# BDX54F

## SILICON PNP POWER DARLINGTON TRANSISTOR

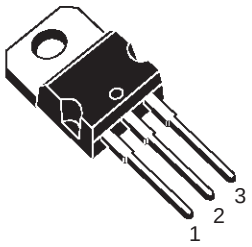
- STMicroelectronics PREFERRED SALESTYPE
- MONOLITHIC DARLINGTON CONFIGURATION
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

**APPLICATIONS**

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

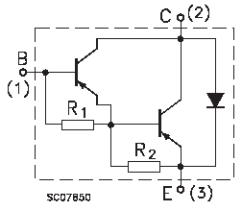
**DESCRIPTION**

The BDX54F is a silicon Epitaxial-Base PNP power transistor in monolithic Darlington configuration, mounted in Jedec TO-220 plastic package. It is intented for use in power linear and switching applications.




**TO-220**

**INTERNAL SCHEMATIC DIAGRAM**




$R_1$ Typ. = 10 KΩ $R_2$ Typ. = 150 Ω

**ABSOLUTE MAXIMUM RATINGS**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage ($I_E$ = 0) | 160 | V |
| $V_{CEO}$ | Collector-Emitter Voltage ($I_B$ = 0) | 160 | V |
| $V_{EBO}$ | Emitter-base Voltage ($I_C$ = 0) | 5 | V |
| $I_C$ | Collector Current | 8 | A |
| $I_{CM}$ | Collector Peak Current | 12 | A |
| $I_B$ | Base Current | 0.2 | A |
| $P_{tot}$ | Total Dissipation at $T_c \leq 25\ ^oC$ | 60 | W |
| $T_{stg}$ | Storage Temperature | -65 to 150 | $^oC$ |
| $T_j$ | Max. Operating Junction Temperature | 150 | $^oC$ |

## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{thj\text{-}case}$ | Thermal Resistance Junction-case | Max | 2.08 | $^oC/W$ |
| $R_{thj\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 70 | $^oC/W$ |

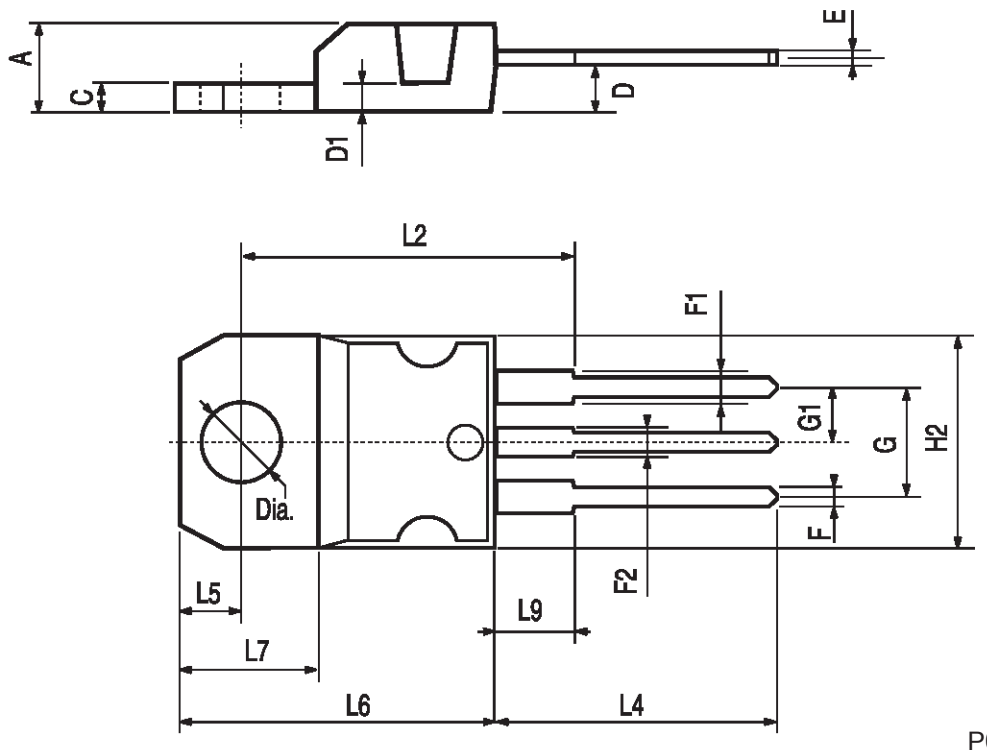
## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25 $^oC$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_{CEO}$ | Collector Cut-off Current ($I_E$ = 0) | $V_{CE}$ = 80 V | | | | 0.5 | mA |
| $I_{CBO}$ | Collector Cut-off Current ($I_B$ = 0) | $V_{CB}$ = 160 V | | | | 0.2 | mA |
| $I_{EBO}$ | Emitter Cut-off Current ($I_C$ = 0) | $V_{EB}$ = 5 V | | | | 5 | mA |
| $V_{CEO(sus)}$* | Collector-Emitter Sustaining Voltage ($I_B$ = 0) | $I_C$ = 50 mA | | 160 | | | V |
| $V_{CE(sat)}$* | Collector-emitter Saturation Voltage | $I_C$ = 2 A | $I_B$ =10 mA | | | 2 | V |
| $V_{BE(sat)}$* | Base-emitter Saturation Voltage | $I_C$ = 2 A | $I_B$ =10 mA | | | 2.5 | V |
| $h_{FE}$* | DC Current Gain | $I_C$ = 2 A<br>$I_C$ = 3 A | $V_{CE}$ = 5 V<br>$V_{CE}$ = 5 V | 500<br>150 | | | |
| $V_F$* | Parallel Diode Forward Voltage | $I_F$ = 2 A | | | | 2.5 | V |
| $h_{fe}$* | Small Signal Current Gain | $I_C$ = 0.5 A<br>f = 1MHz | $V_{CE}$ = 2 V | | 20 | | |

* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %.

## TO-220 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| C | 1.23 | | 1.32 | 0.048 | | 0.051 |
| D | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D1 | | 1.27 | | | 0.050 | |
| E | 0.49 | | 0.70 | 0.019 | | 0.027 |
| F | 0.61 | | 0.88 | 0.024 | | 0.034 |
| F1 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| F2 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| G | 4.95 | | 5.15 | 0.194 | | 0.203 |
| G1 | 2.4 | | 2.7 | 0.094 | | 0.106 |
| H2 | 10.0 | | 10.40 | 0.393 | | 0.409 |
| L2 | | 16.4 | | | 0.645 | |
| L4 | 13.0 | | 14.0 | 0.511 | | 0.551 |
| L5 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| L6 | 15.25 | | 15.75 | 0.600 | | 0.620 |
| L7 | 6.2 | | 6.6 | 0.244 | | 0.260 |
| L9 | 3.5 | | 3.93 | 0.137 | | 0.154 |
| DIA. | 3.75 | | 3.85 | 0.147 | | 0.151 |

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