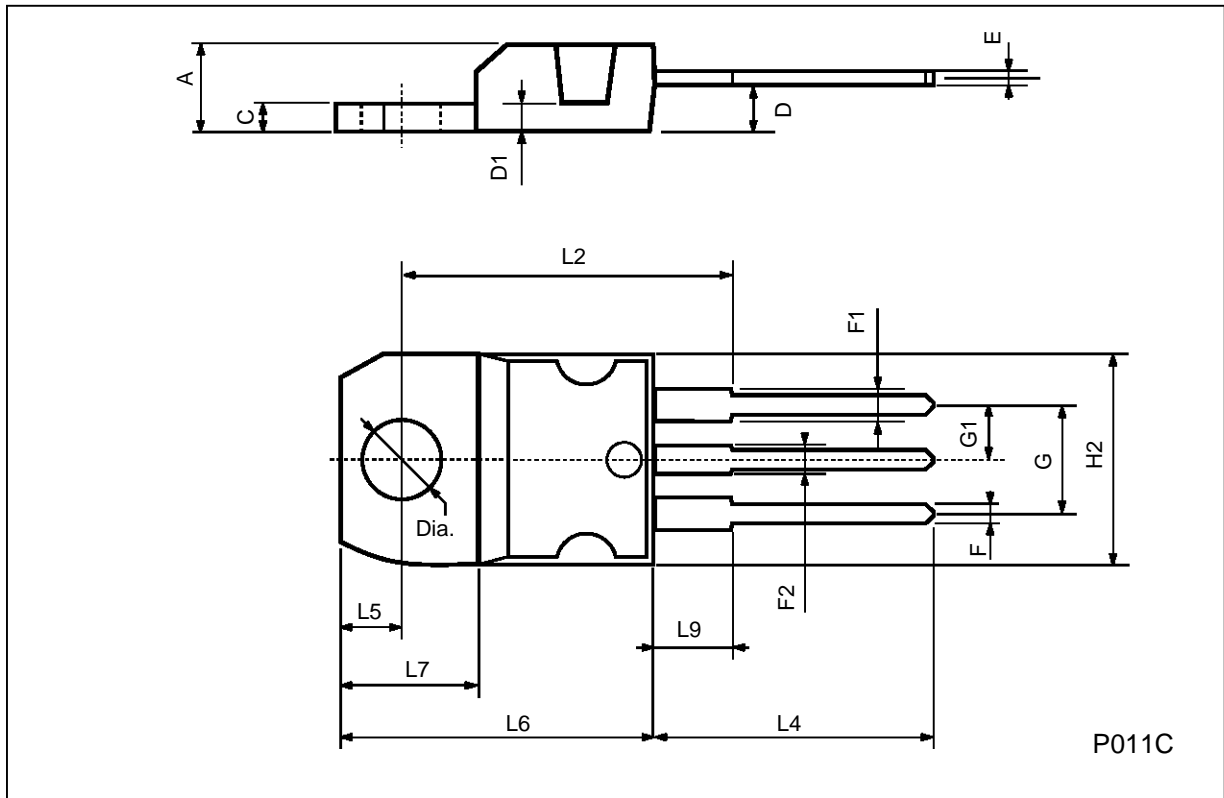
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	for <b>BDX33A/34A</b> V <sub>CB</sub> = 60 V for <b>BDX33B/34B</b> V <sub>CB</sub> = 80 V for <b>BDX33C/34C</b> V <sub>CB</sub> = 100V T <sub>case</sub> = 100 °C for <b>BDX33A/34A</b> V <sub>CB</sub> = 60 V for <b>BDX33B/34B</b> V <sub>CB</sub> = 80 V for <b>BDX33C/34C</b> V <sub>CB</sub> = 100 V			0.2 0.2 0.2 5 5 5	mA mA mA mA mA mA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	for <b>BDX33A/34A</b> V <sub>CB</sub> = 30 V for <b>BDX33B/34B</b> V <sub>CB</sub> = 40 V for <b>BDX33C/34C</b> V <sub>CB</sub> = 50V T <sub>case</sub> = 100 °C for <b>BDX33A/34A</b> V <sub>CB</sub> = 30 V for <b>BDX33B/34B</b> V <sub>CB</sub> = 40 V for <b>BDX33C/34C</b> V <sub>CB</sub> = 50 V			0.5 0.5 0.5 10 10 10	mA mA mA mA mA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			5	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 100 mA for <b>BDX33A/34A</b> for <b>BDX33B/34B</b> for <b>BDX33C/34C</b>	60 80 100			V V V
V <sub>CER(sus)*</sub>	Collector-emitter Sustaining Voltage (I <sub>B</sub> =0 R <sub>BE</sub> =100 Ω)	I <sub>C</sub> = 100 mA for <b>BDX33A/34A</b> for <b>BDX33B/34B</b> for <b>BDX33C/34C</b>	60 80 100			V V V
V <sub>CEV(sus)*</sub>	Collector-emitter Sustaining Voltage (I <sub>B</sub> =0 V <sub>BE</sub> =-1.5V)	I <sub>C</sub> = 100 mA for <b>BDX33A/34A</b> for <b>BDX33B/34B</b> for <b>BDX33C/34C</b>	60 80 100			V V V
V <sub>CE(sat)*</sub>	Collector-emitter Saturation Voltage	for <b>BDX33A/34A</b> I <sub>C</sub> = 4 A I <sub>B</sub> = 8 mA for <b>BDX33B/33C/34B/34C</b> I <sub>C</sub> = 3 A I <sub>B</sub> = 6 mA			2.5 2.5	V V
V <sub>BE*</sub>	Base-emitter Voltage	for <b>BDX33A/34A</b> I <sub>C</sub> = 4 A V <sub>CE</sub> = 3 V for <b>BDX33B/33C/34B/34C</b> I <sub>C</sub> = 3 A V <sub>CE</sub> = 3 V			2.5 2.5	V V
h <sub>FE*</sub>	DC Current Gain	for <b>BDX33A/34A</b> I <sub>C</sub> = 4 A V <sub>CE</sub> = 3 V for <b>BDX33B/33C/34B/34C</b> I <sub>C</sub> = 3 A V <sub>CE</sub> = 3 V	750 750			V V
V <sub>F*</sub>	Parallel-Diode Forward Voltage	I <sub>F</sub> = 8 A			4	V
h <sub>fe</sub>	Small Signal Current Gain	I <sub>C</sub> = 1 A V <sub>CE</sub> = 5 V f = 1MHz	100			

\* 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



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1995 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -  
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A