

## NPN TIP120-121-122

### SILICON DARLINGTON POWER TRANSISTORS

NPN epitaxial-base transistors in a monolithic Darlington circuit and housed in a TO-220 envelope. They are intended for use in power linear and switching applications. PNP complements are TIP125-126-127. Compliance to RoHS.

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit	
$V_{CBO}$	Collector-Base Voltage	TIP120	60	V	
		TIP121	80		
		TIP122	100		
$V_{CEO}$	Collector-Emitter Voltage	TIP120	60	V	
		TIP121	80		
		TIP122	100		
$V_{EBO}$	Emitter-Base Voltage	TIP120	5	V	
		TIP121			
		TIP122			
$I_C$	Collector Current	TIP120	5	A	
		TIP121			
		TIP122			
$I_{CM}$	Collector Peak Current	TIP120	8	A	
		TIP121			
		TIP122			
$I_B$	Base Current	TIP120	120	mA	
		TIP121			
		TIP122			
$P_T$	Power Dissipation	@ $T_c < 25^\circ$	TIP120	65	Watts
			TIP121		
			TIP122		
		@ $T_a < 25^\circ$	TIP120	2	
			TIP121		
			TIP122		
$T_J$	Junction Temperature	TIP120	150	$^\circ\text{C}$	
		TIP121			
		TIP122			
$T_s$	Storage Temperature range	TIP120	-65 to +150	$^\circ\text{C}$	
		TIP121			
		TIP122			

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### THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
$R_{thJ-case}$	From junction-case	1.92	°C/W
$R_{thJ-amb}$	From junction-ambient	62.5	°C/W

### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

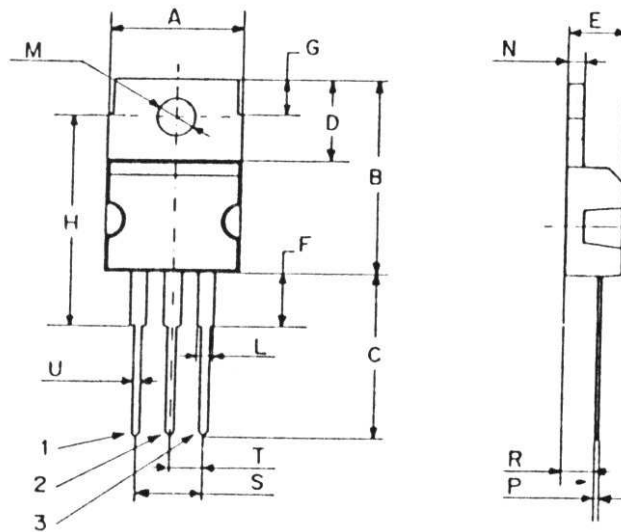
Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit	
$I_{CBO}$	Collector Cutoff Current	$I_E = 0, V_{CB} = V_{CB0max}$	TIP120	-	-	0.2	mA
			TIP121				
			TIP122				
$I_{CEO}$	Collector Cutoff Current	$I_E = 0$ $V_{CE} = 1/2 V_{CEOmax}$	TIP120	-	-	0.5	mA
			TIP121				
			TIP122				
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 5 V, I_C = 0$	TIP120	-	-	2	mA
			TIP121				
			TIP122				
$V_{CEO}$	Collector-Emitter Breakdown Voltage (*)	$I_C = 30 mA, I_B = 0$	TIP120	60	-	-	V
			TIP121	80	-	-	
			TIP122	100	-	-	
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C = 3 A, I_B = 12 mA$	TIP120	-	-	2	V
			TIP121				
			TIP122				
		$I_C = 5 A, I_B = 20 mA$	TIP120	-	-	4	
			TIP121				
			TIP122				
$V_{BE(on)}$	Base-Emitter Voltage (*)	$I_C = 3 A, V_{CE} = 3 V$	TIP120	-	-	2.5	V
			TIP121				
			TIP122				
$h_{FE}$	DC Current Gain (*)	$V_{CE} = 3.0 V, I_C = 0.5 A$	TIP120	1000	-	-	-
			TIP121				
			TIP122				
		$V_{CE} = 3.0 V, I_C = 3 A$	TIP120	1000	-	-	
			TIP121				
			TIP122				
$C_{OB}$	Output Capacitance	$I_E = 0, V_{CB} = 10 V,$ $f_{test} = 1MHz$	TIP120	-	-	200	pF
			TIP121				
			TIP122				

(\*) Pulse Width  $\approx 300 \mu s$ , Duty Cycle  $\angle 2.0\%$

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### MECHANICAL DATA CASE TO-220

DIMENSIONS (mm)		
	Min.	Max.
A	9,90	10,30
B	15,65	15,90
C	13,20	13,40
D	6,45	6,65
E	4,30	4,50
F	2,70	3,15
G	2,60	3,00
H	15,75	17,15
L	1,15	1,40
M	3,50	3,70
N	-	1,37
P	0,46	0,55
R	2,50	2,70
S	4,98	5,08
T	2.49	2.54
U	0,70	0,90



Pin 1 :	Base
Pin 2 :	Collector
Pin 3 :	Emitter
Case :	Collector

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