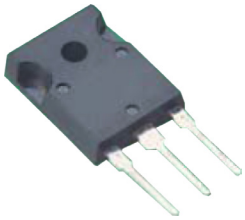
Darlington Transistor

multicomp PRO



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

NPN

TIP162

10 Amperes
Darlington
Power Transistor
380V
125W

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

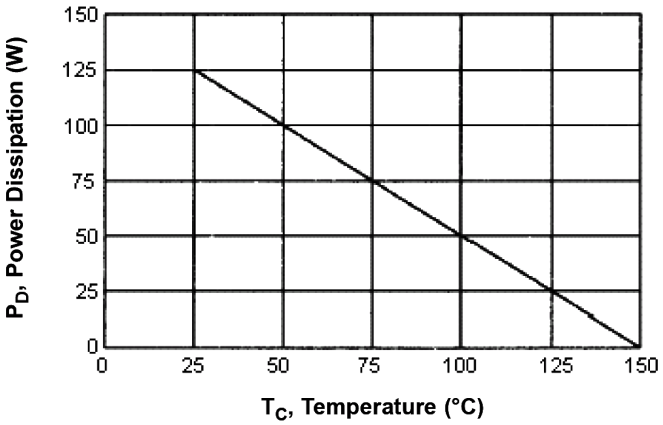
Maximum Ratings

Characteristic	Symbol	Ratings	Unit
Collector - Emitter Voltage	V_{CEO}	380	V
Collector - Base Voltage	V_{CBO}		
Emitter - Base Voltage	V_{EBO}	5	
Collector Current - Continuous - Peak	I_C I_{CM}	10 15	A
Base Current	I_B	1	
Total Power Dissipation at T_C = 25°C Derate above 25°C	P_D	125 1	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	$R_{\theta JC}$	1	°C / W

Figure - 1 Power Derating



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

Characteristic		Symbol	Minimum	Maximum	Unit
OFF Characteristics					
Collector Cut off Current (V_{CE} = 380V, I_B = 0)		$I_{CEO\ (sus)}$	-	1	mA
Emitter Cut off Current (V_{EB} = 5V, I_C = 0)		I_{EBO}	-	100	
ON Characteristics (1)					
DC Current Gain (I_C= 4A, V_{CE} = 2.2V)		h_{FE}	200	-	-
Collector-Emitter Saturation Voltage (I_C = 6.5A, I_B = 0.1A) (I_C = 10A, I_B = 1A)		$V_{CE\ (sat)}$	-	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	
Switching Characteristics					
Delay Time	V_{CC} = 33V, I_C = 6.5A I_{B1} = -I_{B2} = 100mA tp = 20µs, 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 = 30µs, Duty cycle = 2%

Figure - 2 DC Current Gain

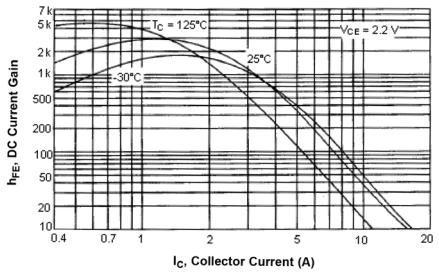


Figure - 3 Base-Emitter Voltage

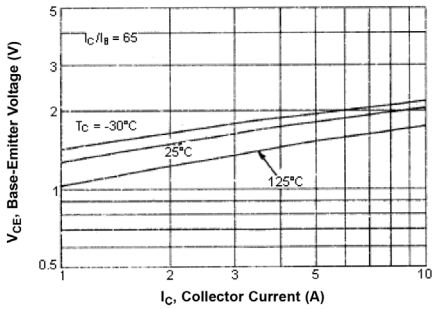


Figure - 4 Base-Emitter Voltage

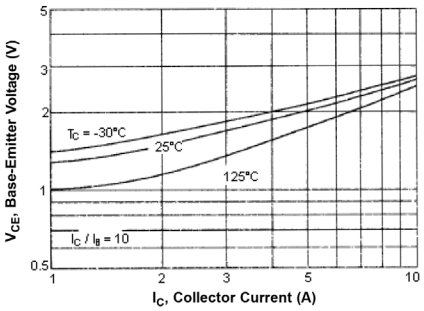


Figure - 5 Collector-Emitter Saturation Voltage

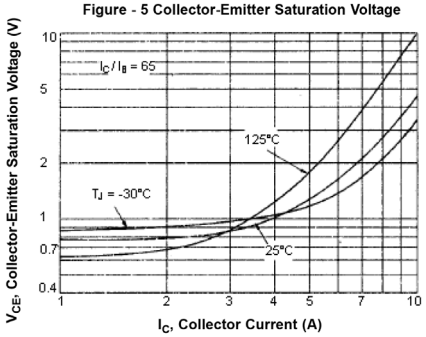


Figure - 6 Collector-Emitter Saturation Voltage

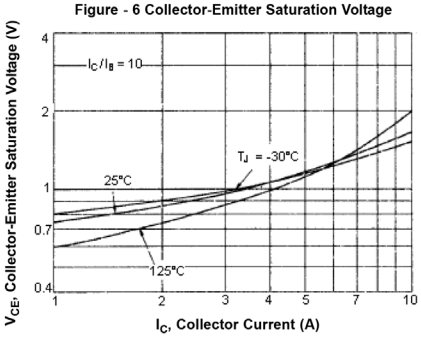


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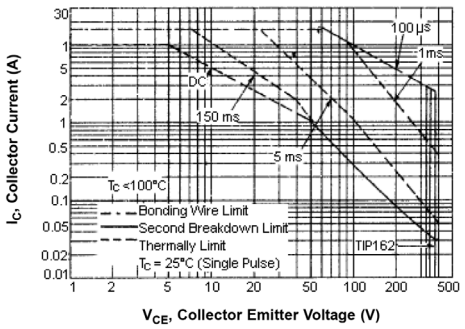
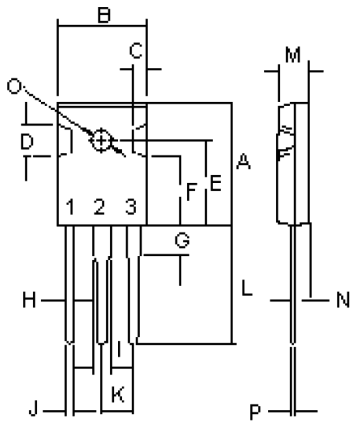
Figure - 7 Active Region Safe Operating Area



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; TC isvariable depending on power level. 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

Diagram



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

Dimensions	Minimum	Maximum
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

Specification Table

$I_{C\,(av)}$ (A)	V_{CEO} Maximum (V)	h_{FE} Minimum	I_C (A)	Ptot at 25°C (W)	Package	Type	Part Number
10	380	200	4	125	TO-247	NPN	TIP162