

Darlington Transistors

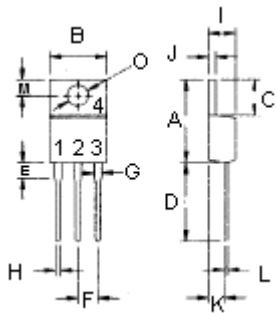


BDW93, BDW94 Series



Features:

- Designed for general-purpose amplifier and low speed switching applications
- Collector-emitter sustaining voltage- $V_{CEO(sus)} = 80\text{ V}$ (Minimum) - BDW93B, BDW94B
100 V (Minimum) - BDW93C, BDW94C
- Collector-emitter saturation voltage- $V_{CE(sat)} = 2\text{ V}$ (Maximum) at $I_C = 5\text{ A}$
- Monolithic construction with built-in-base-emitter shunt resistor



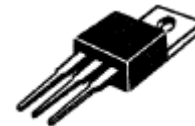
- Pin : 1. Base
2. Collector
3. Emitter
4. Collector (Case)

Dimension	Minimum	Maximum
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.9

NPN
BDW93B
BDW93C

PNP
BDW94B
BDW94C

12 A
Darlington
Complementary Silicon
Power Transistors
45 to 100 V
80 W



TO-220

Dimensions : Millimetres

Maximum Ratings

Characteristic	Symbol	BDW93B BDW94B	BDW93C BDW94C	Unit
Collector-Emitter Voltage	V_{CEO}	80	100	V
Collector-Base Voltage	V_{CBO}			
Emitter-Base Voltage	V_{EBO}	5		
Collector Current-Continuous Peak	I_C I_{CM}	12 15		A
Base Current	I_B	0.2		
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate Above 25°C	P_D	80 0.64		W W / $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150		$^\circ\text{C}$

Thermal Characteristics

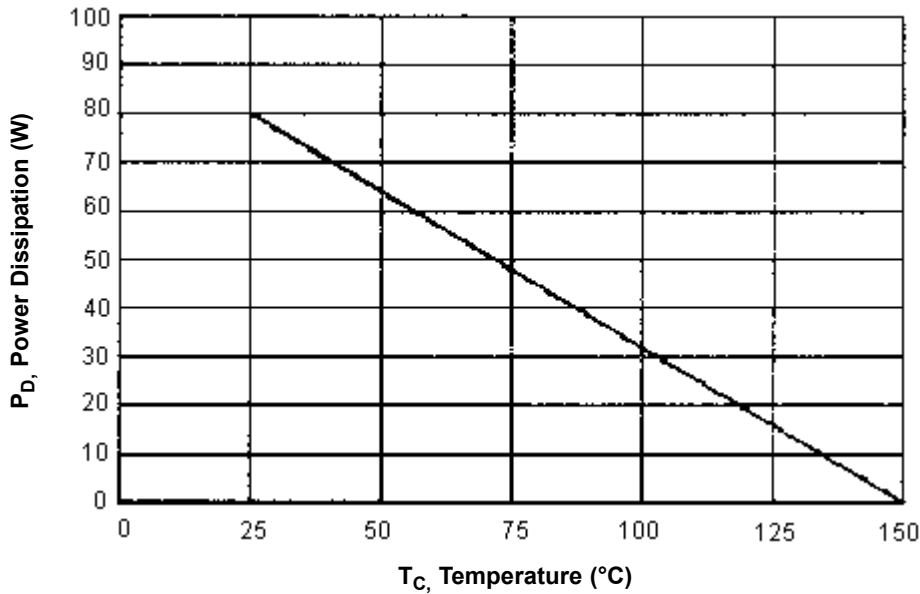
Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.56	$^\circ\text{C} / \text{W}$

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BDW93, BDW94 Series



Figure1 Power Derating



Electrical Characteristics ($T_C = 25^\circ\text{C}$ unless otherwise noted)

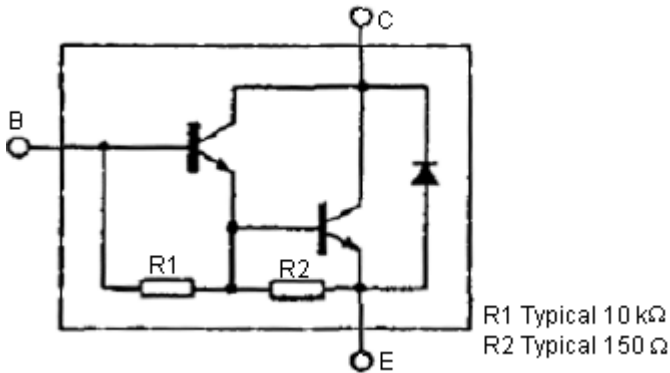
Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) ($I_C = 100\text{ mA}$, $I_B = 0$)	BDW93B, BDW94B BDW93C, BDW94C	$V_{CEO(sus)}$	80 100	- V
Collector Cut off Current ($V_{CE} = 80\text{ V}$, $I_B = 0$)	BDW93B, BDW94B BDW93C, BDW94C	I_{CEO}	-	1 mA
Collector-Base Cut off Current ($V_{CB} = \text{Rated } V_{CB}$, $I_E = 0$)		I_{CBO}	-	100 μA
Emitter-Base Cut off Current ($V_{EB} = 5\text{ V}$, $I_C = 0$)		I_{EBO}	-	2 mA
ON Characteristics (1)				
DC Current Gain ($I_C = 3\text{ A}$, $V_{CE} = 3\text{ V}$) ($I_C = 5\text{ A}$, $V_{CE} = 3\text{ V}$) ($I_C = 10\text{ A}$, $V_{CE} = 3\text{ V}$)		h_{FE}	1,000 750 100	20,000 -
Collector-Emitter Saturation Voltage ($I_C = 5\text{ A}$, $I_B = 20\text{ mA}$) ($I_C = 10\text{ A}$, $I_B = 100\text{ mA}$)		$V_{CE(sat)}$	-	2 3 V
Base-Emitter Saturation Voltage V ($I_C = 5\text{ A}$, $I_B = 20\text{ mA}$) ($I_C = 10\text{ A}$, $I_B = 100\text{ mA}$)		$V_{BE(sat)}$	-	2.5 4

(1) Pulse Test : Pulse Width = 300 μs , Duty Cycle = 2%

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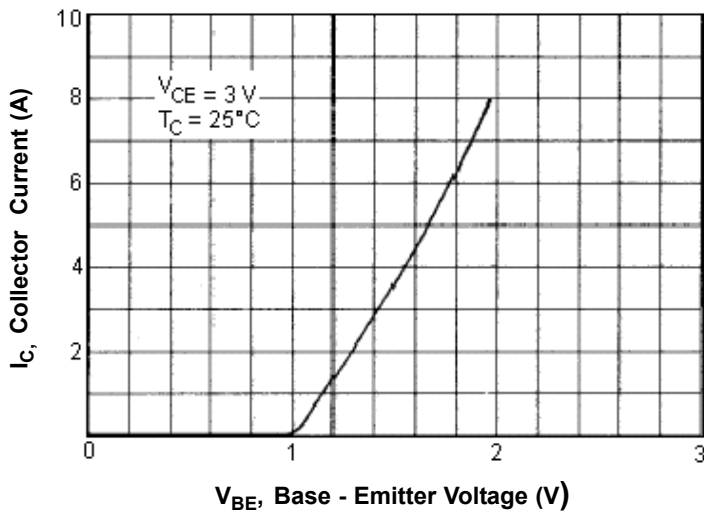
BDW93, BDW94 Series

BDW93 Series NPN

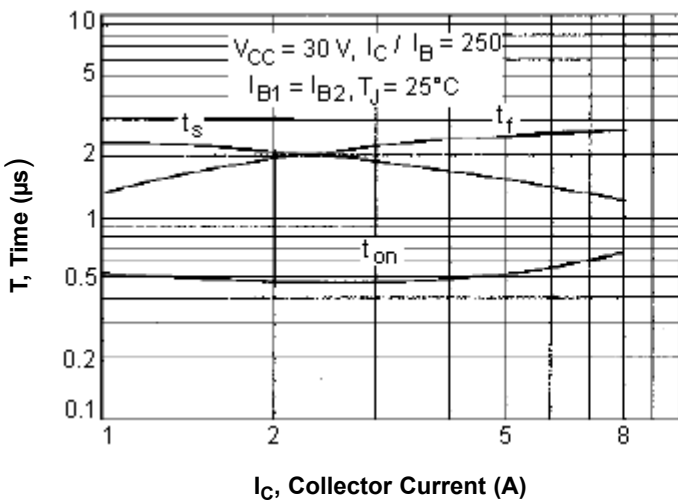


NPN BDW93B and C

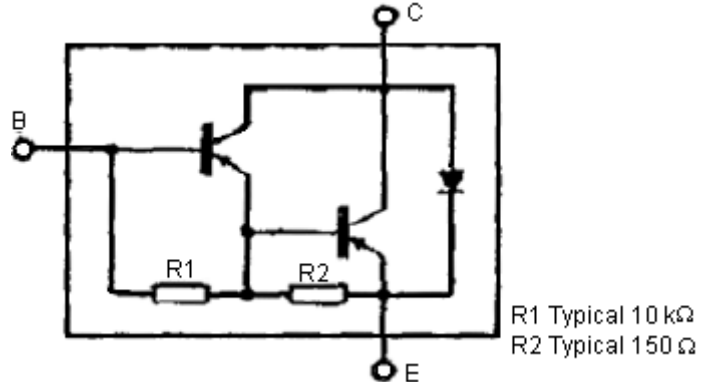
$I_C - V_{be}$



Switching Time

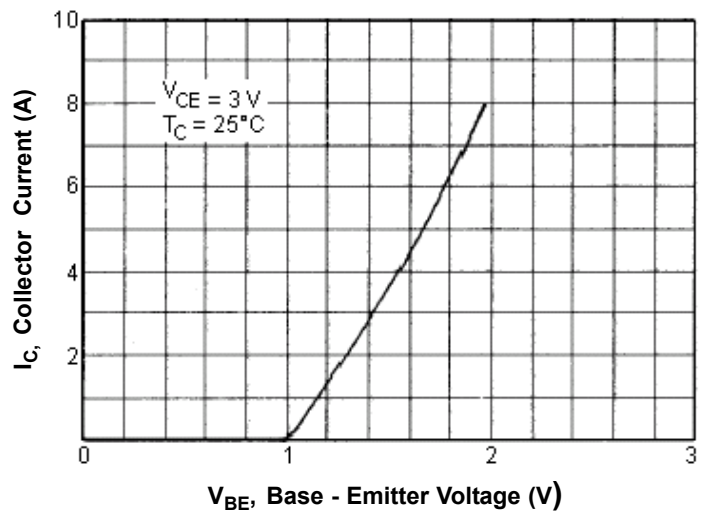


BDW94 Series PNP

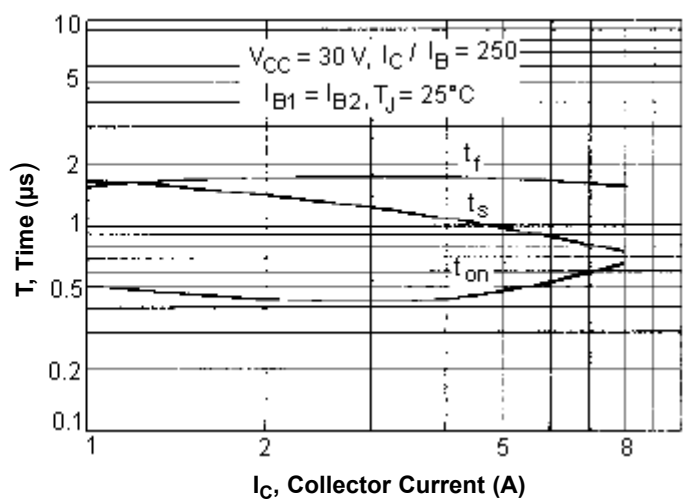


NPN BDW94B and C

$I_C - V_{be}$



Switching Time



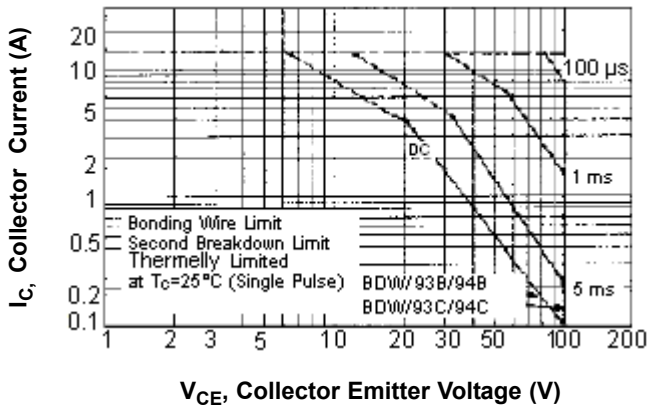
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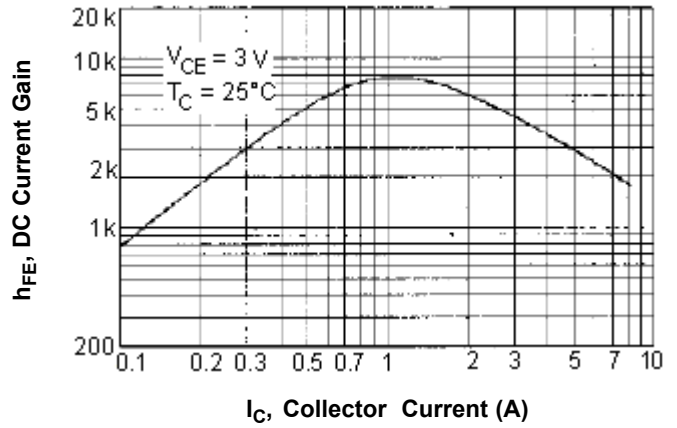
NPN BDW93B and C/PNP BDW94B and C

Active-Region Safe Operating Area (SOA)



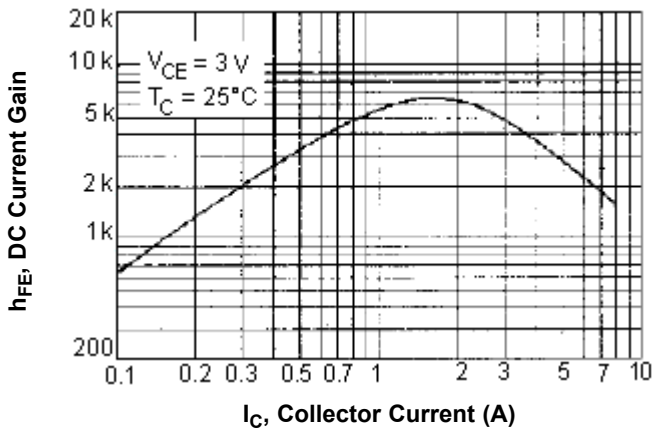
NPN BDW93B and C

DC Current Gain



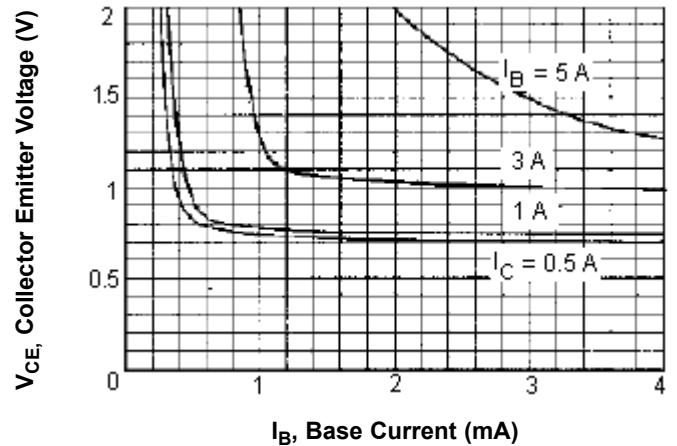
PNP BDW94B and C

DC Current Gain



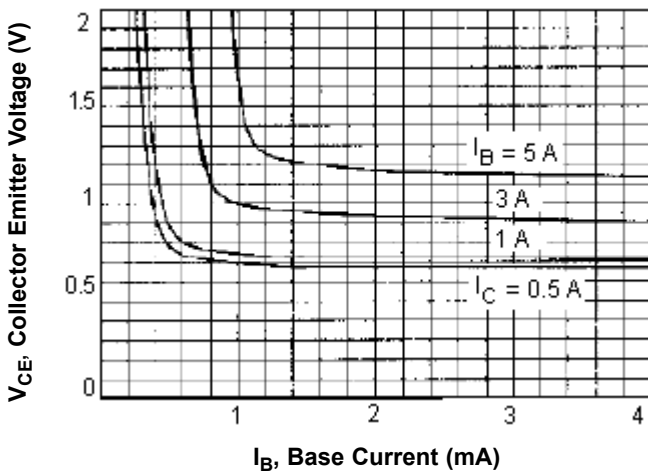
NPN BDW93B and C

Collector Saturation Region



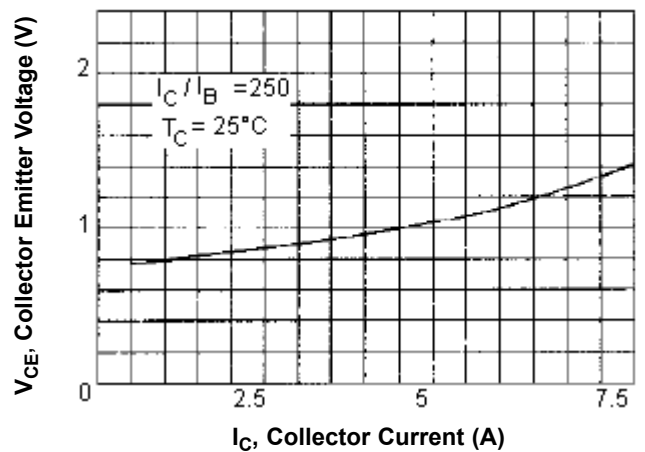
PNP BDW94B and C

Collector Saturation Region



NPN BDW93B and C

$V_{CE(Sat)} - I_C$



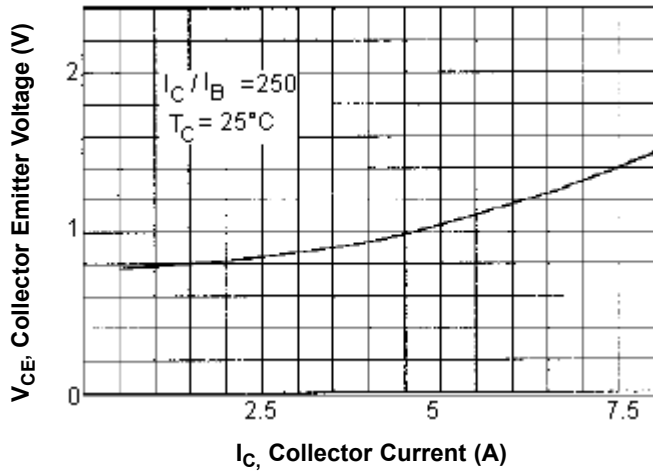
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PNP BDW94B and C

$$V_{CE(Sat)} - I_C$$



Specification Table

I_C (av) Maximum (A)	V_{CEO} Maximum V	hFE Minimum at $I_C = 5\text{ A}$	Ptot at 25°C (W)	Package	Type	Part Number
12	80	750	80	TO-220	NPN	BDW94B
						BDW93B
	100				PNP	BDW93C
						BDW94C

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