

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

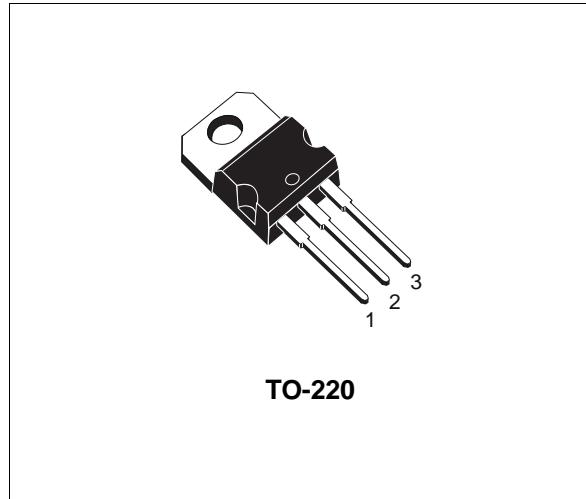
- STMicroelectronics PREFERRED SALES TYPES
- COMPLEMENTARY PNP - NPN DEVICES
- MONOLITHIC DARLINGTON CONFIGURATION
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

### APPLICATIONS

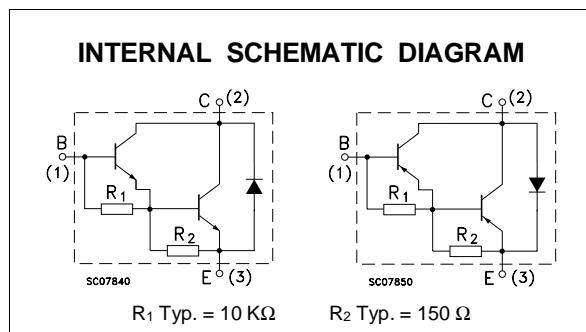
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

### DESCRIPTION

The BDX53F is a silicon Epitaxial-Base NPN power transistor in monolithic Darlington configuration, mounted in Jedec TO-220 plastic package. It is intended for use in power linear and switching applications. The complementary PNP type is BDX54F.



TO-220



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		NPN	BDX53F	
		PNP	BDX54F	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )		160	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )		160	V
$V_{EBO}$	Emitter-base Voltage ( $I_C = 0$ )		5	V
$I_C$	Collector Current		8	A
$I_{CM}$	Collector Peak Current		12	A
$I_B$	Base Current		0.2	A
$P_{tot}$	Total Dissipation at $T_c \leq 25^\circ\text{C}$		60	W
$T_{stg}$	Storage Temperature		-65 to 150	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature		150	$^\circ\text{C}$

For PNP types voltage and current values are negative.

## BDX53F / BDX54F

### THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	2.08	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-ambient	Max	70	°C/W

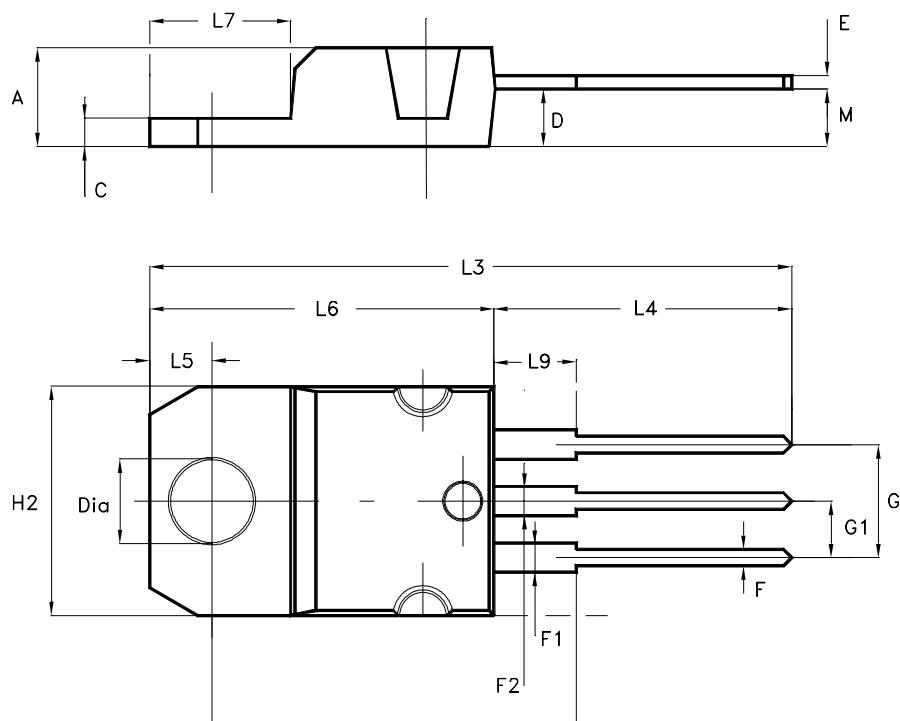
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CE</sub> = 80 V			0.5	mA
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CB</sub> = 160 V			0.2	mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			5	mA
V <sub>C EO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 50 mA	160			V
V <sub>CE(sat)*</sub>	Collector-emitter Saturation Voltage	I <sub>C</sub> = 2 A I <sub>B</sub> = 10 mA			2	V
V <sub>BE(sat)*</sub>	Base-emitter Saturation Voltage	I <sub>C</sub> = 2 A I <sub>B</sub> = 10 mA			2.5	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 2 A V <sub>CE</sub> = 5 V I <sub>C</sub> = 3 A V <sub>CE</sub> = 5 V	500 150			
V <sub>F*</sub>	Parallel Diode Forward Voltage	I <sub>F</sub> = 2 A			2.5	V
h <sub>fe*</sub>	Small Signal Current Gain	I <sub>C</sub> = 0.5 A f = 1MHz V <sub>CE</sub> = 2 V		20		

\* 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		0.052
D	2.40		2.72	0.094		0.107
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		0.202
G1	2.40		2.70	0.094		0.106
H2	10.00		10.40	0.394		0.409
L2		16.40			0.645	
L4	13.00		14.00	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.20		6.60	0.244		0.260
L9	3.50		3.93	0.137		0.154
M		2.60			0.102	
DIA.	3.75		3.85	0.147		0.151



P011CI

Information furnished is believed to be accurate and reliable. However, STMicroelectronics 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 STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics.

All other names are the property of their respective owners.

© 2003 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.

<http://www.st.com>