



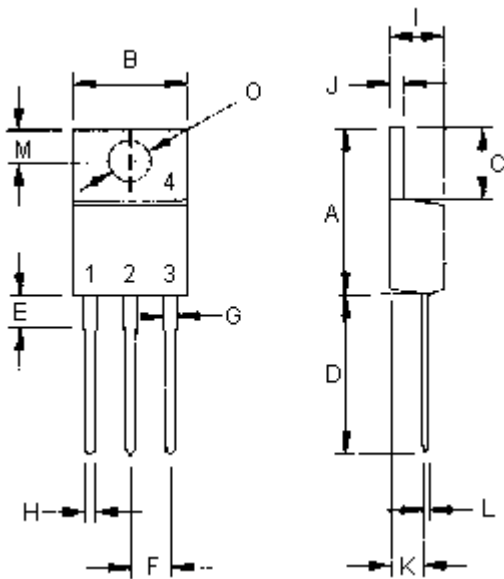
NPN Silicon power darlington transistors are designed for use in automotive ignition. Switching and motor control applications.

Features:

- Collector-emitter sustaining voltage
 $V_{CEO(SUS)} = 400V$ (minimum).
- Collector-emitter saturation voltage
 $V_{CE(sat)} = 2.0V$ (maximum) at $I_C = 5.0A$.
- Reverse-base SOA at 300V to 400V at 7A.

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	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

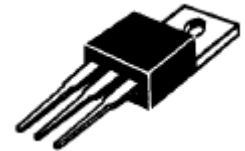
Dimensions : Millimetres



- Pin 1. Base
- 2. Collector
- 3. Emitter
- 4. Collector(Case)

**NPN
TIP152**

7 Ampere
Darlington
Power Transistors
300 to 400 Volts
80 Watts



TO-220

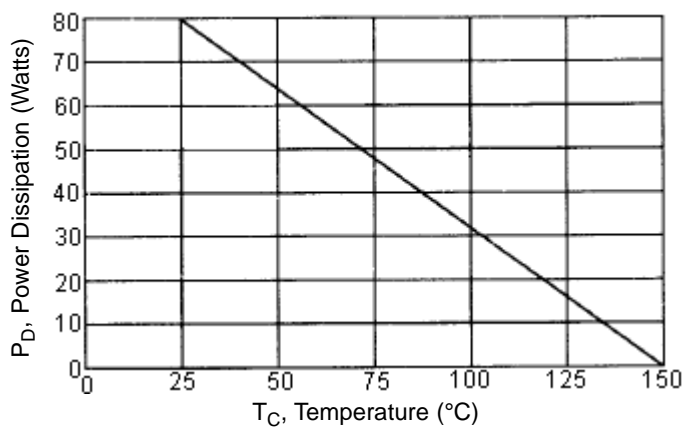
Maximum Ratings

Parameter	Symbol	TIP152	Unit
Collector-Emitter Voltage	V_{CEO}	400	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}		
Collector Current-Continuous -Peak	I_C I_{CM}	7.0 1.0	A
Base Current	I_B	1.5	
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	80 0.64	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	$R_{\theta jc}$	1.56	$^\circ\text{C/W}$

Power Derating

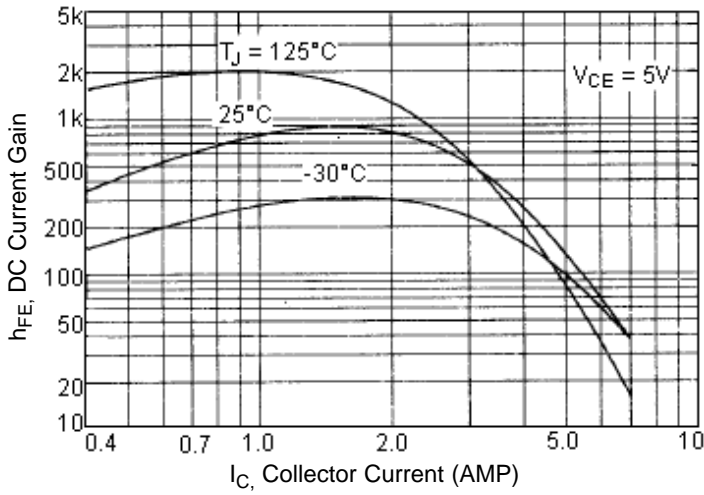


Electrical Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise noted)

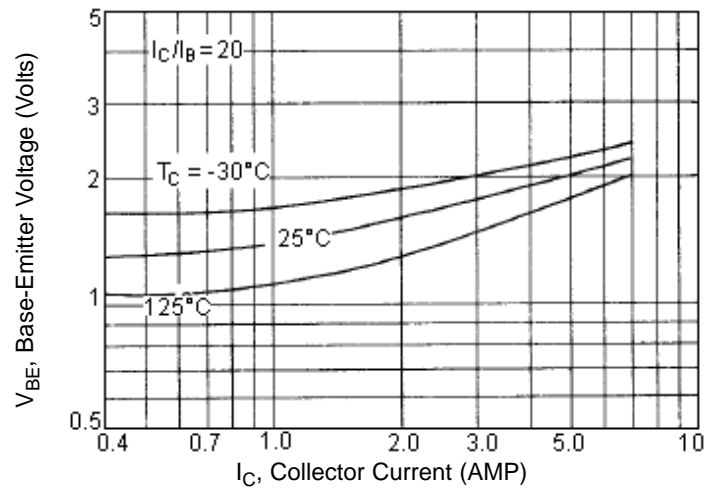
Parameter	Symbol	Minimum	Maximum	Unit	
Off Characteristics					
Collector-Emitter Breakdown Voltage (1) ($I_C = 10\text{mA}$, $I_B = 0$)	TIP152 $V_{(BR) CEO}$	400	-	V	
Collector-Base Breakdown Voltage (1) ($I_C = 1.0\text{mA}$, $I_B = 0$)	TIP152 $V_{(BR) CBO}$		-		
Collector Cut off Current ($V_{CE} = 400\text{V}$, $I_B = 0$)	TIP152 I_{CEO}	-	250	μA	
Emitter Cut off Current ($V_{EB} = 8.0\text{V}$, $I_C = 0$)	I_{EBO}	-	15	mA	
On Characteristics (1)					
DC Current Gain ($I_C = 2.5\text{A}$, $V_{CE} = 5.0\text{V}$) ($I_C = 5.0\text{A}$, $V_{CE} = 5.0\text{V}$) ($I_C = 7.0\text{A}$, $V_{CE} = 5.0\text{V}$)	h_{FE}	150 50 15	-	-	
Collector-Emitter Saturation Voltage ($I_C = 1.0\text{A}$, $I_B = 10\text{mA}$) ($I_C = 2.0\text{A}$, $I_B = 100\text{mA}$) ($I_C = 5.0\text{A}$, $I_B = 250\text{mA}$)	$V_{CE (sat)}$	-	1.5 1.5 2.0	V	
Base-Emitter Saturation Voltage ($I_C = 2.0\text{A}$, $I_B = 100\text{mA}$) ($I_C = 5.0\text{A}$, $I_B = 250\text{mA}$)	$V_{BE (sat)}$	-	2.2 2.3		
Diode Forward Voltage ($I_F = 7.0\text{A}$)	V_F	-	3.5		
Dynamic Characteristics					
Small-Signal Current Gain ($I_C = 0.5\text{A}$, $V_{CE} = 5.0\text{V}$, $f = 1.0\text{KHz}$)	h_{fe}	200	-	-	
Output Capacitance ($V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1.0\text{MHz}$)	C_{ob}	-	150	pF	
Switching Characteristics					
Delay Time	$V_{CC} = 250\text{V}$, $I_C = 5.0\text{A}$ $I_{B1} = -I_{B2} = 250\text{mA}$, $t_p = 200\mu\text{S}$, Duty Cycle $\leq 2.0\%$	t_d	30 (Typical)	-	ns
Rise Time		t_r	180 (Typical)	-	
Storage Time		t_s	3.5 (Typical)	-	μs
Fall Time		t_f	1.6 (Typical)	-	

(1) Pulse Test : Pulse width: $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

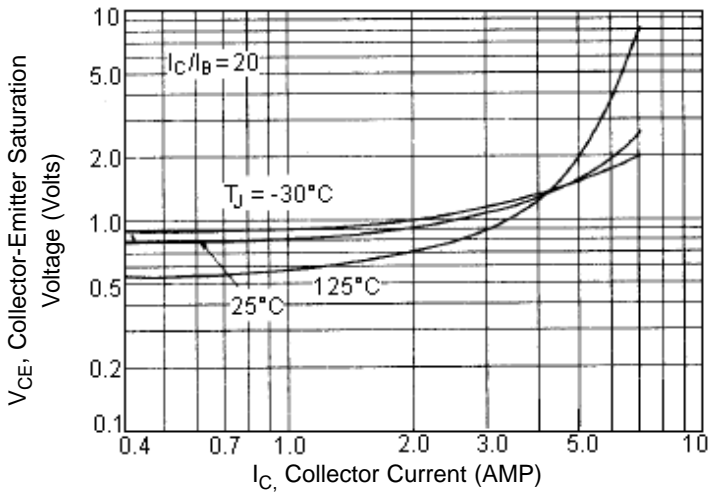
DC Current Gain



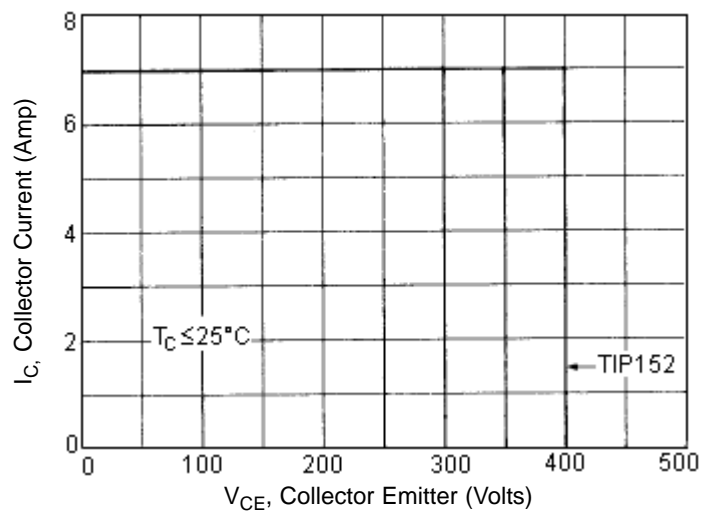
Base-Emitter Voltage



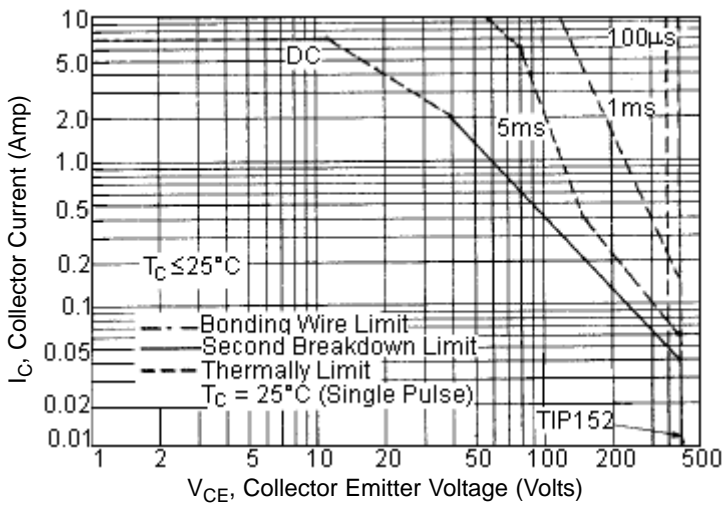
Collector-Emitter Saturation Voltage



Reverse Bias Safe Operating Area



Active Region Safe Operating Area



There are two limitation 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 curves indicate.



The data of curve is base 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.

Part Number Table

Description	Part Number
Darlington Transistor, TO-220	TIP152

Notes:

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[TIP152](#)

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