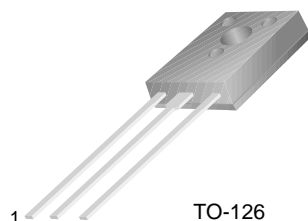


## BD675A/677A/679A/681

### Medium Power Linear and Switching Applications

- Medium Power Darlington TR
- Complement to BD676A, BD678A, BD680A and BD682 respectively

### NPN Epitaxial Silicon Transistor



TO-126  
1. Emitter 2. Collector 3. Base

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

| Symbol    | Parameter  | Value      | Units            |
|-----------|--|------------|------------------|
| $V_{CB0}$ | Collector-Base Voltage : BD675A                  | 45         | V                |
|           | : BD677A   | 60         | V                |
|           | : BD679A   | 80         | V                |
|           | : BD681  | 100        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage : BD675A               | 45         | V                |
|           | : BD677A   | 60         | V                |
|           | : BD679A   | 80         | V                |
|           | : BD681  | 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 ( $T_C=25^\circ\text{C}$ ) | 40         | 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 : BD675A            | $I_C = 50\text{mA}, I_B = 0$            | 45   |      |      | V             |
|                | : BD677A  |   |      |      |      | V             |
|                | : BD679A  |   |      |      |      | V             |
|                | : BD681   |   |      |      |      | V             |
| $I_{CBO}$      | Collector-Base Voltage : BD675A                           | $V_{CB} = 45\text{V}, I_E = 0$          |      |      | 200  | $\mu\text{A}$ |
|                | : BD677A  | $V_{CB} = 60\text{V}, I_E = 0$          |      |      | 200  | $\mu\text{A}$ |
|                | : BD679A  | $V_{CB} = 80\text{V}, I_E = 0$          |      |      | 200  | $\mu\text{A}$ |
|                | : BD681   | $V_{CB} = 100\text{V}, V_{BE} = 0$      |      |      | 200  | $\mu\text{A}$ |
| $I_{CEO}$      | Collector Cut-off Current : BD675A                        | $V_{CE} = 45\text{V}, V_{BE} = 0$       |      |      | 500  | $\mu\text{A}$ |
|                | : BD677A  | $V_{CE} = 60\text{V}, V_{BE} = 0$       |      |      | 500  | $\mu\text{A}$ |
|                | : BD679A  | $V_{CE} = 80\text{V}, V_{BE} = 0$       |      |      | 500  | $\mu\text{A}$ |
|                | : BD681   | $V_{CE} = 100\text{V}, V_{BE} = 0$      |      |      | 500  | $\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current                                   | $V_{EB} = 5\text{V}, I_C = 0$           |      |      | 2    | mA            |
| $h_{FE}$       | * DC Current Gain : BD675A/677A/679A                      | $V_{CE} = 3\text{V}, I_C = 2\text{A}$   | 750  |      |      |               |
|                | : BD681   | $V_{CE} = 3\text{V}, I_C = 1.5\text{A}$ | 750  |      |      |               |
| $V_{CE(sat)}$  | * Collector-Emitter Saturation Voltage : BD675A/677A/679A | $I_C = 2\text{A}, I_B = 40\text{mA}$    |      |      | 2.8  | V             |
|                | : BD681   | $I_C = 1.5\text{A}, I_B = 30\text{mA}$  |      |      | 2.5  | V             |
| $V_{BE(on)}$   | * Base-Emitter ON Voltage : BD675A/677A/679A              | $V_{CE} = 3\text{V}, I_C = 2\text{A}$   |      |      | 2.5  | V             |
|                | : BD681   | $V_{CE} = 3\text{V}, I_C = 1.5\text{A}$ |      |      | 2.5  | V             |

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

# Typical Characteristics

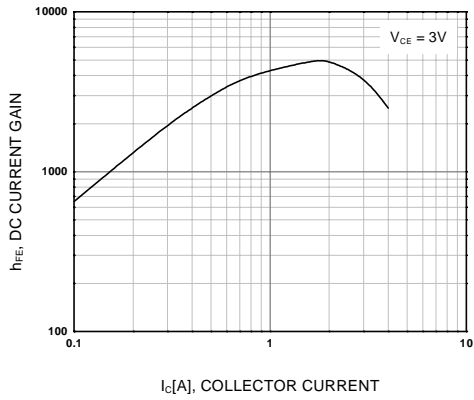


Figure 1. DC current Gain

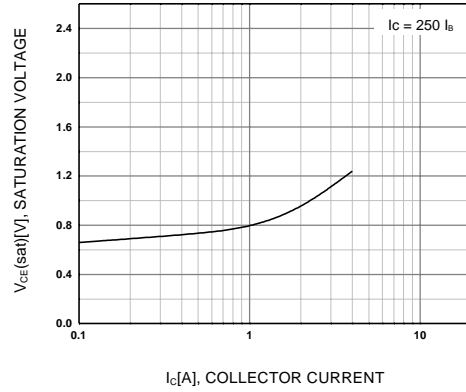


Figure 2. Collector-Emitter Saturation Voltage

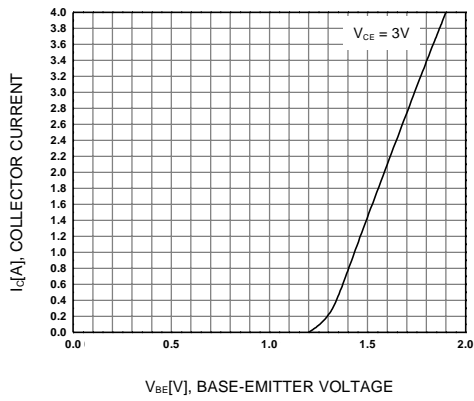


Figure 3. Base-Emitter On Voltage

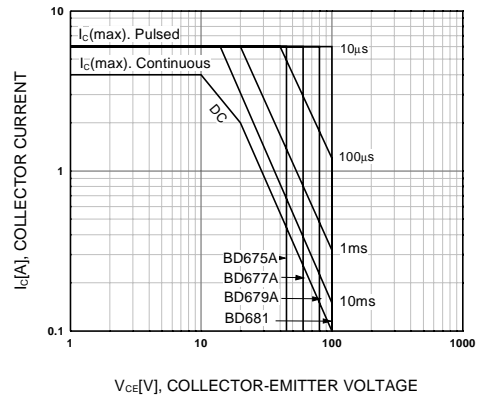


Figure 4. Safe Operating Area

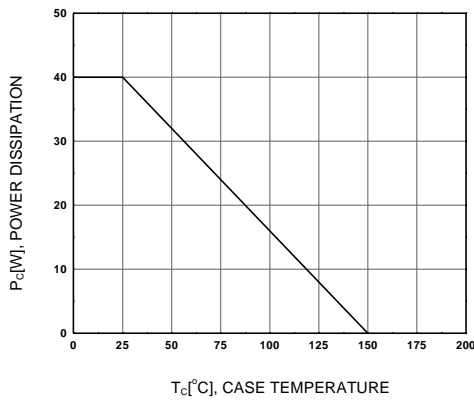
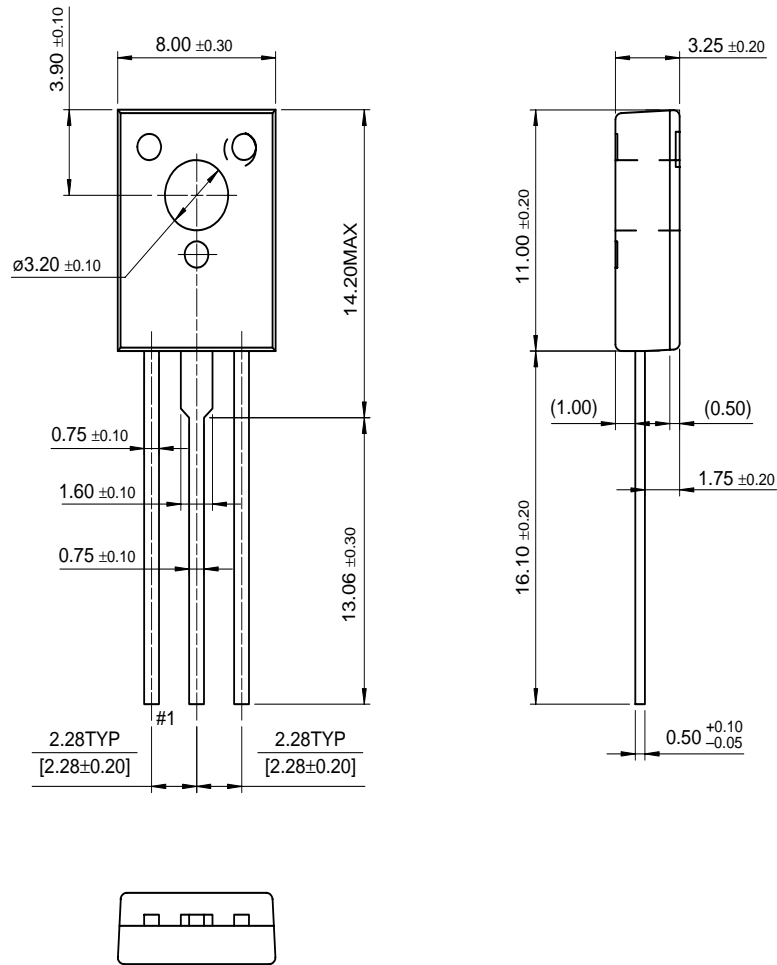


Figure 5. Power Derating

# Package Dimensions

## TO-126



BD675A/677A/679A/681

Dimensions in Millimeters

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