



# BDW93CFP BDW94CFP

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

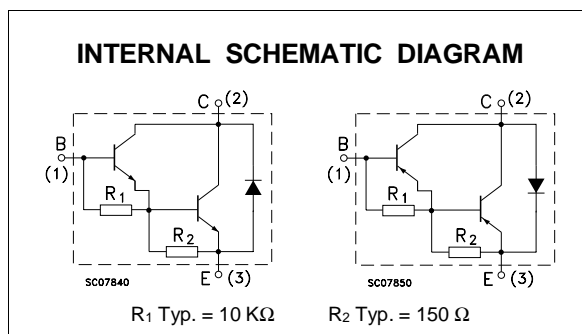
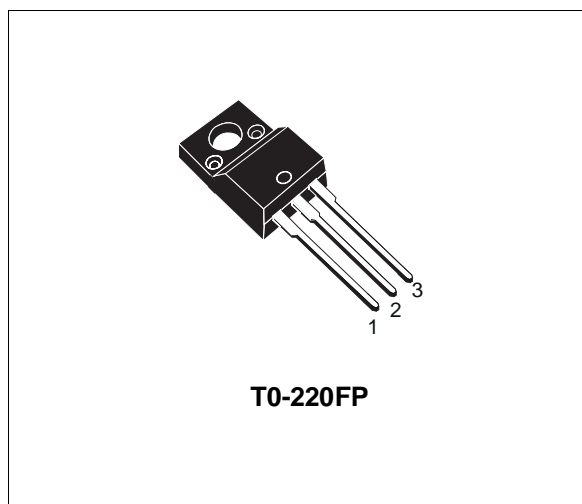
- STMicroelectronics PREFERRED SALESTYPES
- MONOLITHIC DARLINGTON CONFIGURATION
- COMPLEMENTARY PNP - NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE
- FULLY MOLDED INSULATED PACKAGE
- 2000 V DC INSULATION (U.L. COMPLIANT)

### APPLICATIONS

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

### DESCRIPTION

The BDW93CFP is a silicon Epitaxial-Base NPN transistor in monolithic Darlington configuration mounted in TO-220FP fully molded insulated package. It is intended for use in power linear and switching applications. The complementary PNP type is the BDW94CFP.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN	Value	Unit
		PNP	BDW94CFP	
V <sub>CBO</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)		100	V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)		100	V
I <sub>C</sub>	Collector Current		12	A
I <sub>CM</sub>	Collector Peak Current		15	A
I <sub>B</sub>	Base Current		0.2	A
P <sub>tot</sub>	Total Dissipation at T <sub>c</sub> ≤ 25 °C		33	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.

BDW93CFP / BDW94CFP

THERMAL DATA

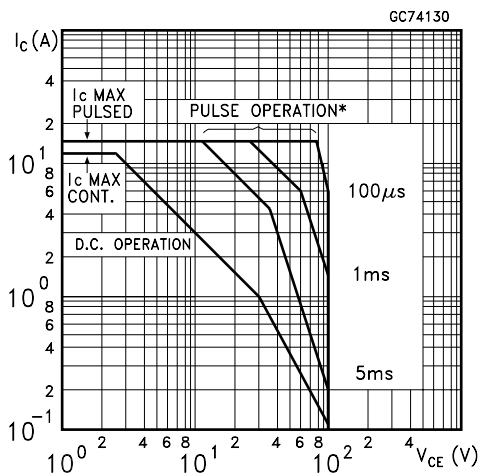
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	3.8	°C/W
-----------------------	----------------------------------	-----	-----	------

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)	V <sub>CB</sub> = 100 V V <sub>CB</sub> = 100 V      T <sub>case</sub> = 150 °C			100 5	μA mA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = 80 V			1	mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			2	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 100 mA	100			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 5 A I <sub>C</sub> = 10 A      I <sub>B</sub> = 20 mA I <sub>B</sub> = 100 mA			2 3	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 5 A I <sub>C</sub> = 10 A      I <sub>B</sub> = 20 mA I <sub>B</sub> = 100 mA			2.5 4	V V
h <sub>FE</sub> *	DC Current Gain	I <sub>C</sub> = 3 A I <sub>C</sub> = 5 A I <sub>C</sub> = 10 A      V <sub>CE</sub> = 3 V V <sub>CE</sub> = 3 V V <sub>CE</sub> = 3 V	1000 750 100		20000	
V <sub>F</sub> *	Parallel-diode Forward Voltage	I <sub>F</sub> = 5 A I <sub>F</sub> = 10 A		1.3 1.8	2 4	V V
h <sub>fe</sub>	Small Signal Current Gain	I <sub>C</sub> = 1 A f = 1 MHz      V <sub>CE</sub> = 10 V	20			

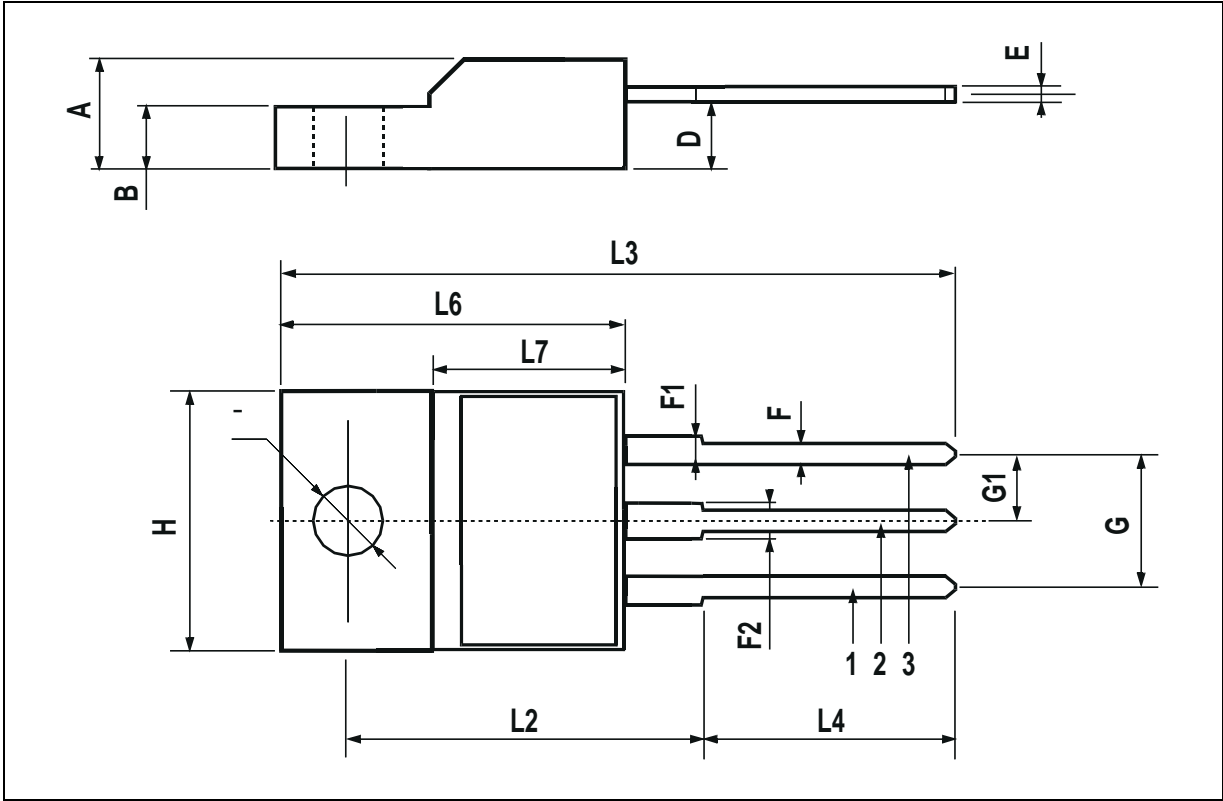
\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %  
For PNP types voltage and current values are negative.

Safe Operating Area



TO-220FP MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.45		0.7	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.7	0.045		0.067
F2	1.15		1.7	0.045		0.067
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
H	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
Ø	3		3.2	0.118		0.126



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

© 2001 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco -  
Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>