

TO-220F Plastic-Encapsulate Transistors

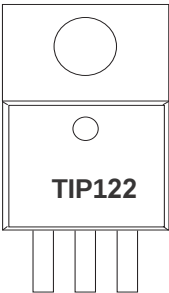
TIP122F

DARLINGTON TRANSISTOR (NPN)

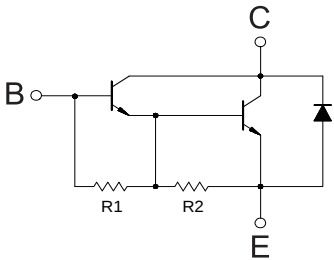
FEATURES

- Medium Power Complementary Silicon Transistors

MARKING

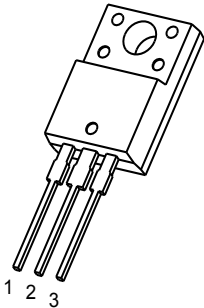


Equivalent Circuit



TO-220F

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



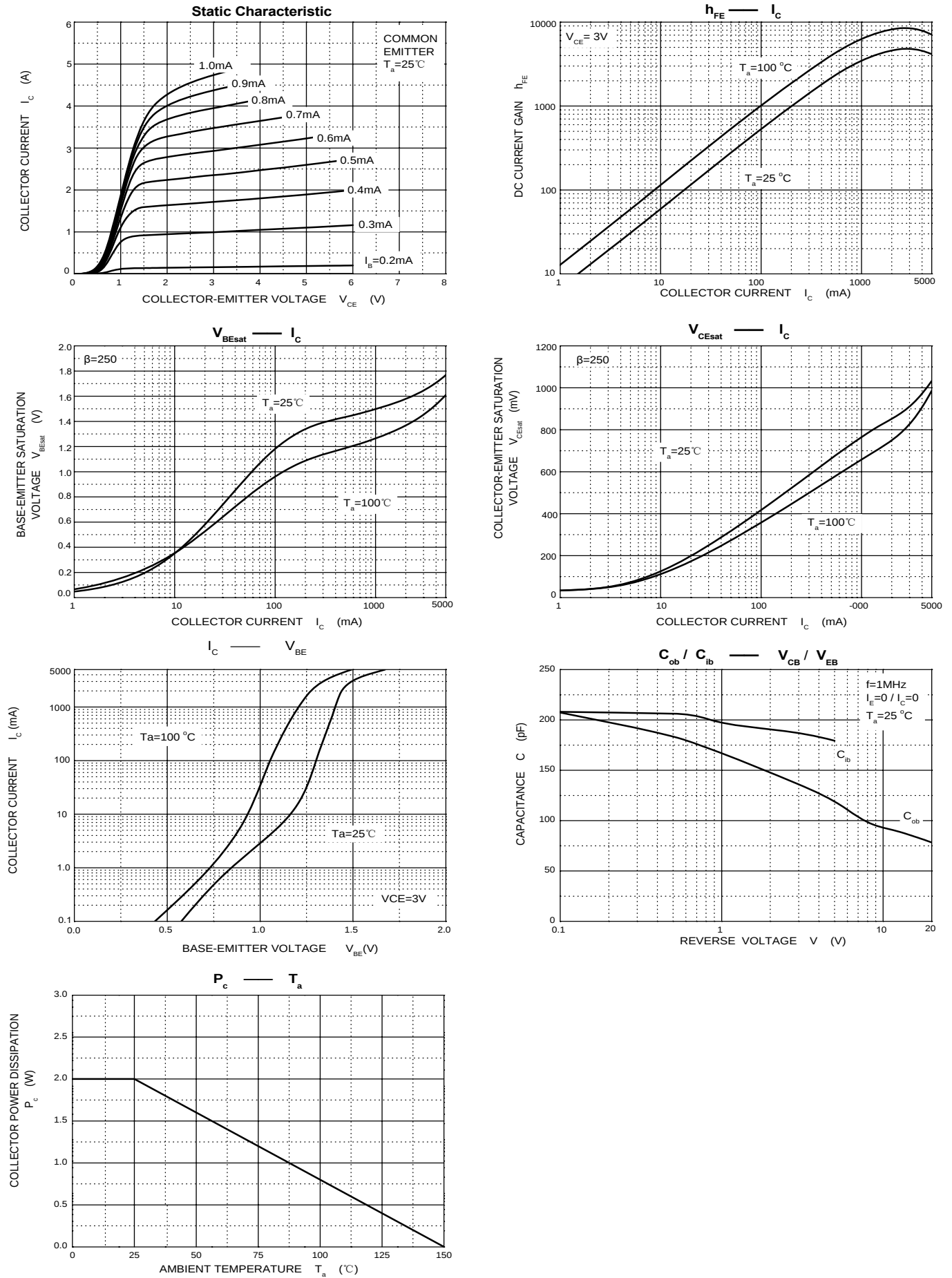
MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

| Symbol                            | Parameter                                        | Value    | Unit |
|-----------------------------------|--------------------------------------------------|----------|------|
| V <sub>CBO</sub>                  | Collector-Base Voltage                           | 100      | V    |
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 100      | V    |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | 5        | V    |
| I <sub>C</sub>                    | Collector Current -Continuous                    | 5        | A    |
| P <sub>C</sub>                    | Collector Power Dissipation                      | 2        | W    |
| R <sub>θJA</sub>                  | Thermal Resistance, Junction to Ambient          | 62.5     | °C/W |
| R <sub>θJC</sub>                  | Thermal Resistance, Junction to Case             | 1.92     | °C/W |
| T <sub>J</sub> , T <sub>stg</sub> | Operation Junction and Storage Temperature Range | -55~+150 | °C   |

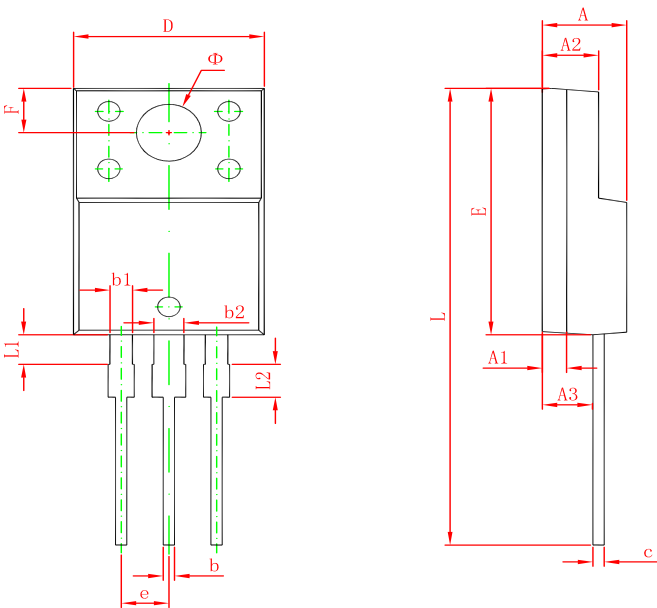
ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

| Parameter                            | Symbol                | Test conditions                                                                       | Min  | Max    | Unit |
|--------------------------------------|-----------------------|---------------------------------------------------------------------------------------|------|--------|------|
| Collector-base breakdown voltage     | V <sub>(BR)CBO</sub>  | I <sub>C</sub> = 1mA, I <sub>E</sub> =0                                               | 100  |        | V    |
| Collector-emitter breakdown voltage  | V <sub>CEO(SUS)</sub> | I <sub>C</sub> = 30mA, I <sub>B</sub> =0                                              | 100  |        | V    |
| Collector cut-off current            | I <sub>CBO</sub>      | V <sub>CB</sub> =100V, I <sub>E</sub> =0                                              |      | 0.2    | mA   |
| Collector cut-off current            | I <sub>CEO</sub>      | V <sub>CE</sub> =50 V, I <sub>B</sub> =0                                              |      | 0.5    | mA   |
| Emitter cut-off current              | I <sub>EBO</sub>      | V <sub>EB</sub> =5 V, I <sub>C</sub> =0                                               |      | 2      | mA   |
| DC current gain                      | h <sub>FE(1)</sub>    | V <sub>CE</sub> = 3V, I <sub>C</sub> =0.5A                                            | 1000 |        |      |
|                                      | h <sub>FE(2)</sub>    | V <sub>CE</sub> = 3V, I <sub>C</sub> =3 A                                             | 1000 | 12000  |      |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub>  | I <sub>C</sub> =3A, I <sub>B</sub> =12mA<br>I <sub>C</sub> =5 A, I <sub>B</sub> =20mA |      | 2<br>4 | V    |
| Base-emitter voltage                 | V <sub>BE</sub>       | V <sub>CE</sub> =3V, I <sub>C</sub> =3 A                                              |      | 2.5    | V    |
| Output Capacitance                   | C <sub>ob</sub>       | V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=0.1MHZ                                     |      | 200    | pF   |

## Typical Characteristics



Package Outline Dimensions (TO-220F)



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 4.300                     | 4.700  | 0.169                | 0.185 |
| A1     | 1.300 REF.                |        | 0.051 REF.           |       |
| A2     | 2.800                     | 3.200  | 0.110                | 0.126 |
| A3     | 2.500                     | 2.900  | 0.098                | 0.114 |
| b      | 0.500                     | 0.750  | 0.020                | 0.030 |
| b1     | 1.100                     | 1.350  | 0.043                | 0.053 |
| b2     | 1.500                     | 1.750  | 0.059                | 0.069 |
| c      | 0.500                     | 0.750  | 0.020                | 0.030 |
| D      | 9.960                     | 10.360 | 0.392                | 0.408 |
| E      | 14.800                    | 15.200 | 0.583                | 0.598 |
| e      | 2.540 TYP.                |        | 0.100 TYP.           |       |
| F      | 2.700 REF.                |        | 0.106 REF.           |       |
| $\Phi$ | 3.300                     | 3.700  | 0.130                | 0.146 |
| L      | 28.000                    | 28.400 | 1.102                | 1.118 |
| L1     | 1.700                     | 1.900  | 0.067                | 0.075 |
| L2     | 0.900                     | 1.100  | 0.035                | 0.043 |