

## Pin Configuration:

1. Emitter
2. Collector
3. Base

## Absolute Maximum Ratings

| Parameter                                                                              | Symbol         | BD680       | Unit                      |
|----------------------------------------------------------------------------------------|----------------|-------------|---------------------------|
| Collector Base Voltage                                                                 | $V_{CBO}$      | 80          | V                         |
| Collector Emitter Voltage                                                              | $V_{CEO}$      |             |                           |
| Emitter Base Voltage                                                                   | $V_{EBO}$      | 5           |                           |
| Collector Current                                                                      | $I_C$          | 4           | A                         |
| Base Current                                                                           | $I_B$          | 0.1         |                           |
| Total Power Dissipation at $T_a = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.25<br>10  | W<br>mW/ $^\circ\text{C}$ |
| Total Power Dissipation at $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ |                | 40<br>0.32  | W<br>W/ $^\circ\text{C}$  |
| Operating and Storage Junction<br>Temperature Range                                    | $T_j, T_{stg}$ | -55 to +150 | $^\circ\text{C}$          |

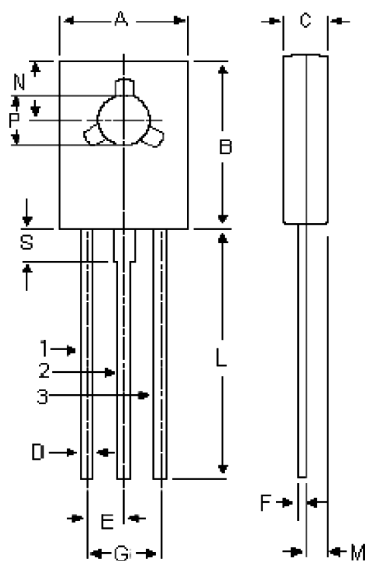
## Thermal Resistance

|                                 |               |      |                    |
|---------------------------------|---------------|------|--------------------|
| Junction to Case                | $R_{th(j-c)}$ | 3.13 | $^\circ\text{C/W}$ |
| Junction to Ambient in Free Air | $R_{th(j-a)}$ | 100  |                    |

## Electrical Characteristics ( $T_a = 25^\circ\text{C}$ unless specified otherwise)

| Parameter                                         | Symbol          | Test Condition                                                         | Min. | Max. | Unit          |
|---------------------------------------------------|-----------------|------------------------------------------------------------------------|------|------|---------------|
| Collector Emitter Voltage                         | $V_{CEO}^*$     | $I_C = 50\text{mA}, I_B = 0$                                           | 80   | -    | V             |
| Collector Cut off Current                         | $I_{CEO}$       | $V_{CE} = \text{Half Rated } V_{CEO}, I_B = 0$                         | -    | 500  | $\mu\text{A}$ |
|                                                   | $I_{CBO}$       | $V_{CB} = \text{Rated } V_{CBO}, I_E = 0$                              |      | 0.2  | mA            |
|                                                   | $I_{CBO}$       | $V_{CB} = \text{Rated } V_{CBO}, I_E = 0$<br>$T_C = 100^\circ\text{C}$ |      | 2    | mA            |
| Emitter Cut off Current                           | $I_{EBO}$       | $V_{EB} = 5\text{V}, I_C = 0$                                          | -    | 2    | mA            |
| Collector Emitter Saturation Voltage <b>NON A</b> | $V_{CE(sat)}^*$ | $I_C = 1.5\text{A}, I_B = 6\text{mA}$                                  | -    | 2.5  | V             |
| Base Emitter On Voltage <b>NON A</b>              | $V_{EB(on)}^*$  | $I_C = 1.5\text{A}, V_{CE} = 3\text{V}$                                | -    |      |               |
| DC Current Gain <b>NON A</b>                      | $h_{FE}^*$      | $I_C = 1.5\text{A}, V_{CE} = 3\text{V}$                                | 750  | -    | -             |
| Small Signal Current Gain                         | $ h_{fe} $      | $I_C = 1.5\text{A}, V_{CE} = 3\text{V}$<br>$f = 1\text{MHz}$           | 1    | -    | -             |

\*Pulse Test : Pulse Width =  $\leq 300\mu\text{s}$ , Duty Cycle =  $\leq 2\%$ .



### Pin Configuration:

1. Emitter
2. Collector
3. Base

| 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 (Typical) |      |
| F          | 0.49           | 0.75 |
| G          | 4.5 (Typical)  |      |
| L          | 15.7 (Typical) |      |
| M          | 1.27 (Typical) |      |
| N          | 3.75 (Typical) |      |
| P          | 3              | 3.2  |
| S          | 2.5 (Typical)  |      |

Dimensions : Millimetres

## Part Number Table

| Description                   | Part Number |
|-------------------------------|-------------|
| Darlington Transistor, TO-126 | BD680       |

**Important Notice :** This data sheet and its contents (the "Information") belong to the members of the AVNET group of companies (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp Pro is the registered trademark of Premier Farnell Limited 2019.