

Complementary power Darlington transistors

Features

- Good h_{FE} linearity
- High f_T frequency
- Monolithic Darlington configuration with integrated antiparallel collector-emitter diode

Application

- Audio amplifiers
- Linear and switching industrial equipment

Description

The devices are manufactured in planar base island technology with monolithic Darlington configuration.



Figure 1. Internal schematic diagram

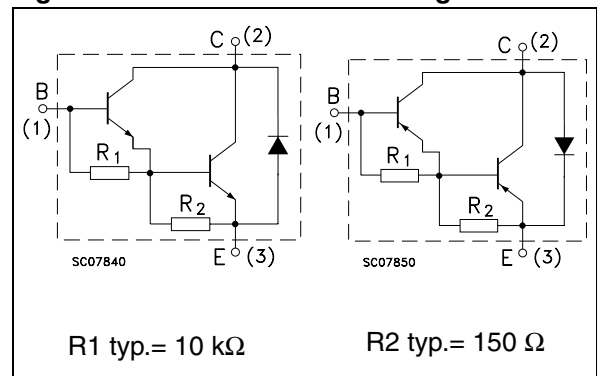


Table 1. Device summary

Order code	Marking	Package	Packaging
BDX53B	BDX53B	TO-220	Tube
BDX53C	BDX53C		
BDX54B	BDX54B		
BDX54C	BDX54C		

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value			Unit
		NPN	BDX53B	BDX53C	
		PNP	BDX54B	BDX54C	
V_{CBO}	Collector-base voltage ($I_E = 0$)	80	100	V	
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	80	100	V	
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5		V	
I_C	Collector current	8		A	
I_{CM}	Collector peak current (repetitive)	12		A	
I_B	Base current	0.2		mA	
P_{TOT}	Total dissipation at $T_C = 25^\circ\text{C}$	60		W	
T_{stg}	Storage temperature	-65 to 150		$^\circ\text{C}$	
T_J	Max. operating junction temperature	150		$^\circ\text{C}$	

Note: For PNP types voltage and current values are negative.

2 Electrical characteristics

($T_{CASE}=25^{\circ}C$ unless otherwise specified)

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{CE(sus)}^{(1)}$	Collector-emitter sustaining voltage ($I_B = 0$)	$I_C = 100\text{ mA}$ for BDX53B - BDX54B for BDX53C - BDX54C	80 100			V V
I_{CBO}	Collector cut-off current ($I_E = 0$)	$V_{CB} = 80\text{ V}$ for BDX53B - BDX54B			0.2	mA
		$V_{CB} = 100\text{ V}$ for BDX53C - BDX54C			0.2	mA
I_{CEO}	Collector cut-off current ($I_B = 0$)	$V_{CE} = 40\text{ V}$ for BDX53B - BDX54B			0.5	mA
		$V_{CE} = 50\text{ V}$ for BDX53C - BDX54C			0.5	mA
I_{EBO}	Emitter cut-off current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			2	mA
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 3\text{ A}; I_B = 12\text{ mA}$			2	V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 3\text{ A}; I_B = 12\text{ mA}$			2.5	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 3\text{ A}; V_{CE} = 3\text{ V}$	750			
$V_F^{(1)}$	Diode forward voltage	$I_F = 3\text{ A};$		1.8	2.5	V
		$I_F = 8\text{ A};$		2.5		V

1. Pulsed: pulse duration = 300 μs , duty cycle 1.5%

Note: For PNP types voltage and current values are negative.

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

TO-220 mechanical data

Dim	mm			inch		
	Min	Typ	Max	Min	Typ	Max
A	4.40		4.60	0.173		0.181
b	0.61		0.88	0.024		0.034
b1	1.14		1.70	0.044		0.066
c	0.49		0.70	0.019		0.027
D	15.25		15.75	0.6		0.62
D1		1.27			0.050	
E	10		10.40	0.393		0.409
e	2.40		2.70	0.094		0.106
e1	4.95		5.15	0.194		0.202
F	1.23		1.32	0.048		0.051
H1	6.20		6.60	0.244		0.256
J1	2.40		2.72	0.094		0.107
L	13		14	0.511		0.551
L1	3.50		3.93	0.137		0.154
L20		16.40			0.645	
L30		28.90			1.137	
∅P	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



4 Revision history

Table 4. Document revision history

Date	Revision	Changes
09-Sep-2004	3	
23-Oct-2007	4	Technology change from epibase to planar (PCN APM-PWR/07/2417 and APM-PWR/07/2615)

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2007 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[BDX53B](#) [BDX54C](#) [BDX53C](#)