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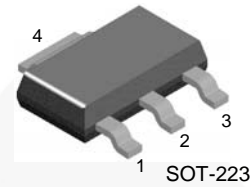
November 2014

BSP52

NPN Darlington Transistor

Description

This device is designed for applications requiring extremely high-current gain at collector currents to 500 mA. Sourced from process 03.



1. Base 2,4. Collector 3. Emitter

Ordering Information

| Part Number | Marking | Package | Packing Method |
|-------------|---------|------------|----------------|
| BSP52 | BSP52 | SOT-223 4L | Tape and Reel |

Absolute Maximum Ratings^{(1),(2)}

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|----------------|--|-------------|------------------|
| V_{CES} | Collector-Emitter Voltage | 80 | V |
| V_{CBO} | Collector-Base Voltage | 90 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current - Continuous | 800 | mA |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ\text{C}$ |

Notes:

1. These ratings are based on a maximum junction temperature of 150°C .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics⁽³⁾

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Max. | Unit |
|-----------------|---|------|---------------------------|
| P_D | Total Device Dissipation | 1000 | mW |
| | Derate Above 25°C | 8.0 | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 125 | $^\circ\text{C}/\text{W}$ |

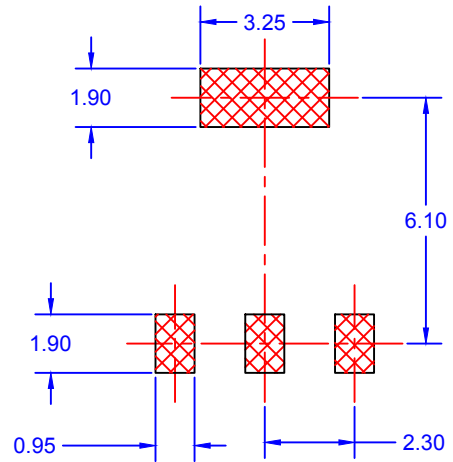
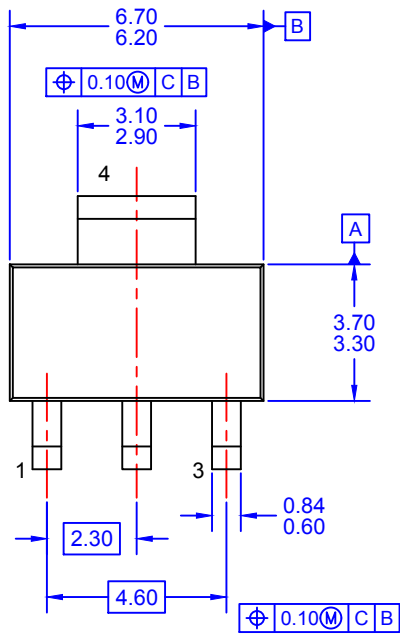
Note:

3. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

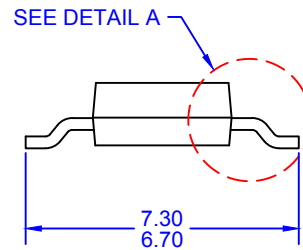
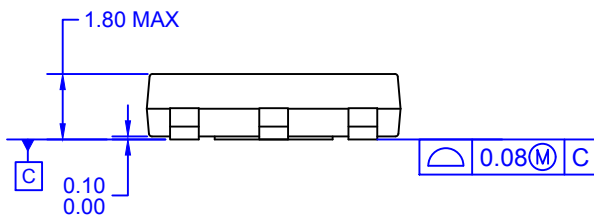
Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

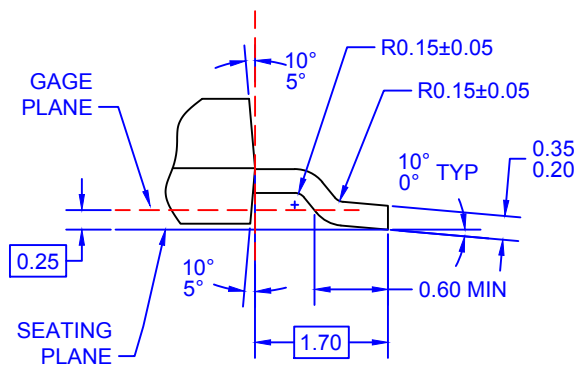
| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------|--------------------------------------|--|------|------|------|---------------|
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C = 100 \mu\text{A}$, $I_E = 0$ | 90 | | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E = 10 \mu\text{A}$, $I_C = 0$ | 5 | | | V |
| I_{CES} | Collector Cut-Off Current | $V_{CE} = 80 \text{ V}$, $V_{BE} = 0$ | | | 10 | μA |
| I_{EBO} | Emitter Cut-Off Current | $V_{EB} = 4.0 \text{ V}$, $I_C = 0$ | | | 10 | μA |
| h_{FE} | DC Current Gain | $I_C = 150 \text{ mA}$, $V_{CE} = 10 \text{ V}$ | 1000 | | | |
| | | $I_C = 500 \text{ mA}$, $V_{CE} = 10 \text{ V}$ | 2000 | | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 500 \text{ mA}$, $I_B = 0.5 \text{ mA}$ | | | 1.3 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 500 \text{ mA}$, $I_B = 0.5 \text{ mA}$ | | | 1.9 | V |



LAND PATTERN RECOMMENDATION



- NOTES: UNLESS OTHERWISE SPECIFIED
 A) DRAWING BASED ON JEDEC REGISTRATION TO-261C, VARIATION AA.
 B) ALL DIMENSIONS ARE IN MILLIMETERS.
 C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.
 D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
 E) LANDPATTERN NAME: SOT230P700X180-4BN
 F) DRAWING FILENAME: MKT-MA04AREV3



DETAIL A
 SCALE: 2:1





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- PowerXS™
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- QFET®
- QS™
- Quiet Series™
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- ™
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|--------------------------|-----------------------|---|
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| Preliminary | First Production | Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design. |
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