

TO-220-3L Plastic-Encapsulate Transistors

TIP111 DARLINGTON TRANSISTOR (NPN)

FEATURES

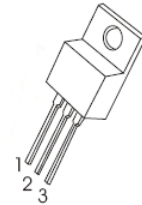
- High DC Current Gain : $h_{FE}=1000$ @ $V_{CE}=4V, I_C=1A(\text{Min.})$
- Low Collector-Emitter Saturation Voltage
- Industrial Use

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

| Symbol | Parameter | Value | Unit |
|-----------|-------------------------------|-------------|------------------|
| V_{CBO} | Collector-Base Voltage | 80 | V |
| V_{CEO} | Collector-Emitter Voltage | 80 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current -Continuous | 2 | A |
| P_C | Collector Dissipation | 2 | W |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature | -55 to +150 | $^\circ\text{C}$ |

TO-220-3L

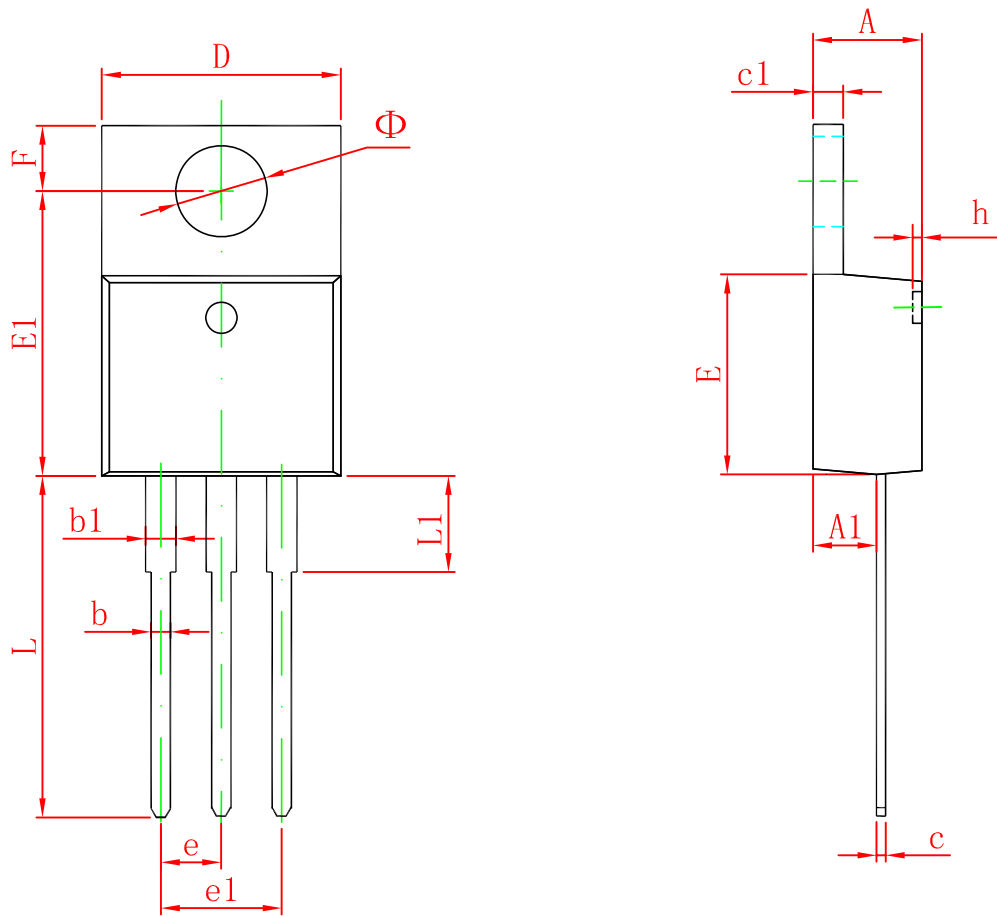
1. BASE
2. COLLECTOR
3. EMITTER



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

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|-------------------|--------------------------------------|------|-----|-----|------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C=10\text{mA}, I_E=0$ | 80 | | | V |
| Collector-emitter sustaining voltage | $V_{CEO}^{(SUS)}$ | $I_C=30\text{mA}, I_B=0$ | 80 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E=10\text{mA}, I_C=0$ | 5 | | | V |
| Collector cut-off current | I_{CEO} | $V_{CE}=40V, I_B=0$ | | | 2 | mA |
| Collector cut-off current | I_{CBO} | $V_{CB}=80V, I_E=0$ | | | 1 | mA |
| Emitter cut-off current | I_{EBO} | $V_{EB}=5V, I_C=0$ | | | 2 | mA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}=4V, I_C=1A$ | 1000 | | | |
| | $h_{FE(2)}$ | $V_{CE}=4V, I_C=2A$ | 500 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=2A, I_B=8\text{mA}$ | | | 2.5 | V |
| Base-emitter voltage | V_{BE} | $V_{CE}=4V, I_C=2A$ | | | 2.8 | V |
| Collector output capacitance | C_{ob} | $V_{CB}=10V, I_E=0, f=0.1\text{MHz}$ | | | 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 |