

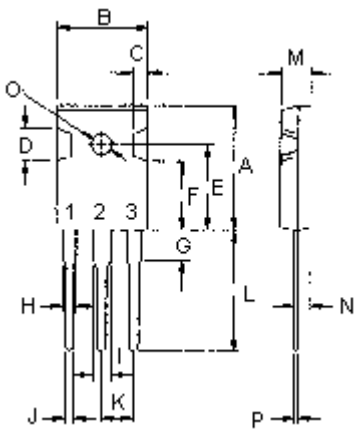
Darlington Power Transistor



NPN Silicon Power Darlington Transistors are designed for use in automotive ignition, switching and motor control applications

Features:

- Collector-Emitter Sustaining Voltage - $V_{CEO(sus)} = 380\text{ V}$ (Minimum)
- Collector-Emitter Saturation Voltage $V_{CE(sat)} = 2.9\text{ V}$ (Maximum) at $I_C = 10\text{ A}$
- 10 A Rated continuous collector current



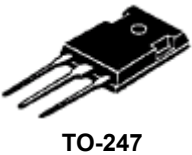
Pin 1. Base
2. Collector
3. Emitter

Dimensions	Minimum	Maximum
A	20.63	22.38
B	15.38	16.2
C	1.9	2.7
D	5.1	6.1
E	14.81	15.22
F	11.72	12.84
G	4.2	4.5
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.5	21.5
M	4.68	5.36
N	2.4	2.8
O	3.25	3.65
P	0.55	0.7

Dimensions : Millimetres

**NPN
TIP162**

10 A
Darlington
Power Transistor
380 V
125 W



TO-247

Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	380	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}		
Collector Current -Continuous -Peak	I_C I_{CM}	10 15	A
Base Current	I_B	1	
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate Above 25°C	P_D	125 1	W W / $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$



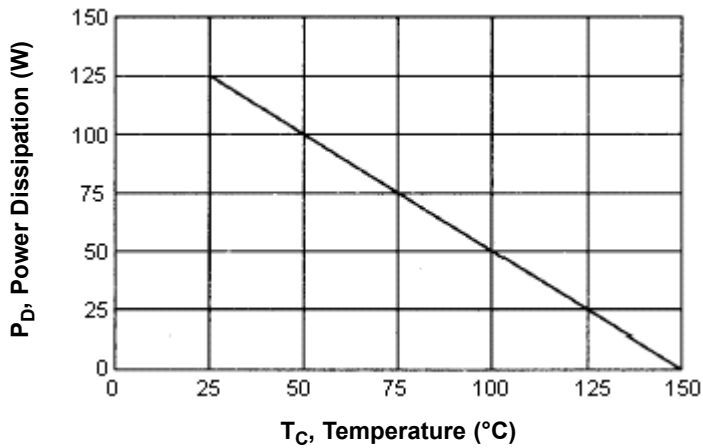
Darlington Power Transistor



Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1	$^{\circ}\text{C} / \text{W}$

Figure - 1 Power Derating



Electrical Characteristics ($T_C = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristic	Symbol	Minimum	Maximum	Unit	
Off Characteristics					
Collector Cut off Current (V _{CE} = 380 V, I _B = 0)	I _{CEO}	-	1	mA	
Emitter Cut off Current (V _{EB} = 5 V, I _C = 0)	I _{EBO}	-	100		
On Characteristics (1)					
DC Current Gain (I _C = 4 A, V _{CE} = 2.2 V)	h _{FE}	200	-	-	
Collector-Emitter Saturation Voltage (I _C = 6.5 A, I _B = 0.1 A) (I _C = 10 A, I _B = 1 A)	V _{CE (sat)}	-	2.8 2.9	V	
Base-Emitter Saturation Voltage (I _C = 6.5 A, I _B = 0.1 A)	V _{BE (sat)}	-	2.2		
Diode Forward Voltage (I _F = 10 A)	V _F	-	3.5		
Switching Characteristics					
Delay Time	V _{CC} = 33 V, I _C = 6.5 A I _{B1} = -I _{B2} = 100 mA, t _p = 20 μs, duty cycle 2%	t _d	0.3 (Typical)	-	μs
Rise Time		t _r	1.5 (Typical)	-	
Storage Time		t _s	2.3 (Typical)	-	
Fall Time		t _f	2.8 (Typical)	-	

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

Figure - 2 DC Current Gain

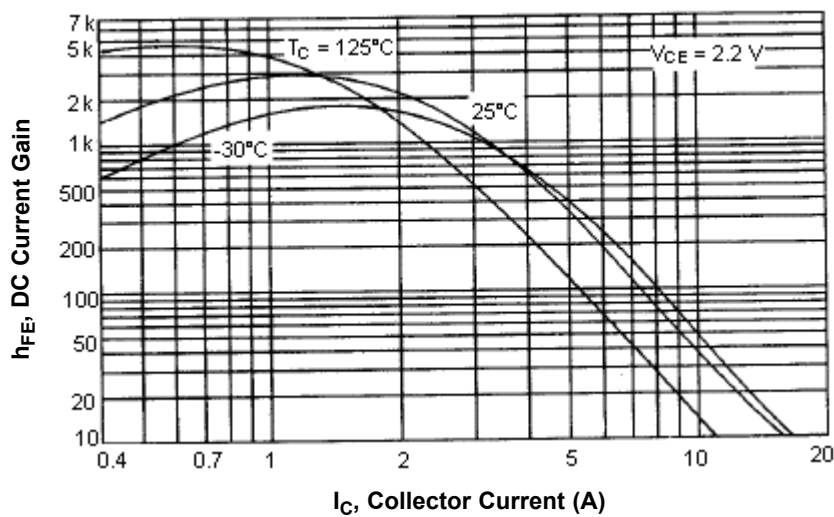


Figure - 3 Base-Emitter Voltage

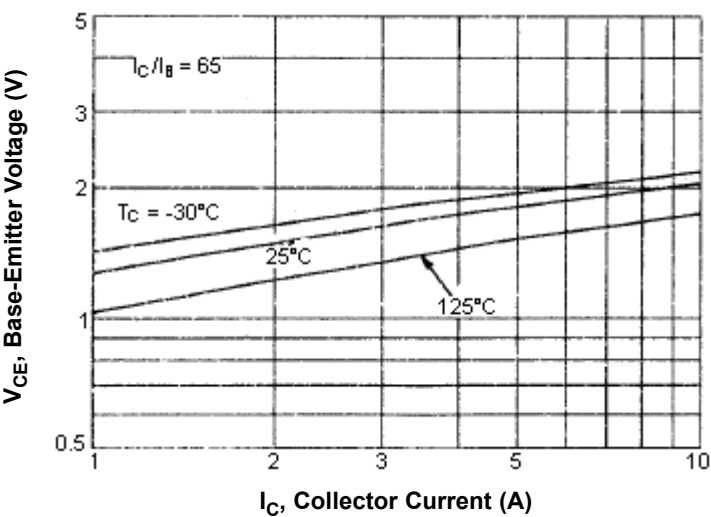
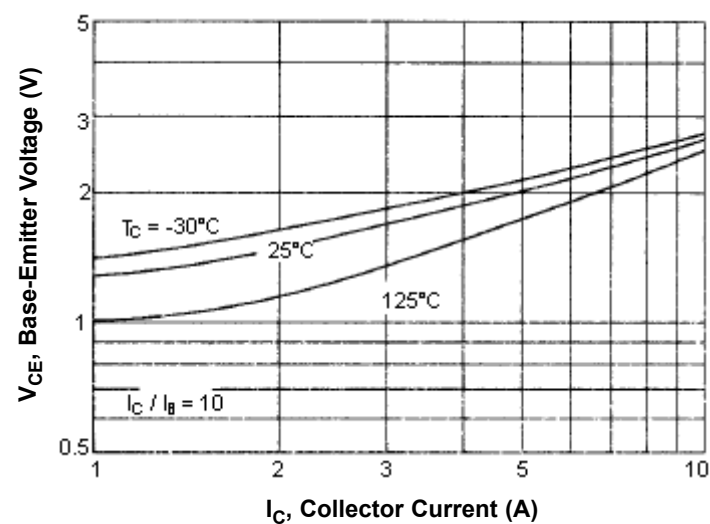


Figure - 4 Base-Emitter Voltage



Darlington Power Transistor



Figure - 5 Collector-Emitter Saturation Voltage

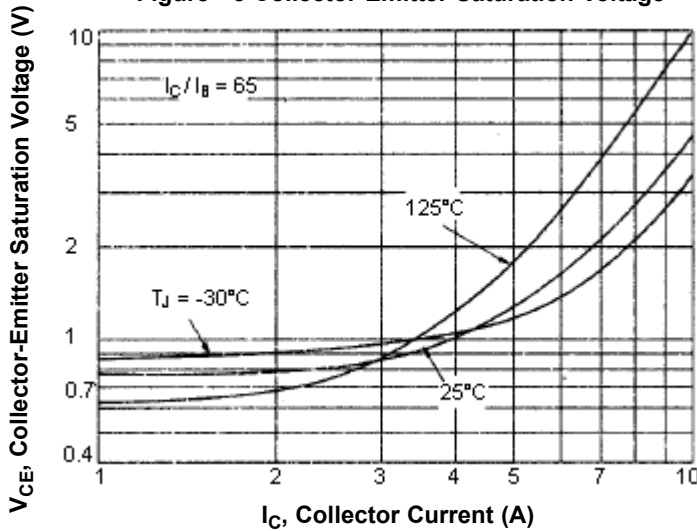


Figure - 6 Collector-Emitter Saturation Voltage

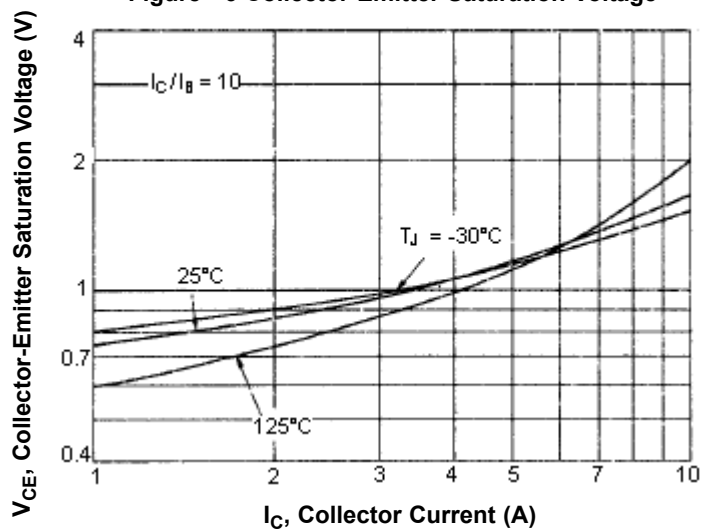
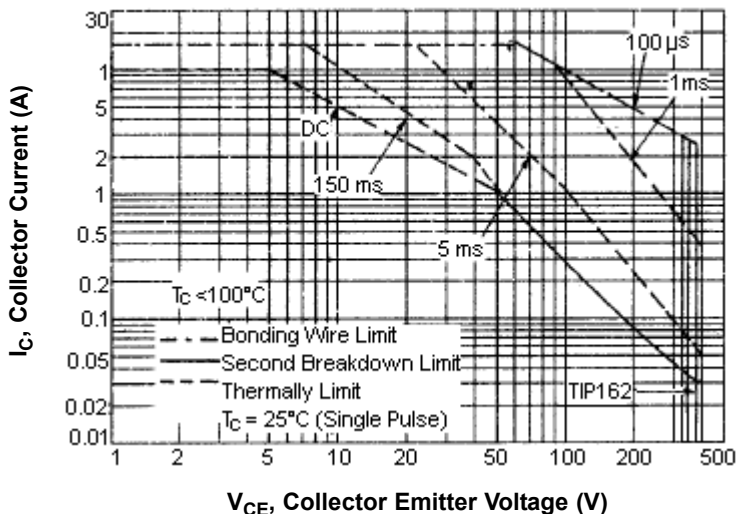


Figure - 7 Active Region Safe Operating Area



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 - 7 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 $T_{J(PK)} \leq 150^\circ\text{C}$. 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

I_C (av) Maximum (A)	V_{CE0} Maximum (V)	h_{FE} Minimum	I_C (A)	P_{tot} at 25°C (W)	Package	Type	Part Number
10	380	200	4	125	TO-247	NPN	TIP162

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 2012.