

# BCA65S30D3

## Silicon Carbide Schottky Diode

650V, 30A



### Description

BCA65S30D3 utilizes Bestirpower’s advanced silicon carbide diode technology. This technology combines the benefits of excellent low forward voltage and robustness. Consequently, the family is suitable for application requiring high power efficiency

### Benefits

- High-speed switching
- Low heat dissipation requirements
- Reduce size and cost of the system
- High-reliability
- System efficiency improvement

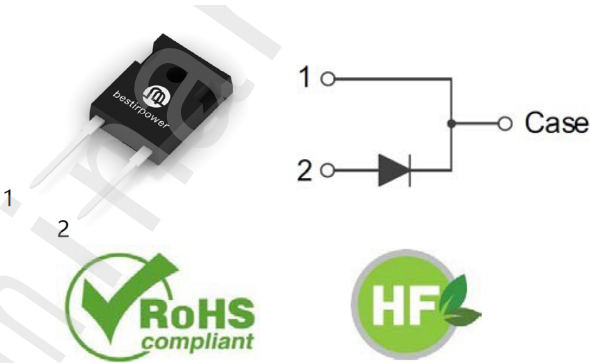
### Applications

- Free Wheeling Diodes in Inverter stages
- Power factor correction
- Data Center
- Switch mode power supply

### Features

| $V_{RRM}$ | $I_F$ | $T_C$ | $Q_C$ |
|-----------|-------|-------|-------|
| 650 V     | 30 A  | 142°C | 85 nC |

- High surge current capability
- No reverse recovery
- Positive temperature coefficient
- Benchmark switching behavior
- RoHS compliant / Halogen-free



### Absolute Maximum Ratings (T<sub>C</sub> = 25°C unless otherwise noted)

| Symbol         | Parameter                                  |                                          | Value       | Unit             |
|----------------|--------------------------------------------|------------------------------------------|-------------|------------------|
| $V_{RRM}$      | Repetitive Peak Reverse Voltage            |                                          | 650         | V                |
| $I_F$          | Forward Current                            | $T_C = 25^{\circ}C$                      | 64          | A                |
|                |                                            | $T_C = 135^{\circ}C$                     | 30          | A                |
| $I_{F,SM}$     | Non-Repetitive Forward Surge Current       | $T_C = 25^{\circ}C, t_p = 10\text{ ms}$  | 216         | A                |
|                |                                            | $T_C = 110^{\circ}C, t_p = 10\text{ ms}$ | 187         | A                |
| $I_{F,RM}$     | Repetitive Peak Forward Surge Current      | $T_C = 25^{\circ}C, t_p = 10\text{ ms}$  | 186         | A                |
| $I^2dt$ value  | $\int I^2 dt$                              | $T_C = 25^{\circ}C, t_p = 10\text{ ms}$  | 233         | A <sup>2</sup> s |
|                |                                            | $T_C = 110^{\circ}C, t_p = 10\text{ ms}$ | 174         | A <sup>2</sup> s |
| $P_{tot}$      | Power Dissipation                          | $T_C = 25^{\circ}C$                      | 217         | W                |
|                |                                            | $T_C = 110^{\circ}C$                     | 94          | W                |
|                |                                            | $T_C = 150^{\circ}C$                     | 36          | W                |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature |                                          | -55 to +175 | °C               |

Thermal Characteristics

| Symbol          | Parameter                                  | Value | Unit |
|-----------------|--------------------------------------------|-------|------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case, Typ. | 0.69  | °C/W |

Electrical Characteristics (T<sub>C</sub> = 25°C unless otherwise noted)

| Symbol          | Parameter                 | Test Conditions                                | Min | Typ  | Max | Unit |
|-----------------|---------------------------|------------------------------------------------|-----|------|-----|------|
| V <sub>DC</sub> | DC blocking voltage       | I <sub>R</sub> =100uA                          | 650 | -    | -   | V    |
| V <sub>F</sub>  | Forward Voltage           | I <sub>F</sub> =30A, T <sub>J</sub> =25°C      | -   | 1.45 | 1.8 | V    |
|                 |                           | I <sub>F</sub> =30A, T <sub>J</sub> =175°C     | -   | 1.95 | -   |      |
| I <sub>R</sub>  | Reverse Current           | V <sub>R</sub> = 650 V, T <sub>J</sub> = 25°C  | -   | 2    | 20  | μA   |
|                 |                           | V <sub>R</sub> = 650 V, T <sub>J</sub> = 175°C | -   | 40   | 200 |      |
| Q <sub>C</sub>  | Total Capacitive Charge   | V <sub>R</sub> = 400 V, T <sub>J</sub> = 25°C  | -   | 85   | -   | nC   |
| C               | Total Capacitance         | V <sub>R</sub> = 0V, f=1MHz                    | -   | 2050 | -   | pF   |
|                 |                           | V <sub>R</sub> = 200V, f=1MHz                  | -   | 162  | -   |      |
|                 |                           | V <sub>R</sub> = 400V, f=1MHz                  | -   | 137  | -   |      |
| E <sub>C</sub>  | Capacitance Stored Energy | V <sub>R</sub> = 400V                          | -   | 21   | -   | μJ   |
|                 |                           |                                                |     |      |     |      |

Package Marking and Ordering Information

| Part Number | Top Marking | Package | Packing Method | Quantity |
|-------------|-------------|---------|----------------|----------|
| BCA65S30D3  | BCA65S30D3  | TO247-2 | Tube           | 30units  |

Typical Performance Characteristics

Figure 1. Forward Characteristics

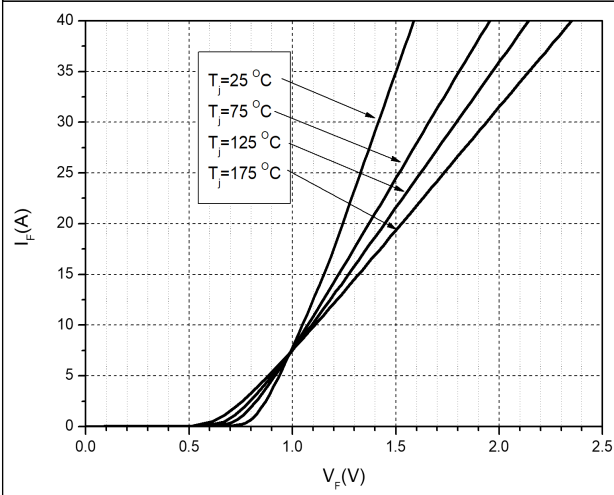


Figure 2. Reverse Characteristics

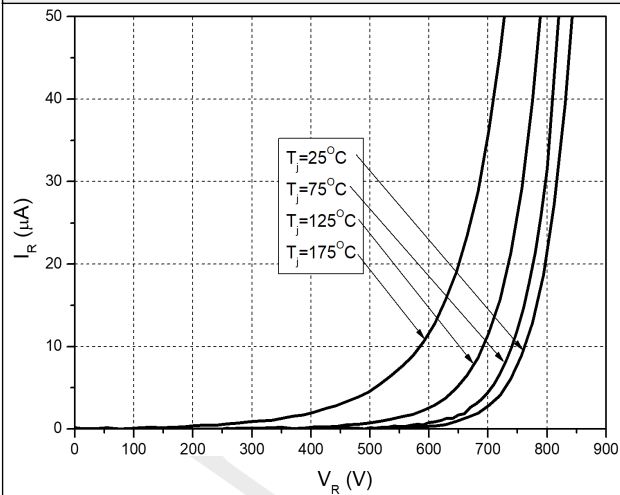


Figure 3. Peak Forward Current Derating

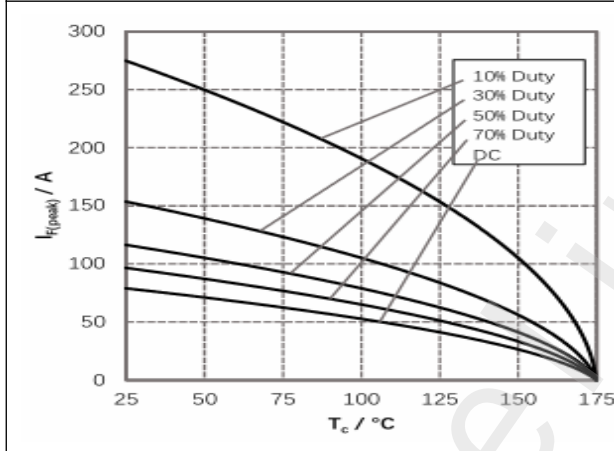


Figure 4. Power Dissipation

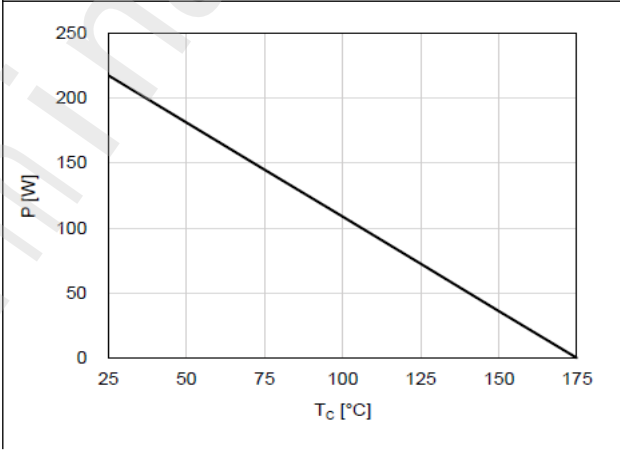


Figure 5. Capacitance vs. Reverse Voltage

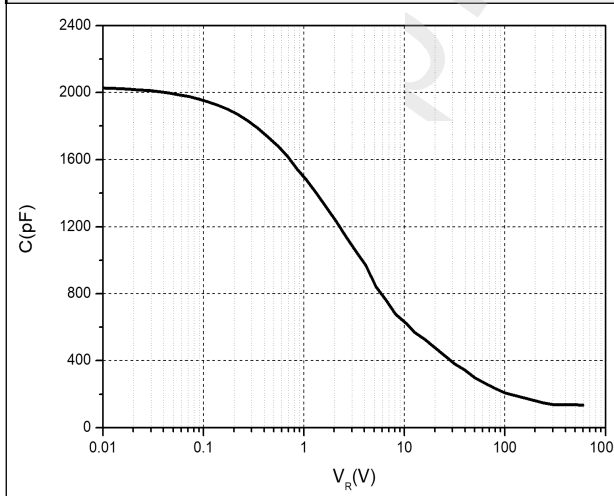
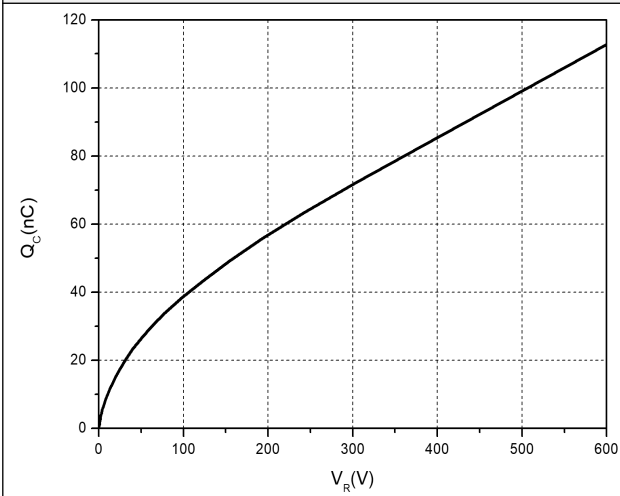
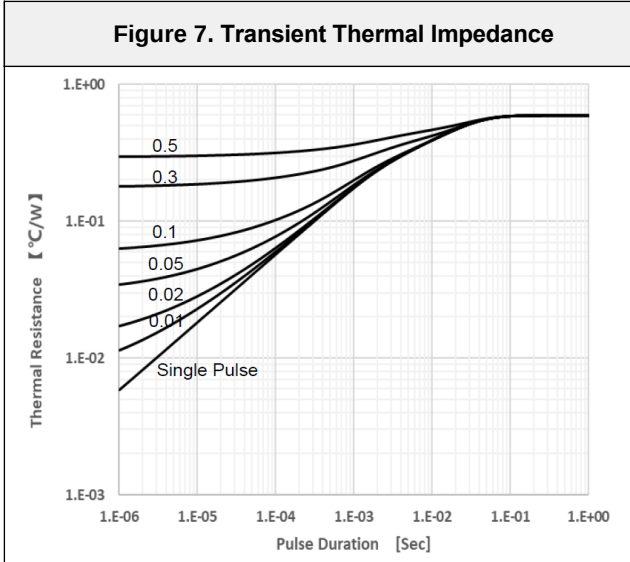


Figure 6. Capacitance Charge vs. Reverse Voltage

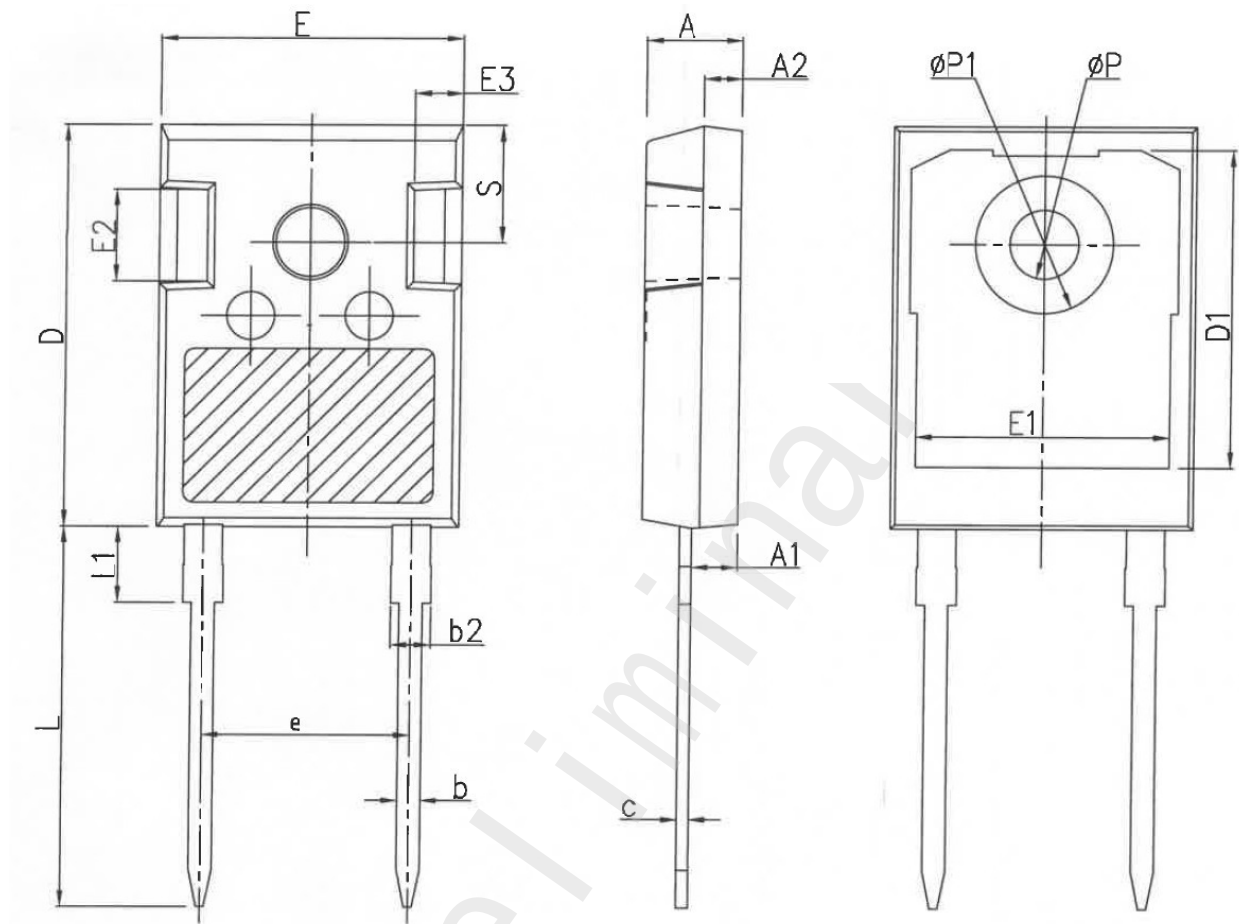


Typical Performance Characteristics

Figure 7. Transient Thermal Impedance



Package Outlines  
TO247-2



COMMON DIMENSIONS

| SYMBOL    | mm       |       |       |
|-----------|----------|-------|-------|
|           | MIN      | NOM   | MAX   |
| A         | 4.80     | 5.00  | 5.20  |
| A1        | 2.21     | 2.41  | 2.59  |
| A2        | 1.85     | 2.00  | 2.15  |
| b         | 1.11     | 1.21  | 1.36  |
| b2        | 1.91     | 2.01  | 2.21  |
| c         | 0.51     | 0.61  | 0.75  |
| D         | 20.70    | 21.00 | 21.30 |
| D1        | 16.25    | 16.55 | 16.85 |
| E         | 15.50    | 15.80 | 16.10 |
| E1        | 13.00    | 13.30 | 13.60 |
| E2        | 4.80     | 5.00  | 5.20  |
| E3        | 2.30     | 2.50  | 2.70  |
| e         | 10.88BSC |       |       |
| L         | 19.62    | 19.92 | 20.22 |
| L1        | -        | -     | 4.30  |
| $\phi P$  | 3.40     | 3.60  | 3.80  |
| $\phi P1$ | -        | -     | 7.30  |
| S         | 6.15BSC  |       |       |

\* Dimensions in millimeters

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