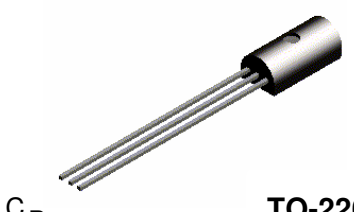
FAIRCHILD SEMICONDUCTOR™

*Discrete Power & Signal Technologies*

# TN6725A



C B E

**TO-226**

## NPN Darlington Transistor

This device is designed for applications requiring extremely high current gain at collector currents to 1A. Sourced from Process 05. See MPSA14 for characteristics.

## Absolute Maximum Ratings*

$T_{A = 25°C}$ unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CES}$ | Collector-Emitter Voltage | 50 | V |
| $V_{CBO}$ | Collector-Base Voltage | 60 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 12 | V |
| $I_C$ | Collector Current - Continuous | 1.2 | A |
| $T_{J, Tstg}$ | Operating and Storage Junction Temperature Range | -55 to +150 | °C |

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

1) These ratings are based on a maximum junction temperature of 150°C.

2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

## Thermal Characteristics

$T_{A = 25°C}$ unless otherwise noted

| Symbol | Characteristic | Max | Units |
|---|---|---|---|
| | | TN6725A | |
| $P_D$ | Total Device Dissipation<br>Derate above 25°C | 1<br>8 | W<br>mW/°C |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 50 | °C/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 125 | °C/W |

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## NPN Darlington Transistor

(continued)

### Electrical Characteristics

$T_{A = 25°C}$ unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Max | Units |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| $BV_{CES}$ | Collector-Emitter Breakdown Voltage | $I_C$ = 1 mA | 50 | | V |
| $BV_{CBO}$ | Collector-Base Breakdown Voltage | $I_C$ = 100 μA | 60 | | V |
| $BV_{EBO}$ | Emitter-Base Breakdown Voltage | $I_E$ = 10 μA | 12 | | V |
| $I_{CBO}$ | Collector Cutoff Current | $V_{CB}$ = 40 V | | 100 | nA |
| $I_{EBO}$ | Emitter Cutoff Current | $V_{EB}$ = 10 V | | 100 | nA |
| **ON CHARACTERISTICS*** | | | | | |
| $h_{FE}$ | DC Current Gain | $I_C$ = 200 mA, $V_{CE}$ = 5 V<br>$I_C$ = 500 mA, $V_{CE}$ = 5 V<br>$I_C$ = 1A, $V_{CE}$ = 5 V | 25,000<br>15,000<br>4000 | <br><br>40,000 | - |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$ = 200 mA, $I_B$ = 2 mA<br>$I_C$ = 1 A, $I_B$ = 2 mA | | 1.0<br>1.5 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$ = 1 A, $I_B$ = 2 mA | | 2 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage | $I_C$ = 1 A, $V_{CE}$ = 5.0 V | | 2 | V |
| **SMALL SIGNAL CHARACTERISTICS** | | | | | |
| $C_{cb}$ | Output Capacitance | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1MHz | | 10 | pF |
| $h_{fe}$ | Small Signal Current Gain | $I_C$ = 200 mA,$V_{CE}$ = 5 V, f=100MHz | 1 | 10 | - |

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 1.0%

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