

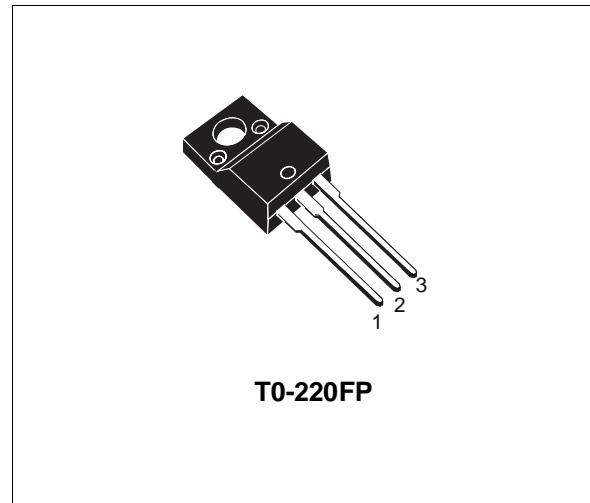
## SILICON POWER DARLINGTON TRANSISTOR

### APPLICATIONS:

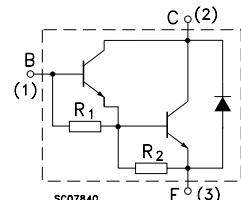
- GENERAL PURPOSE SWITCHING AND AMPLIFIER
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING

### DESCRIPTION

The BDX53BFP is a silicon Epitaxial-Base NPN power transistor in monolithic Darlington configuration mounted in T0-220FP fully molded isolated package. It is intended for use in hammer drivers, audio amplifiers and other medium power linear and switching applications.



### INTERNAL SCHEMATIC DIAGRAM



R<sub>1</sub> Typ. = 10 K $\Omega$       R<sub>2</sub> Typ. = 150  $\Omega$

### ABSOLUTE MAXIMUM RATINGS

| Symbol            | Parameter  | Value      | Unit |
|-------------------|--|------------|------|
| V <sub>CBO</sub>  | Collector-Base Voltage (I <sub>E</sub> = 0)                                  | 80         | V    |
| V <sub>CEO</sub>  | Collector-Emitter Voltage (I <sub>B</sub> = 0)                               | 80         | V    |
| V <sub>EBO</sub>  | Emitter-base Voltage (I <sub>C</sub> = 0)                                    | 5          | V    |
| I <sub>C</sub>    | Collector Current  | 8          | A    |
| I <sub>CM</sub>   | Collector Peak Current (repetitive)  | 12         | A    |
| I <sub>B</sub>    | Base Current   | 0.2        | A    |
| P <sub>tot</sub>  | Total Dissipation at T <sub>c</sub> $\leq$ 25 °C                             | 29         | W    |
| V <sub>isol</sub> | Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink | 1500       | V    |
| T <sub>stg</sub>  | Storage Temperature  | -65 to 150 | °C   |
| T <sub>j</sub>    | Max. Operating Junction Temperature  | 150        | °C   |

## BDX53BFP

### THERMAL DATA

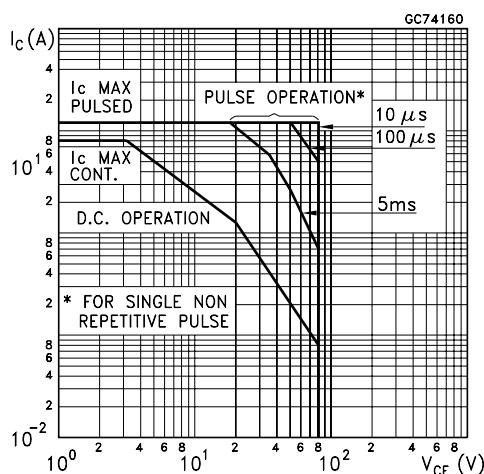
|                       |                                     |     |     |      |
|-----------------------|-------------------------------------|-----|-----|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case    | Max | 4.3 | °C/W |
| R <sub>thj-amb</sub>  | Thermal Resistance Junction-ambient | Max | 70  | °C/W |

### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                 | Parameter   | Test Conditions                             | Min. | Typ.       | Max. | Unit   |
|------------------------|---|---|------|------------|------|--------|
| I <sub>CBO</sub>       | Collector Cut-off Current (I <sub>E</sub> = 0)            | V <sub>CB</sub> = 80 V                      |      |            | 0.2  | mA     |
| I <sub>CEO</sub>       | Collector Cut-off Current (I <sub>B</sub> = 0)            | V <sub>CE</sub> = 40 V                      |      |            | 0.5  | mA     |
| I <sub>EBO</sub>       | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V                       |      |            | 2    | mA     |
| V <sub>CEO(sus)*</sub> | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 100 mA                     | 80   |            |      | V      |
| V <sub>CE(sat)*</sub>  | Collector-emitter Saturation Voltage                      | I <sub>C</sub> = 3 A I <sub>B</sub> = 12 mA |      |            | 2    | V      |
| V <sub>BE(sat)*</sub>  | Base-emitter Saturation Voltage                           | I <sub>C</sub> = 3 A I <sub>B</sub> = 12 mA |      |            | 2.5  | V      |
| h <sub>FE</sub> *      | DC Current Gain   | I <sub>C</sub> = 3 A V <sub>CE</sub> = 3 V  | 750  |            |      |        |
| V <sub>F</sub> *       | Parallel Diode Forward Voltage                            | I <sub>F</sub> = 3 A I <sub>F</sub> = 8 A   |      | 1.8<br>2.5 | 2.5  | V<br>V |

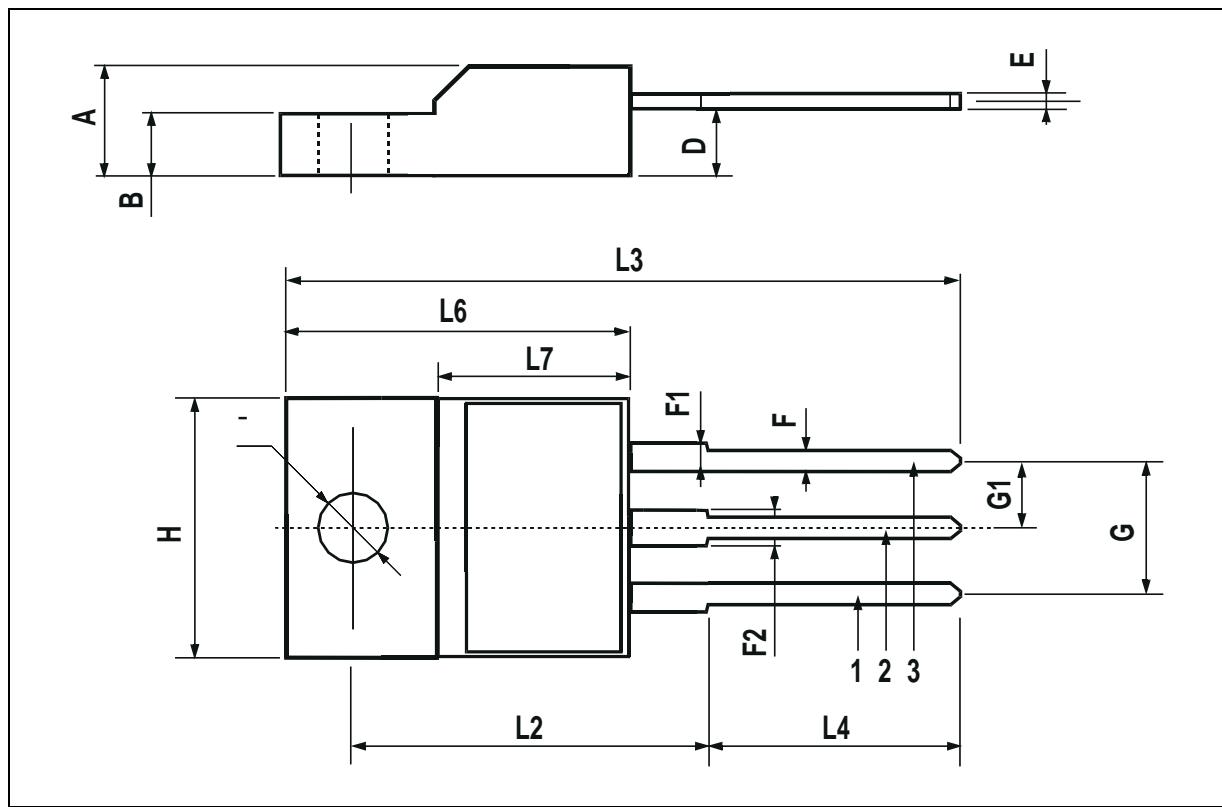
\* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

### Safe Operating Area



## TO-220FP MECHANICAL DATA

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 4.4  |      | 4.6  | 0.173 |       | 0.181 |
| B    | 2.5  |      | 2.7  | 0.098 |       | 0.106 |
| D    | 2.5  |      | 2.75 | 0.098 |       | 0.108 |
| E    | 0.45 |      | 0.7  | 0.017 |       | 0.027 |
| F    | 0.75 |      | 1    | 0.030 |       | 0.039 |
| F1   | 1.15 |      | 1.7  | 0.045 |       | 0.067 |
| F2   | 1.15 |      | 1.7  | 0.045 |       | 0.067 |
| G    | 4.95 |      | 5.2  | 0.195 |       | 0.204 |
| G1   | 2.4  |      | 2.7  | 0.094 |       | 0.106 |
| H    | 10   |      | 10.4 | 0.393 |       | 0.409 |
| L2   |      | 16   |      |       | 0.630 |       |
| L3   | 28.6 |      | 30.6 | 1.126 |       | 1.204 |
| L4   | 9.8  |      | 10.6 | 0.385 |       | 0.417 |
| L6   | 15.9 |      | 16.4 | 0.626 |       | 0.645 |
| L7   | 9    |      | 9.3  | 0.354 |       | 0.366 |
| Ø    | 3    |      | 3.2  | 0.118 |       | 0.126 |



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