BDW93C
BDW94B/BDW94C

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

APPLICATIONS

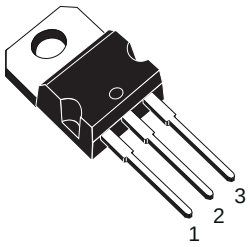
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

DESCRIPTION

The BDW93C is a silicon Epitaxial-Base NPN power transistor in monolithic Darlington configuration mounted in Jedec TO-220 plastic package. It is intented for use in power linear and switching applications.

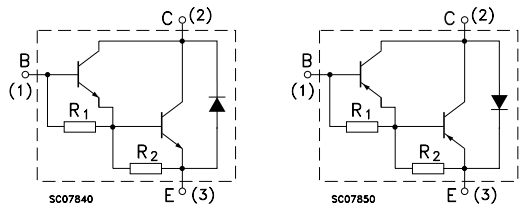
The complementary PNP type is BDW94C.

Also BDW94B is a PNP type.



TO-220

INTERNAL SCHEMATIC DIAGRAM



R_1 Typ. = 10 KΩ R_2 Typ. = 150 Ω

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
	NPN		BDW93C	
	PNP	BDW94B	BDW94C	
V_{CBO}	Collector-Base Voltage (I_E = 0)	80	100	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	80	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 $T_c \leq 25\ ^oC$	80		W
T_{stg}	Storage Temperature	-65 to 150		^oC
T_j	Max. Operating Junction Temperature	150		^oC

For PNP types voltage and current values are negative.

THERMAL DATA

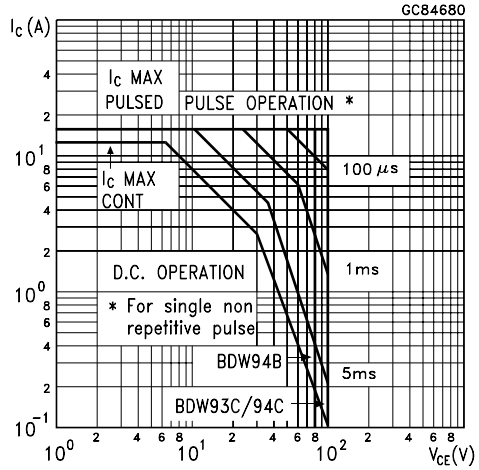
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	1.56	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

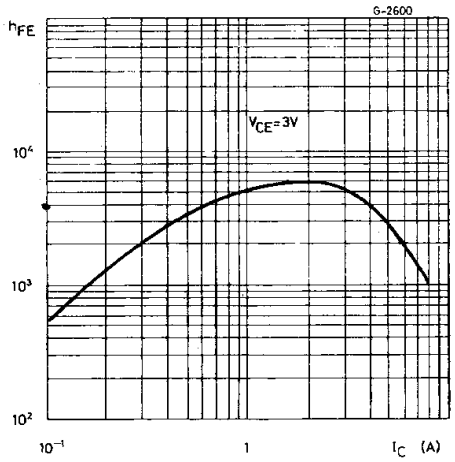
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **BDW94B**	V_{CB} = 80 V			100	µA
		for **BDW93C/94C**	V_{CB} = 100 V			100	µA
		T_{case} = 150 ^oC					
		for **BDW94B**	V_{CB} = 80 V			5	mA
		for **BDW93C/94C**	V_{CB} = 100 V			5	mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	for **BDW94B**	V_{CE} = 80 V			1	mA
		for **BDW93C/94C**	V_{CE} = 100 V			1	mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V				2	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA					
		for **BDW94B**		80			V
		for **BDW93C/94C**		100			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 5 A	I_B = 20 mA			2	V
		I_C = 10 A	I_B = 100 mA			3	V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 5 A	I_B = 20 mA			2.5	V
		I_C = 10 A	I_B = 100 mA			4	V
h_{FE}*	DC Current Gain	I_C = 3 A	V_{CE} = 3 V	1000			
		I_C = 5 A	V_{CE} = 3 V	750		20K	
		I_C = 10 A	V_{CE} = 3 V	100			
V_F*	Parallel-diode Forward Voltage	I_F = 5 A			1.3	2	V
		I_F = 10 A			1.8	4	V
h_{fe}	Small Signal Current Gain	I_C = 1 A	V_{CE} = 10 V				
		f = 1 MHz		20			

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

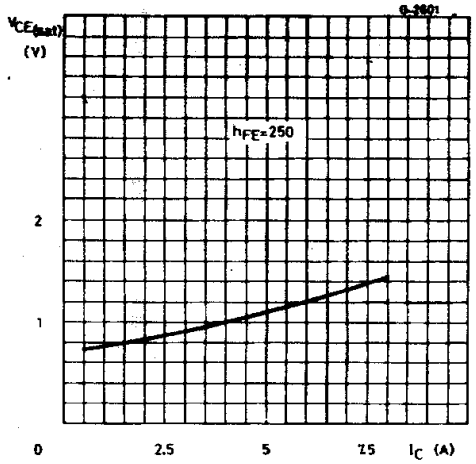
Safe Operating Area



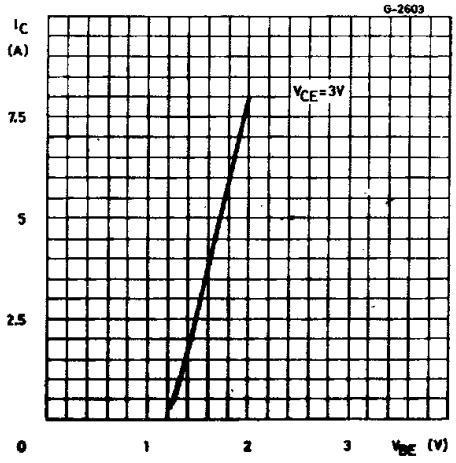
DC Current Gain (NPN types)



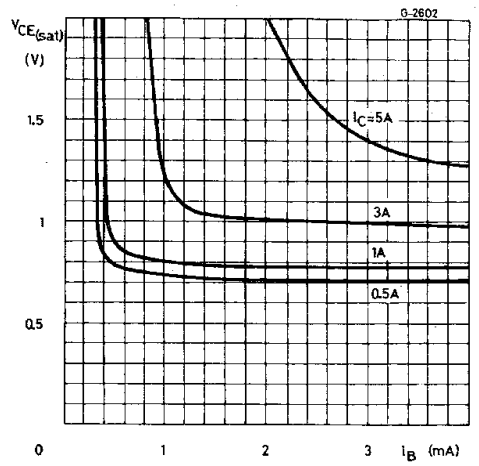
Collector Emitter Saturation Voltage (NPN types)



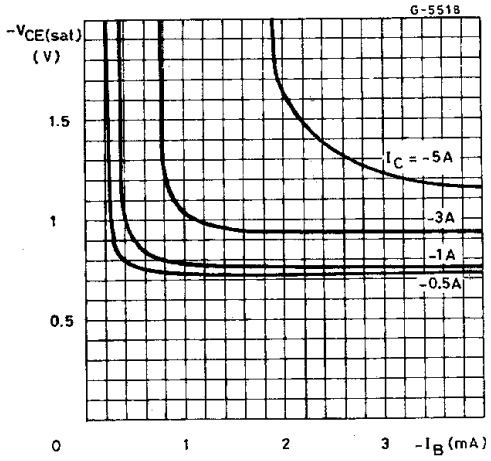
DC Transconductance (NPN types)



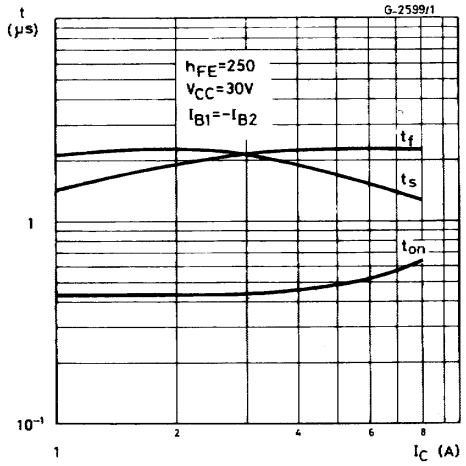
Collector Emitter Saturation Voltage (NPN types)



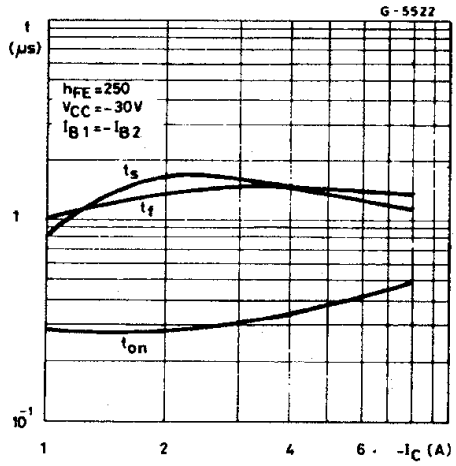
Collector Emitter Saturation Voltage (PNP types)



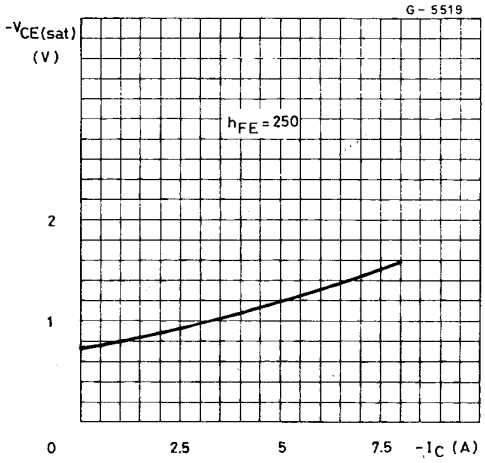
Saturated Switching Characteristics (NPN types)



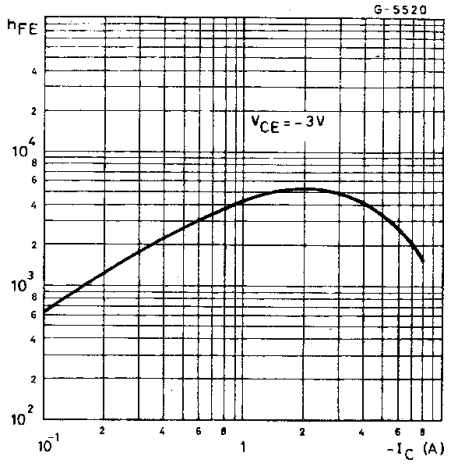
Saturated Switching Characteristics (PNP types)



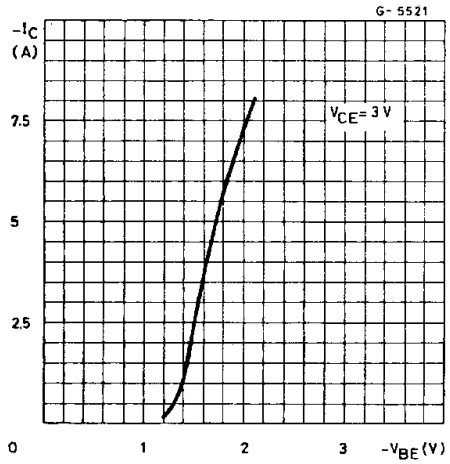
Collector Emitter Saturation Voltage (PNP types)



DC Current Gain (PNP types)

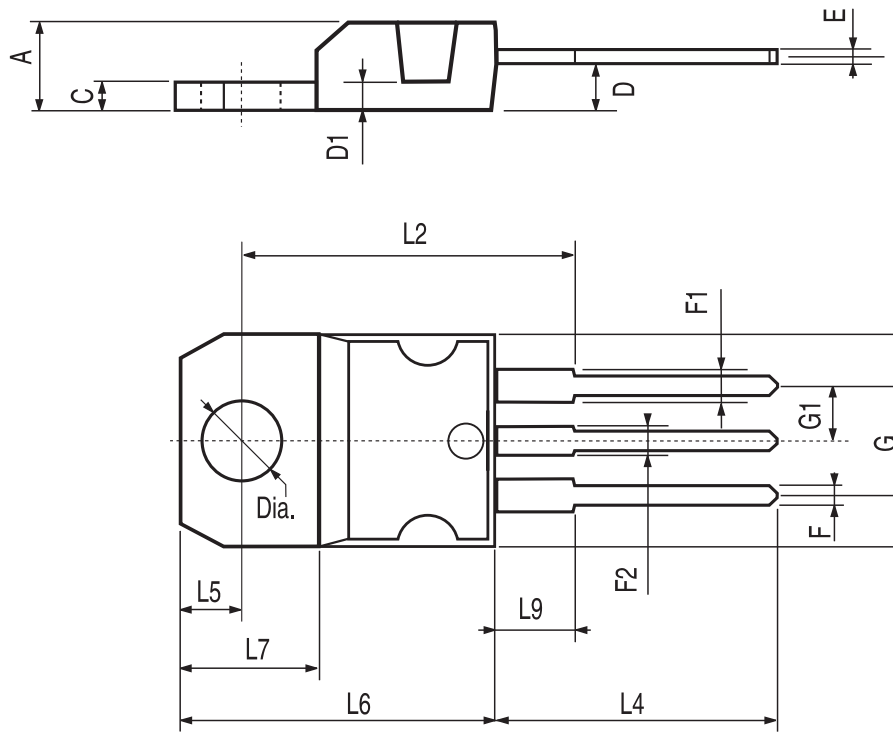


DC Transconductance (PNP types)



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		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
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		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



P011C