



# BDW93CFP BDW94CFP

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

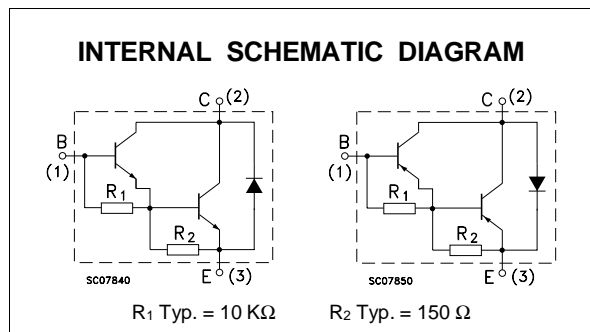
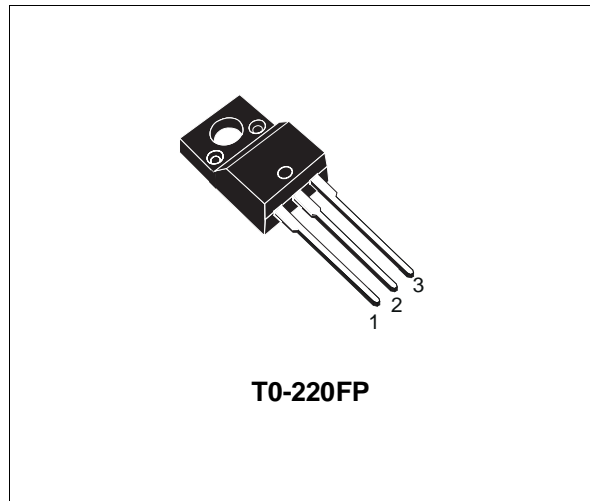
- STMicroelectronics PREFERRED SALESTYPES
- MONOLITHIC DARLINGTON CONFIGURATION
- COMPLEMENTARY PNP - NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE
- FULLY MOLDED INSULATED PACKAGE
- 2000 V DC INSULATION (U.L. COMPLIANT)

### 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	Value		Unit
		NPN	BDW93CFP	
		PNP	BDW94CFP	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )		100	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )		100	V
$I_C$	Collector Current		12	A
$I_{CM}$	Collector Peak Current		15	A
$I_B$	Base Current		0.2	A
$P_{tot}$	Total Dissipation at $T_c \leq 25^\circ\text{C}$		33	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.

# BDW93CFP / BDW94CFP

## THERMAL DATA

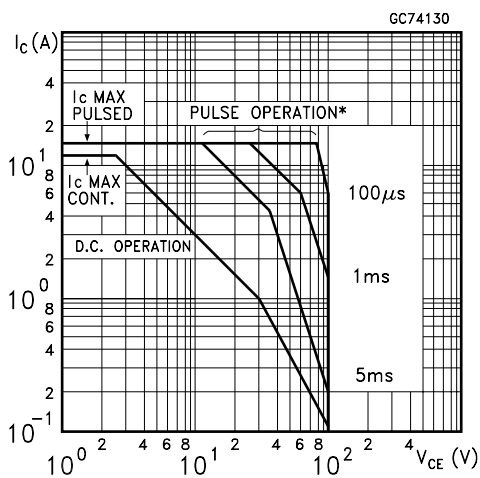
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	3.8	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

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

