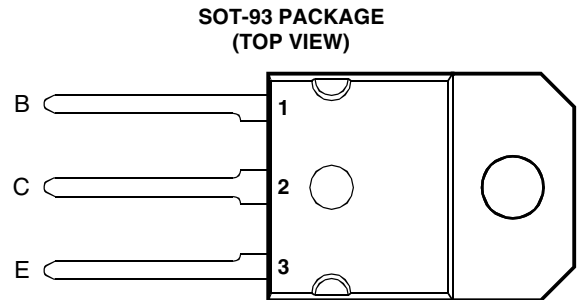




# THE DATASHEET OF BDV65C-S

- Designed for Complementary Use with BDV64, BDV64A, BDV64B and BDV64C
- 125 W at 25°C Case Temperature
- 12 A Continuous Collector Current
- Minimum  $h_{FE}$  of 1000 at 4 V, 5 A



Pin 2 is in electrical contact with the mounting base.

MDTRAAA

**absolute maximum ratings at 25°C case temperature (unless otherwise noted)**

| RATING                                                                             |        | SYMBOL    | VALUE       | UNIT |
|------------------------------------------------------------------------------------|--------|-----------|-------------|------|
| Collector-base voltage ( $I_E = 0$ )                                               | BDV65  | $V_{CBO}$ | 60          | V    |
|                                                                                    | BDV65A |           | 80          |      |
|                                                                                    | BDV65B |           | 100         |      |
|                                                                                    | BDV65C |           | 120         |      |
| Collector-emitter voltage ( $I_B = 0$ )                                            | BDV65  | $V_{CEO}$ | 60          | V    |
|                                                                                    | BDV65A |           | 80          |      |
|                                                                                    | BDV65B |           | 100         |      |
|                                                                                    | BDV65C |           | 120         |      |
| Emitter-base voltage                                                               |        | $V_{EBO}$ | 5           | V    |
| Continuous collector current                                                       |        | $I_C$     | 12          | A    |
| Peak collector current (see Note 1)                                                |        | $I_{CM}$  | 15          | A    |
| Continuous base current                                                            |        | $I_B$     | 0.5         | A    |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 2)     |        | $P_{tot}$ | 125         | W    |
| Continuous device dissipation at (or below) 25°C free air temperature (see Note 3) |        | $P_{tot}$ | 3.5         | W    |
| Operating junction temperature range                                               |        | $T_j$     | -65 to +150 | °C   |
| Storage temperature range                                                          |        | $T_{stg}$ | -65 to +150 | °C   |
| Lead temperature 3.2 mm from case for 10 seconds                                   |        | $T_L$     | 260         | °C   |

NOTES: 1. This value applies for  $t_p \leq 0.1$  ms, duty cycle  $\leq 10\%$   
2. Derate linearly to 150°C case temperature at the rate of 0.56 W/°C.  
3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.

**PRODUCT INFORMATION**

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Specifications are subject to change without notice.

**BDV65, BDV65A, BDV65B, BDV65C**  
**NPN SILICON POWER DARLINGTONS**

**BOURNS®**

**electrical characteristics at 25°C case temperature (unless otherwise noted)**

| PARAMETER                                          | TEST CONDITIONS                                                                                                                                                                                                        |                                                                                                      |                                                                                                                  | MIN                                                                        | TYP                    | MAX                                          | UNIT |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------|----------------------------------------------|------|
| $V_{(BR)CEO}$ Collector-emitter breakdown voltage  | $I_C = 30 \text{ mA}$                                                                                                                                                                                                  | $I_B = 0$                                                                                            | (see Note 4)                                                                                                     | BDV65<br>BDV65A<br>BDV65B<br>BDV65C                                        | 60<br>80<br>100<br>120 |                                              | V    |
| $I_{CEO}$ Collector-emitter cut-off current        | $V_{CB} = 30 \text{ V}$<br>$V_{CB} = 40 \text{ V}$<br>$V_{CB} = 50 \text{ V}$<br>$V_{CB} = 60 \text{ V}$                                                                                                               | $I_B = 0$<br>$I_B = 0$<br>$I_B = 0$<br>$I_B = 0$                                                     |                                                                                                                  | BDV65<br>BDV65A<br>BDV65B<br>BDV65C                                        |                        | 2<br>2<br>2<br>2                             | mA   |
| $I_{CBO}$ Collector cut-off current                | $V_{CB} = 60 \text{ V}$<br>$V_{CB} = 80 \text{ V}$<br>$V_{CB} = 100 \text{ V}$<br>$V_{CB} = 120 \text{ V}$<br>$V_{CB} = 30 \text{ V}$<br>$V_{CB} = 40 \text{ V}$<br>$V_{CB} = 50 \text{ V}$<br>$V_{CB} = 60 \text{ V}$ | $I_E = 0$<br>$I_E = 0$<br>$I_E = 0$<br>$I_E = 0$<br>$I_E = 0$<br>$I_E = 0$<br>$I_E = 0$<br>$I_E = 0$ | $T_C = 150^\circ\text{C}$<br>$T_C = 150^\circ\text{C}$<br>$T_C = 150^\circ\text{C}$<br>$T_C = 150^\circ\text{C}$ | BDV65<br>BDV65A<br>BDV65B<br>BDV65C<br>BDV65<br>BDV65A<br>BDV65B<br>BDV65C |                        | 0.4<br>0.4<br>0.4<br>0.4<br>2<br>2<br>2<br>2 | mA   |
| $I_{EBO}$ Emitter cut-off current                  | $V_{EB} = 5 \text{ V}$                                                                                                                                                                                                 | $I_C = 0$                                                                                            |                                                                                                                  |                                                                            |                        | 5                                            | mA   |
| $h_{FE}$ Forward current transfer ratio            | $V_{CE} = 4 \text{ V}$                                                                                                                                                                                                 | $I_C = 5 \text{ A}$                                                                                  | (see Notes 4 and 5)                                                                                              | 1000                                                                       |                        |                                              |      |
| $V_{CE(sat)}$ Collector-emitter saturation voltage | $I_B = 20 \text{ mA}$                                                                                                                                                                                                  | $I_C = 5 \text{ A}$                                                                                  | (see Notes 4 and 5)                                                                                              |                                                                            |                        | 2                                            | V    |
| $V_{BE}$ Base-emitter voltage                      | $V_{CE} = 4 \text{ V}$                                                                                                                                                                                                 | $I_C = 5 \text{ A}$                                                                                  | (see Notes 4 and 5)                                                                                              |                                                                            |                        | 2.5                                          | V    |
| $V_{EC}$ Parallel diode forward voltage            | $I_E = 10 \text{ A}$                                                                                                                                                                                                   | $I_B = 0$                                                                                            | (see Notes 4 and 5)                                                                                              |                                                                            |                        | 3.5                                          | V    |

NOTES: 4. These parameters must be measured using pulse techniques,  $t_p = 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

5. These parameters must be measured using voltage sensing contacts, separate from the current carrying contacts.

**thermal characteristics**

| PARAMETER                                               | MIN | TYP | MAX  | UNIT               |
|---------------------------------------------------------|-----|-----|------|--------------------|
| $R_{\theta JC}$ Junction to case thermal resistance     |     |     | 1    | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ Junction to free air thermal resistance |     |     | 35.7 | $^\circ\text{C/W}$ |

**PRODUCT INFORMATION**

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TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN  
vs  
COLLECTOR CURRENT

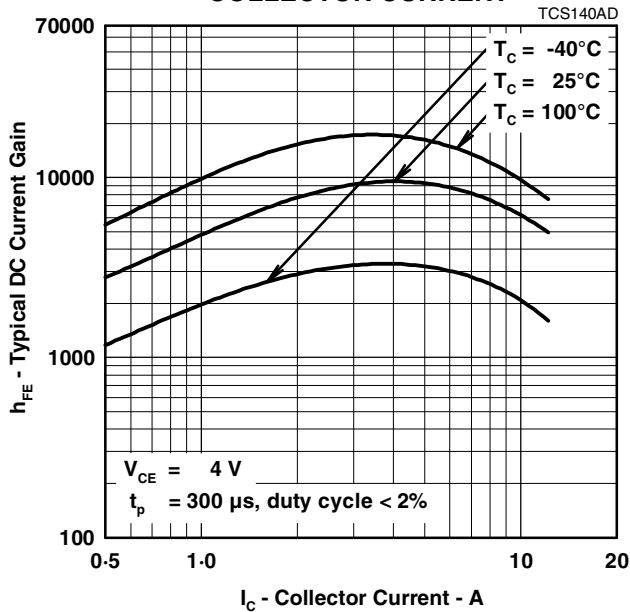


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE  
vs  
COLLECTOR CURRENT

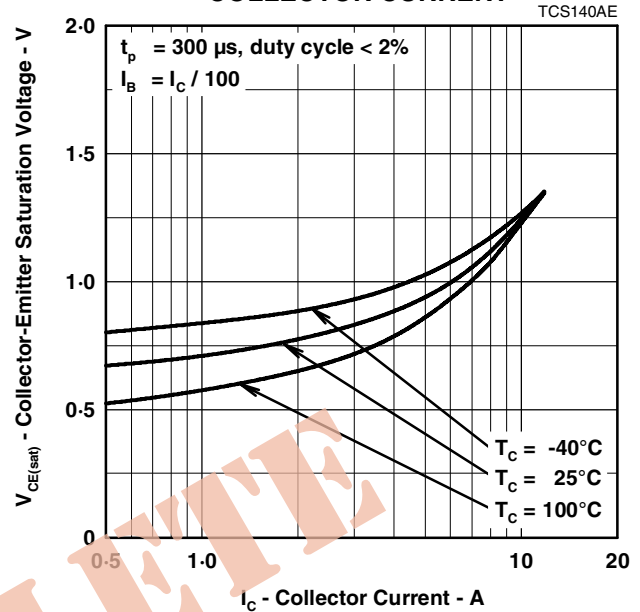


Figure 2.

BASE-EMITTER SATURATION VOLTAGE  
vs  
COLLECTOR CURRENT

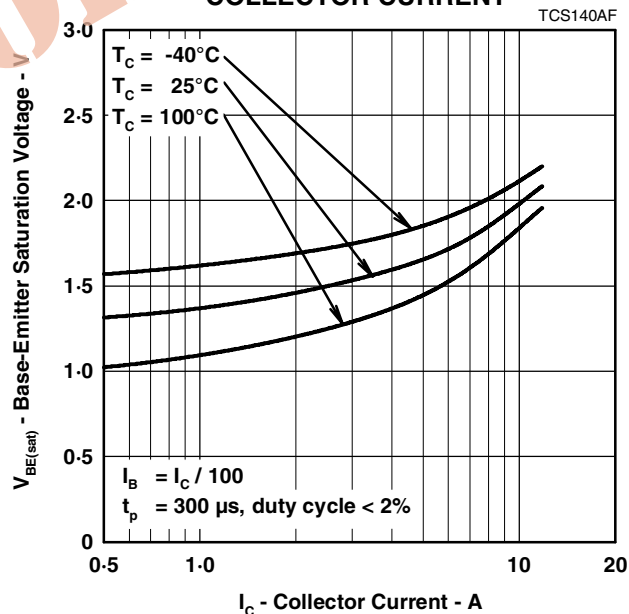


Figure 3.

**PRODUCT INFORMATION**

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**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
vs  
CASE TEMPERATURE**

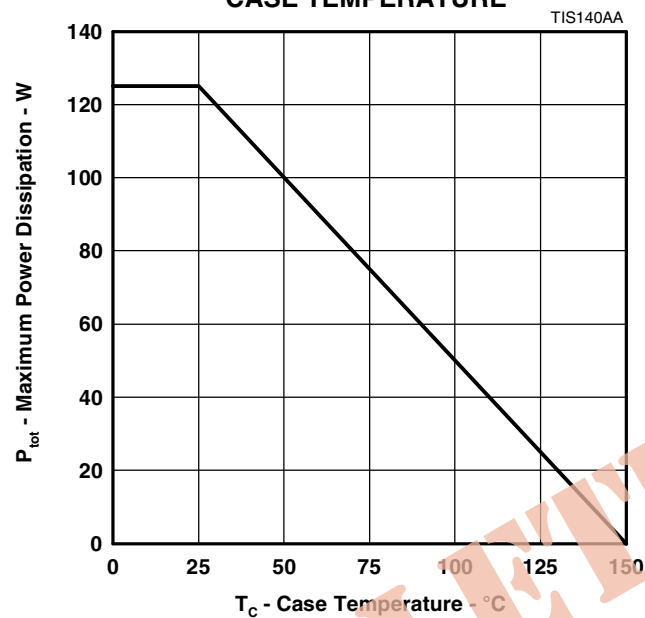


Figure 4.

**PRODUCT INFORMATION**

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