

## NPN BD201 – BD203

### SILICON EPITAXIAL-BASE POWER TRANSISTORS

The BD201 and BD203 are NPN transistors mounted in Jedec TO-220 plastic package. They are primarily intended for use in if-hi equipment delivering an output of 15 to 25 W into 4Ω or 8Ω load.

PNP complements are BD202 and BD204

Compliance to RoHS.

#### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Ratings                                                        |                    | Value       | Unit |
|-----------|----------------------------------------------------------------|--------------------|-------------|------|
| $V_{CEO}$ | Collector-Emitter Voltage                                      | BD201              | 45          | V    |
|           |                                                                | BD203              | 60          |      |
| $V_{CBO}$ | Collector-Base Voltage                                         | BD201              | 60          | V    |
|           |                                                                | BD203              | 60          |      |
| $V_{EBO}$ | Emitter-Base Voltage                                           |                    | 5.0         | V    |
| $I_C$     | Collector Current                                              | $I_C$              | 8           | A    |
|           |                                                                | $I_{CM}$           | 12          | A    |
| $I_{CSM}$ | Collector Current (non-repetitive peak value, $t_p$ max. 2 ms) |                    | 25          | A    |
| $I_B$     | Base Current                                                   |                    | 3           | A    |
| $P_D$     | Total Device Dissipation                                       | @ $T_C = 25^\circ$ | 60          | W    |
| $T_J$     | Junction Temperature                                           |                    | 150         | °C   |
| $T_{Stg}$ | Storage Temperature range                                      |                    | -65 to +200 | °C   |

#### THERMAL CHARACTERISTICS

| Symbol       | Ratings                                             | Value | Unit |
|--------------|-----------------------------------------------------|-------|------|
| $R_{thJ-a}$  | Thermal Resistance, Junction to mounting base       | 70    | K/W  |
| $R_{thJ-mb}$ | Thermal Resistance, Junction to ambient in free air | 2.08  | K/W  |

## NPN BD201 – BD203

### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

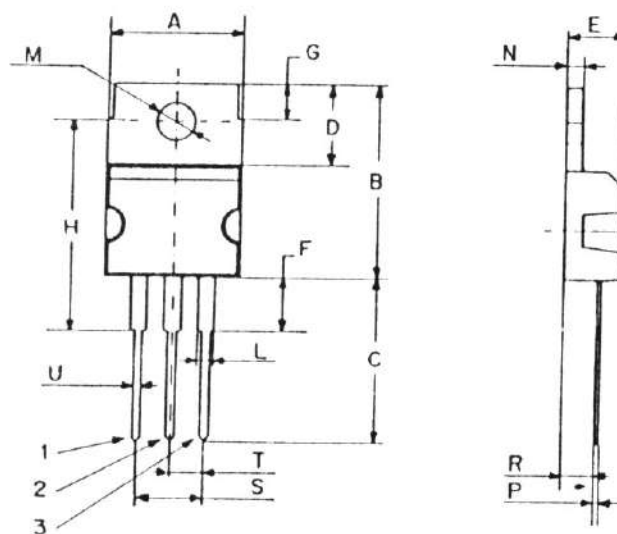
| Symbol                             | Ratings                                         | Test Condition(s)                                                         |                | Min      | Typ    | Max    | Unit |
|------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------|----------------|----------|--------|--------|------|
| I <sub>CEO</sub>                   | Collector Cutoff Current                        | V <sub>CE</sub> =30 V, I <sub>B</sub> =0V                                 | BD201<br>BD203 | -        | -      | 0.2    | mA   |
| I <sub>CBO</sub>                   | Collector Cutoff Current                        | V <sub>CB</sub> =40 V, I <sub>E</sub> =0V<br>T <sub>j</sub> =150°C        | BD201<br>BD203 | -        | -      | 1      | mA   |
| I <sub>EBO</sub>                   | Emitter Cutoff Current                          | V <sub>BE</sub> =5 V, I <sub>C</sub> =0                                   | BD201<br>BD203 | -        | -      | 0.5    | mA   |
| V <sub>CBO</sub>                   | Collector-Base Breakdown Voltage                | I <sub>C</sub> =1 m A, I <sub>E</sub> = 0                                 | BD201<br>BD203 | 60       | -      | -      | V    |
| V <sub>CEO</sub>                   | Collector Emitter Breakdown Voltage (*)         | I <sub>C</sub> =200 m A, I <sub>B</sub> = 0                               | BD201<br>BD203 | 45<br>60 | -<br>- | -<br>- | V    |
| V <sub>EBO</sub>                   | Emitter Base Breakdown Voltage                  | I <sub>E</sub> =1 mA, I <sub>C</sub> =0                                   | BD201<br>BD203 | 5        | -      | -      | V    |
| V <sub>CE(SAT)</sub>               | Collector-Emitter saturation Voltage (*)        | I <sub>C</sub> =3 A, I <sub>B</sub> =300 mA                               | BD201          | -        | -      | 1      | V    |
|                                    |                                                 |                                                                           | BD203          |          |        |        |      |
|                                    |                                                 | I <sub>C</sub> =6 A, I <sub>B</sub> =600 mA                               | BD201          | -        | -      | 1.5    |      |
|                                    |                                                 |                                                                           | BD203          |          |        |        |      |
| V <sub>BE(SAT)</sub>               | Base-Emitter saturation Voltage (*)             | I <sub>C</sub> =6 A, I <sub>B</sub> =600 mA                               | BD201<br>BD203 | -        | -      | 2      |      |
| V <sub>BE</sub>                    | Base Emitter Voltage (*)                        | I <sub>C</sub> =3 A, V <sub>CE</sub> =2 V                                 | BD201<br>BD203 | -        | -      | 1.5    |      |
| h <sub>FE</sub>                    | DC Current Gain (*)                             | I <sub>C</sub> =3 A, V <sub>CE</sub> =2 V                                 | BD201          | 30       | -      | -      | -    |
|                                    |                                                 | I <sub>C</sub> =2 A, V <sub>CE</sub> =2 V                                 | BD203          | 30       | -      | -      |      |
| f <sub>hfe</sub>                   | Cut-off frequency                               | I <sub>C</sub> =300 mA, V <sub>CE</sub> =3 V                              | BD201<br>BD203 | 25       | -      | -      | KHz  |
| f <sub>T</sub>                     | Transition frequency                            | I <sub>C</sub> =300 mA, V <sub>CE</sub> =3 V<br>f= 1MHz                   | BD201<br>BD203 | 7        | -      | -      | MHz  |
| I <sub>s/b</sub>                   | Forward bias second breakdown collector current | V <sub>CE</sub> =40 V, t <sub>p</sub> = 0.1 s<br>T <sub>amb</sub> = 25 °C | BD201<br>BD203 | 1.5      | -      | -      | A    |
| h <sub>FE1</sub> /h <sub>FE2</sub> | DC current gain                                 | I <sub>C</sub> =1 A, V <sub>CE</sub> =2 V                                 | BD201<br>BD203 | 2.5      | -      | -      | -    |
| t <sub>on</sub>                    | Turn-on time                                    | I <sub>Con</sub> =2 A<br>I <sub>Bon</sub> = -I <sub>Boff</sub> =200 mA    | BD201<br>BD203 | -        | -      | 1      | µs   |
| T <sub>off</sub>                   | Turn-off time                                   |                                                                           | BD201<br>BD203 | -        | -      | 4      |      |

(\*) Pulse conditions :  $t_p < 300\text{ }\mu\text{s}$ ,  $\delta = 2\%$

## NPN BD201 – BD203

### MECHANICAL DATA CASE TO-220

| DIMENSIONS (mm) |       |       |
|-----------------|-------|-------|
|                 | Min.  | Max.  |
| A               | 9,90  | 10,30 |
| B               | 15,65 | 15,90 |
| C               | 13,20 | 13,40 |
| D               | 6,45  | 6,65  |
| E               | 4,30  | 4,50  |
| F               | 2,70  | 3,15  |
| G               | 2,60  | 3,00  |
| H               | 15,75 | 17,15 |
| L               | 1,15  | 1,40  |
| M               | 3,50  | 3,70  |
| N               | -     | 1,37  |
| P               | 0,46  | 0,55  |
| R               | 2,50  | 2,70  |
| S               | 4,98  | 5,08  |
| T               | 2,49  | 2,54  |
| U               | 0,70  | 0,90  |



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

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