

## NPN TIP110-111-112

### SILICON DARLINGTON POWER TRANSISTORS

NPN epitaxial-base transistors in a monolithic Darlington circuit and housed in a TO-220 envelope.

They are designed for general purpose amplifier and low-speed switching applications. PNP complements are TIP115-116-117

Compliance to RoHS-

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit	
$V_{CBO}$	Collector-Base Voltage	TIP110	60	V	
		TIP111	80		
		TIP112	100		
$V_{CEO}$	Collector-Emitter Voltage	TIP110	60	V	
		TIP111	80		
		TIP112	100		
$V_{EBO}$	Emitter-Base Voltage	TIP110	5	V	
		TIP111			
		TIP112			
$I_C$	Collector Current	TIP110	2	A	
		TIP111			
		TIP112			
$I_{CM}$	Collector Peak Current	TIP110	4	A	
		TIP111			
		TIP112			
$I_B$	Base Current	TIP110	50	mA	
		TIP111			
		TIP112			
$P_T$	Power Dissipation	@ $T_c < 25^\circ$	TIP110	50	Watts
			TIP111		
			TIP112		
		@ $T_a < 25^\circ$	TIP110	2	
			TIP111		
			TIP112		
$T_J$	Junction Temperature	TIP110	150	°C	
		TIP111			
		TIP112			
$T_s$	Storage Temperature range	TIP110	-65 to +150		
		TIP111			
		TIP112			

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### THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit	
$R_{thJ-case}$	From junction-case	TIP110	2.5	°C/W
		TIP111		
		TIP112		
$R_{thJ-amb}$	From junction-ambient	TIP110	62.5	°C/W
		TIP111		
		TIP112		

### ELECTRICAL CHARACTERISTICS

$T_C=25^{\circ}\text{C}$  unless otherwise noted

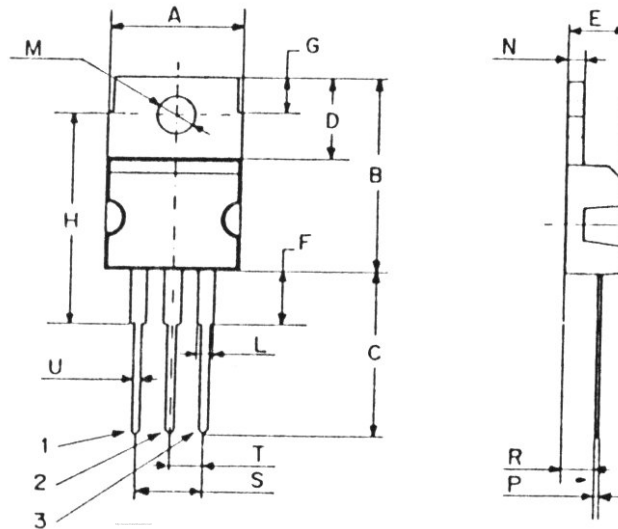
Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit	
$I_{CBO}$	Collector Cutoff Current	$I_E=0, V_{CB}=V_{CB0max}$	TIP110	-	-	1	mA
			TIP111				
			TIP112				
$I_{CEO}$	Collector Cutoff Current	$I_E=0, V_{CE}=1/2 V_{CE0max}$	TIP110	-	-	2	mA
			TIP111				
			TIP112				
$I_{EBO}$	Emitter Cutoff Current	$V_{EB}=5\text{ V}, I_C=0$	TIP110	-	-	2	mA
			TIP111				
			TIP112				
$V_{CEO}$	Collector-Emitter Breakdown Voltage (*)	$I_C=30\text{ mA}, I_B=0$	TIP110	60	-	-	V
			TIP111	80	-	-	
			TIP112	100	-	-	
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C=2\text{ A}, I_B=8\text{ mA}$	TIP110	-	-	2.5	V
			TIP111				
			TIP112				
$V_{BE(on)}$	Base-Emitter Voltage (*)	$I_C=2\text{ A}, V_{CE}=4\text{ V}$	TIP110	-	-	2.8	V
			TIP111				
			TIP112				
$h_{FE}$	DC Current Gain (*)	$V_{CE}=4\text{ V}, I_C=1\text{ A}$	TIP110	1000	-	-	-
			TIP111				
			TIP112				
		$V_{CE}=4\text{ V}, I_C=2\text{ A}$	TIP110	500	-	-	
			TIP111				
			TIP112				
$C_{OB}$	Output Capacitance	$I_E=0, V_{CB}=10\text{ V}$ $f=0.1\text{ MHz}$	TIP110	-	-	100	pF
			TIP111				
			TIP112				

(\*) Pulse Width  $\approx 300\ \mu\text{s}$ , 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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