

# BDX63(A)(B)(C)

## NPN DARLINGTON POWER TRANSISTORS

### FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

### MAXIMUM RATINGS

| Characteristic                                     | Symbol          | BDX63       | BDX63A | BDX63B | BDX63C | Unit                      |
|--|-----------------|-------------|--------|--------|--------|---------------------------|
| Collector-Emitter Voltage                          | $V_{CBO}$       | 80          | 100    | 120    | 140    | V                         |
| Collector-Emitter Voltage                          | $V_{CEO}$       | 60          | 80     | 100    | 120    | V                         |
| Emitter-Base Voltage                               | $V_{EBO}$       | 5.0         |        |        |        | V                         |
| Collector Current – continuous                     | $I_C$           | 8.0         |        |        |        | A                         |
| Peak   |                 | 12          |        |        |        |                           |
| Base Current -continuous                           | $I_B$           | 0.15        |        |        |        | A                         |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ | $P_D$           | 90          |        |        |        | W                         |
| Operating and Storage Temperature Range            | $T_J, T_{stg}$  | -65 to +200 |        |        |        | $^\circ\text{C}$          |
| Thermal Resistance, Junction to Case               | $R_{\theta JC}$ | 1.94        |        |        |        | $^\circ\text{C}/\text{W}$ |

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

| Characteristic   |   | Symbol         | Min            | Typ               | Max         | Unit          |
|--|---|----------------|----------------|-------------------|-------------|---------------|
| Collector-Emitter Sustaining Voltage<br>( $I_C = 100\text{mA}, I_B = 0$ )  | BDX63   | $V_{CEO(sus)}$ | 60             | -                 | -           | V             |
|  | BDX63A  |                | 80             | -                 | -           |               |
|  | BDX63B  |                | 100            | -                 | -           |               |
|  | BDX63C  |                | 120            | -                 | -           |               |
| Collector-Emitter Saturation Voltage<br>( $I_C = 3.0\text{A}, I_B = 12\text{mA}$ )   |   | $V_{CE(sat)}$  | -              | -                 | 2.0         | V             |
| Base-Emitter On Voltage<br>( $I_C = 3.0\text{A}, I_B = 12\text{mA}$ )  |   | $V_{BE(on)}$   | -              | -                 | 2.5         | V             |
| C-E Diode Forward Voltage<br>$I_F = 3\text{A}$   |   | $V_{ECF}$      | -              | 1.2               | -           | V             |
| Collector Cutoff Current<br>( $V_{CB} = 1/2V_{CE0max}, I_E = 0$ )<br>( $V_{CB} = 1/2V_{CBOmax}, I_E = 0$ ), $T_J = 0$  |   | $I_{CEO}$      | -              | -                 | 0.2<br>2.0  | mA            |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0\text{V}, I_C = 0$ )  |   | $I_{EBO}$      | -              | -                 | 5           | mA            |
| DC Current Gain<br>( $I_C = 0.5\text{A}, V_{CE} = 3.0\text{V}$ )<br>( $I_C = 3.0\text{A}, V_{CE} = 3.0\text{V}$ )<br>( $I_C = 8.0\text{A}, V_{CE} = 3.0\text{V}$ ) |   | $h_{FE}$       | -<br>1000<br>- | 2500<br>-<br>2600 | -<br>-<br>- | -             |
| Output Capacitance<br>( $V_{CB} = 10\text{V}, I_E = 0, f = 1.0\text{MHz}$ )  |   | $C_{ob}$       | -              | 100               | -           | pF            |
| Turn-On Time   | $I_C = 3.0\text{A}, I_{B1} = -I_{B2} = 12\text{mA}$ | $t_{on}$       | -              | 0.5               | -           | $\mu\text{s}$ |
| Turn-Off Time  |   | $t_{off}$      | -              | 5                 | -           |               |

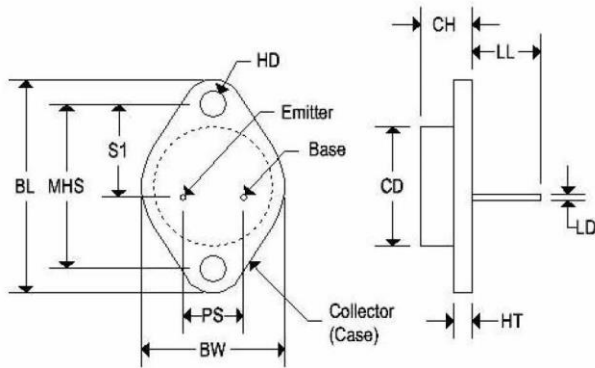
Note 1: Pulse test: Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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## MECHANICAL CHARACTERISTICS

|                  |               |
|------------------|---------------|
| <b>Case:</b>     | TO-3          |
| <b>Marking:</b>  | Alpha-Numeric |
| <b>Polarity:</b> | See below     |



|     | TO-3      |       |             |        |
|-----|-----------|-------|-------------|--------|
|     | Inches    |       | Millimeters |        |
|     | Min       | Max   | Min         | Max    |
| CD  | -         | 0.875 | -           | 22.220 |
| CH  | 0.250     | 0.380 | 6.860       | 9.650  |
| HT  | 0.060     | 0.135 | 1.520       | 3.430  |
| BW  | -         | 1.050 | -           | 26.670 |
| HD  | 0.131     | 0.188 | 3.330       | 4.780  |
| LD  | 0.038     | 0.043 | 0.970       | 1.090  |
| LL  | 0.312     | 0.500 | 7.920       | 12.700 |
| BL  | 1.550 REF |       | 39.370 REF  |        |
| MHS | 1.177     | 1.197 | 29.900      | 30.400 |
| PS  | 0.420     | 0.440 | 10.670      | 11.180 |
| S1  | 0.655     | 0.675 | 16.640      | 17.150 |