

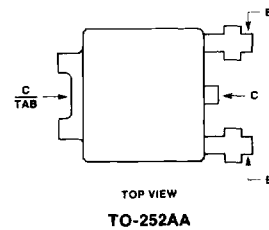
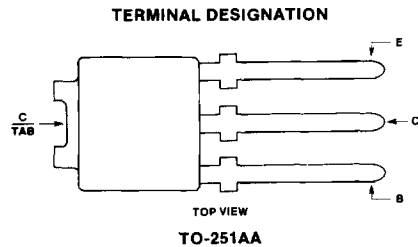
4-Ampere N-P-N Power Darlington Transistors

Features:

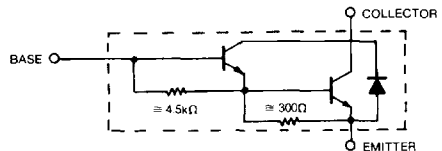
- Operates from IC without predriver
- h_{FE} Min. = 2000
- Complementary to D73FY4D1,2

The D72FY4D1 and D72FY4D2 silicon n-p-n power Darlington transistors are designed for use in general-purpose amplifier and medium-speed switching circuits. The high gain of these devices makes it possible for them to be driven directly from integrated circuits.

The D72FY4D1 is supplied in the JEDEC TO-251 package and the D72FY4D2 is supplied in the JEDEC TO-252 surface-mount package.



92CS-43476



Schematic diagram

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

| RATING | SYMBOL | D72FY4D1,2 | UNITS |
|--|----------------|-------------|------------------|
| Collector-Emitter Voltage | V_{CE0} | 80 | Volts |
| Collector-Base Voltage | V_{CB0} | 100 | Volts |
| Emitter Base Voltage | V_{EB0} | 5 | Volts |
| Collector Current — Continuous | I_C | 4 | A |
| Base Current — Continuous | I_B | -1 | A |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$ | P_D | 1.0 15 | Watts |
| Operating and Storage Junction Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS ⁽¹⁾

| | | | |
|---|-------|-----|------------------|
| Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds | T_L | 235 | $^\circ\text{C}$ |
|---|-------|-----|------------------|

(1) See page 7-16 for thermal considerations.

D72FY4D1, D72FY4D2

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

| CHARACTERISTIC | SYMBOL | MIN | TYP | MAX | UNIT |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|--|---------------|----|---|------|---------------|
| Collector-Emitter Breakdown Voltage ($I_C = 10\text{mA}$, $I_B = 0$) | $V_{(BR)CEO}$ | 80 | — | — | Volts |
| Collector Cutoff Current ($V_{CB} = 100\text{V}$, $I_E = 0$) | I_{CBO} | — | — | -20 | μA |
| Emitter Cutoff Current ($V_{EB} = 5\text{V}$, $I_C = 0$) | I_{EBO} | — | — | -2.5 | mA |

SECOND BREAKDOWN

| | | | | | |
|---|-------|---------------|--|--|--|
| Second Breakdown with Base Forward Biased | FBSOA | SEE FIGURE 10 | | | |
|---|-------|---------------|--|--|--|

ON CHARACTERISTICS

| | | | | | |
|---|---------------|------|---|-----|-------|
| DC Current Gain ($I_C = 1\text{A}$, $V_{CE} = 2\text{V}$) ($I_C = 3\text{A}$, $V_{CE} = 2\text{V}$) | h_{FE} | 2000 | — | — | — |
| | h_{FE} | 1000 | — | — | — |
| Collector-Emitter Saturation Voltage ($I_C = 3\text{A}$, $I_B = 6\text{mA}$) | $V_{CE(sat)}$ | — | — | 1.5 | V |
| Base-Emitter Saturation Voltage ($I_C = 3\text{A}$, $I_B = 6\text{mA}$) | $V_{BE(sat)}$ | — | — | 2.0 | Volts |

SWITCHING CHARACTERISTICS

| | | | | | | |
|--------------|---|-----------|---|-----|---|---------------|
| Turn-on Time | $V_{CC} = 30\text{V}$ $I_{B1} = -I_{B2} = 6\text{mA}$ Duty Cycle $\leq 1\%$ | t_{on} | — | 0.2 | — | μs |
| Storage Time | | t_{stg} | — | 1.5 | — | |
| Fall Time | | t_f | — | 0.6 | — | |

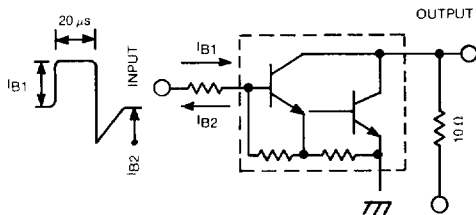


FIG. 1 SWITCHING TIME TEST CIRCUIT

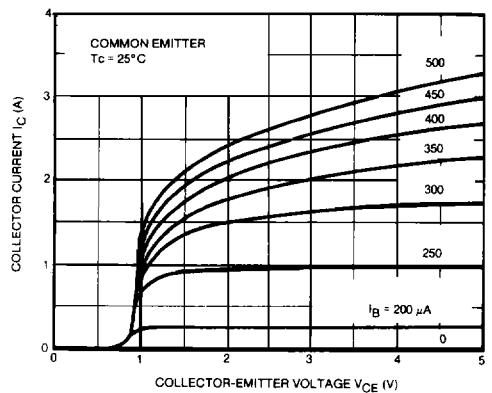


FIG. 2 $I_C - V_{CE}$

D72FY4D1, D72FY4D2

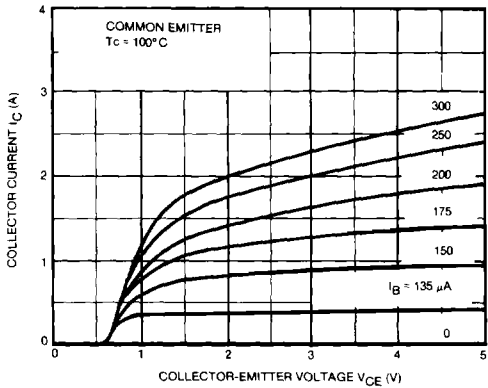


FIG. 3 I_C - V_{CE}

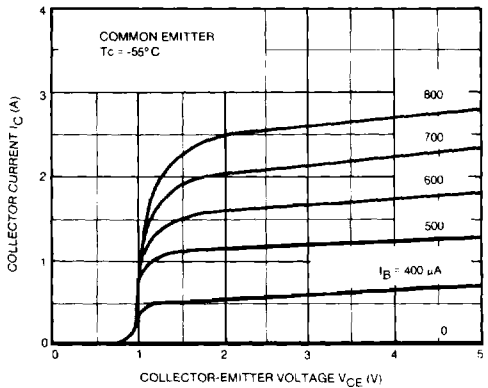


FIG. 4 I_C - V_{CE}

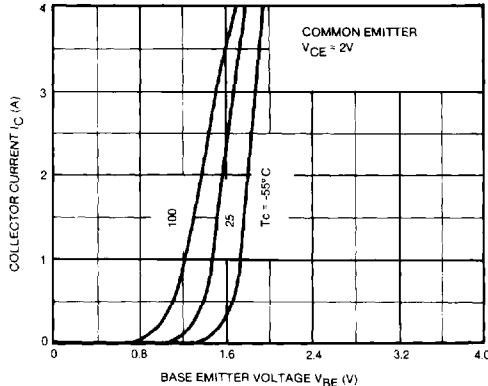


FIG. 5 I_C - V_{BE}

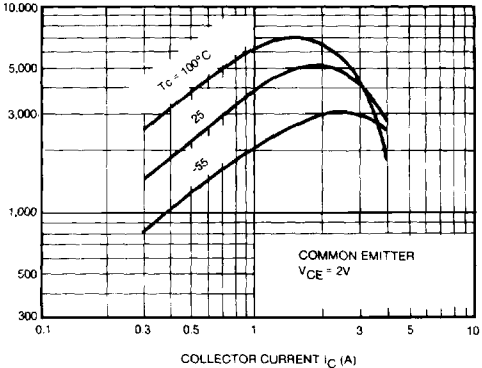


FIG. 6 hFE - I_C

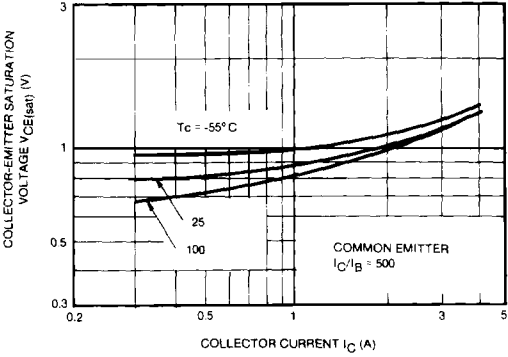


FIG. 7 V_{CE(sat)} - I_C

D72FY4D1, D72FY4D2

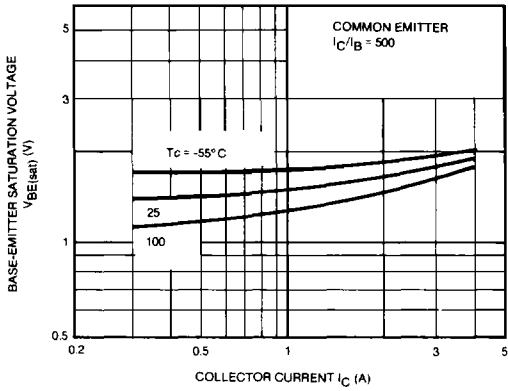


FIG. 8 $V_{BE(sat)} - I_C$

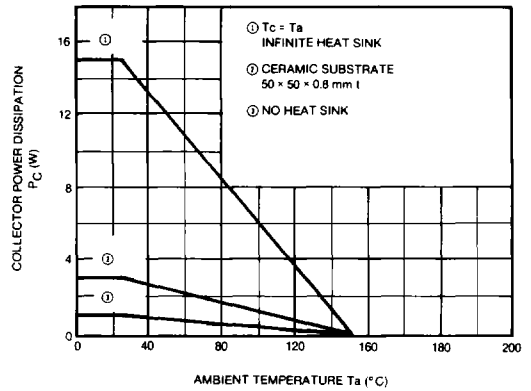


FIG. 9 $P_C - T_a$

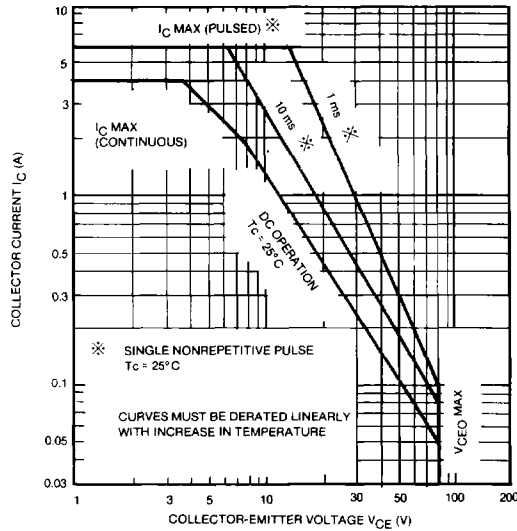


FIG. 10 SAFE OPERATING AREA