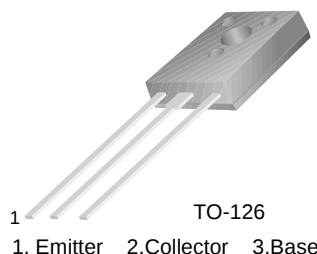


# BD676A/678A/680A/682

## Medium Power Linear and Switching Applications

- Medium Power Darlington TR
- Complement to BD675A, BD677A, BD679A and BD681 respectively



## PNP Epitaxial Silicon Transistor

### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol          | Parameter                                        | Value      | Units              |
|-----------------|--------------------------------------------------|------------|--------------------|
| $V_{CBO}$       | Collector-Base Voltage : BD676A                  | - 45       | V                  |
|                 | : BD678A                                         | - 60       | V                  |
|                 | : BD680A                                         | - 80       | V                  |
|                 | : BD682                                          | - 100      | V                  |
| $V_{CEO}$       | Collector-Emitter Voltage : BD676A               | - 45       | V                  |
|                 | : BD678A                                         | - 60       | V                  |
|                 | : BD680A                                         | - 80       | V                  |
|                 | : BD682                                          | - 100      | V                  |
| $V_{EBO}$       | Emitter-Base Voltage                             | - 5        | V                  |
| $I_C$           | Collector Current (DC)                           | - 4        | A                  |
| $I_{CP}$        | *Collector Current (Pulse)                       | - 6        | A                  |
| $I_B$           | Base Current                                     | - 100      | mA                 |
| $P_C$           | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 14         | W                  |
| $R_{\theta ja}$ | Thermal Resistance (Junction to Ambient)         | 88         | $^\circ\text{C/W}$ |
| $T_J$           | Junction Temperature                             | 150        | $^\circ\text{C}$   |
| $T_{STG}$       | Storage Temperature                              | - 65 ~ 150 | $^\circ\text{C}$   |

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol         | Parameter                                                                           | Test Condition                                                                                                                                                        | Min.                          | Typ. | Max.                             | Units                                                            |
|----------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------|----------------------------------|------------------------------------------------------------------|
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage<br>: BD676A<br>: BD678A<br>: BD680A<br>: BD682 | $I_C = - 50\text{mA}$ , $I_B = 0$                                                                                                                                     | - 45<br>- 60<br>- 80<br>- 100 |      |                                  |                                                                  |
| $I_{CBO}$      | Collector-Base Voltage : BD676A<br>: BD678A<br>: BD680A<br>: BD682                  | $V_{CB} = - 45\text{V}$ , $I_E = 0$<br>$V_{CB} = - 60\text{V}$ , $I_E = 0$<br>$V_{CB} = - 80\text{V}$ , $I_E = 0$<br>$V_{CB} = - 100\text{V}$ , $V_{BE} = 0$          |                               |      | - 200<br>- 200<br>- 200<br>- 200 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{CEO}$      | Collector Cut-off Current : BD676A<br>: BD678A<br>: BD680A<br>: BD682               | $V_{CE} = - 45\text{V}$ , $V_{BE} = 0$<br>$V_{CE} = - 60\text{V}$ , $V_{BE} = 0$<br>$V_{CE} = - 80\text{V}$ , $V_{BE} = 0$<br>$V_{CE} = - 100\text{V}$ , $V_{BE} = 0$ |                               |      | - 500<br>- 500<br>- 500<br>- 500 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current                                                             | $V_{EB} = - 5\text{V}$ , $I_C = 0$                                                                                                                                    |                               |      | - 2                              | mA                                                               |
| $h_{FE}$       | * DC Current Gain : BD676A/678A/680A<br>: BD682                                     | $V_{CE} = - 3\text{V}$ , $I_C = - 2\text{A}$<br>$V_{CE} = - 3\text{V}$ , $I_C = - 1.5\text{A}$                                                                        | 750<br>750                    |      |                                  |                                                                  |
| $V_{CE(sat)}$  | * Collector-Emitter Saturation Voltage<br>: BD676A/678A/680A<br>: BD682             | $I_C = - 2\text{A}$ , $I_B = - 40\text{mA}$<br>$I_C = - 1.5\text{A}$ , $I_B = - 30\text{mA}$                                                                          |                               |      | - 2.8<br>- 2.5                   | V<br>V                                                           |
| $V_{BE(on)}$   | * Base-Emitter On Voltage : BD676A/678A/680A<br>: BD682                             | $V_{CE} = - 3\text{V}$ , $I_C = - 2\text{A}$<br>$V_{CE} = - 3\text{V}$ , $I_C = - 1.5\text{A}$                                                                        |                               |      | - 2.5<br>- 2.5                   | V<br>V                                                           |

\* Pulse Test: PW=300 $\mu\text{s}$ , duty Cycle=1.5% Pulse

## Typical Characteristics

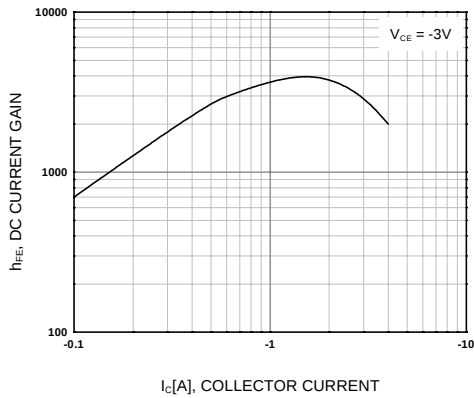


Figure 1. DC current Gain

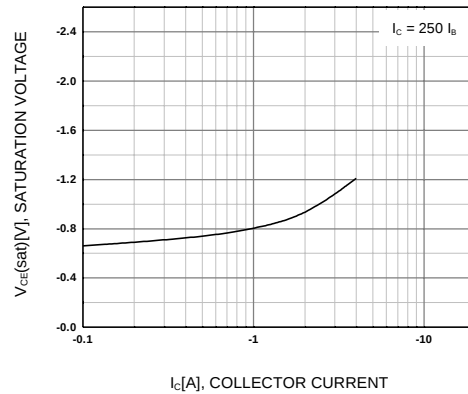


Figure 2. Collector-Emitter Saturation Voltage

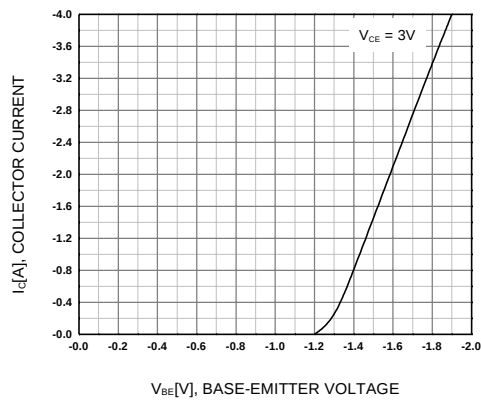


Figure 3. Base-Emitter On Voltage

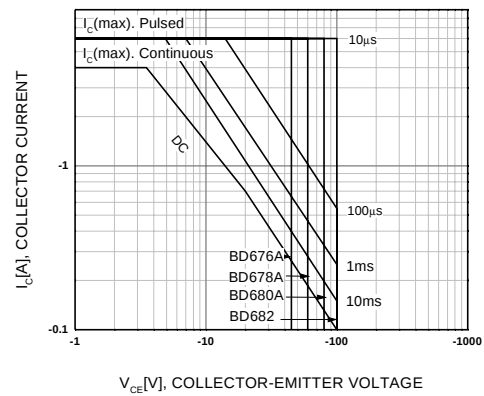


Figure 4. Safe Operating Area

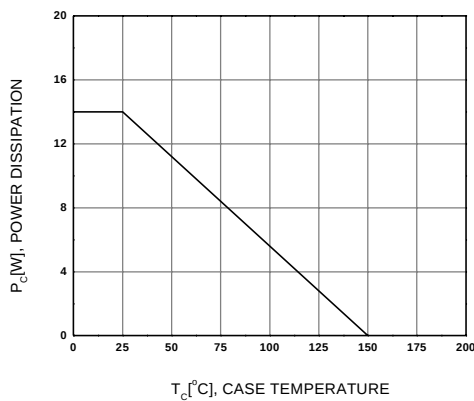
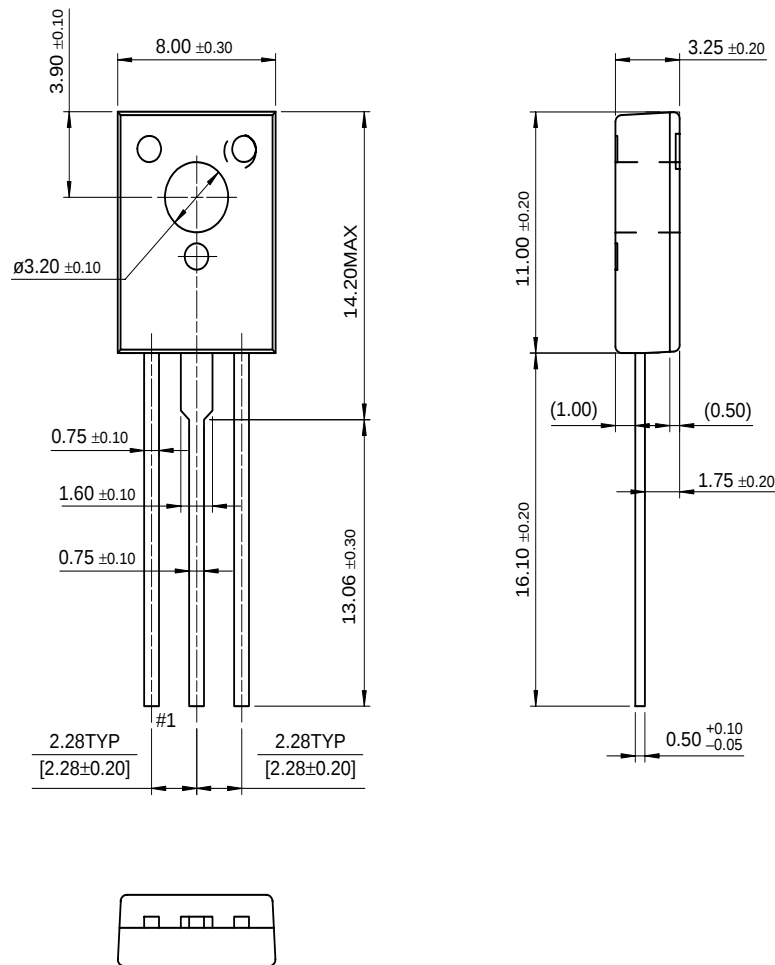


Figure 5. Power Derating

# Package Dimensions

## TO-126



Dimensions in Millimeters

BD676A/678A/680A/682

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