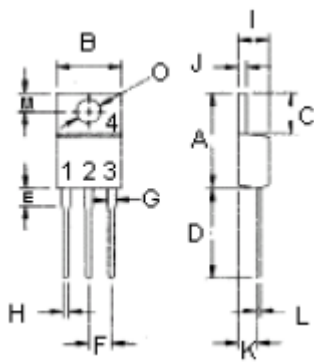


# BDW93C, BDW94C Series



## Darlington Transistors



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

### Features

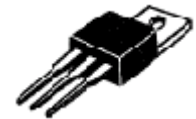
Designed for general-purpose amplifier and low speed switching applications

- 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

Dimensions : Millimetres

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



TO-220

### 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 $25^\circ\text{C}$	$P_D$	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

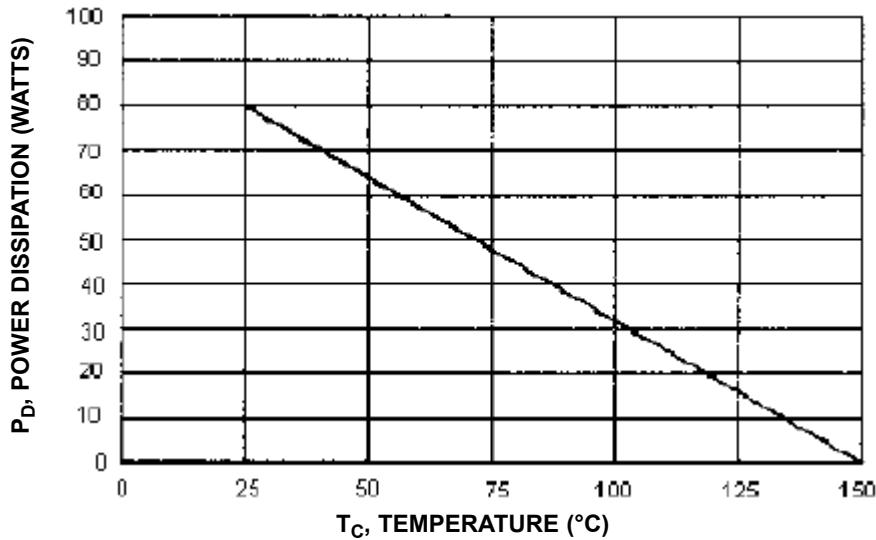
Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.56	$^\circ\text{C/W}$

# BDW93C, BDW94C Series



## Darlington Transistors

Figure1 Power Derating



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

Characteristic	Symbol	Minimum	Maximum	Unit
<b>OFF Characteristics</b>				
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	$\mu\text{A}$
Emitter-Base Cut off Current ( $V_{EB} = 5 \text{ V}$ , $I_C = 0$ )	$I_{EBO}$	-	2	mA
<b>ON Characteristics (1)</b>				
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	

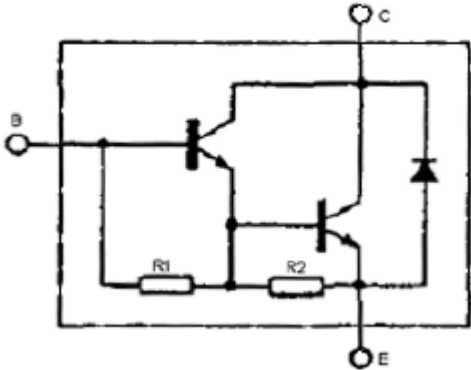
(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

# BDW93C, BDW94C Series



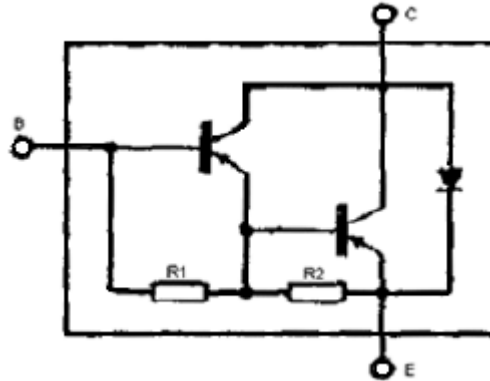
## Darlington Transistors

BDW93C NPN



R1 Typical 10 kΩ  
R2 Typical 150 Ω

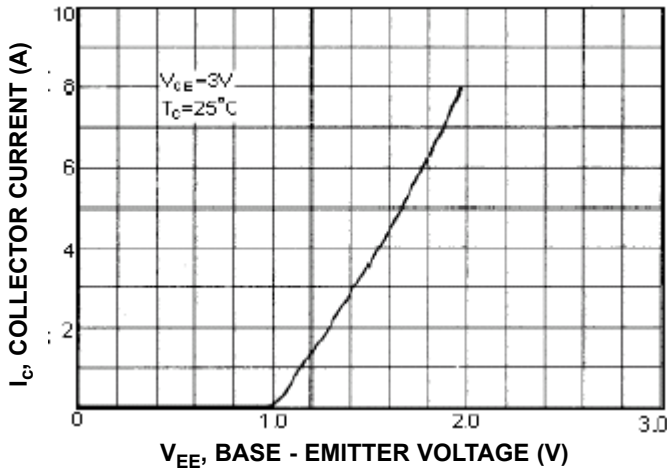
BDW94C PNP



R1 Typical 10 kΩ  
R2 Typical 150 Ω

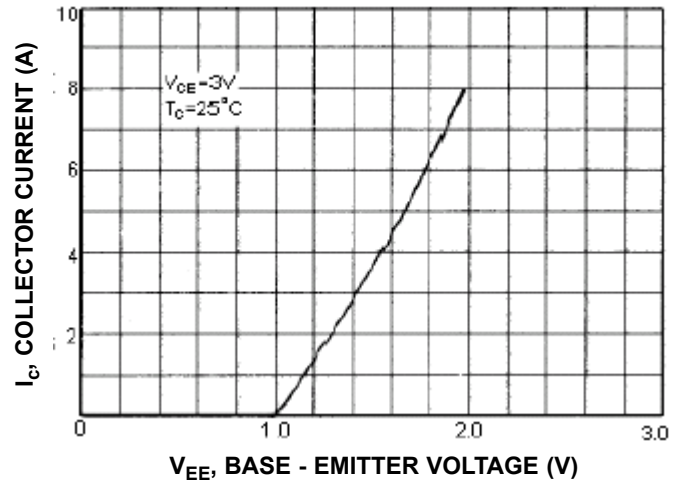
NPN BDW93C

$I_C - V_{be}$

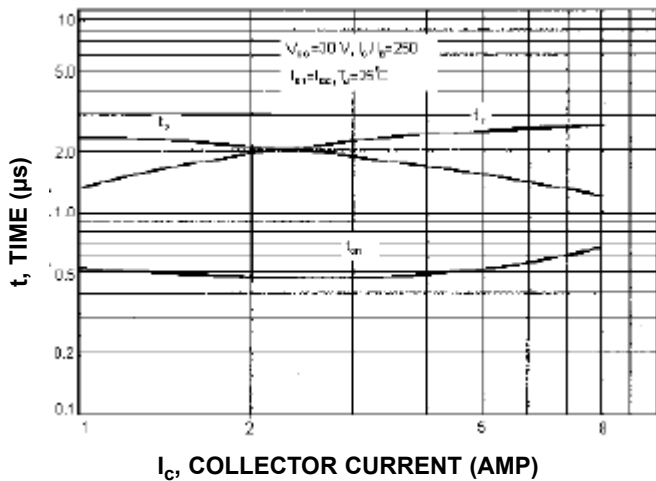


PNP BDW94C

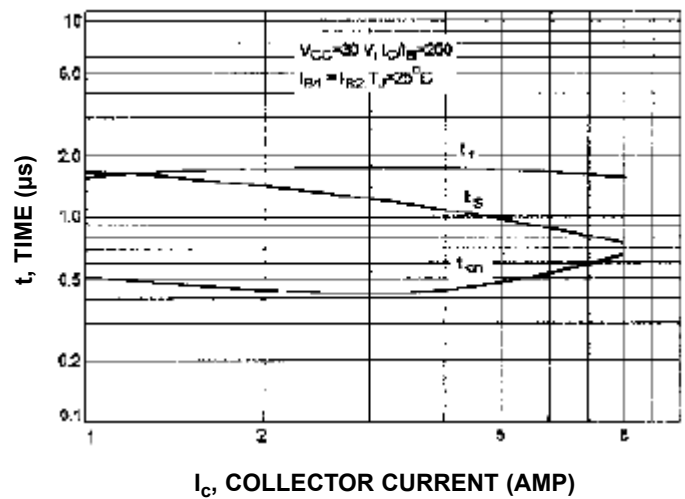
$I_C - V_{be}$



Switching Time



Switching Time

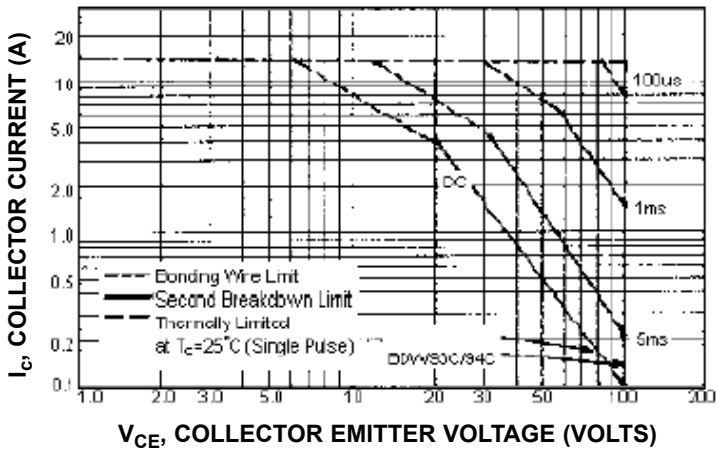


# BDW93C, BDW94C Series

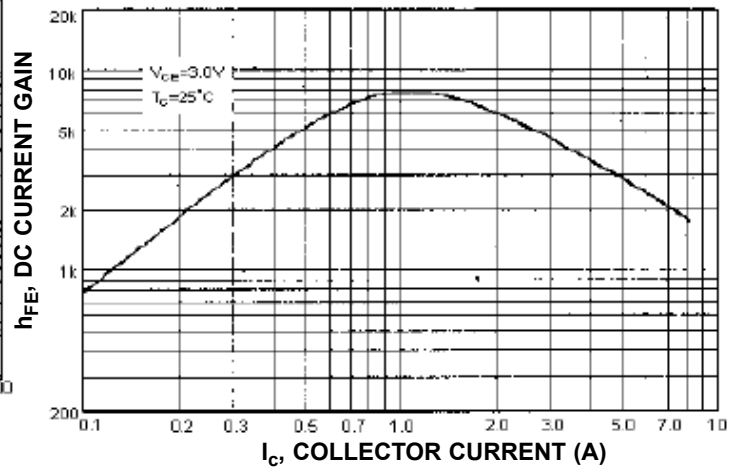


## Darlington Transistors

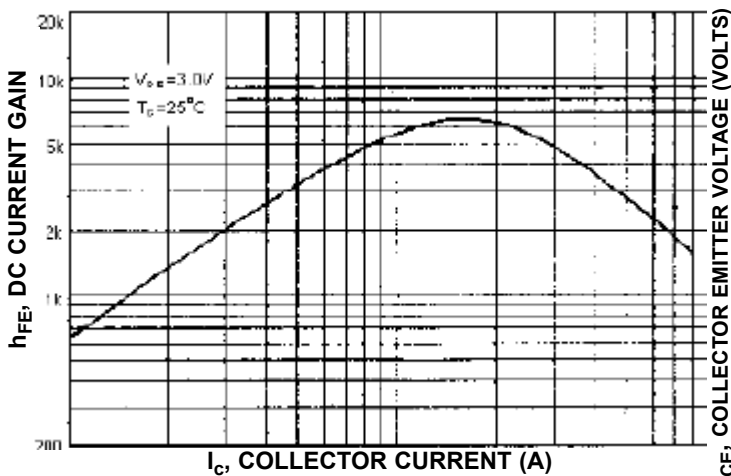
NPN BDW93C / PNP BDW94C  
Active-Region Safe Operating Area (SOA)



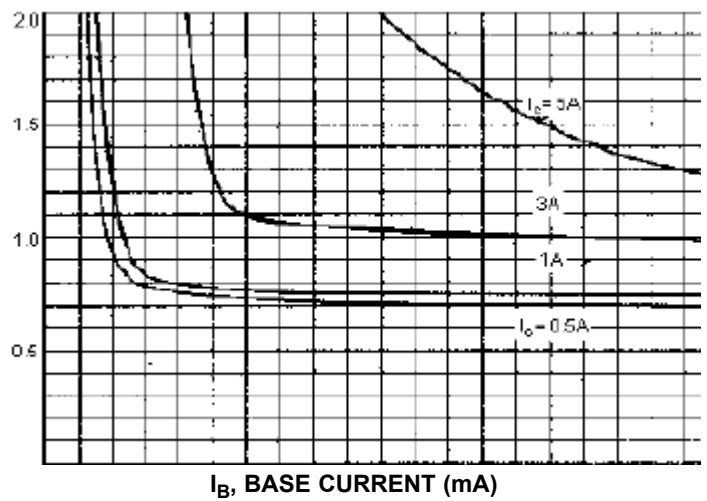
NPN BDW93C  
DC Current Gain



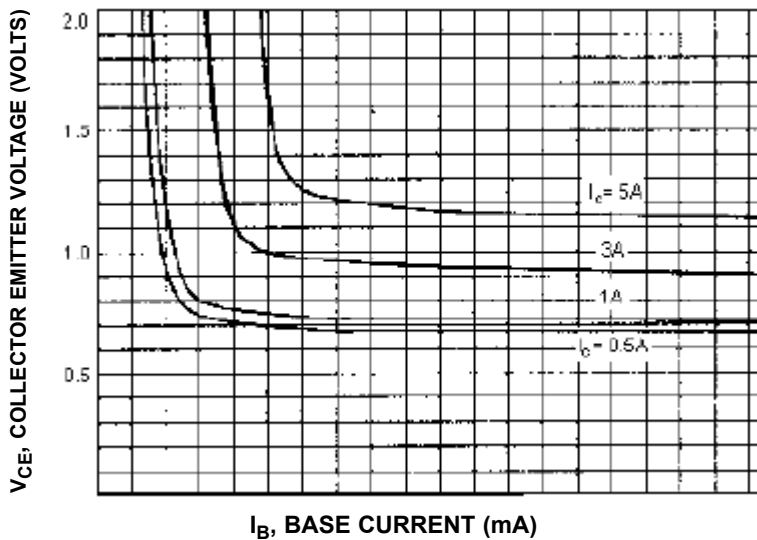
PNP BDW94C  
DC Current Gain



NPN BDW93C  
Collector Saturation Region



PNP BDW94C - Collector Saturation Region



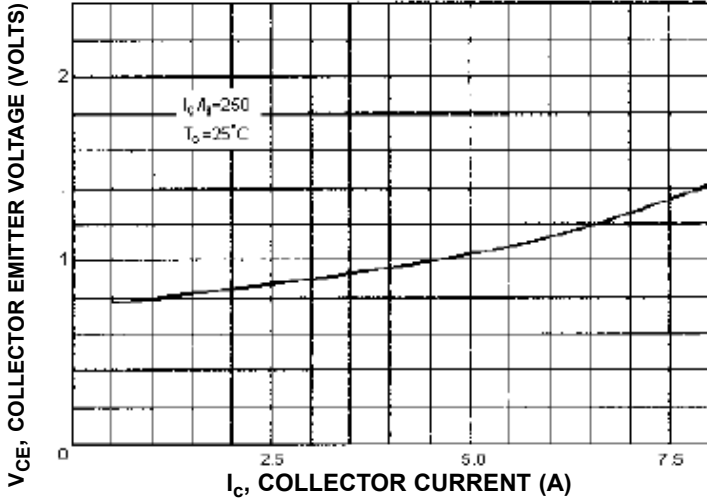
# BDW93C, BDW94C Series



## Darlington Transistors

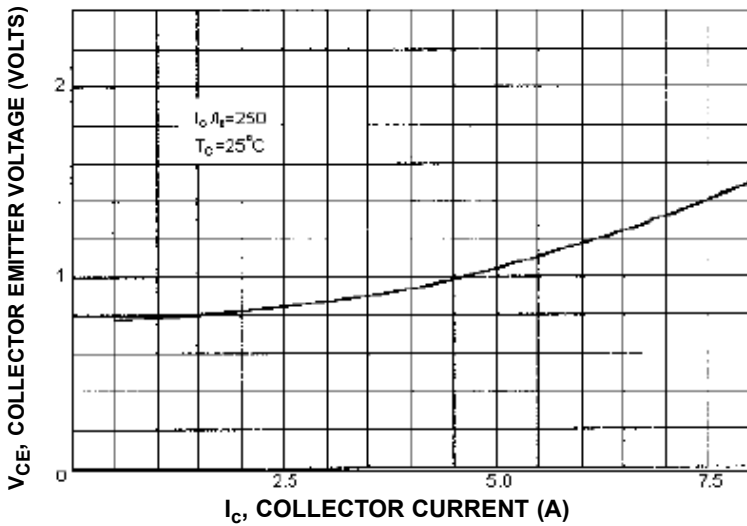
NPN BDW93C

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



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°C (W)	Package	Type	Part Number
12	100	750	80	TO-220	NPN	BDW93C
					PNP	BDW94C

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