

Silicon NPN Power Transistors

BD645/647/649/651

DESCRIPTION

- With TO-220C package
- Complement to type BD646/648/650/652
- DARLINGTON

APPLICATIONS

- For use in output stages in audio equipment ,general amplifier,and analogue switching applications

PINNING

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

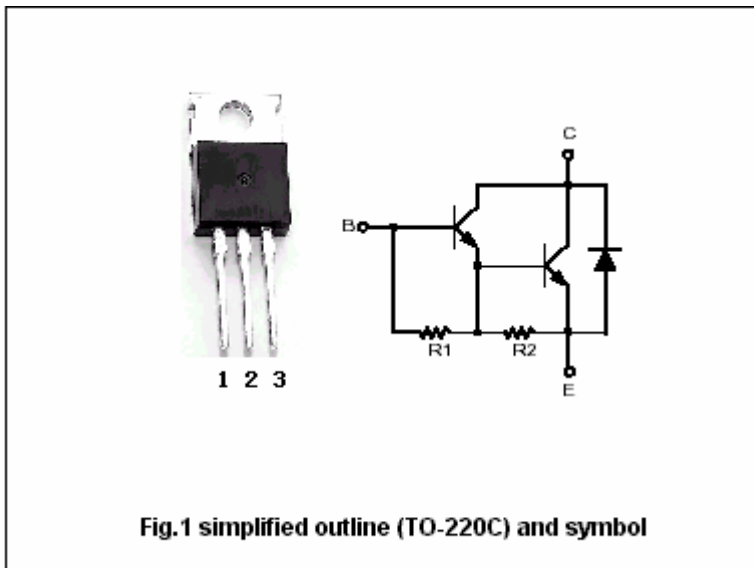


Fig.1 simplified outline (TO-220C) and symbol

Absolute maximum ratings(Ta=25°C)

| SYMBOL           | PARAMETER                   | CONDITIONS           | VALUE   | UNIT |
|------------------|-----------------------------|----------------------|---------|------|
| V <sub>CBO</sub> | Collector-base voltage      | BD645                | 80      | V    |
|                  |                             | BD647                | 100     |      |
|                  |                             | BD649                | 120     |      |
|                  |                             | BD651                | 140     |      |
| V <sub>CEO</sub> | Collector-emitter voltage   | BD645                | 60      | V    |
|                  |                             | BD647                | 80      |      |
|                  |                             | BD649                | 100     |      |
|                  |                             | BD651                | 120     |      |
| V <sub>EBO</sub> | Emitter-base voltage        | Open collector       | 5       | V    |
| I <sub>C</sub>   | Collector current-DC        |                      | 8       | A    |
| I <sub>CM</sub>  | Collector current-Pulse     |                      | 12      | A    |
| I <sub>B</sub>   | Base current                |                      | 0.3     | mA   |
| P <sub>C</sub>   | Collector power dissipation | T <sub>C</sub> =25°C | 62.5    | W    |
| T <sub>j</sub>   | Junction temperature        |                      | 150     | °C   |
| T <sub>stg</sub> | Storage temperature         |                      | -65~150 | °C   |

## Silicon NPN Power Transistors

## BD645/647/649/651

## CHARACTERISTICS

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

www.datasheet4u.com

| SYMBOL               | PARAMETER                            | CONDITIONS  | MIN                                     | TYP. | MAX | UNIT |  |
|----------------------|--------------------------------------|---|---|------|-----|------|--|
| V <sub>(BR)CEO</sub> | Collector-emitter breakdown voltage  | I <sub>C</sub> =30mA, I <sub>B</sub> =0   | 60                                      |      |     | V    |  |
|                      |                                      |   | 80                                      |      |     |      |  |
|                      |                                      |   | 100                                     |      |     |      |  |
|                      |                                      |   | 120                                     |      |     |      |  |
| V <sub>CEsat-1</sub> | Collector-emitter saturation voltage | I <sub>C</sub> =3A, I <sub>B</sub> =12mA  |   |      | 2.0 | V    |  |
| V <sub>CEsat-2</sub> | Collector-emitter saturation voltage | I <sub>C</sub> =5A, I <sub>B</sub> =50mA  |   |      | 2.5 | V    |  |
| V <sub>BEsat</sub>   | Base-emitter saturation voltage      | I <sub>C</sub> =5A, I <sub>B</sub> =50mA  |   |      | 3.0 | V    |  |
| V <sub>BE</sub>      | Base-emitter on voltage              | I <sub>C</sub> =3A; V <sub>CE</sub> =3V   |   |      | 2.5 | V    |  |
| I <sub>CBO</sub>     | Collector cut-off current            | V <sub>CB</sub> =60V, I <sub>E</sub> =0<br>V <sub>CB</sub> =40V, I <sub>E</sub> =0; T <sub>C</sub> =150°C | 0.2                                     |      | 2.0 | mA   |  |
|                      |                                      |   | 0.2                                     |      | 2.0 |      |  |
|                      |                                      |   | 0.2                                     |      | 2.0 |      |  |
|                      |                                      |   | 0.2                                     |      | 2.0 |      |  |
| I <sub>CEO</sub>     | Collector cut-off current            | V <sub>CE</sub> =30V, I <sub>B</sub> =0   |   |      | 0.5 | mA   |  |
|                      |                                      |   | V <sub>CE</sub> =40V, I <sub>B</sub> =0 |      |     |      |  |
|                      |                                      |   | V <sub>CE</sub> =50V, I <sub>B</sub> =0 |      |     |      |  |
|                      |                                      |   | V <sub>CE</sub> =60V, 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                      | I <sub>C</sub> =3A; V <sub>CE</sub> =3V   | 750                                     |      |     |      |  |

## THERMAL CHARACTERISTICS

| SYMBOL              | PARAMETER                           | MAX | UNIT |
|---------------------|-------------------------------------|-----|------|
| R <sub>th j-c</sub> | Thermal resistance junction to case | 2.0 | °C/W |

Silicon NPN Power Transistors

BD645/647/649/651

PACKAGE OUTLINE

www.datasheet4u.com

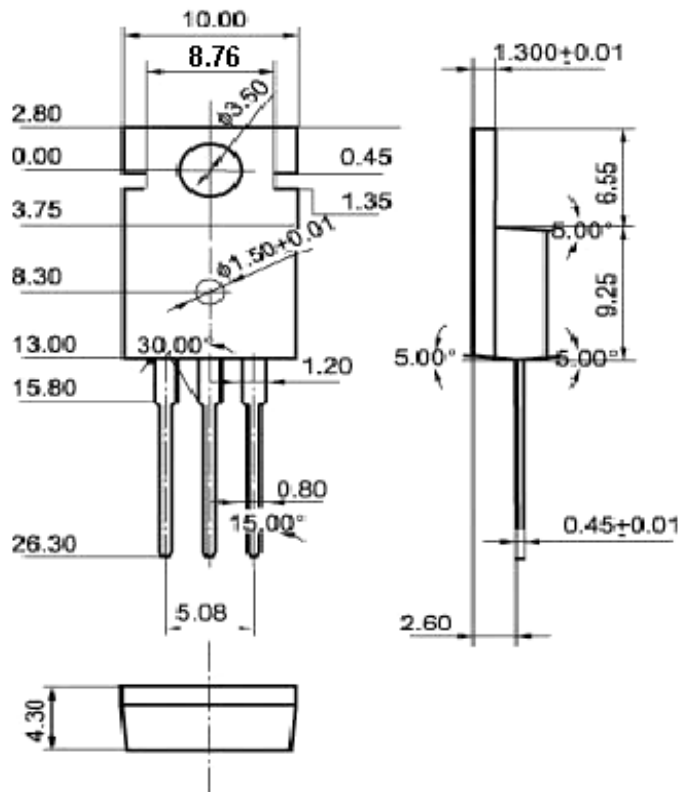


Fig.2 Outline dimensions

Silicon NPN Power Transistors

BD645/647/649/651

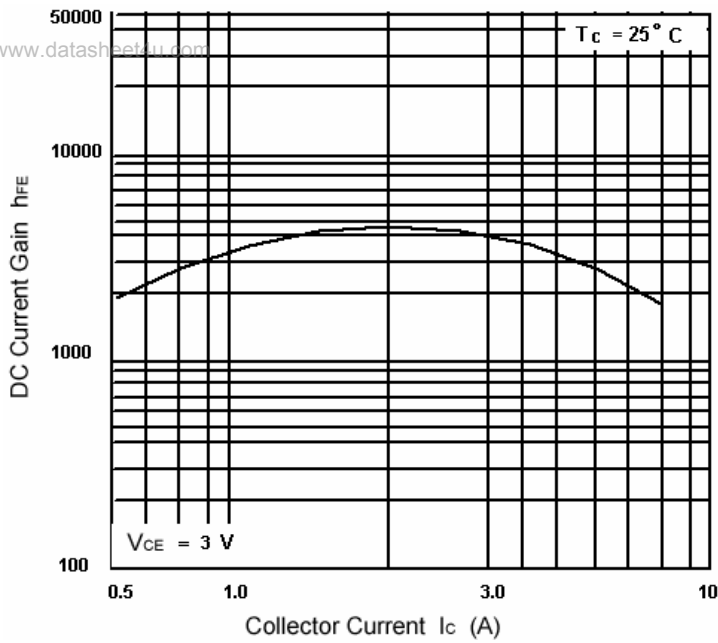


Fig.3 DC current Gain

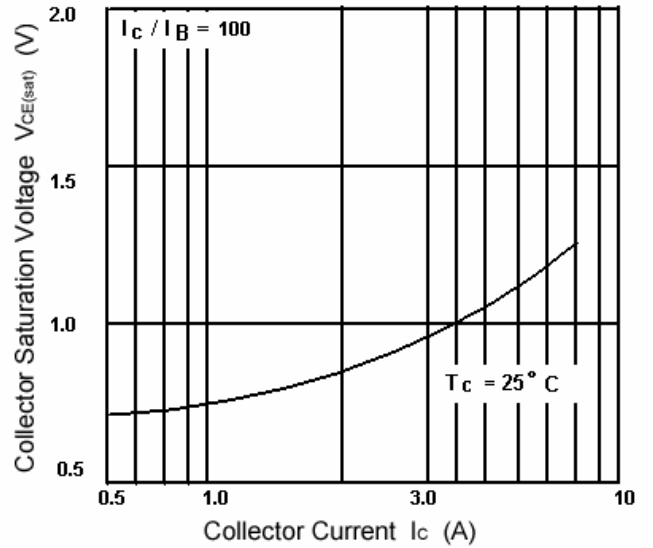


Fig.4 Collector-Emitter Saturation Voltage

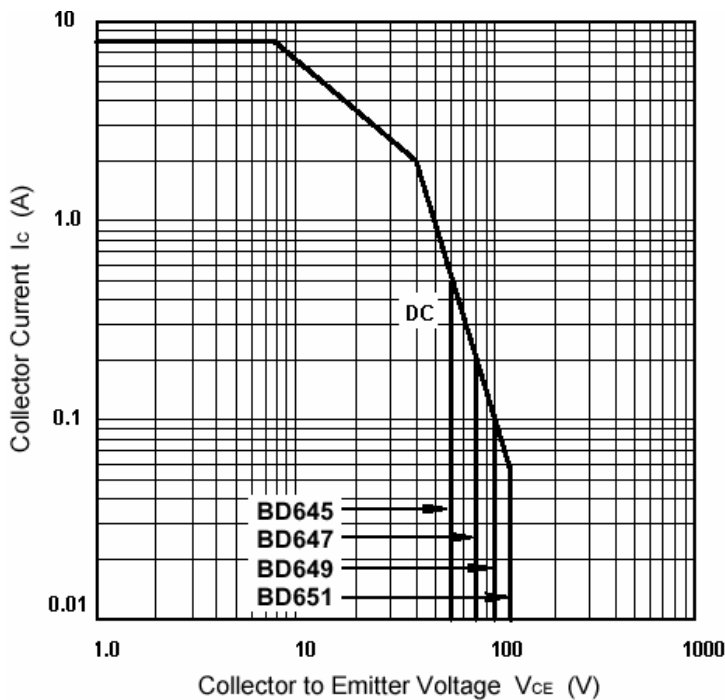


Fig.5 Safe Operating Area

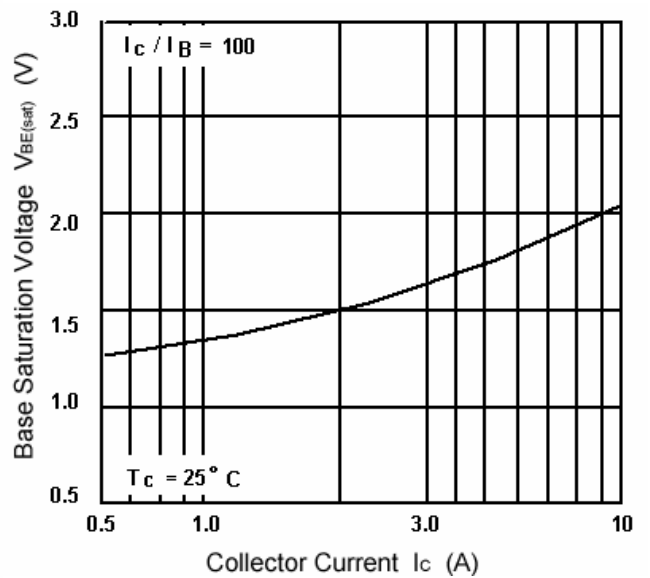


Fig.6 Base-Emitter Saturation Voltage