

## Silicon NPN Power Transistors

## BDX33/A/B/C

## DESCRIPTION

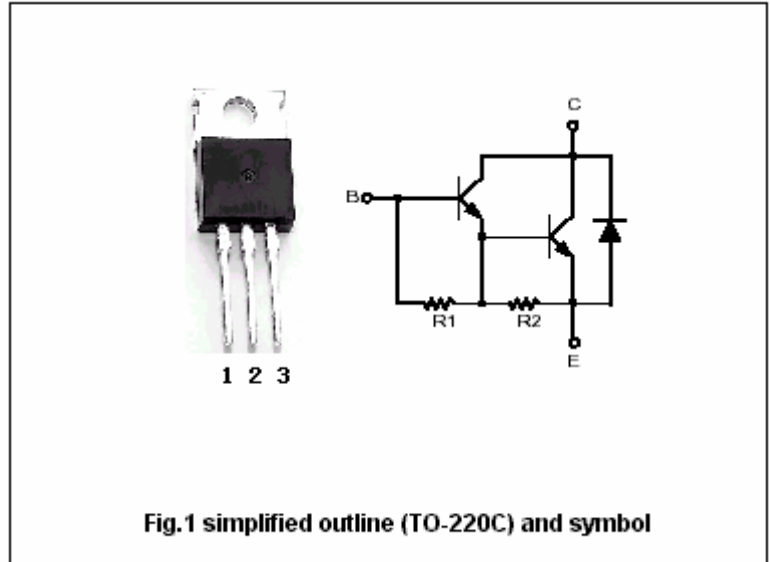
- With TO-220C package
- High DC current gain
- DARLINGTON
- Complement to type BDX34/A/B/C

## APPLICATIONS

- For power linear and switching applications

## PINNING

| PIN | DESCRIPTION                          |
|-----|--------------------------------------|
| 1   | Base                                 |
| 2   | Collector;connected to mounting base |
| 3   | Emitter                              |

Absolute maximum ratings( $T_a=25^\circ\text{C}$ )

| SYMBOL    | PARAMETER                   | CONDITIONS             | VALUE   | UNIT             |
|-----------|-----------------------------|------------------------|---------|------------------|
| $V_{CBO}$ | Collector-base voltage      | BDX33                  | 45      | V                |
|           |                             | BDX33A                 | 60      |                  |
|           |                             | BDX33B                 | 80      |                  |
|           |                             | BDX33C                 | 100     |                  |
| $V_{CEO}$ | Collector-emitter voltage   | BDX33                  | 45      | V                |
|           |                             | BDX33A                 | 60      |                  |
|           |                             | BDX33B                 | 80      |                  |
|           |                             | BDX33C                 | 100     |                  |
| $V_{EBO}$ | Emitter-base voltage        | Open collector         | 5       | V                |
| $I_C$     | Collector current-DC        |                        | 10      | A                |
| $I_{CM}$  | Collector current-Pulse     |                        | 15      | A                |
| $I_B$     | Base current                |                        | 0.25    | A                |
| $P_C$     | Collector power dissipation | $T_C=25^\circ\text{C}$ | 70      | W                |
| $T_j$     | Junction temperature        |                        | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage temperature         |                        | -65~150 | $^\circ\text{C}$ |

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                           | MAX  | UNIT                      |
|---------------|-------------------------------------|------|---------------------------|
| $R_{th\ j-c}$ | Thermal resistance junction to case | 1.78 | $^\circ\text{C}/\text{W}$ |

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## CHARACTERISTICS

T<sub>j</sub>=25 °C unless otherwise specified

| SYMBOL                | PARAMETER                            |            | CONDITIONS                               | MIN | TYP. | MAX | UNIT |
|-----------------------|--------------------------------------|------------|--|-----|------|-----|------|
| V <sub>CEO(SUS)</sub> | Collector-emitter sustaining voltage | BDX33      | I <sub>C</sub> =0.1A, I <sub>B</sub> =0  | 45  |      |     | V    |
|                       |                                      | BDX33A     |  | 60  |      |     |      |
|                       |                                      | BDX33B     |  | 80  |      |     |      |
|                       |                                      | BDX33C     |  | 100 |      |     |      |
| V <sub>CEsat</sub>    | Collector-emitter saturation voltage | BDX33/33A  | I <sub>C</sub> =4A, I <sub>B</sub> =8mA  |     |      | 2.5 | V    |
|                       |                                      | BDX33B/33C | I <sub>C</sub> =3A, I <sub>B</sub> =6mA  |     |      |     |      |
| V <sub>BE</sub>       | Base-emitter on voltage              | BDX33/33A  | I <sub>C</sub> =4A; V <sub>CE</sub> =3V  |     |      | 2.5 | V    |
|                       |                                      | BDX33B/33C | I <sub>C</sub> =3A; V <sub>CE</sub> =3V  |     |      |     |      |
| I <sub>CBO</sub>      | Collector cut-off current            | BDX33      | V <sub>CB</sub> =45V, I <sub>E</sub> =0  |     |      | 0.2 | mA   |
|                       |                                      | BDX33A     | V <sub>CB</sub> =60V, I <sub>E</sub> =0  |     |      |     |      |
|                       |                                      | BDX33B     | V <sub>CB</sub> =80V, I <sub>E</sub> =0  |     |      |     |      |
|                       |                                      | BDX33C     | V <sub>CB</sub> =100V, I <sub>E</sub> =0 |     |      |     |      |
| I <sub>CEO</sub>      | Collector cut-off current            | BDX33      | V <sub>CE</sub> =22V, I <sub>B</sub> =0  |     |      | 0.5 | mA   |
|                       |                                      | BDX33A     | V <sub>CE</sub> =30V, I <sub>B</sub> =0  |     |      |     |      |
|                       |                                      | BDX33B     | V <sub>CE</sub> =40V, I <sub>B</sub> =0  |     |      |     |      |
|                       |                                      | BDX33C     | V <sub>CE</sub> =50V, I <sub>B</sub> =0  |     |      |     |      |
| I <sub>EBO</sub>      | Emitter cut-off current              |            | V <sub>EB</sub> =5V; I <sub>C</sub> =0   |     |      | 5   | mA   |
| h <sub>FE</sub>       | DC current gain                      | BDX33/33A  | I <sub>C</sub> =4A; V <sub>CE</sub> =3V  | 750 |      |     |      |
|                       |                                      | BDX33B/33C | I <sub>C</sub> =3A; V <sub>CE</sub> =3V  |     |      |     |      |
| V <sub>F</sub>        | Forward diode voltage                |            | I <sub>F</sub> =8A                       |     |      | 4.0 | V    |

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## PACKAGE OUTLINE

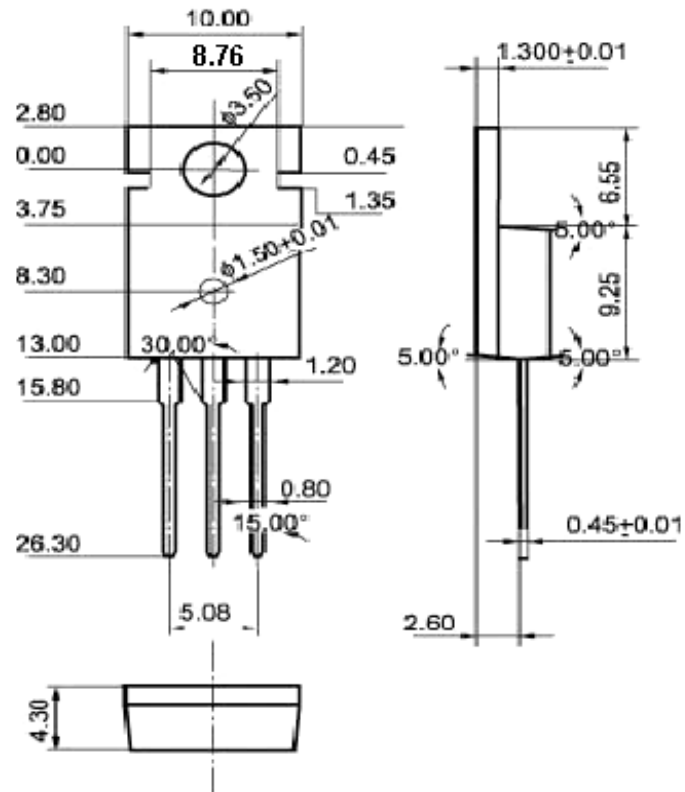


Fig.2 Outline dimensions