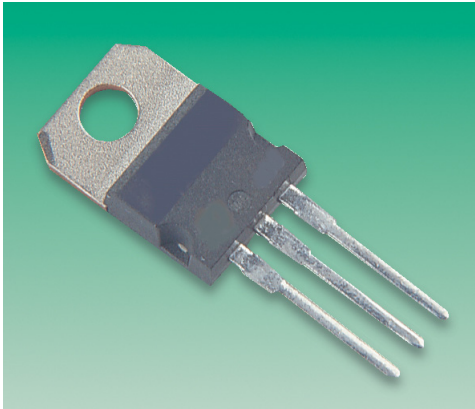


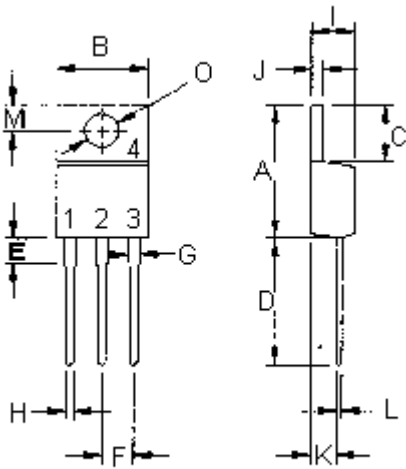
# TIP131, 132, 136, 137

## Darlington Transistors



### Features:

- Collector-Emitter sustaining voltage-  
 $V_{CE(sus)} = 80V$  (Minimum) - TIP131, TIP136  
 $= 100V$  (Minimum) - TIP132, TIP137
- Collector-Emitter saturation voltage -  
 $V_{CE(sat)} = 2.0V$  (Maximum) at  $I_C = 4.0A$
- Monolithic construction with Built-in Base-Emitter shunt resistor.

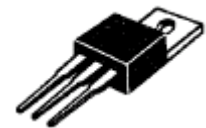


Dimensions	Minimum	Maximum
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

**NPN**  
**TIP131**  
**TIP132**

**PNP**  
**TIP136**  
**TIP137**

8.0 Ampere  
 Darlington  
 Complementary Silicon  
 Power Transistors  
 80 - 100 Volts  
 70 Watts



TO-220

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

Dimensions : Millimetres



# TIP131, 132, 136, 137

## Darlington Transistors



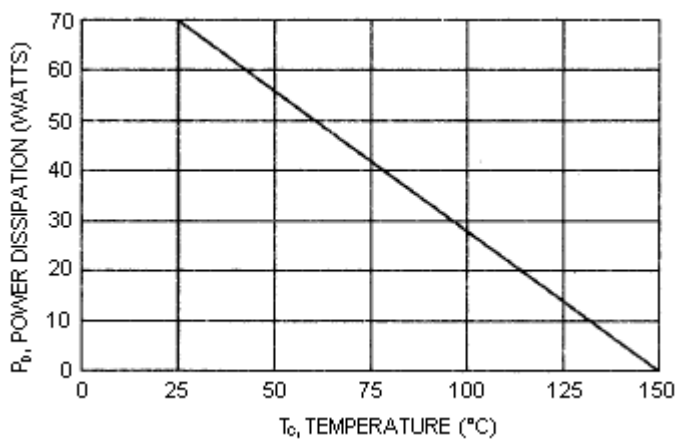
### MAXIMUM RATINGS

Characteristic	Symbol	TIP131 TIP136	TIP132 TIP137	Unit
Collector-Emitter Voltage	$V_{CEO}$	80	100	V
Collector-Base Voltage	$V_{CBO}$			
Emitter-Base Voltage	$V_{EBO}$	5.0		
Collector Current-Continuous -Peak	$I_C$ $I_{CM}$	8.0 12		A
Base Current	$I_B$	0.3		mA
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	70 0.56		W W/ $^\circ\text{C}$
Operation 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	$R_{\theta jc}$	1.785	$^\circ\text{C}/\text{W}$

Figure - 1 Power Derating



# TIP131, 132, 136, 137

## Darlington Transistors



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

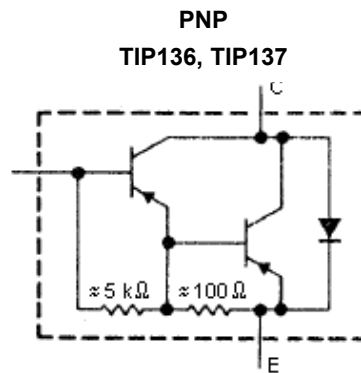
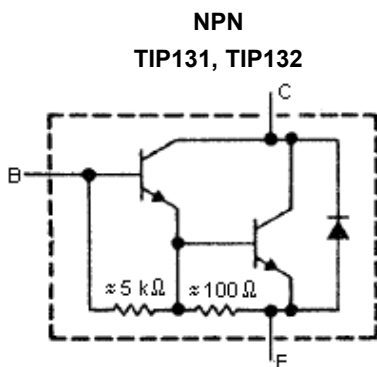
Characteristic	Symbol	Minimum	Maximum	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage (1) ( $I_C = 30\text{mA}$ , $I_B = 0$ ) TIP131, TIP136 TIP132, TIP137	$V_{CEO(sus)}$	80 100	-	V
Collector Cut off Current ( $V_{CE} = 40\text{V}$ , $I_B = 0$ ) ( $V_{CE} = 50\text{V}$ , $I_B = 0$ ) TIP131, TIP136 TIP132, TIP137	$I_{CEO}$	-	0.5 0.5	mA
Collector Cut off Current ( $V_{CB} = 80\text{V}$ , $I_E = 0$ ) ( $V_{CB} = 100\text{V}$ , $I_E = 0$ ) TIP131, TIP136 TIP132, TIP137	$I_{CBO}$	-	0.2 0.2	
Emitter Cut off Current ( $V_{EB} = 5.0\text{V}$ , $I_C = 0$ )	$I_{EBO}$	-	5.0	

### ON CHARACTERISTICS (1)

DC Current Gain ( $I_C = 1.0\text{A}$ , $V_{CE} = 4.0\text{V}$ ) ( $I_C = 4.0\text{A}$ , $V_{CE} = 4.0\text{V}$ )	$h_{FE}$	500 1000	15,000	-
Collector-Emitter Saturation Voltage ( $I_C = 4.0\text{A}$ , $I_B = 16\text{mA}$ ) ( $I_C = 6.0\text{A}$ , $I_B = 30\text{mA}$ )	$V_{CE(sat)}$	-	2.0 3.0	V
Base-Emitter On Voltage ( $I_C = 4.0\text{A}$ , $V_{CE} = 4.0\text{V}$ )	$V_{BE(on)}$	-	2.5	
<b>DYNAMIC CHARACTERISTICS</b>				
Output Capacitance ( $V_{CB} = 10\text{V}$ , $I_E = 0$ , $f = 0.1\text{MHz}$ )	$C_{ob}$	-	250	pF

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

### Internal Schematic Diagram



# TIP131, 132, 136, 137

## Darlington Transistors



Figure - 2 DC Current Gain

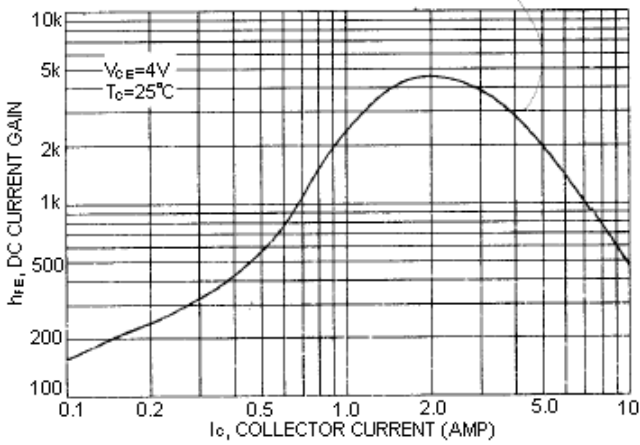


Figure - 3 Base-Emitter Voltage

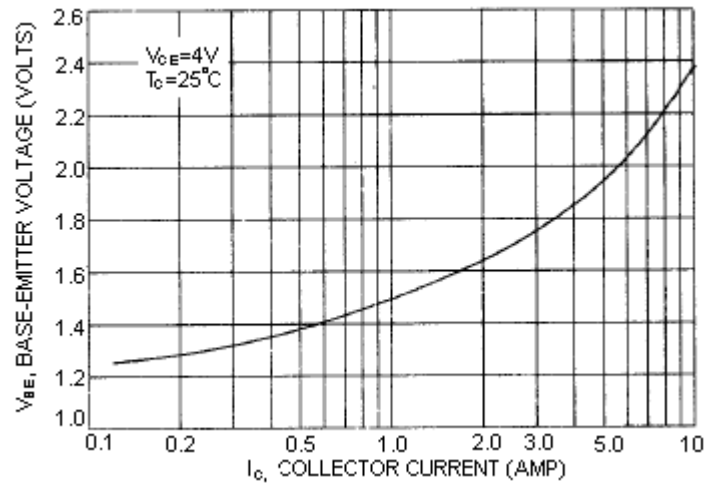


Figure - 4 Collector-Emitter Saturation Voltage

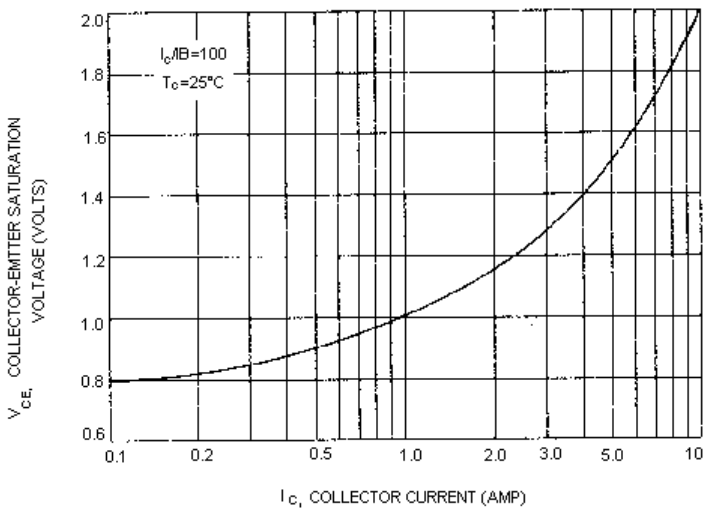
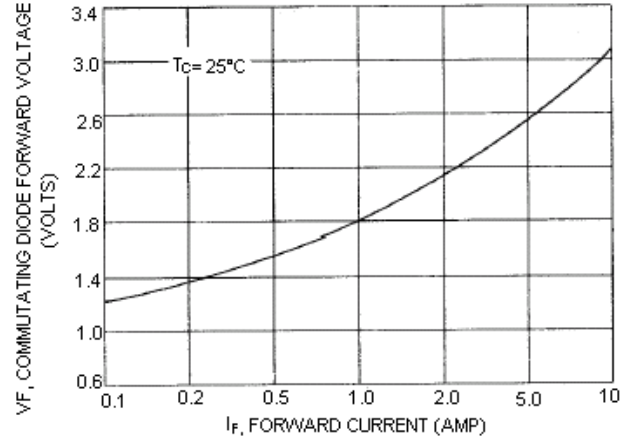


Figure - 5 Forward Voltage Commutating Diode

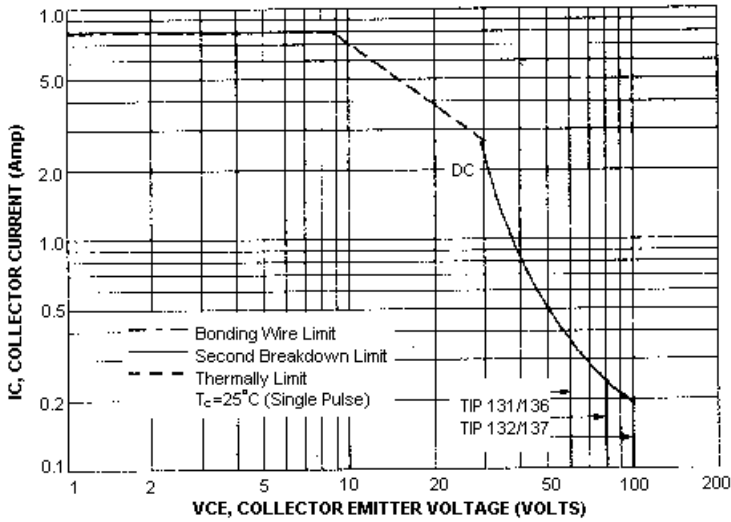


# TIP131, 132, 136, 137

## Darlington Transistors



Figure - 6 Active Region Safe Operating Area



There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure - 6 curve is based on  $T_{J(PK)} = 150^\circ\text{C}$ ;  $T_C$  is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)} \leq 150^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

### Specifications

TYPE	Part Number
NPN	TIP131
	TIP132
PNP	TIP136
	TIP137

# TIP131, 132, 136, 137

## Darlington Transistors



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