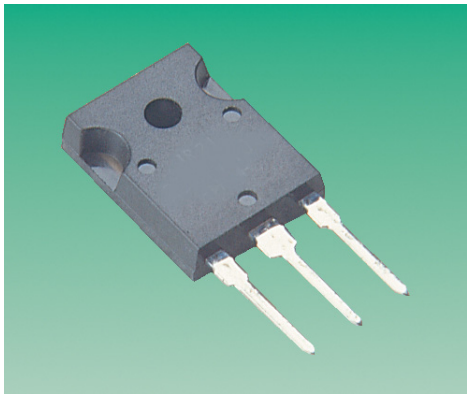
TIP162

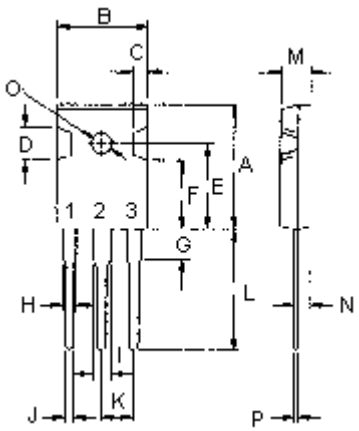
Darlington Power Transistor



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

Features:

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



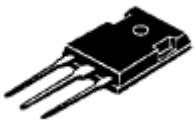
Pin 1. Base
2. Collector
3. Emitter

Dimensions	Minimum	Maximum
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

Dimensions : Millimetres

NPN
TIP162

10 Ampere
Darlington
Power Transistor
380 Volts
125 Watts



TO-247

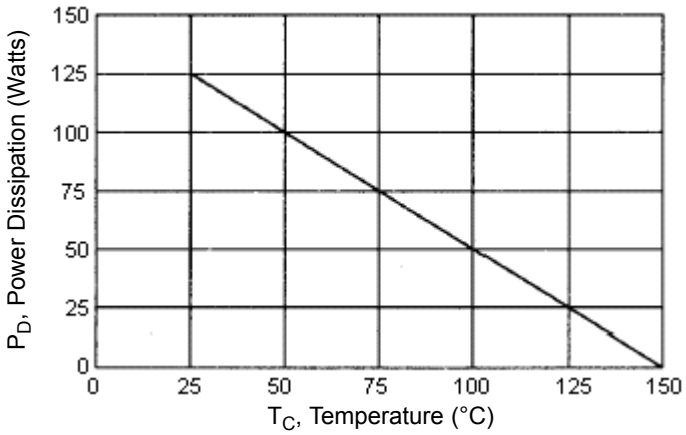
Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	380	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}	5.0	
Collector Current-Continuous -Peak	I_C I_{CM}	10 15	A
Base Current	I_B	1.0	
Total Power Dissipation at T_C = 25°C Derate above 25°C	P_D	125 1.0	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150	°C

Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	Rθjc	1.0	°C/W

Figure - 1 Power Derating



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

Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector Cut off Current (V_{CE} = 380V, I_B = 0)	I_{CEO}	-	1.0	mA
Emitter Cut off Current (V_{EB} = 5.0V, I_C = 0)	I_{EBO}	-	100	
ON Characteristics (1)				
DC Current Gain (I_C = 4.0A, V_{CE} = 2.2V)	h_{FE}	200	-	-
Collector-Emitter Saturation Voltage (I_C = 6.5A, I_B = 0.1A) (I_C = 10A, I_B = 1.0A)	$V_{CE(sat)}$	-	2.8 2.9	V
Base-Emitter Saturation Voltage (I_C = 6.5A, I_B = 0.1A)	$V_{BE(sat)}$	-	2.2	
Diode Forward Voltage (I_F = 10A)	V_F	-	3.5	

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

Characteristic		Symbol	Minimum	Maximum	Unit
Switching Characteristics					
Delay Time	V_{CC} = 33V, I_C = 6.5A I_{B1} = -I_{B2} = 100mA, tp = 20µs, Duty Cycle ≤2.0%	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 = 300µs, Duty Cycle ≤2.0%.

Figure - 2 DC Current Gain

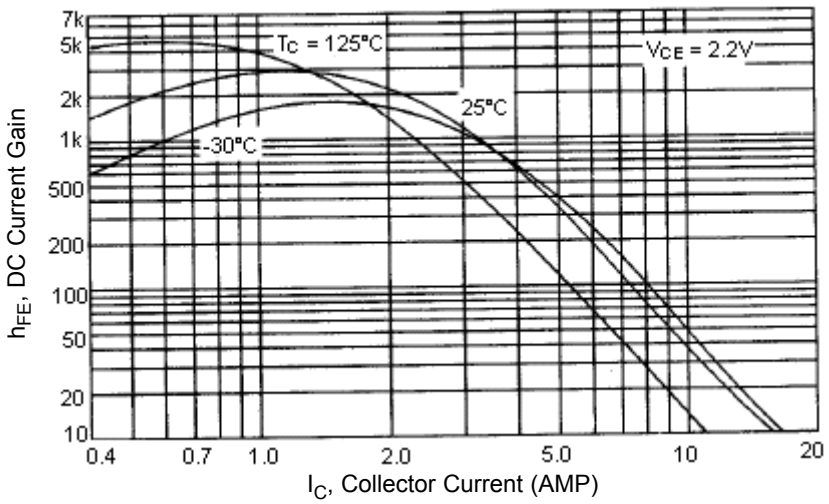


Figure - 3 Base-Emitter Voltage

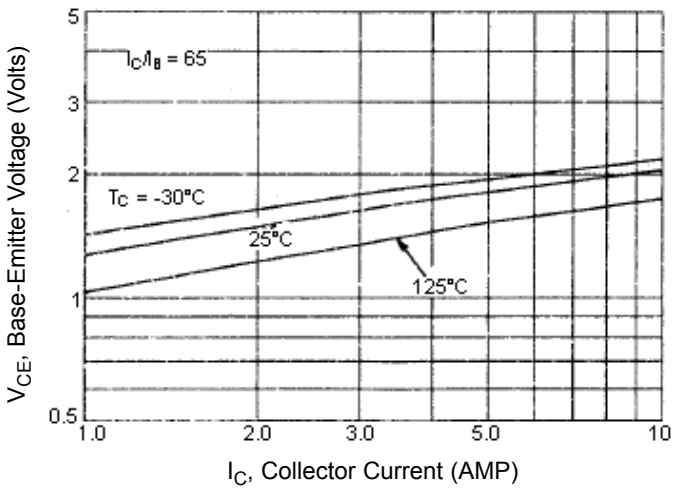


Figure - 4 Base-Emitter Voltage

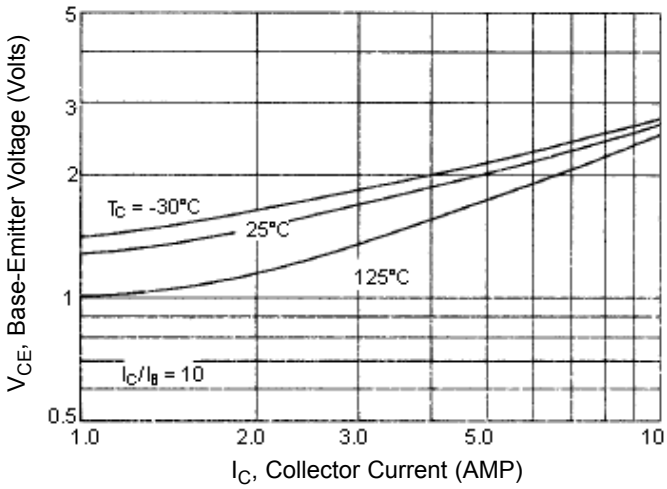


Figure - 5 Collector-Emitter Saturation Voltage

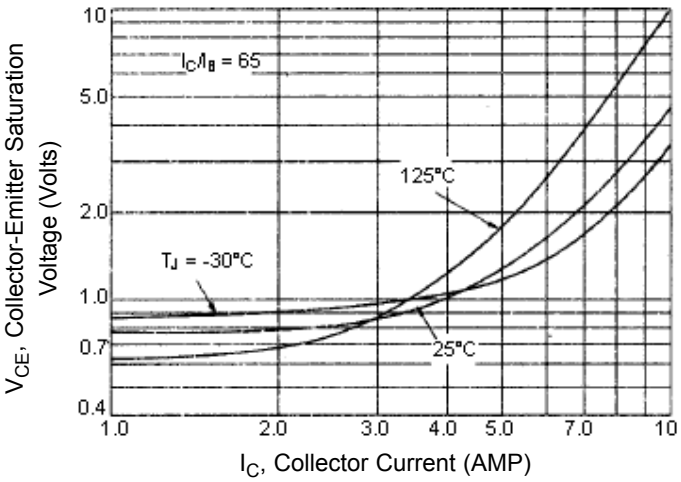


Figure - 6 Collector-Emitter Saturation Voltage

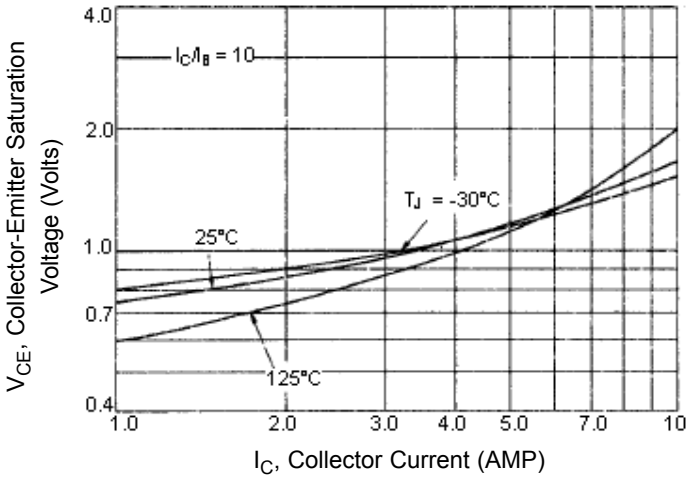
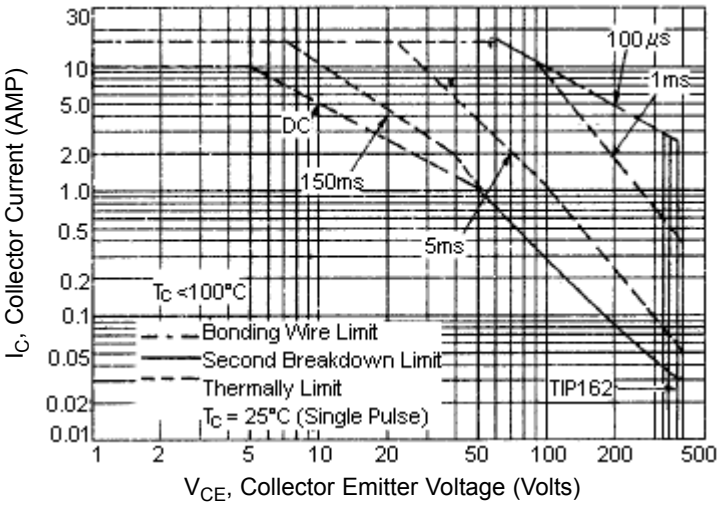


Figure - 7 Active Region Safe Operating Area



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°C; T_C is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150°C$, At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

Specifications

$I_{C(av)}$ maximum (A)	V_{CEO} 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

TIP162

Darlington Power Transistor

Notes:

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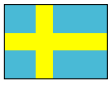

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