

BDW93C, BDW94C Series



Darlington Transistors



Features

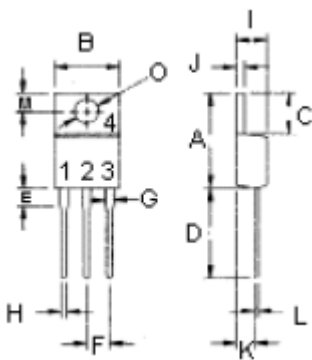
- Designed for general-purpose amplifier and low speed switching applications
- Collector-emitter sustaining voltage- $V_{CEO(sus)} = 100\text{ V}$ (Minimum)
 - Collector-emitter saturation voltage- $V_{CE(sat)} = 2\text{ V}$ (Maximum) at $I_C = 5\text{ A}$
 - Monolithic construction with built-in-base-emitter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

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	2.2	2.97
L	0.33	0.55
M	2.48	2.98
O	3.7	3.9

12 Amperes
Darlington
Complementary Silicon
Power Transistors
45 - 100 Volts
80 Watts



TO-220



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

Dimensions : Millimetres

Maximum Ratings

Characteristic	Symbol	BDW93C	Unit
		BDW94C	
Collector-Emitter Voltage	V_{CEO}	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	A
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	$^\circ\text{C/W}$

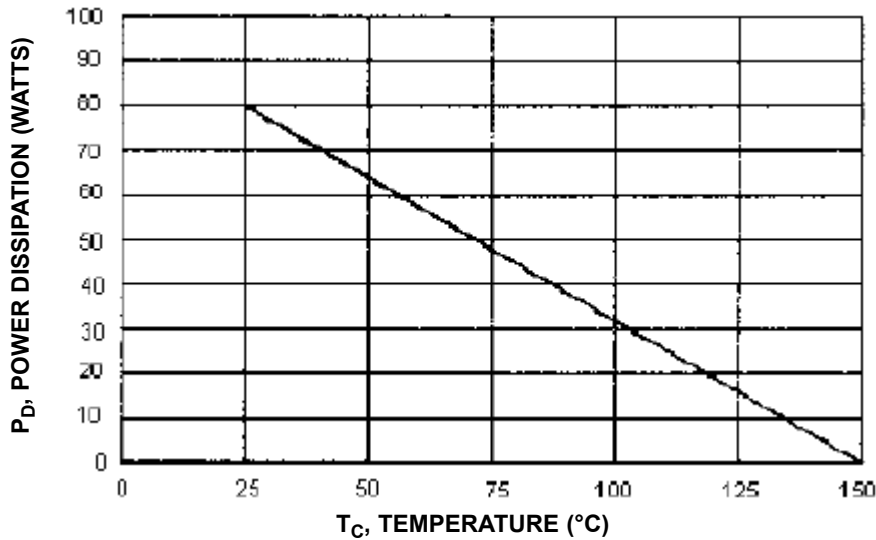


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Figure1 Power Derating



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

Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) ($I_C = 100\text{ mA}$, $I_B = 0$)	$V_{CEO(sus)}$	80 100	-	V
Collector Cut off Current ($V_{CE} = 80\text{ V}$, $I_B = 0$)	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 ($I_C = 5\text{ A}$, $I_B = 20\text{ mA}$) ($I_C = 10\text{ A}$, $I_B = 100\text{ mA}$)	$V_{BE(sat)}$	-	2.5 4	

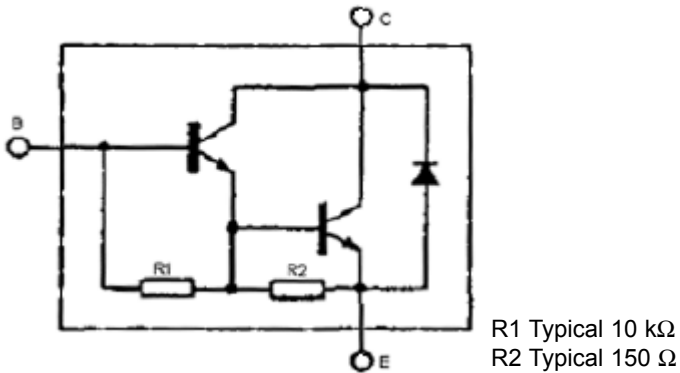
(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$

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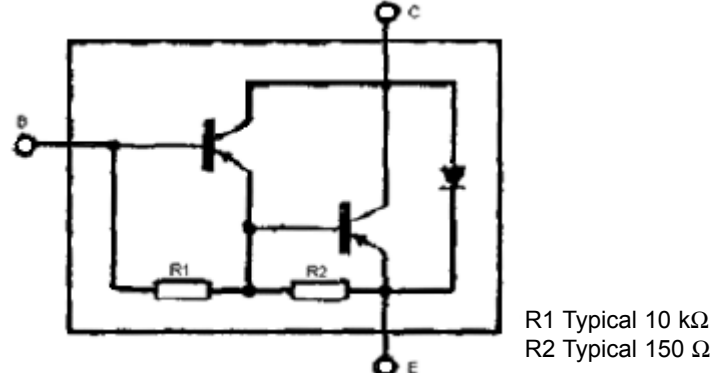


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BDW93C NPN

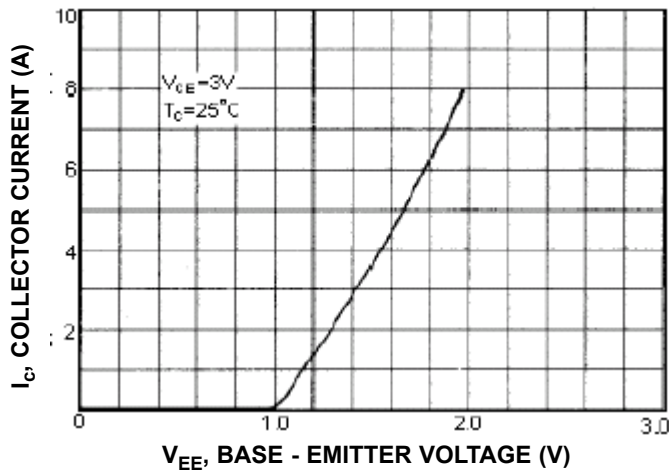


BDW94C PNP



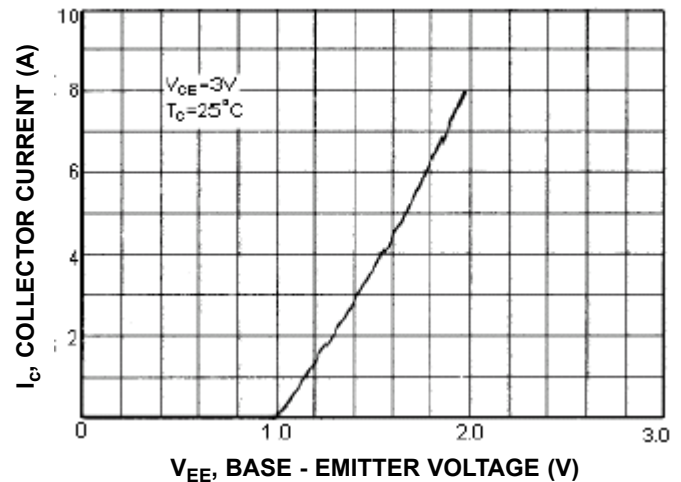
NPN BDW93C

$I_C - V_{be}$

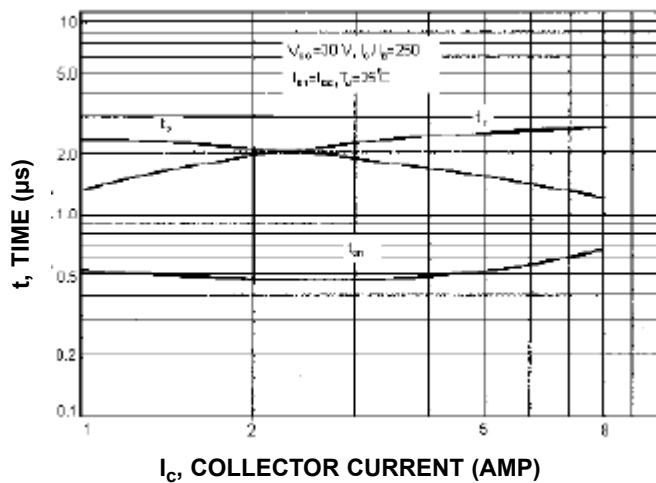


PNP BDW94C

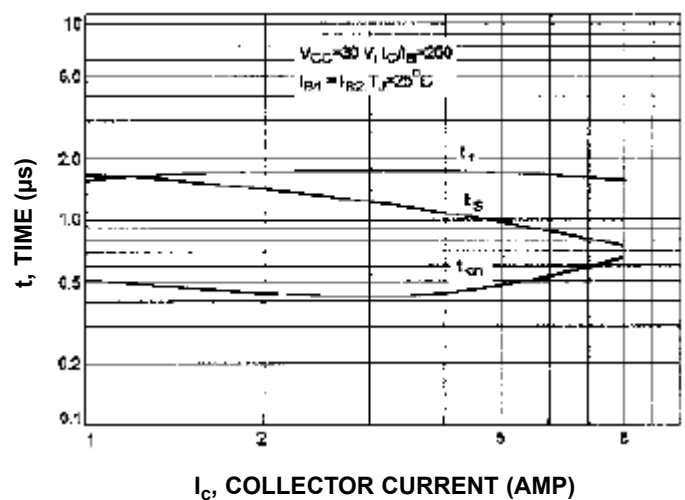
$I_C - V_{be}$



Switching Time



Switching Time



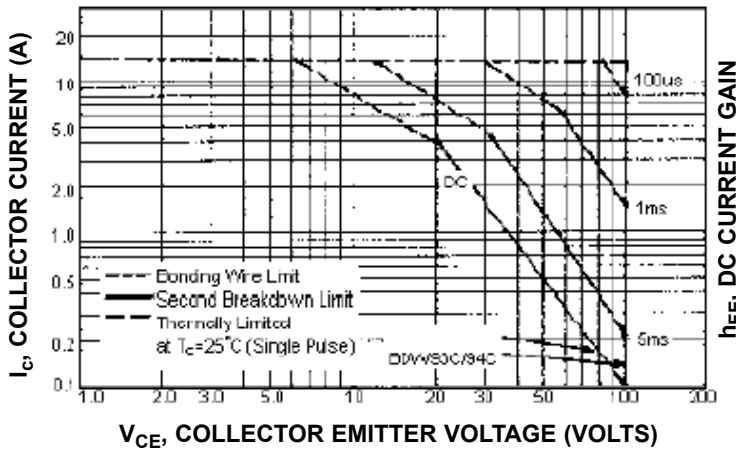
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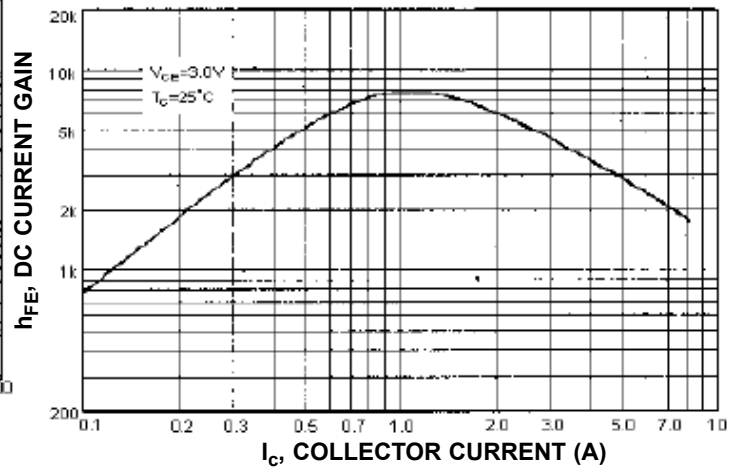
NPN BDW93C / PNP BDW94C

Active-Region Safe Operating Area (SOA)



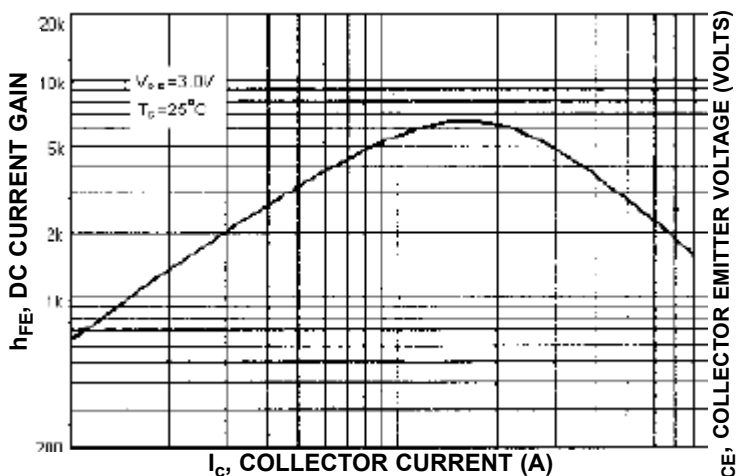
NPN BDW93C

DC Current Gain



PNP BDW94C

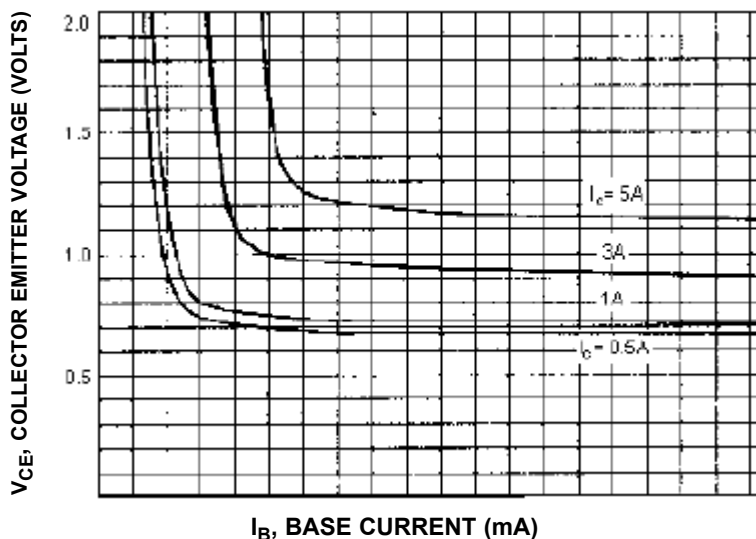
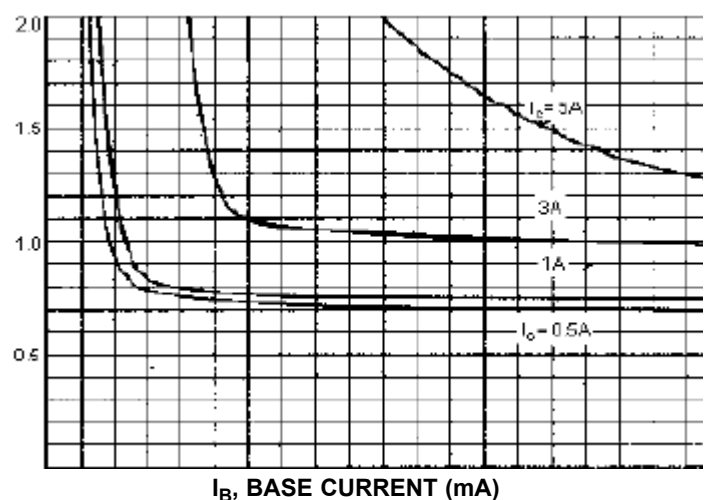
DC Current Gain



PNP BDW94C - Collector Saturation Region

NPN BDW93C

Collector Saturation Region



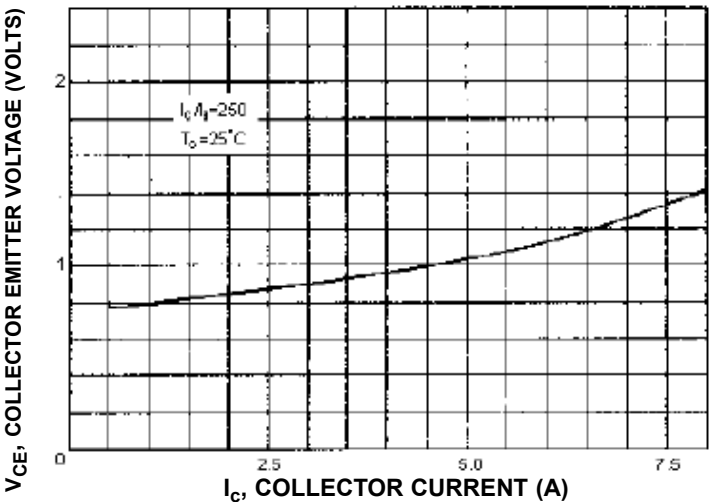
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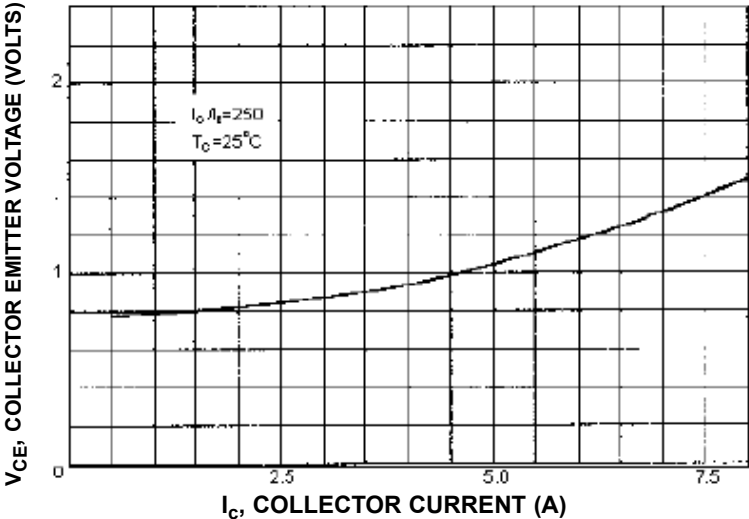
NPN BDW93C

$V_{CE(Sat)} - I_C$



PNP BDW94C

$V_{CE(Sat)} - I_C$



Specification Table

I_C (av) maximum (A)	V_{CEO} maximum V	h_{FE} minimum at $I_C = 5 A$	P_{tot} at $25^\circ C$ (W)	Package	Type	Part Number
12	100	750	80	TO-220	NPN	BDW93C
					PNP	BDW94C

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