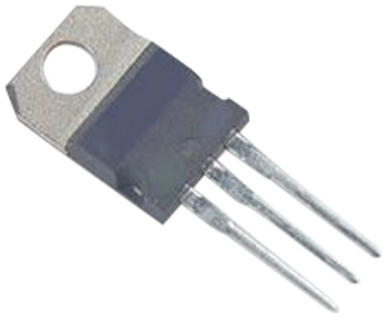
Darlington Power Transistor



Description:

Plastic Medium-Power Silicon Transistors are designed for general-purpose amplifier and low speed switching applications.

Features:

- Collector-Emitter Sustaining Voltage
  $V_{CEO(sus)}$ = 80V (Min.)
- Collector-Emitter Saturation Voltage
  $V_{CE(sat)}$ = 2V (Max.) at I_C = 5A
- DC Current Gain h_{FE} = 3,000 (Typ.) at I_C = 4A

Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	80	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}	5	
Collector Current-Continuous -Peak	I_C	10 15	A
Base Current	I_B	0.25	
Total Power Dissipation at T_C = 25°C Derate above 25°C	P_D	65 0.52	W W/°C
Operation and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150	°C

Thermal Characteristics

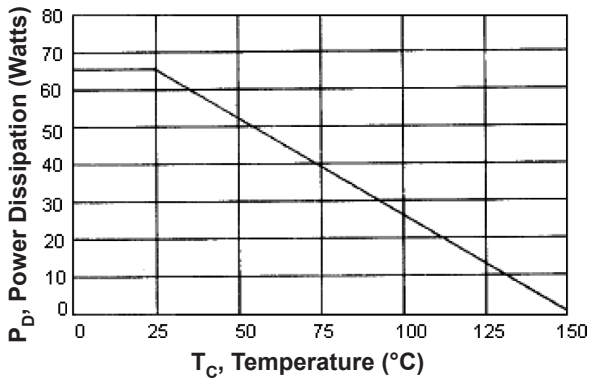
Characteristic	Symbol	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.92	°C/W

Electrical Characteristics (T_C = 25°C unless otherwise noted)

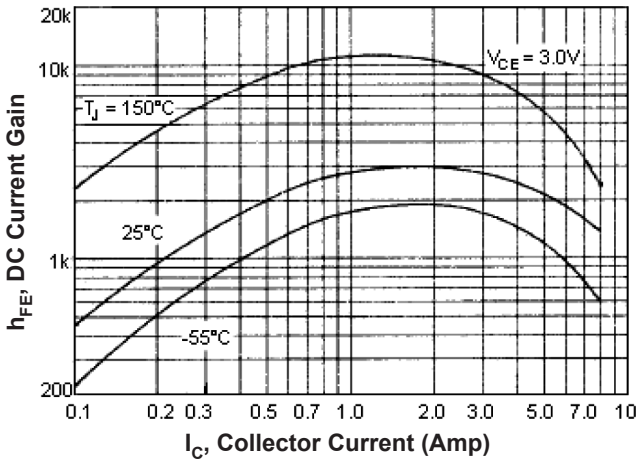
Characteristic	Symbol	Min.	Max.	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) I_C = 200mA, I_B = 0	$V_{CEO(sus)}$	80	-	V
Collector Cut off Current V_{CE} = 80V, I_B = 0	I_{CEO}	-	1	mA
Collector Cut off Current V_{CE} = 80V, $V_{BE(off)}$ = 1.5V V_{CE} = 80V, $V_{BE(off)}$ = 1.5V, T_C = 125°C	I_{CEX}	-	0.3 3	
Emitter Cut off Current V_{EB} = 5V, I_C = 0	I_{EBO}	-	5	
ON Characteristics (1)				
DC Current Gain I_C = 5A, V_{CE} = 3V I_C = 10A, V_{CE} = 3V	h_{FE}	1,000 100	20,000	-
Collector-Emitter Saturation Voltage I_C = 5A, I_B = 10mA I_C = 10A, I_B = 100mA	$V_{CE(sat)}$	-	2 3	V
Base-Emitter On Voltage I_C = 5A, V_{CE} = 3V I_C = 10A, V_{CE} = 3V	$V_{BE(on)}$	-	2.8 4.5	
Dynamic Characteristics				
Small-Signal Current Gain I_C = 1A, V_{CE} = 5V, f = 1kHz	h_{fe}	1,000	-	
Output Capacitance V_{CB} = 10V, I_E = 0, f = 1MHz	C_{ob}	-	200	pF

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤2%

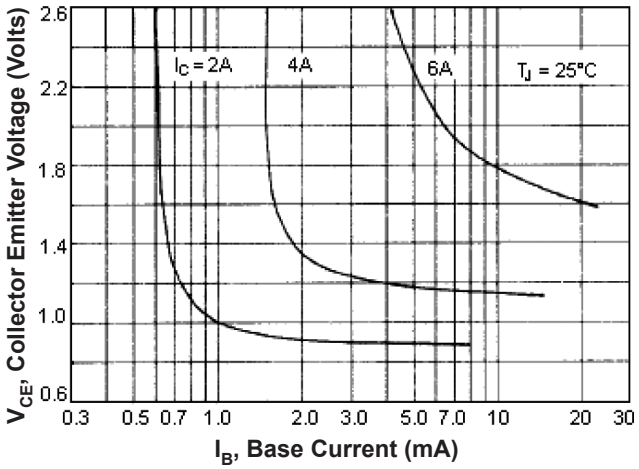
Figure - 1 Power Derating



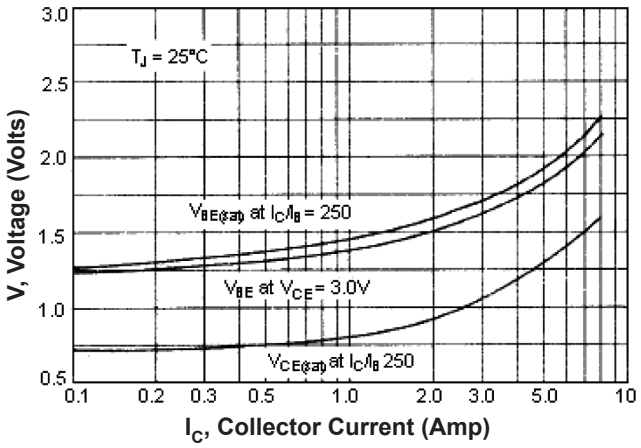
DC Current Gain



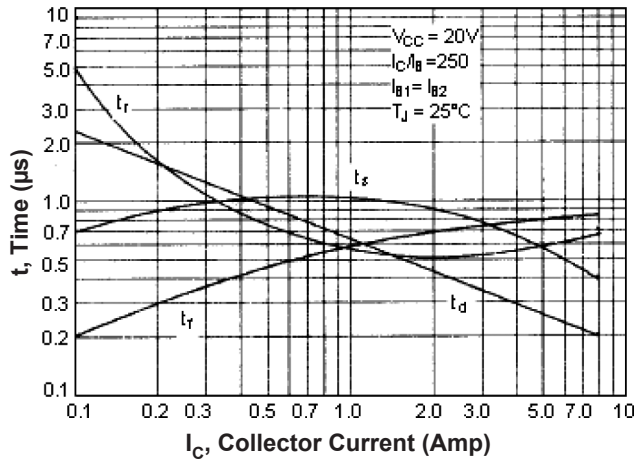
Collector Saturation Region



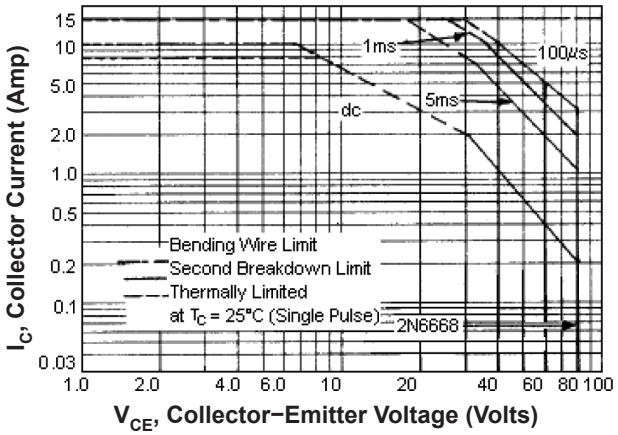
"ON" Voltages



Switching Time



Active-Region Safe Operating Area (SOA)



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 SOA curve is based on $T_{J(PK)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)}$≤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.

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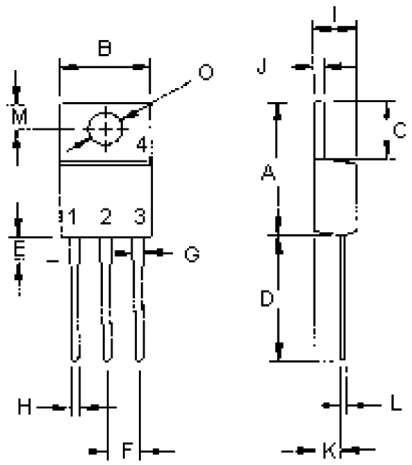
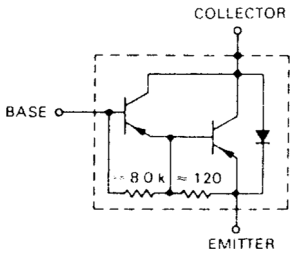


Pin Configuration:

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

Dimensions	Min.	Max.
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



Part Number Table

Description	Part Number
Darlington Transistor, TO-220	2N6668