

## Features

- Collector-Emitter Sustaining Voltage -  $V_{CEO(sus)} = 30V$  (Minimum)
- Collector-Emitter Saturation Voltage  $V_{CE(sat)} = 2V$  (Maximum) at  $I_C = 5A$
- Reverse-Base SOA - 300V to 400V at 7A

**NPN**

TIP150

7 Amperes

Darlington

Power Transistor

300V to 400V

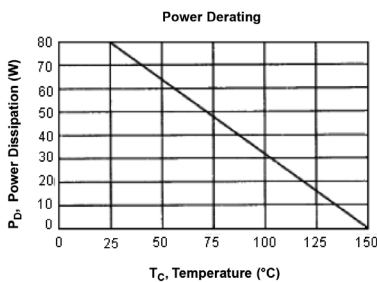
80W

## Maximum Ratings

Characteristic	Symbol	Ratings	Unit
Collector - Emitter Voltage	$V_{CEO}$	300	V
Collector - Base Voltage	$V_{CBO}$		
Emitter - Base Voltage	$V_{EBO}$	8	
Collector Current - Continuous - Peak	$I_C$	7	A
	$I_{CM}$	10	
Base Current	$I_B$	1.5	
Total Power Dissipation at $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	80	W
		0.64	W / $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ C$

## Thermal Characteristics

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

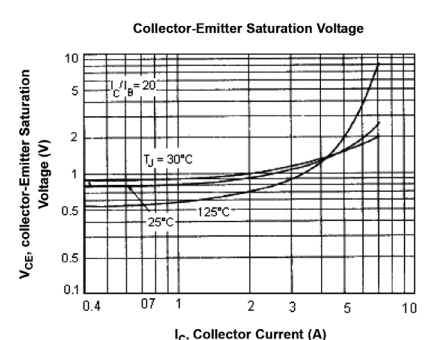
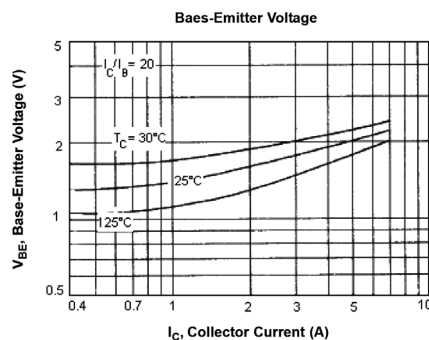
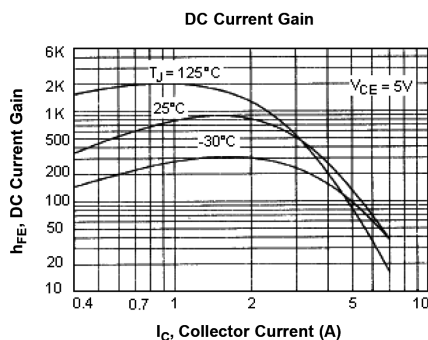


## Electrical Characteristics ( $T_C = 25^\circ C$ unless otherwise specified)

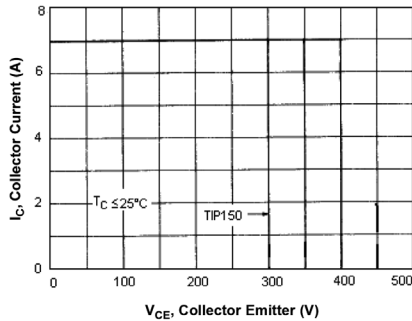
Characteristic	Symbol	Minimum	Maximum	Unit
<b>OFF Characteristics</b>				
Collector - Emitter Breakdown Voltage (1) ( $I_C = 10mA, I_B = 0$ )	$V_{(BR)CEO}$	300	-	V
Collector - Base Breakdown Voltage (1) ( $I_C = 1mA, I_B = 0$ )	$V_{(BR)CBO}$			
Collector Cutoff Current ( $V_{CE} = 300V, I_B = 0$ )	$I_{CEO}$	-	250	$\mu A$

Characteristic	Symbol	Minimum	Maximum	Unit
Emitter Cut off Current ( $V_{EB} = 5V, I_C = 0$ )	$I_{EBO}$	-	15	mA
<b>ON Characteristics (1)</b>				
DC Current Gain ( $I_C = 2.5A, V_{CE} = 5V$ ) ( $I_C = 5A, V_{CE} = 5V$ ) ( $I_C = 7A, V_{CE} = 5V$ )	$h_{FE}$	150 50 15	-	-
Collector-Emitter Saturation Voltage ( $I_C = 1A, I_B = 10mA$ ) ( $I_C = 2A, I_B = 100mA$ ) ( $I_C = 5A, I_B = 250mA$ )	$V_{CE(sat)}$	-	1.5 1.5 2	V
Base-Emitter Saturation Voltage ( $I_C = 2A, I_B = 100mA$ ) ( $I_C = 5A, I_B = 250mA$ )	$V_{BE(sat)}$	-	2.2 2.3	
Diode Forward Voltage ( $I_F = 7A$ )	$V_F$	-	3.5	
<b>Dynamic Characteristics</b>				
Small-Signal Current Gain ( $I_C = 0.5A, V_{CE} = 5V, f = 1kHz$ )	$H_{fe}$	200	-	-
Output Capacitance ( $V_{CB} = 10V, I_E = 0, f = 1MHz$ )	$C_{ob}$	-	150	pF
<b>Switching Characteristics</b>				
Delay Time	$V_{CC} = 33V, I_C = 6.5A$	$t_d$	30 (Typical)	μs
Rise Time	$I_{B1} = -I_{B2} = 250mA$ $t_p = 20\mu s$ , Duty cycle $\leq 2\%$	$t_r$	180 (Typical)	
Storage Time		$t_s$	3.5 (Typical)	
Fall Time		$t_f$	1.6 (Typical)	

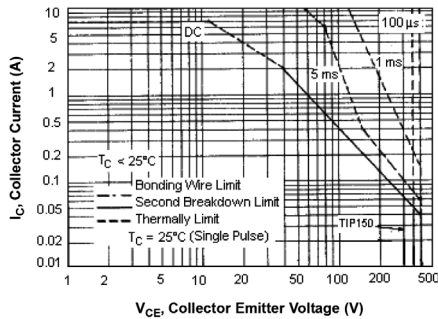
1. Pulse Test : Pulse width = 30μs, Duty cycle = 2%



Reverse Biase Safe Operating Area

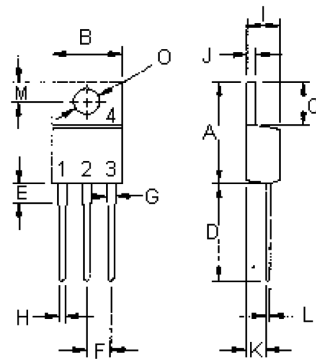


Active Region Sage Operating Area



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  $T_{J(PK)} < 150^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown

## Diagram



Dimensions	Minimum	Maximum
A	14.68	15.31
B	9.78	10.42
C	5.01	8.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36

Dimensions	Minimum	Maximum
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

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

## Part Number Table

Description	Part Number
Darlington Transistor, TO-220	TIP150

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