



TO-220-3L Plastic-Encapsulate Transistors

TIP110 DARLINGTON TRANSISTOR (NPN)

FEATURES

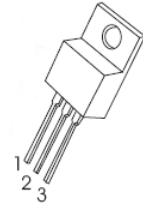
- High DC Current Gain : $h_{FE}=1000$ @ $V_{CE}=4V, I_C=1A$ (Min.)
- Low Collector-Emitter Saturation Voltage
- Industrial Use

MAXIMUM RATINGS ($T_a=25\text{ }^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	60	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current -Continuous	2	A
P_C	Collector Power Dissipation	2	W
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

TO-220-3L

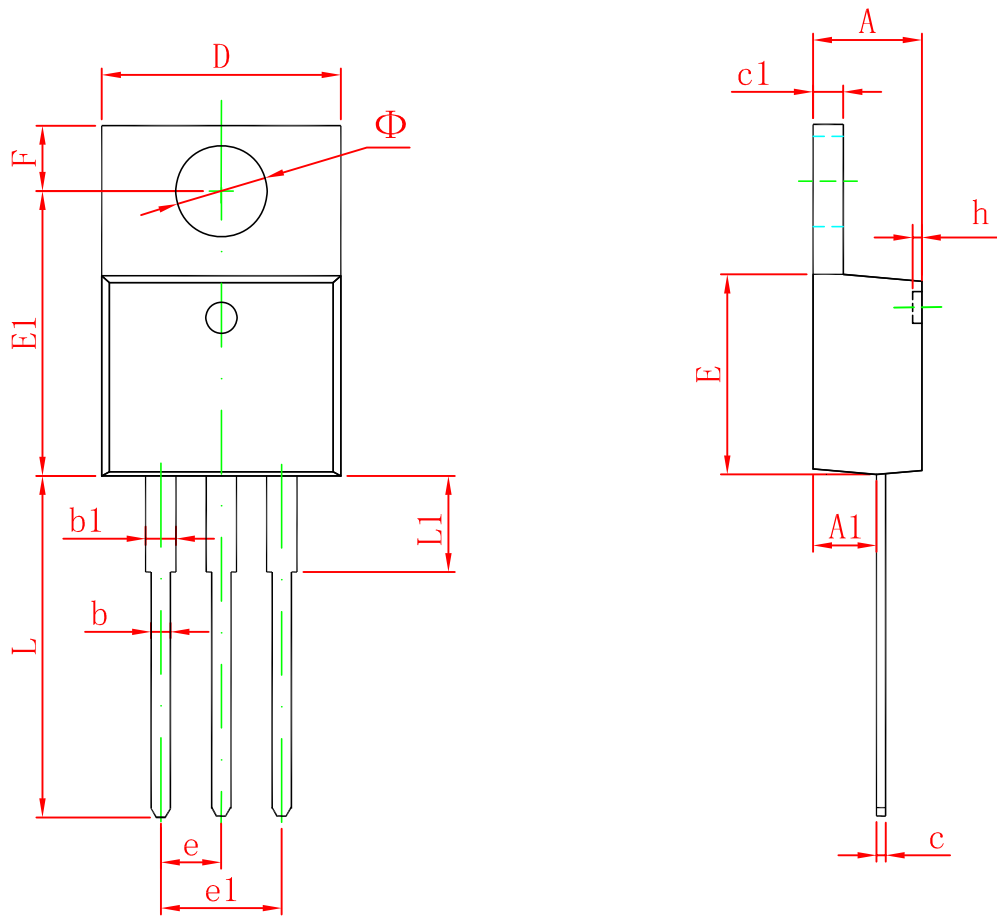
- 1. BASE
- 2. COLLECTOR
- 3. EMITTER



ELECTRICAL CHARACTERISTICS ($T_a=25\text{ }^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\text{mA}, I_E=0$	60			V
Collector-emitter sustaining voltage	$V_{CEO}^{(sus)}$	$I_C=30\text{mA}, I_B=0$	60			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\text{mA}, I_C=0$	5			V
Collector cut-off current	I_{CEO}	$V_{CE}=30\text{V}, I_B=0$			2	mA
Collector cut-off current	I_{CBO}	$V_{CB}=60\text{V}, I_E=0$			1	mA
Emitter cut-off current	I_{EBO}	$V_{EB}=5\text{V}, I_C=0$			2	mA
DC current gain	$h_{FE(1)}$	$V_{CE}=4\text{V}, I_C=1\text{A}$	1000			
	$h_{FE(2)}$	$V_{CE}=4\text{V}, I_C=2\text{A}$	500			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=2\text{A}, I_B=8\text{mA}$			2.5	V
Base-emitter voltage	V_{BE}	$V_{CE}=4\text{V}, I_C=2\text{A}$			2.8	V
Collector output capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$			100	pF

TO-220-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155