

BD676, BD676A, BD678, BD678A, BD680, BD680A, BD682, BD682T

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|--|--|------------|-----------------------|------------------|-----------------|
| Collector-Emitter Breakdown Voltage (Note 1) ($I_C = 50\text{ mAdc}$, $I_B = 0$) | BD676, 676A BD678, 678A BD680, 680A BD682 | BV_{CEO} | 45 60 80 100 | – – – – | Vdc |
| Collector Cutoff Current ($V_{CE} = \text{Half Rated } BV_{CEO}$, $I_B = 0$) | | I_{CEO} | – | 500 | μAdc |
| Collector Cutoff Current ($V_{CB} = \text{Rated } BV_{CEO}$, $I_E = 0$) ($V_{CB} = \text{Rated } BV_{CEO}$, $I_E = 0$, $T_C = 100^\circ\text{C}$) | | I_{CBO} | – – | 0.2 2.0 | mAdc |
| Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$) | | I_{EBO} | – | 2.0 | mAdc |

ON CHARACTERISTICS

| | | | | | |
|---|--|---------------|------------|------------|--------|
| DC Current Gain (Note 1) ($I_C = 1.5\text{ Adc}$, $V_{CE} = 3.0\text{ Vdc}$) ($I_C = 2.0\text{ Adc}$, $V_{CE} = 3.0\text{ Vdc}$) | BD676, 678, 680, 682 BD676A, 678A, 680A | h_{FE} | 750 750 | – – | – – |
| Collector-Emitter Saturation Voltage (Note 1) ($I_C = 1.5\text{ Adc}$, $I_B = 30\text{ mAdc}$) ($I_C = 2.0\text{ Adc}$, $I_B = 40\text{ mAdc}$) | BD678, 680, 682 BD676A, 678A, 680A | $V_{CE(sat)}$ | – – | 2.5 2.8 | Vdc |
| Base-Emitter On Voltage (Note 1) ($I_C = 1.5\text{ Adc}$, $V_{CE} = 3.0\text{ Vdc}$) ($I_C = 2.0\text{ Adc}$, $V_{CE} = 3.0\text{ Vdc}$) | BD678, 680, 682 BD676A, 678A, 680A | $V_{BE(on)}$ | – – | 2.5 2.5 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|---|----------|-----|---|---|
| Small-Signal Current Gain ($I_C = 1.5\text{ Adc}$, $V_{CE} = 3.0\text{ Vdc}$, $f = 1.0\text{ MHz}$) | h_{fe} | 1.0 | – | – |
|---|----------|-----|---|---|

1. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

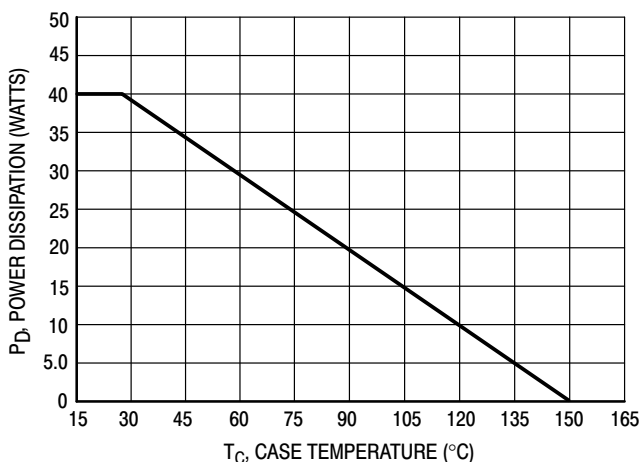


Figure 1. Power Temperature Derating

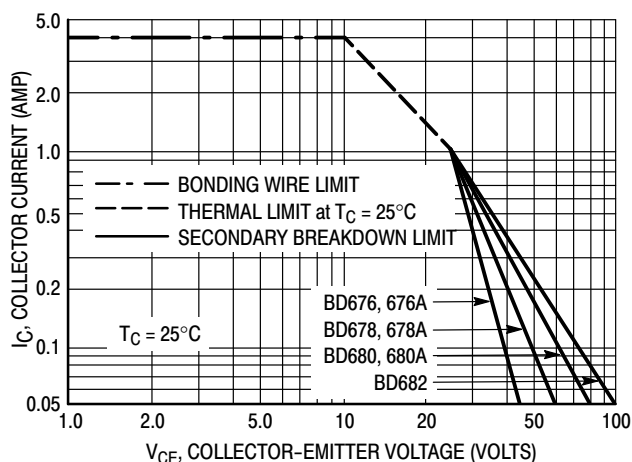


Figure 2. DC Safe Operating Area

There are two limitations on the power handling ability of a transistor average junction temperature and secondary breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; e.g., the transistor must not be subjected to greater dissipation than the curves indicate.

At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by secondary breakdown.

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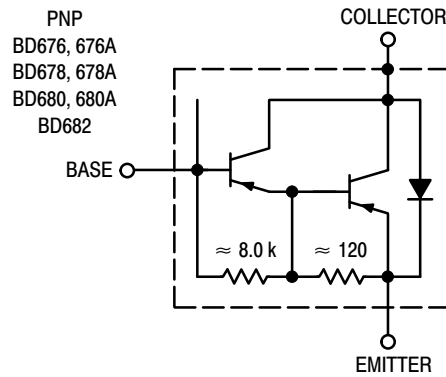


Figure 3. Darlington Circuit Schematic

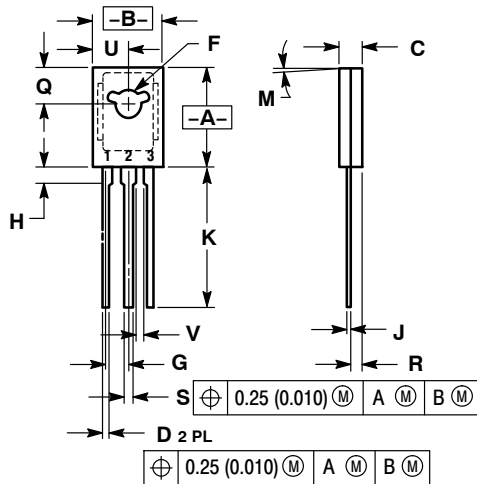
ORDERING INFORMATION

| Device | Package | Shipping |
|---------|-----------------------|-----------------|
| BD676 | TO-225AA | 500 Units / Box |
| BD676G | TO-225AA (Pb-Free) | 500 Units / Box |
| BD676A | TO-225AA | 500 Units / Box |
| BD676AG | TO-225AA (Pb-Free) | 500 Units / Box |
| BD678 | TO-225AA | 500 Units / Box |
| BD678G | TO-225AA (Pb-Free) | 500 Units / Box |
| BD678A | TO-225AA | 500 Units / Box |
| BD678AG | TO-225AA (Pb-Free) | 500 Units / Box |
| BD680 | TO-225AA | 500 Units / Box |
| BD680G | TO-225AA (Pb-Free) | 500 Units / Box |
| BD680A | TO-225AA | 500 Units / Box |
| BD680AG | TO-225AA (Pb-Free) | 500 Units / Box |
| BD682 | TO-225AA | 500 Units / Box |
| BD682G | TO-225AA (Pb-Free) | 500 Units / Box |
| BD682T | TO-225AA | 50 Units / Rail |
| BD682TG | TO-225AA (Pb-Free) | 50 Units / Rail |

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PACKAGE DIMENSIONS

TO-225AA
CASE 77-09
ISSUE Z




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077-01 THRU -08 OBSOLETE, NEW STANDARD 077-09.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.425 | 0.435 | 10.80 | 11.04 |
| B | 0.295 | 0.305 | 7.50 | 7.74 |
| C | 0.095 | 0.105 | 2.42 | 2.66 |
| D | 0.020 | 0.026 | 0.51 | 0.66 |
| F | 0.115 | 0.130 | 2.93 | 3.30 |
| G | 0.094 BSC | | 2.39 BSC | |
| H | 0.050 | 0.095 | 1.27 | 2.41 |
| J | 0.015 | 0.025 | 0.39 | 0.63 |
| K | 0.575 | 0.655 | 14.61 | 16.63 |
| M | 5° TYP | | 5° TYP | |
| Q | 0.148 | 0.158 | 3.76 | 4.01 |
| R | 0.045 | 0.065 | 1.15 | 1.65 |
| S | 0.025 | 0.035 | 0.64 | 0.88 |
| U | 0.145 | 0.155 | 3.69 | 3.93 |
| V | 0.040 | --- | 1.02 | --- |

STYLE 1:

- PIN 1. EMITTER
- COLLECTOR
- BASE

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