

2N6388

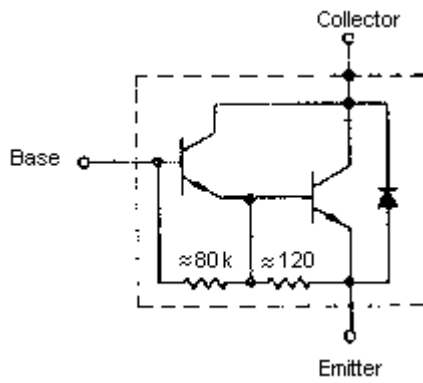
Darlington Power Transistor



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

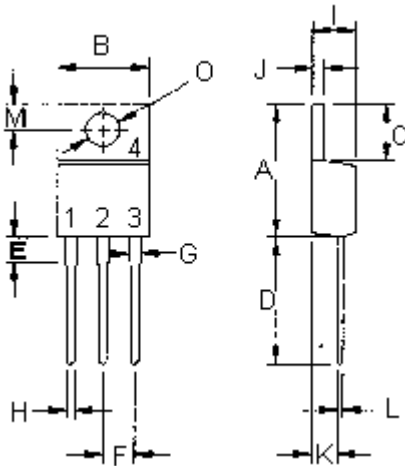
Features:

- 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

Darlington Power Transistor

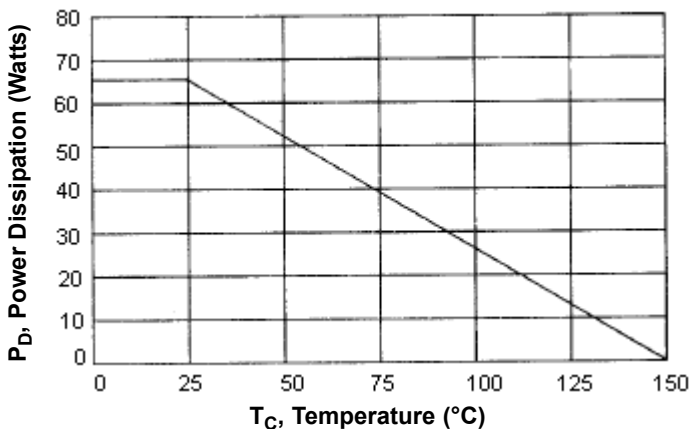
Maximum Ratings

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	$^\circ\text{C}/\text{W}$

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 $\leq 2\%$

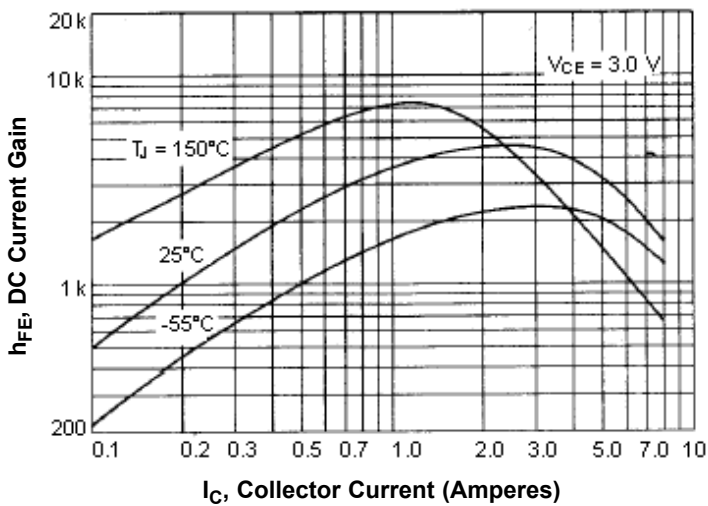
Darlington Power Transistor

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

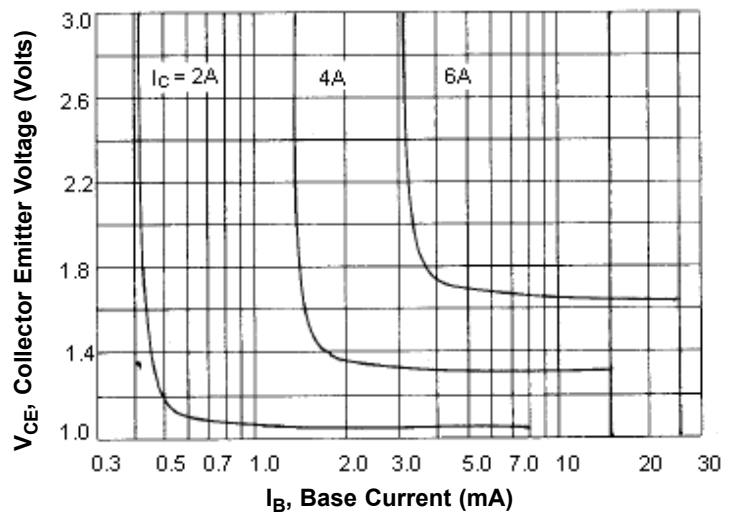
Characteristic	Symbol	Minimum	Maximum	Unit
ON Characteristics (1)				
DC current gain ($I_C = 5\text{ A}, V_{CE} = 3\text{ V}$) ($I_C = 10\text{ A}, V_{CE} = 3\text{ V}$)	h_{FE}	1,000 100	20,000	-
Collector - emitter saturation voltage ($I_C = 5\text{ A}, V_{CE} = 10\text{ mA}$) ($I_C = 10\text{ A}, V_{CE} = 100\text{ mA}$)	$V_{CE(sat)}$	-	2 3	V
Base - emitter on voltage ($I_C = 5\text{ A}, V_{CE} = 3\text{ V}$) ($I_C = 10\text{ A}, V_{CE} = 3\text{ V}$)	$V_{BE(on)}$	-	2.8 4.5	
Dynamic Characteristics				
Current gain - bandwidth product (2) ($I_C = 1\text{ A}, V_{CE} = 5\text{ V}, f = 1\text{ KHz}$)	h_{fe}	1,000	-	-
Output Capacitance ($V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$)	C_{ob}	-	200	pF

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

DC Current Gain



Collector Saturation Region

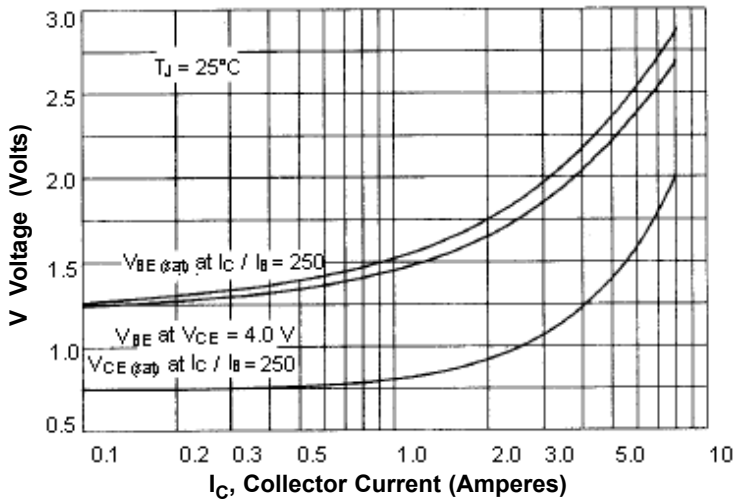


2N6388

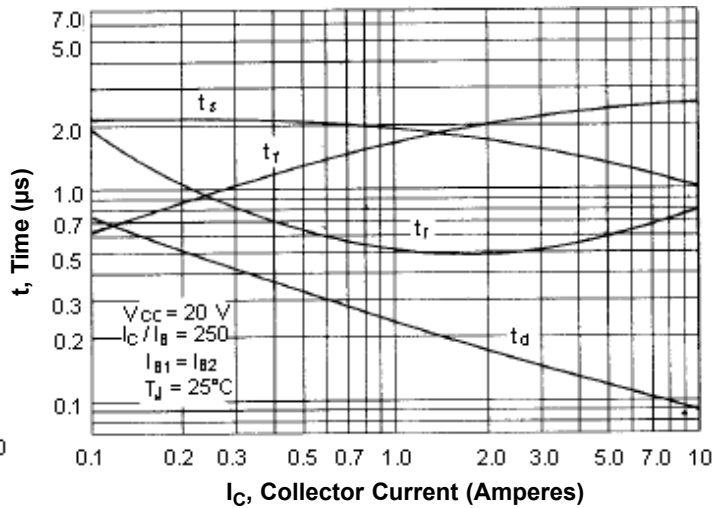


Darlington Power Transistor

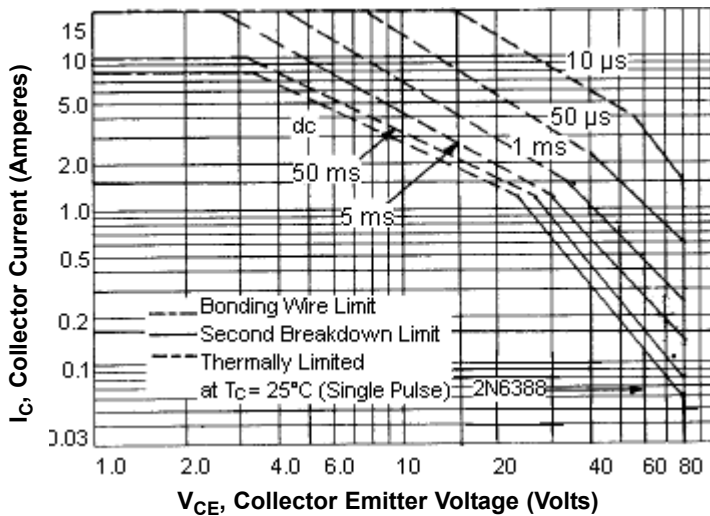
“ON” Voltages



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_{CE0} 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

Important Notice : This data sheet and its contents (the "Information") belong to the members of the Premier Farnell group of companies (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp is the registered trademark of the Group. © Premier Farnell plc 2011.

