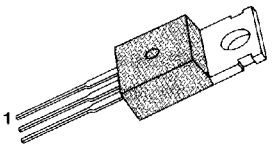
# NPN EPITAXIAL
# TIP110/111/112 SILICON DARLINGTON TRANSISTOR

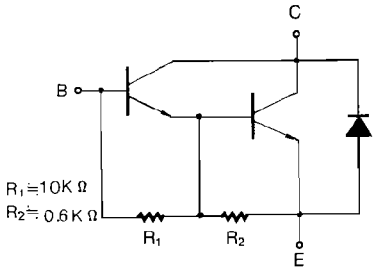
**HIGH DC CURRENT GAIN**
**MIN $h_{FE}$=1000 @ $V_{CE}$=4V, $I_C$=1A**
**LOW COLLECTOR-EMITTER SATURATION VOLTAGE**
**MONOLITHIC CONSTRUCTION WITH BUILT IN BASE-EMITTER SHUNT RESISTORS**
**INDUSTRIAL USE**

• Complementary to TIP115/116/117

TO-220




1.Base 2.Collector 3.Emitter




## ABSOLUTE MAXIMUM RATINGS

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector Base Voltage :TIP110 | $V_{CBO}$ | 60 | V |
| : TIP111 | | 80 | V |
| : TIP112 | | 100 | V |
| Collector Emitter Voltage | | | |
| : TIP110 | $V_{CEO}$ | 60 | V |
| : TIP111 | | 80 | V |
| : TIP112 | | 100 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 5 | V |
| Collector Current (DC) | $I_C$ | 2 | A |
| Collector Current (Pulse) | $I_C$ | 4 | A |
| Base Current (DC) | $I_B$ | 50 | mA |
| Collector Dissipation ($T_A$=25°C) | $P_C$ | 2 | W |
| Collector Dissipation ($T_C$=25°C) | $P_C$ | 50 | W |
| Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature | $T_{STG}$ | -65~150 | °C |



## ELECTRICAL CHARACTERISTICS ($T_C$ =25°C)

| Characteristic | Symbol | Test Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| Collector Emitter Sustaining Voltage | $V_{CEO}$(sus) | | | | |
| : TIP110 | | $I_C$ = 30mA, $I_B$ = 0 | 60 | | V |
| : TIP111 | | | 80 | | V |
| : TIP112 | | | 100 | | V |
| Collector Cutoff Current : TIP110 | $I_{CEO}$ | $V_{CE}$ = 30V, $I_B$ = 0 | | 2 | mA |
| : TIP111 | | $V_{CE}$ = 40V, $I_B$ = 0 | | 2 | mA |
| : TIP112 | | $V_{CE}$ = 50V, $I_B$ = 0 | | 2 | mA |
| Collector Cutoff Current : TIP110 | $I_{CBO}$ | $V_{CB}$ = 60V, $I_E$ = 0 | | 1 | mA |
| : TIP111 | | $V_{CB}$ = 80V, $I_E$ = 0 | | 1 | mA |
| : TIP112 | | $V_{CB}$ = 100V, $I_E$ = 0 | | 1 | mA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{BE}$ = 5V, $I_C$ = 0 | | 2 | mA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = 4V, $I_C$ = 1A | 1000 | | |
| | | $V_{CE}$ = 4V, $I_C$ = 2A | 500 | | |
| Collector Emitter Saturation Voltage | $V_{CE}$(sat) | $I_C$ = 2A, $I_B$ = 8mA | | 2.5 | V |
| Base Emitter On Voltage | $V_{BE}$(on) | $V_{CE}$ = 4V, $I_C$ = 2A | | 2.8 | V |
| Output Capacitance | $C_{OB}$ | $V_{CB}$ = 10V, $I_E$ = 0, f = 0.1MHz | | 100 | pF |



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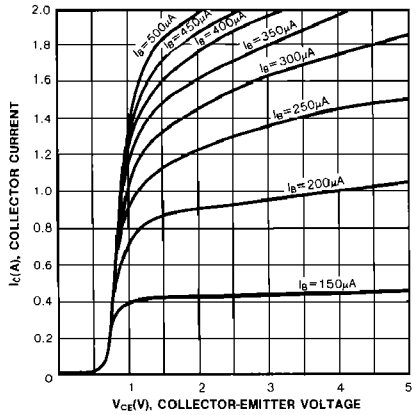
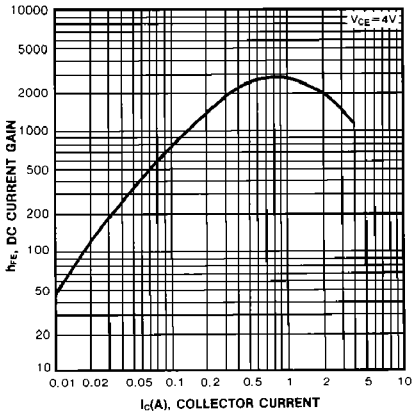
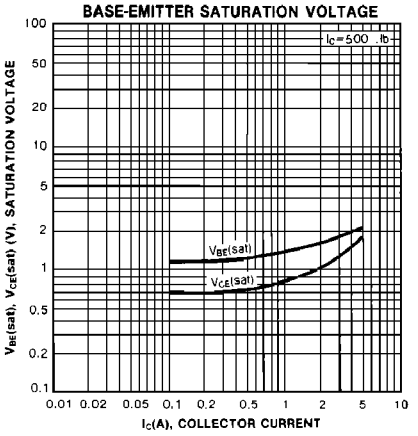
STATIC CHARACTERISTIC



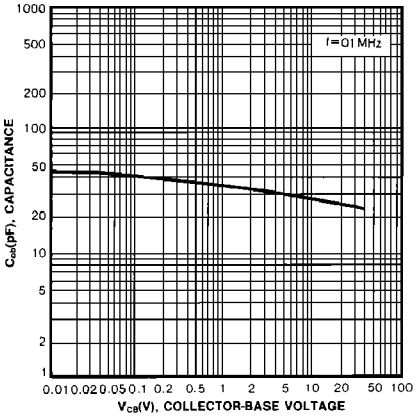

DC CURRENT GAIN



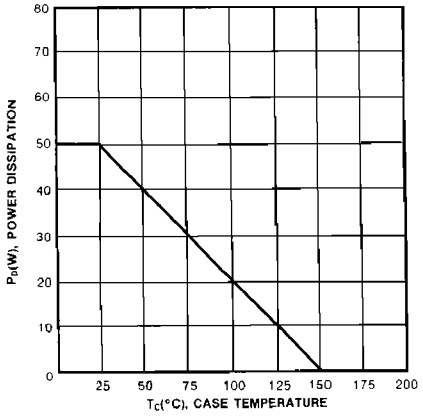

COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE



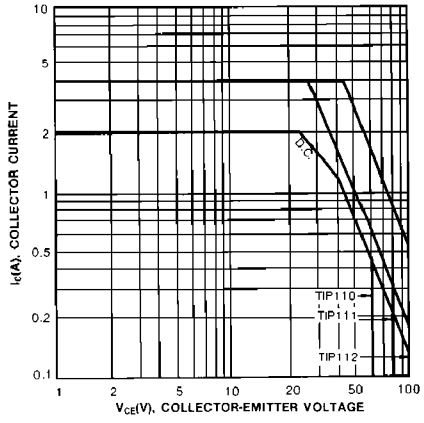

COLLECTOR OUTPUT CAPACITANCE




POWER DERATING




SAFE OPERATING AREA

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|---|---|---|
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