

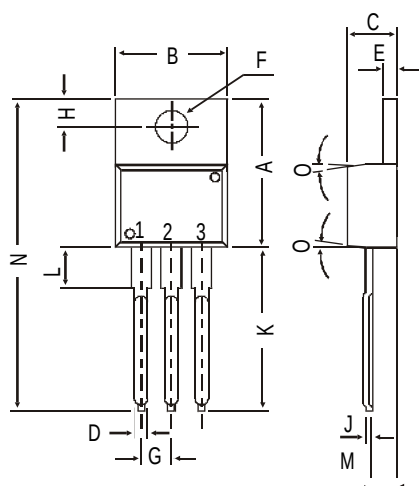
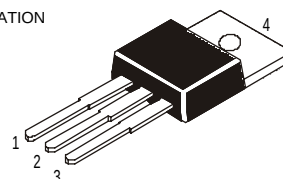
TO-220 Plastic Package

TIP120, TIP121, TIP122
TIP125, TIP126, TIP127

TIP120, 121, 122 NPN PLASTIC POWER TRANSISTORS
TIP125, 126, 127 PNP PLASTIC POWER TRANSISTORS
Power **Darlington** for Linear and Switching Applications

PIN CONFIGURATION

1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR



All dimensions in mm.

DIM	MIN.	MAX.
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D		0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J		0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N		31.24
O	DEG 7	

ABSOLUTE MAXIMUM RATINGS

		120	121	122	
		125	126	127	
Collector-base voltage (open emitter)	V_{CBO}	max. 60	80	100	V
Collector-emitter voltage (open base)	V_{CEO}	max. 60	80	100	V
Collector current	I_C	max. 5.0			A
Total power dissipation up to $T_C = 25^\circ\text{C}$	P_{tot}	max. 65			W
Junction temperature	T_j	max. 150			$^\circ\text{C}$
Collector-emitter saturation voltage					
$I_C = 3\text{ A}; I_B = 12\text{ mA}$	V_{CEsat}	max. 2.0			V
D.C. current gain					
$I_C = 0.5\text{ A}; V_{CE} = 3\text{ V}$	h_{FE}	min. 1.0			

RATINGS (at $T_A=25^\circ\text{C}$ unless otherwise specified)

		120	121	122	
		125	126	127	
Collector-base voltage (open emitter)	V_{CBO}	max. 60	80	100	V
Collector-emitter voltage (open base)	V_{CEO}	max. 60	80	100	V
Emitter-base voltage (open collector)	V_{EBO}	max. 5.0			V

**TIP120, TIP121, TIP122
TIP125, TIP126, TIP127**

Collector current	I_C	max.	5.0	A
Collector current (peak)	I_{CM}	max.	8	A
Base current	I_B	max.	120	mA
Total power dissipation up to $T_C = 25^\circ\text{C}$	P_{tot}	max.	65	W
Derate above 25°C		max	0.52	W/°C
Total power dissipation up to $T_A = 25^\circ\text{C}$	P_{tot}	max.	2	W
Derate above 25°C		max	0.016	W/°C
Junction temperature	T_j	max.	150	°C
Storage temperature	T_{stg}		-65 to +150	°C

THERMAL RESISTANCE

From junction to ambient	$R_{th\ j-a}$		62.5	°C/W
From junction to case	$R_{th\ j-c}$		1.92	°C/W

CHARACTERISTICS

$T_{amb} = 25^\circ\text{C}$ unless otherwise specified

			120	121	122	
			125	126	127	
Collector cutoff current						
$I_E = 0; V_{CB} = 60\text{ V}$	I_{CBO}	max.	0.2	—	—	mA
$I_E = 0; V_{CB} = 80\text{ V}$	I_{CBO}	max.	—	0.2	—	mA
$I_E = 0; V_{CB} = 100\text{ V}$	I_{CBO}	max.	—	—	0.2	mA
$I_B = 0; V_{CE} = 30\text{ V}$	I_{CEO}	max.	0.5	—	—	mA
$I_B = 0; V_{CE} = 40\text{ V}$	I_{CEO}	max.	—	0.5	—	mA
$I_B = 0; V_{CE} = 50\text{ V}$	I_{CEO}	max.	—	—	0.5	mA
Emitter cut-off current						
$I_C = 0; V_{EB} = 5\text{ V}$	I_{EBO}	max.		2.0		mA
Breakdown voltages						
$I_C = 100\text{ mA}; I_B = 0$	$V_{CEO(sus)}^*$	min.	60	80	100	V
$I_C = 1\text{ mA}; I_E = 0$	V_{CBO}	min.	60	80	100	V
$I_E = 1\text{ mA}; I_C = 0$	V_{EBO}	min.		5.0		V
Saturation voltages						
$I_C = 3.0\text{ A}; I_B = 12\text{ mA}$	V_{CEsat}^*	max.		2.0		V
$I_C = 5.0\text{ A}; I_B = 20\text{ mA}$	V_{CEsat}^*	max.		4.0		V
Base-emitter on voltage						
$I_C = 3\text{ A}; V_{CE} = 3\text{ V}$	$V_{BE(on)}^*$	max.		2.5		V
D.C. current gain						
$I_C = 0.5\text{ A}; V_{CE} = 3\text{ V}$	h_{FE}^*	min.		1.0		
$I_C = 3\text{ A}; V_{CE} = 3\text{ V}$		min.		1.0		
Small signal current gain						
$I_C = 3\text{ A}; V_{CE} = 4\text{ V}; f = 1\text{ MHz}$	$ h_{fe} $	min.		4.0		
Output capacitance at $f = 0.1\text{ MHz}$						
$I_E = 0; V_{CB} = 10\text{ V}$	PNP C_o	max.		300		pF
	NPN C_o	max.		200		pF

* Pulse test: pulse width $\leq 300\text{ }\mu\text{s}$; duty cycle $\leq 2\%$.