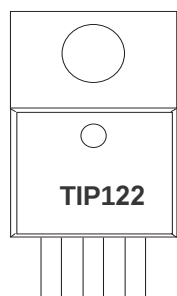
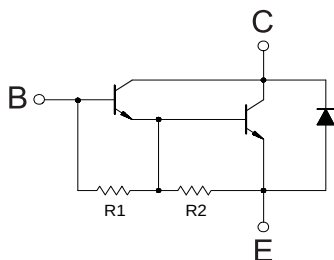


**TO-220-3L Plastic-Encapsulate Transistors****TIP122**

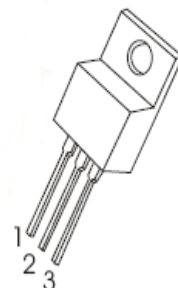
DARLINGTON TRANSISTOR (NPN)

**FEATURES**

- Medium Power Complementary Silicon Transistors

**MARKING****Equivalent Circuit****TO-220-3L**

1. BASE
2. COLLECTOR
3. EMITTER

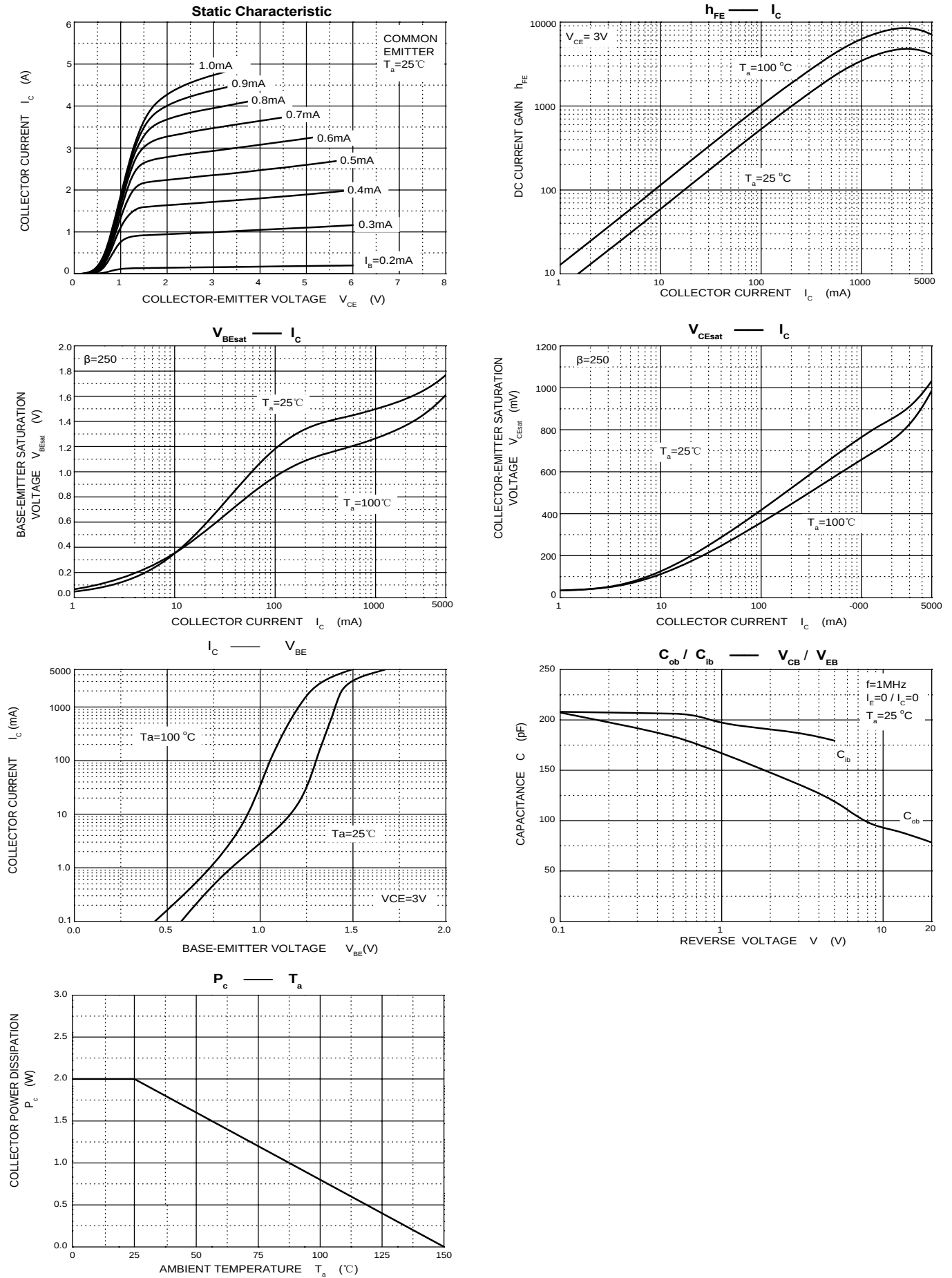
**MAXIMUM RATINGS** ( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

| Symbol          | Parameter                                        | Value    | Unit                        |
|-----------------|--------------------------------------------------|----------|-----------------------------|
| $V_{CBO}$       | Collector-Base Voltage                           | 100      | V                           |
| $V_{CEO}$       | Collector-Emitter Voltage                        | 100      | V                           |
| $V_{EBO}$       | Emitter-Base Voltage                             | 5        | V                           |
| $I_C$           | Collector Current -Continuous                    | 5        | A                           |
| $P_C$           | Collector Power Dissipation                      | 2        | W                           |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient          | 62.5     | $^{\circ}\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case             | 1.92     | $^{\circ}\text{C}/\text{W}$ |
| $T_J, T_{stg}$  | Operation Junction and Storage Temperature Range | -55~+150 | $^{\circ}\text{C}$          |

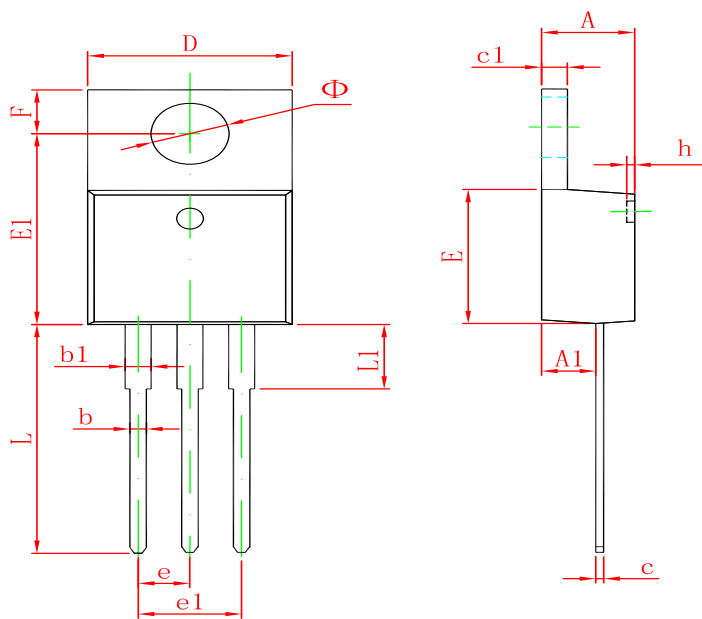
**ELECTRICAL CHARACTERISTICS** ( $T_a=25^{\circ}\text{C}$  unless otherwise specified)

| Parameter                            | Symbol         | Test conditions                                                      | Min  | Max    | Unit |
|--------------------------------------|----------------|----------------------------------------------------------------------|------|--------|------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$  | $I_C=1\text{mA}, I_E=0$                                              | 100  |        | V    |
| Collector-emitter breakdown voltage  | $V_{CEO(SUS)}$ | $I_C=30\text{mA}, I_B=0$                                             | 100  |        | V    |
| Collector cut-off current            | $I_{CBO}$      | $V_{CB}=100\text{V}, I_E=0$                                          |      | 0.2    | mA   |
| Collector cut-off current            | $I_{CEO}$      | $V_{CE}=50\text{V}, I_B=0$                                           |      | 0.5    | mA   |
| Emitter cut-off current              | $I_{EBO}$      | $V_{EB}=5\text{V}, I_C=0$                                            |      | 2      | mA   |
| DC current gain                      | $h_{FE(1)}$    | $V_{CE}=3\text{V}, I_C=0.5\text{A}$                                  | 1000 |        |      |
|                                      | $h_{FE(2)}$    | $V_{CE}=3\text{V}, I_C=3\text{A}$                                    | 1000 | 12000  |      |
| Collector-emitter saturation voltage | $V_{CE(sat)}$  | $I_C=3\text{A}, I_B=12\text{mA}$<br>$I_C=5\text{A}, I_B=20\text{mA}$ |      | 2<br>4 | V    |
| Base-emitter voltage                 | $V_{BE}$       | $V_{CE}=3\text{V}, I_C=3\text{A}$                                    |      | 2.5    | V    |
| Output Capacitance                   | $C_{ob}$       | $V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$                          |      | 200    | pF   |

## Typical Characteristics



Package Outline Dimensions (TO-220-3L)



| 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 |