



# BDW93CFP BDW94CFP

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

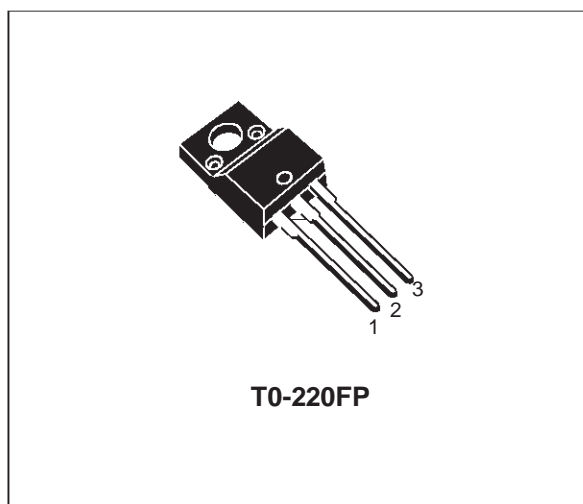
- STMicroelectronics PREFERRED SALESTYPES
- MONOLITHIC DARLINGTON CONFIGURATION
- COMPLEMENTARY PNP - NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE
- FULLY MOLDED ISOLATED PACKAGE
- 2000 V DC ISOLATION (U.L. COMPLIANT)

### APPLICATIONS

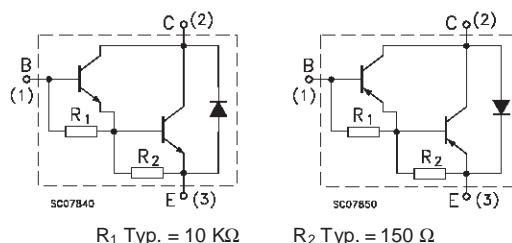
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

### DESCRIPTION

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



### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN	Value	Unit
		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.

## THERMAL DATA

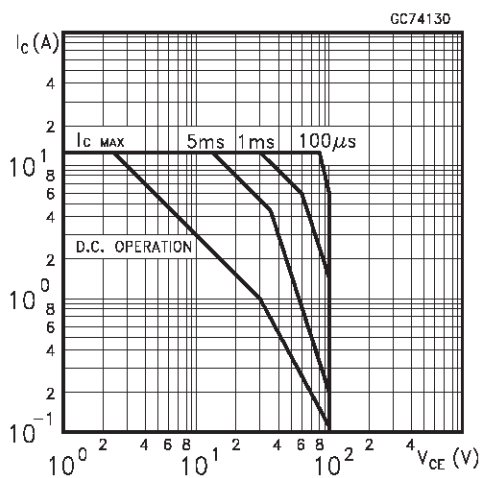
$R_{thj-case}$	Thermal Resistance Junction-case	Max	3.8	$^{\circ}\text{C/W}$
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ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = 100\text{ V}$ $V_{CB} = 100\text{ V}$ $T_{case} = 150^{\circ}\text{C}$			100 5	$\mu\text{A}$ $\text{mA}$
$I_{CEO}$	Collector Cut-off Current ( $I_B = 0$ )	$V_{CE} = 80\text{ V}$			1	$\text{mA}$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			2	$\text{mA}$
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100\text{ mA}$	100			$\text{V}$
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 5\text{ A}$ $I_C = 10\text{ A}$ $I_B = 20\text{ mA}$ $I_B = 100\text{ mA}$			2 3	$\text{V}$ $\text{V}$
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 5\text{ A}$ $I_C = 10\text{ A}$ $I_B = 20\text{ mA}$ $I_B = 100\text{ mA}$			2.5 4	$\text{V}$ $\text{V}$
$h_{FE}^*$	DC Current Gain	$I_C = 3\text{ A}$ $I_C = 5\text{ A}$ $I_C = 10\text{ A}$ $V_{CE} = 3\text{ V}$ $V_{CE} = 3\text{ V}$ $V_{CE} = 3\text{ V}$	1000 750 100		20000	
$V_F^*$	Parallel-diode Forward Voltage	$I_F = 5\text{ A}$ $I_F = 10\text{ A}$		1.3 1.8	2 4	$\text{V}$ $\text{V}$
$h_{fe}$	Small Signal Current Gain	$I_C = 1\text{ A}$ $f = 1\text{ MHz}$ $V_{CE} = 10\text{ V}$	20			

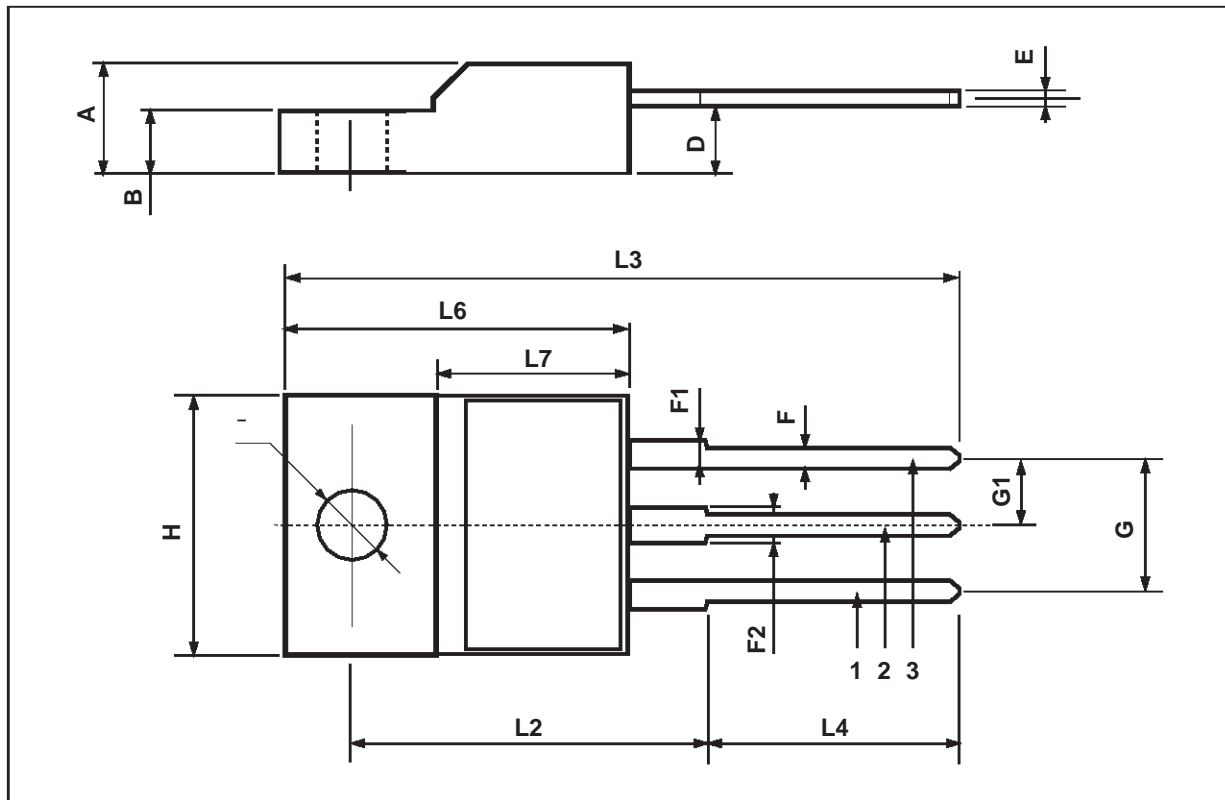
\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5 %  
For PNP types voltage and current values are negative.

## 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



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