



## NPN BDX42 – BDX43– BDX44

### SILICON PLANAR DARLINGTON TRANSISTORS

The BDX42, BDX43 and BDX44 are silicon NPN planar Darlington transistors and are mounted in Jedec TO-126 plastic package.

They are intended for use in industrial switching applications.

The complementary PNP types are the BDX45, BDX46 and BDX47 respectively.

Compliance to RoHS.

#### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Ratings                   |                    | Value       | Unit  |
|-----------|---------------------------|--------------------|-------------|-------|
| $V_{CBO}$ | Collector-Base Voltage    | BDX42              | 60          | V     |
|           |                           | BDX43              | 80          |       |
|           |                           | BDX44              | 90          |       |
| $V_{CER}$ | Collector-Emitter Voltage | BDX42              | 45          | V     |
|           |                           | BDX43              | 60          |       |
|           |                           | BDX44              | 80          |       |
| $V_{EBO}$ | Emitter-Base Voltage      |                    | 5           | V     |
| $I_C$     | Collector Current         | $I_C$              | 1           | A     |
|           |                           | $I_{CM}$           | 2           |       |
| $I_B$     | Base Current              |                    | 0.1         | A     |
| $P_T$     | Power Dissipation         | @ $T_C = 25^\circ$ | 1.25        | Watts |
| $T_J$     | Junction Temperature      |                    | 150         | °C    |
| $T_S$     | Storage Temperature       |                    | -65 to +150 |       |

#### THERMAL CHARACTERISTICS

| Symbol       | Ratings                                       |  | Value | Unit |
|--------------|---|--|-------|------|
| $R_{thJ-a}$  | Thermal Resistance, Junction to Ambient       |  | 100   | K/W  |
| $R_{thJ-mb}$ | Thermal Resistance, Junction to Mounting base |  | 10    |      |

## NPN BDX42 – BDX43– BDX44

### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

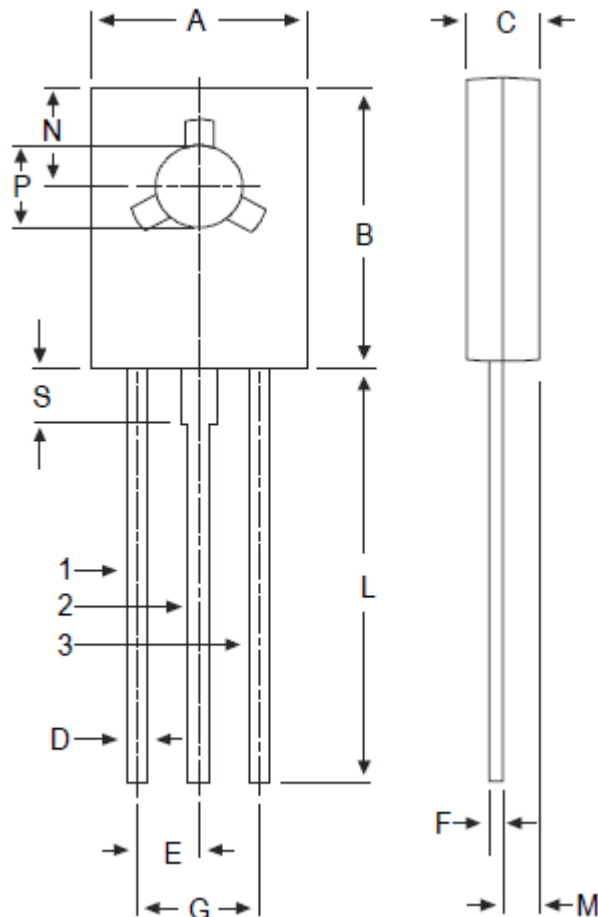
| Symbol  | Ratings                                  | Test Condition(s)   | Min   | Typ  | Max  | Unit |    |
|---|--|---|---|------|------|------|----|
| I <sub>CES</sub>  | Collector cut-off current                | V <sub>BE</sub> = 0 ; V <sub>CE</sub> = 45V                               | BDX42   | -    | -    | 10   | μA |
|   |  | V <sub>BE</sub> = 0 ; V <sub>CE</sub> = 60V                               | BDX43   | -    | -    | 10   |    |
|   |  | V <sub>BE</sub> = 0 ; V <sub>CE</sub> = 80V                               | BDX44   | -    | -    | 10   |    |
| I <sub>EBO</sub>  | Emitter cut-off current                  | I <sub>C</sub> =0 ; V <sub>EB</sub> = 4V                                  | BDX42   | -    | -    | 10   | μA |
|   |  |   | BDX43   | -    | -    | 10   |    |
|   |  |   | BDX44   | -    | -    | 10   |    |
| V <sub>CE(SAT)</sub>  | Collector-Emitter saturation Voltage (*) | I <sub>C</sub> =500 m A, I <sub>B</sub> =0.5 mA                           | BDX42   | -    | -    | 1.3  | V  |
|   |  |   | BDX43   | -    | -    | 1.3  |    |
|   |  |   | BDX44   | -    | -    | 1.3  |    |
|   |  | I <sub>C</sub> =1.0 A, I <sub>B</sub> =1.0 mA                             | BDX43   | -    | -    | 1.6  |    |
|   |  |   | BDX42   | -    | -    | 1.6  |    |
|   |  | I <sub>C</sub> =1.0 A, I <sub>B</sub> =4.0 mA                             | BDX44   | -    | -    | 1.6  |    |
|   |  |   | BDX42   | -    | -    | 1.3  |    |
|   |  | I <sub>C</sub> =500 m A, I <sub>B</sub> =0.5 mA<br>T <sub>j</sub> =150 °C | BDX43   | -    | -    | 1.3  |    |
|   |  |   | BDX44   | -    | -    | 1.3  |    |
|   |  | I <sub>C</sub> =1.0 A, I <sub>B</sub> =1.0 mA<br>T <sub>j</sub> =150 °C   | BDX43   | -    | -    | 1.8  |    |
| BDX42   | -  |   | -   | 1.6  |      |      |    |
| I <sub>C</sub> =1.0 A, I <sub>B</sub> =4.0 mA<br>T <sub>j</sub> =150 °C | BDX44                                    | -   | -   | 1.6  |      |      |    |
|   | BDX44                                    | -   | -   | 2.2  |      |      |    |
| V <sub>BE(SAT)</sub>  | Base-Emitter saturation Voltage (*)      | I <sub>C</sub> =500 m A, I <sub>B</sub> =0.5 mA                           | BDX42   | -    | -    | 1.9  | V  |
|   |  |   | BDX43   | -    | -    | 1.9  |    |
|   |  |   | BDX44   | -    | -    | 1.9  |    |
|   |  | I <sub>C</sub> =1.0 A, I <sub>B</sub> =1.0 mA                             | BDX43   | -    | -    | 2.2  |    |
|   |  |   | BDX42   | -    | -    | 2.2  |    |
| I <sub>C</sub> =1.0 A, I <sub>B</sub> =4.0 mA                           | BDX44                                    | -   | -   | 2.2  |      |      |    |
|   | h <sub>FE</sub>                          | V <sub>CE</sub> =10 V, I <sub>C</sub> =150 mA                             | BDX42   | 1000 | -    | -    | -  |
| BDX43   |  |   | 1000  | -    | -    |      |    |
| BDX44   |  |   | 1000  | -    | -    |      |    |
| V <sub>CE</sub> =10 V, I <sub>C</sub> =500 mA                           |  | BDX42   | 2000  | -    | -    |      |    |
|   |  | BDX43   | 2000  | -    | -    |      |    |
|   |  | BDX44   | 2000  | -    | -    |      |    |
| h <sub>fe</sub>   | Small Signal Current Gain                | V <sub>CE</sub> =5.0 V, I <sub>C</sub> =500 mA<br>f=35MHz                 | BDX42   | -    | 10   | -    | -  |
|   |  |   | BDX43   | -    | 10   | -    |    |
|   |  |   | BDX44   | -    | 10   | -    |    |
| t <sub>on</sub>   | Turn-on time                             | I <sub>C</sub> =500 mA  | -   | 400  | -    | ns   |    |
| t <sub>off</sub>  | Turn-off time                            |   | I <sub>Bon</sub> = -I <sub>Boff</sub> =0.5 mA | -    | 1500 |      | -  |
| t <sub>on</sub>   | Turn-on time                             | I <sub>C</sub> =1 A   | -   | 400  | -    | ns   |    |
| t <sub>off</sub>  | Turn-off time                            |   | I <sub>Bon</sub> = -I <sub>Boff</sub> =1.0 mA | -    | 1500 |      | -  |

## NPN BDX42 – BDX43– BDX44

### MECHANICAL DATA CASE TO-126

|   | DIMENSIONS |      |
|---|------------|------|
|   | min        | max  |
| A | 7.4        | 7.8  |
| B | 10.5       | 10.8 |
| C | 2.4        | 2.7  |
| D | 0.7        | 0.9  |
| E | 2.25 typ.  |      |
| F | 0.49       | 0.75 |
| G | 4.4 typ.   |      |
| L | 15.7 typ.  |      |
| M | 1.27 typ.  |      |
| N | 3.75 typ.  |      |
| P | 3.0        | 3.2  |
| S | 2.54 typ.  |      |

|         |           |
|---------|-----------|
| Pin 1 : | Emitter   |
| Pin 2 : | Collector |
| Pin 3 : | Base      |



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