

# Complementary Silicon Plastic Power Darlington

... for use as output devices in complementary general purpose amplifier applications.

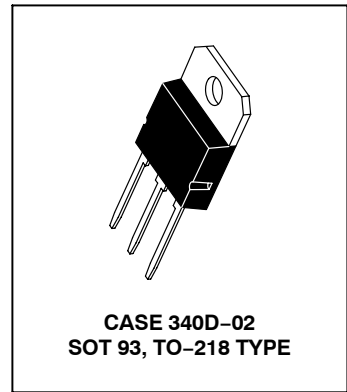
- High DC Current Gain  
HFE = 1000 (min.) @ 5 Adc
- Monolithic Construction with Built-in Base Emitter Shunt Resistors
- These devices are available in Pb-free package(s). Specifications herein apply to both standard and Pb-free devices. Please see our website at [www.onsemi.com](http://www.onsemi.com) for specific Pb-free orderable part numbers, or contact your local ON Semiconductor sales office or representative.

**NPN  
BDV65B  
PNP  
BDV64B**

**DARLINGTONS  
10 AMPERES  
COMPLEMENTARY  
SILICON  
POWER TRANSISTORS  
60-80-100-120 VOLTS  
125 WATTS**

## MAXIMUM RATINGS

| Rating  | Symbol         | Value       | Unit                         |
|---|----------------|-------------|------------------------------|
| Collector-Emitter Voltage   | $V_{CEO}$      | 100         | Vdc                          |
| Collector-Base Voltage  | $V_{CB}$       | 100         | Vdc                          |
| Emitter-Base Voltage  | $V_{EB}$       | 5.0         | Vdc                          |
| Collector Current — Continuous<br>— Peak  | $I_C$          | 10<br>20    | A <sub>dc</sub>              |
| Base Current  | $I_B$          | 0.5         | A <sub>dc</sub>              |
| Total Device Dissipation<br>@ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 125<br>1.0  | Watts<br>W/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                       | $T_J, T_{stg}$ | -65 to +150 | $^\circ\text{C}$             |



## THERMAL CHARACTERISTICS

| Characteristic                       | Symbol        | Max | Unit                      |
|--------------------------------------|---------------|-----|---------------------------|
| Thermal Resistance, Junction to Case | $\theta_{JC}$ | 1.0 | $^\circ\text{C}/\text{W}$ |

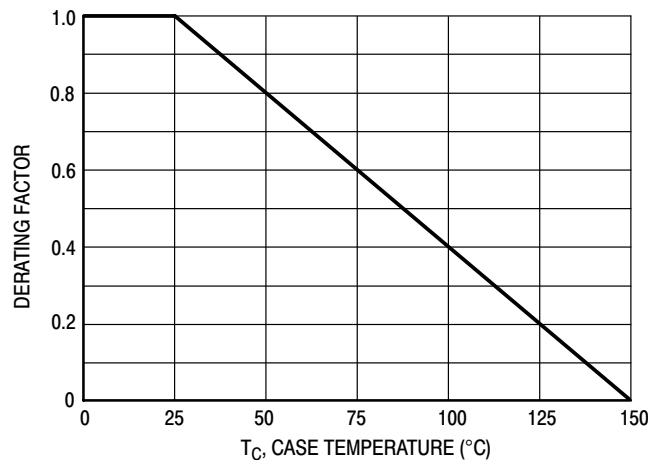
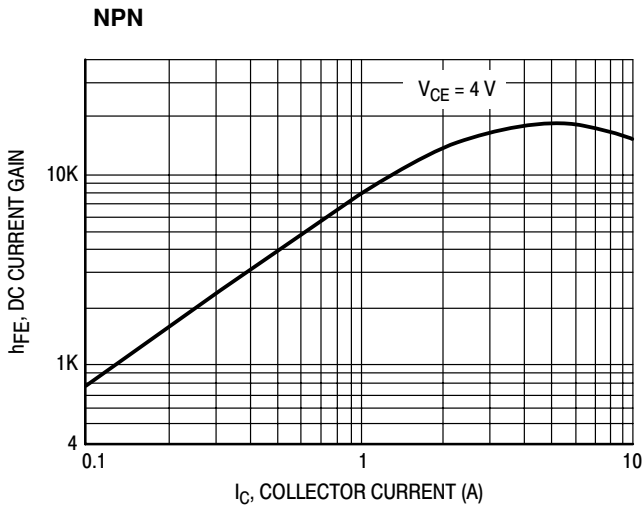


Figure 1. Power Derating

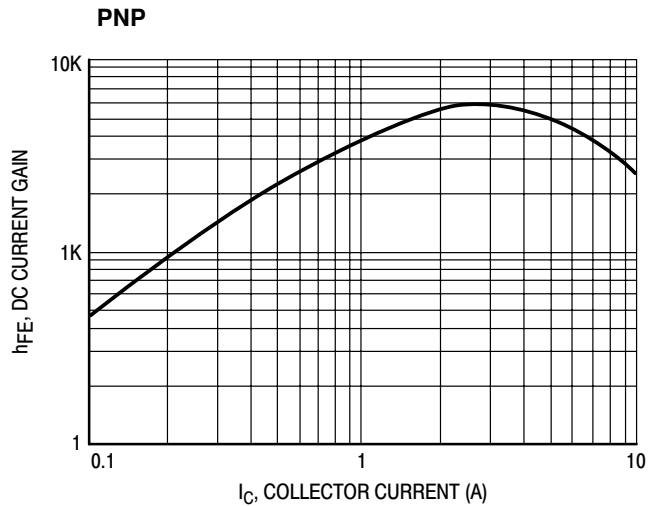
# BDV65B BDV64B

## ELECTRICAL CHARACTERISTICS

| Characteristic  | Symbol         | Min  | Max | Unit |
|---|----------------|------|-----|------|
| <b>OFF CHARACTERISTICS</b>  |                |      |     |      |
| Collector–Emitter Sustaining Voltage (1)<br>( $I_C = 30 \text{ mAdc}$ , $I_B = 0$ )               | $V_{CEO(sus)}$ | 100  | —   | Vdc  |
| Collector Cutoff Current<br>( $V_{CE} = 50 \text{ Vdc}$ , $I_B = 0$ )                             | $I_{CEO}$      | —    | 1.0 | mAdc |
| Collector Cutoff Current<br>( $V_{CB} = 100 \text{ Vdc}$ , $I_E = 0$ )                            | $I_{CBO}$      | —    | 0.4 | mAdc |
| Collector Cutoff Current<br>( $V_{CB} = 50 \text{ Vdc}$ , $I_E = 0$ , $T_C = 150^\circ\text{C}$ ) | $I_{CBO}$      | —    | 2.0 | mAdc |
| Emitter Cutoff Current<br>( $V_{BE} = 5.0 \text{ Vdc}$ , $I_C = 0$ )                              | $I_{EBO}$      | —    | 5.0 | mAdc |
| <b>ON CHARACTERISTICS</b>   |                |      |     |      |
| DC Current Gain<br>( $I_C = 5.0 \text{ Adc}$ , $V_{CE} = 4.0 \text{ Vdc}$ )                       | $h_{FE}$       | 1000 | —   | —    |
| Collector–Emitter Saturation Voltage<br>( $I_C = 5.0 \text{ Adc}$ , $I_B = 0.02 \text{ Adc}$ )    | $V_{CE(sat)}$  | —    | 2.0 | Vdc  |
| Base–Emitter Saturation Voltage<br>( $I_C = 5.0 \text{ Adc}$ , $V_{CE} = 4.0 \text{ Vdc}$ )       | $V_{BE(on)}$   | —    | 2.5 | Vdc  |



**Figure 2. DC Current Gain**



**Figure 3. DC Current Gain**

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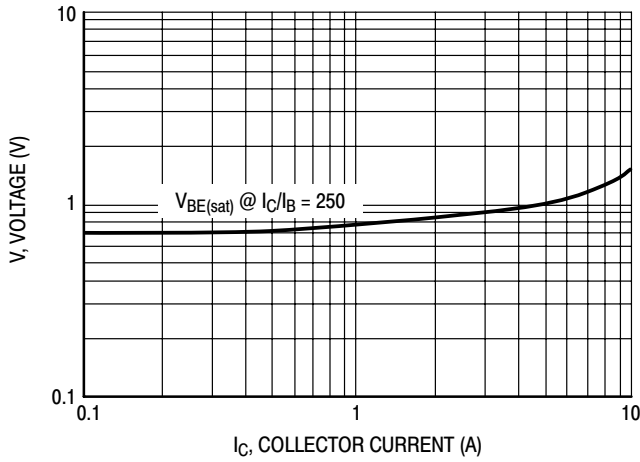


Figure 4. "On" Voltages

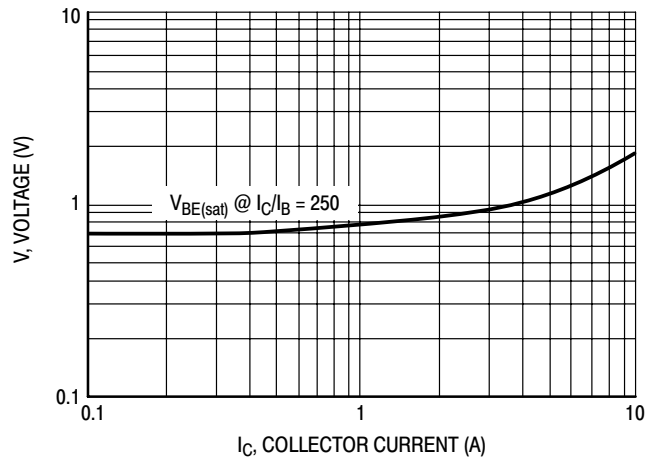


Figure 5. "On" Voltages

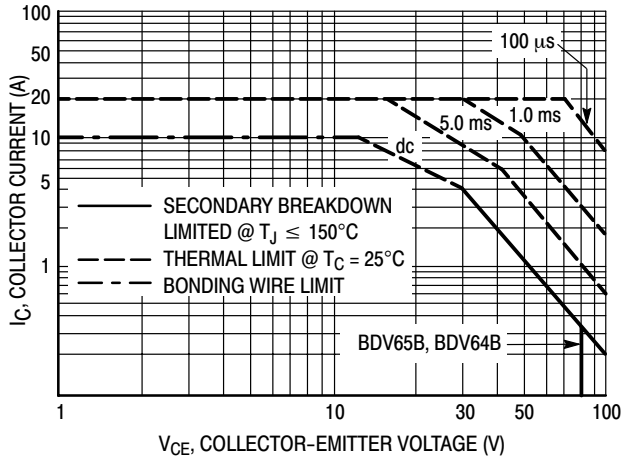


Figure 6. Active Region Safe Operating Area

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

The data of Figure 6 is based on  $T_{J(pk)} = 150^\circ\text{C}$ ,  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(pk)} \leq 150^\circ\text{C}$ .  $T_{J(pk)}$  may be calculated from the data in Figure 7. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

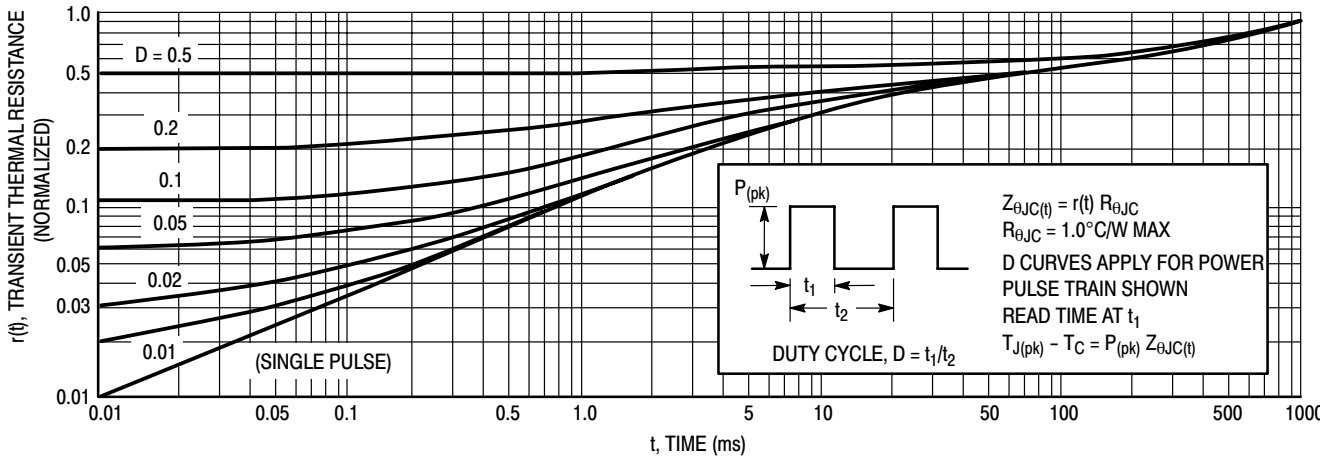
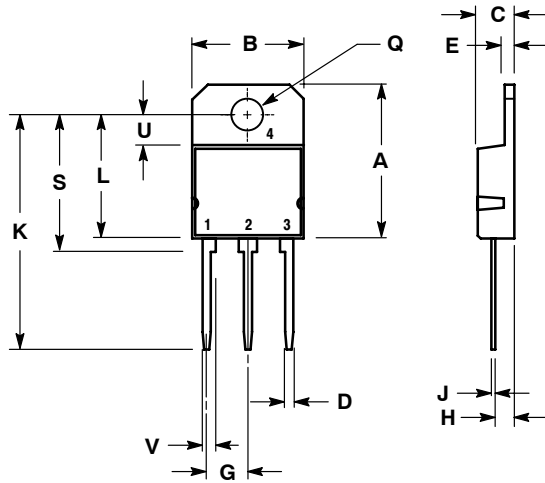


Figure 7. Thermal Response

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## PACKAGE DIMENSIONS

### CASE 340D-02 ISSUE E



- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: MILLIMETER.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | ---         | 20.35 | ---       | 0.801 |
| B   | 14.70       | 15.20 | 0.579     | 0.598 |
| C   | 4.70        | 4.90  | 0.185     | 0.193 |
| D   | 1.10        | 1.30  | 0.043     | 0.051 |
| E   | 1.17        | 1.37  | 0.046     | 0.054 |
| G   | 5.40        | 5.55  | 0.213     | 0.219 |
| H   | 2.00        | 3.00  | 0.079     | 0.118 |
| J   | 0.50        | 0.78  | 0.020     | 0.031 |
| K   | 31.00 REF   |       | 1.220 REF |       |
| L   | ---         | 16.20 | ---       | 0.638 |
| Q   | 4.00        | 4.10  | 0.158     | 0.161 |
| S   | 17.80       | 18.20 | 0.701     | 0.717 |
| U   | 4.00 REF    |       | 0.157 REF |       |
| V   | 1.75 REF    |       | 0.069     |       |

- STYLE 1:  
 PIN 1. BASE  
 2. COLLECTOR  
 3. EMITTER  
 4. COLLECTOR

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