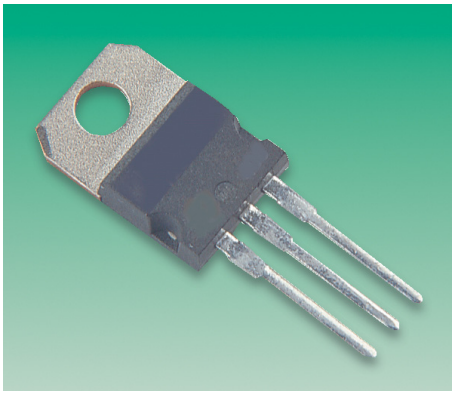
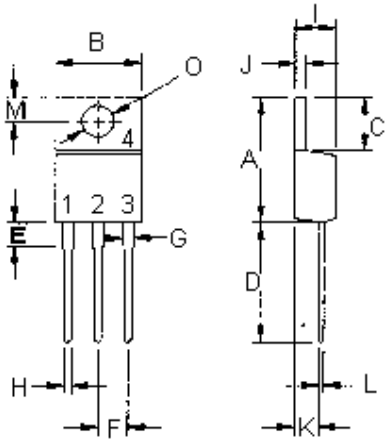
TIP131, 132, 136, 137

Darlington Transistors



Features:

- Collector-Emitter sustaining voltage-
  $V_{CEO(sus)}$ = 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.



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

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

Dimensions : Millimetres

NPN TIP131 TIP132
PNP TIP136 TIP137

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

TO-220

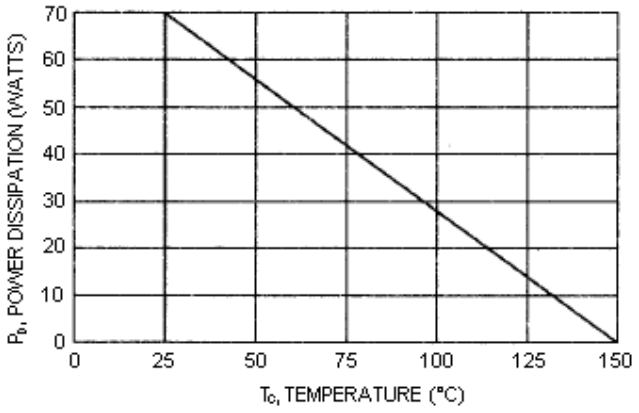
MAXIMUM RATINGS

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°C Derate above 25°C	P_D	70 0.56		W W/°C
Operation and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.785	°C/W

Figure - 1 Power Derating



ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

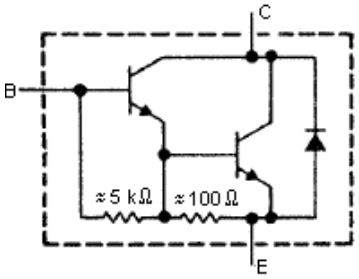
Characteristic	Symbol	Minimum	Maximum	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (1) (I_C = 30mA, I_B = 0) TIP131, TIP136 TIP132, TIP137	$V_{CEO(sus)}$	80 100	-	V
Collector Cut off Current (V_{CE} = 40V, I_B = 0) TIP131, TIP136 (V_{CE} = 50V, I_B = 0) TIP132, TIP137	I_{CEO}	-	0.5 0.5	mA
Collector Cut off Current (V_{CB} = 80V, I_E = 0) TIP131, TIP136 (V_{CB} = 100V, I_E = 0) TIP132, TIP137	I_{CBO}	-	0.2 0.2	
Emitter Cut off Current (V_{EB} = 5.0V, I_C = 0)	I_{EBO}	-	5.0	
ON CHARACTERISTICS (1)				
DC Current Gain (I_C = 1.0A, V_{CE} = 4.0V) (I_C = 4.0A, V_{CE} = 4.0V)	h_{FE}	500 1000	15,000	-
Collector-Emitter Saturation Voltage (I_C = 4.0A, I_B = 16mA) (I_C = 6.0A, I_B = 30mA)	$V_{CE(sat)}$	-	2.0 3.0	V
Base-Emitter On Voltage (I_C = 4.0A, V_{CE} = 4.0V)	$V_{BE(on)}$	-	2.5	
DYNAMIC CHARACTERISTICS				
Output Capacitance (V_{CB} = 10V, I_E = 0, f = 0.1MHz)	C_{ob}	-	250	pF

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤2.0%

Internal Schematic Diagram

NPN

TIP131, TIP132



PNP

TIP136, TIP137

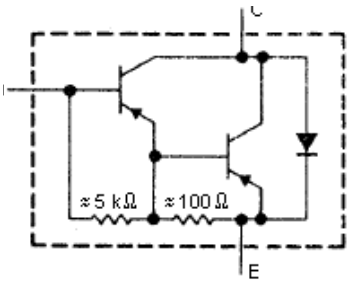


Figure - 2 DC Current Gain

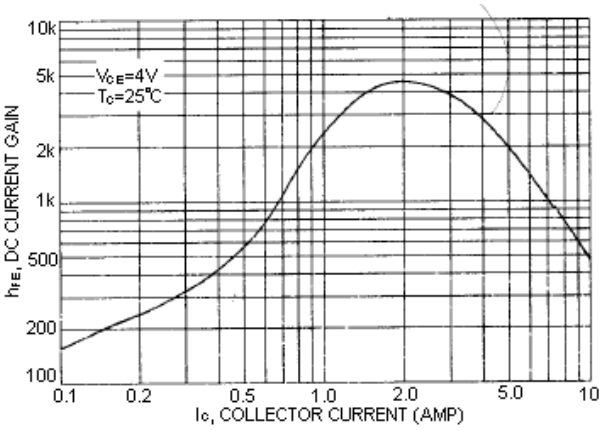


Figure - 3 Base-Emitter Voltage

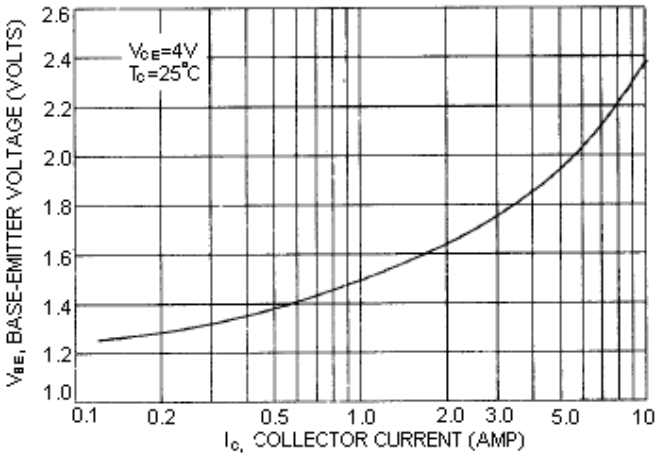


Figure - 4 Collector-Emitter Saturation Voltage

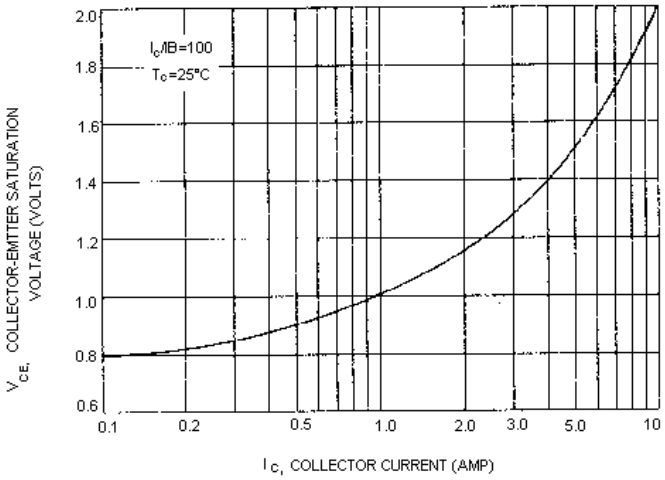


Figure - 5 Forward Voltage Commutating Diode

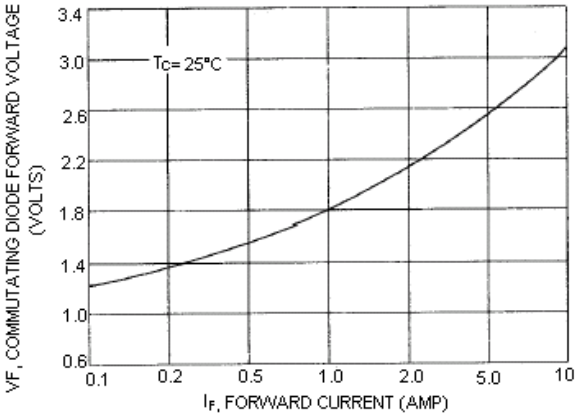
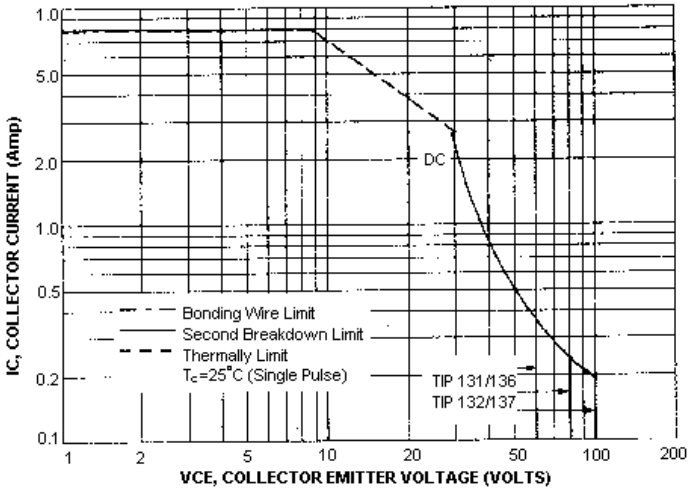


Figure - 6 Active Region Safe Operating Area



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°C; T_C is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150°C$. 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

Notes:

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