

2N6388



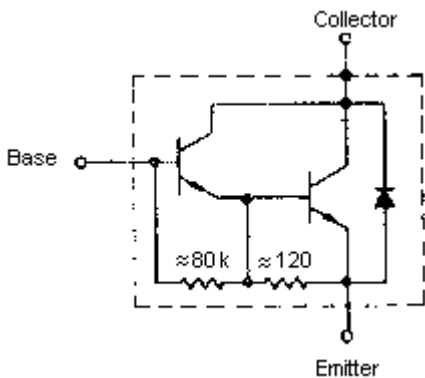
Darlington Power Transistor



Darlington silicon power transistors are designed for general-purpose amplifier and low speed switching applications

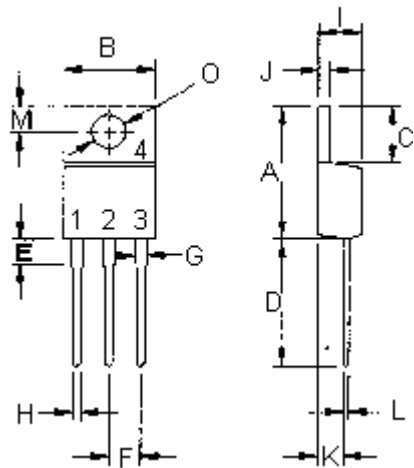
Features:

- Collector - emitter sustaining voltage : $V_{CEO(sus)} = 80\text{ V}$ (Minimum)
- Collector - emitter sustaining voltage : $V_{CE(sat)} = 2\text{ V}$ (Maximum) at $I_C = 5\text{ A}$
- DC Current Gain $h_{FE} = 2,500$ (Typical) at $I_C = 4\text{ A}$



**10 Amperes
Darlington
Power Transistors
NPN Silicon
80 Volts
65 Watts**

TO-220



- 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	2.2	2.97
L	0.33	0.55
M	2.48	2.98
O	3.7	3.9

Dimensions : Millimetres



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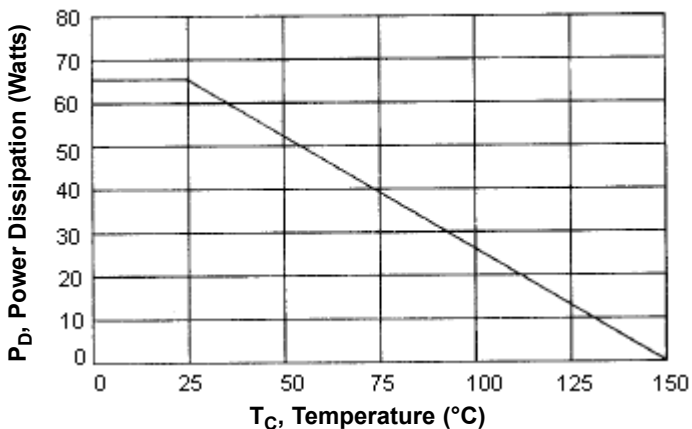
Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector - emitter voltage	V_{CEO}	80	V
Collector - base voltage	V_{CBO}		
Emitter - base voltage	V_{EBO}	5	A
Collector current - continuous - peak	I_C	10	
	I_{CM}	15	
Base current	I_B	0.25	
Total power dissipation at $T_C = 25^\circ\text{C}$ derate above 25°C	P_D	65 0.52	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	$R_{\theta jc}$	1.92	$^\circ\text{C/W}$

Figure - 1 Power Derating



Electrical Characteristics ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector - emitter sustaining voltage (1) ($I_C = 200\text{ mA}$, $I_B = 0$)	$V_{CEO(SUS)}$	80	-	V
Collector cut off current ($V_{CE} = 80\text{ V}$, $I_B = 0$)	I_{CEO}	-	1	mA
Collector cut off current ($V_{CE} = 80\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 80\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_C = 125^\circ\text{C}$)	I_{CEX}	-	0.3 3	
Emitter cut off current ($V_{EB} = 5\text{ V}$, $I_C = 0$)	I_{EBO}	5	-	

(1) Pulse Test : Pulse width = 300 μs , Duty Cycle $\leq 2\%$

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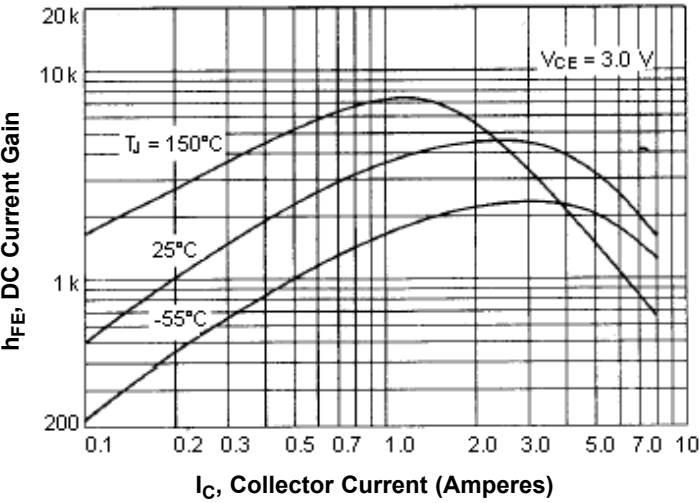
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Electrical Characteristics ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

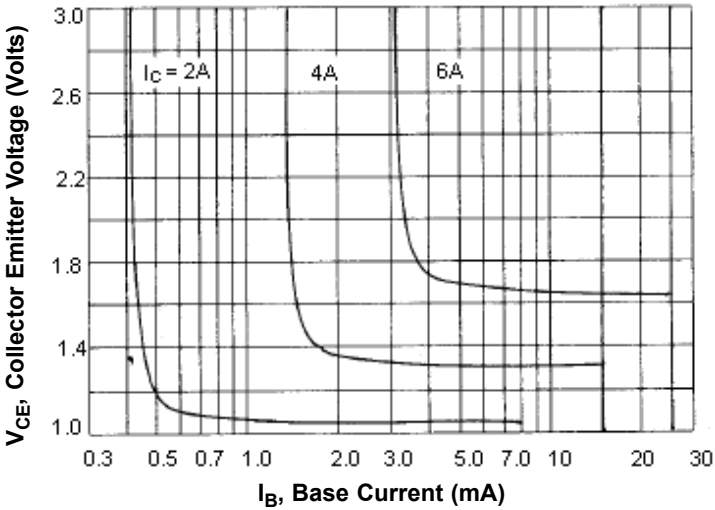
Characteristic	Symbol	Minimum	Maximum	Unit
ON Characteristics (1)				
DC current gain (I _C = 5 A, V _{CE} = 3 V) (I _C = 10 A, V _{CE} = 3 V)	h _{FE}	1,000 100	20,000	-
Collector - emitter saturation voltage (I _C = 5 A, V _{CE} = 10 mA) (I _C = 10 A, V _{CE} = 100 mA)	V _{CE (sat)}	-	2 3	V
Base - emitter on voltage (I _C = 5 A, V _{CE} = 3 V) (I _C = 10 A, V _{CE} = 3 V)	V _{BE (on)}	-	2.8 4.5	
Dynamic Characteristics				
Current gain - bandwidth product (2) (I _C = 1 A, V _{CE} = 5 V, f = 1 KHz)	h _{fe}	1,000	-	-
Output Capacitance (V _{CB} = 10 V, I _E = 0, f = 1 MHz)	C _{ob}	-	200	pF

(1) Pulse Test : Pulse width = 300 μs , Duty Cycle $\leq 2\%$

DC Current Gain

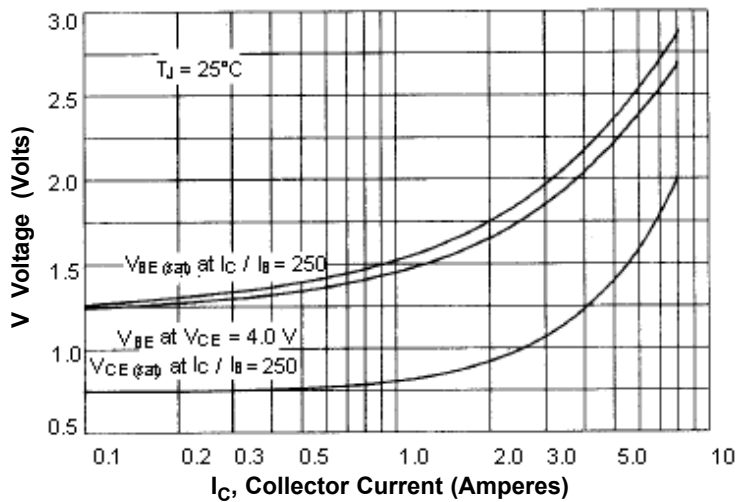


Collector Saturation Region

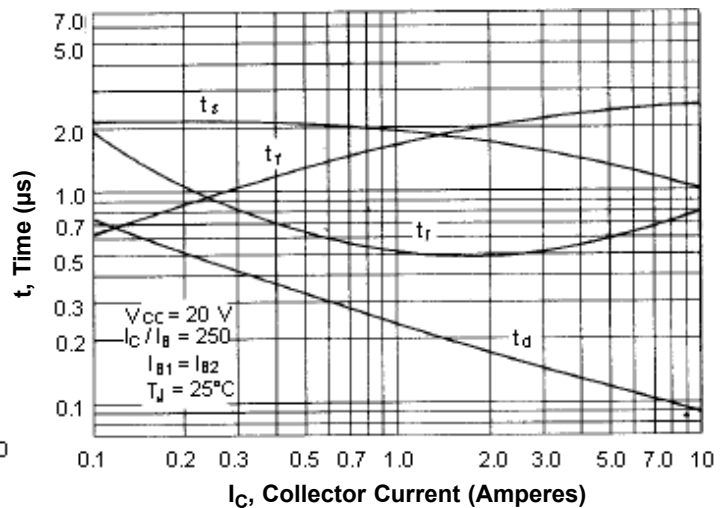


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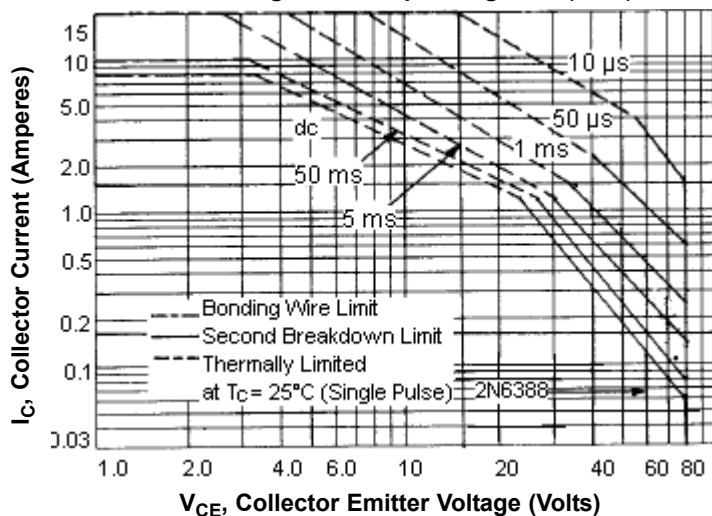
"ON" Voltages



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 that must not be subjected to greater dissipation than the curves indicate.

The data of SOA curve is based on $T_J(PK) = 150^\circ\text{C}$; T_C is variable depending on conditions. 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.

Specification Table

Description	$I_{C(av)}$ Maximum (A)	V_{CEO} Maximum (V)	h_{FE} Minimum at $I_C = 1\text{ A}$	P_{tot} at 25°C (W)	Package	Type	Part Number
Darlington Power Transistor	10	80	1,000	65	TO-220	NPN	2N6388

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