



BCA120S40D2

Silicon Carbide Schottky Diode

1200V, 40A

Description

BCA120S40D2 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

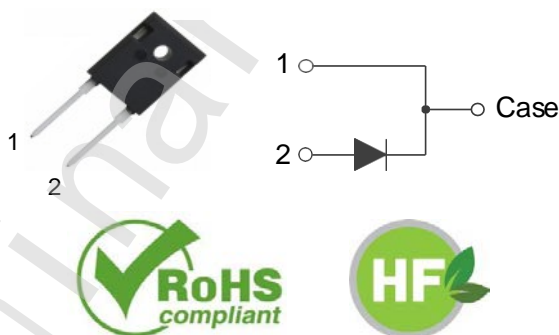
Applications

- Solar inverter, UPS
- EV charging station
- Power Factor Correction

Features

| V_{RRM} | I_F | T_C | Q_C |
|-----------|-------|--------|--------|
| 1200 V | 40 A | 150 °C | 241 nC |

- No reverse recovery current
- Low forward voltage
- 175°C Max junction temperature
- High surge current capability
- Switching behavior independent of temperature
- Halogen Free and RoHS compliant



Absolute Maximum Ratings (T_C = 25°C unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|-----------------------------------|--|--|----------------------|
| V_{RRM} | Repetitive Peak Reverse Voltage | 1200 | V |
| I_F | Forward Current | T _C = 25°C | 115 A |
| | | T _C = 135°C | 50 A |
| | | T _C = 150°C | 40 A |
| $I_{F,SM}$ | Non-Repetitive Forward Surge Current | T _C = 25°C, t _p = 10 ms | 225 A |
| | | T _C = 110°C, t _p = 10 ms | 191 A |
| $I_{F,Max}$ | Non-Repetitive Peak Forward Current | T _C = 25°C, t _p = 10 μs | 1570 A |
| | | T _C = 150°C, t _p = 10 μs | 1335 A |
| I ² dt value | ∫I ² t | T _C = 25°C, t _p = 10 ms | 253 A ² s |
| | | T _C = 150°C, t _p = 10 ms | 182 A ² s |
| P _{tot} | Power Dissipation | T _C = 25°C | 556 W |
| T _J , T _{STG} | Operating Junction and Storage Temperature | -55 to +175 | °C |

Thermal Characteristics

| Symbol | Parameter | Value | Unit |
|-----------------|--|-------|------|
| R _{θC} | Thermal Resistance, Junction to Case, Max. | 0.27 | °C/W |

Package Marking and Ordering Information

| Part Number | Top Marking | Package | Packing Method | Quantity |
|-------------|-------------|---------|----------------|----------|
| BCA120S40D2 | BCA120S40D2 | TO247-2 | Tube | 30 units |

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

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--------|---------------------------|--|-----|------|------|---------------|
| V_F | Forward Voltage | $I_F = 40\text{ A}, T_C = 25^\circ\text{C}$ | | 1.39 | 1.70 | V |
| | | $I_F = 40\text{ A}, T_C = 175^\circ\text{C}$ | | 1.8 | - | |
| I_R | Reverse Current | $V_R = 1200\text{ V}, T_C = 25^\circ\text{C}$ | | 10 | 100 | μA |
| | | $V_R = 1200\text{ V}, T_C = 175^\circ\text{C}$ | | - | 300 | |
| Q_C | Total Capacitive Charge | $V_R = 800\text{ V}, T_C = 25^\circ\text{C}$ | | 241 | | nC |
| C | Total Capacitance | $V_R = 1\text{ V}, f = 100\text{ kHz}$ | | 2638 | | pF |
| | | $V_R = 800\text{ V}, f = 100\text{ kHz}$ | | 165 | | |
| E_C | Capacitance Stored Energy | $V_R = 800\text{ V}, T_C = 25^\circ\text{C}$ | | 69 | | μJ |

Typical Performance Characteristics

Figure 1. Power Derating

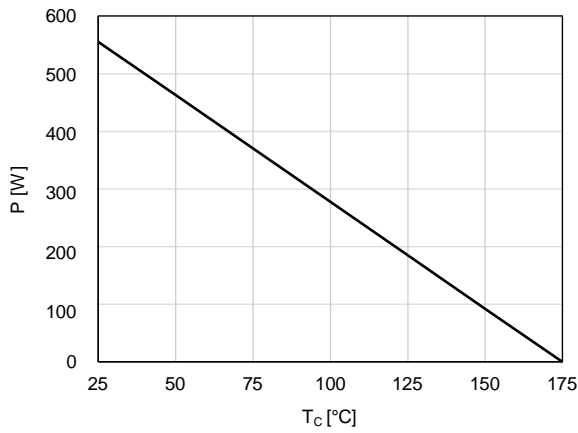


Figure 2. Current Derating

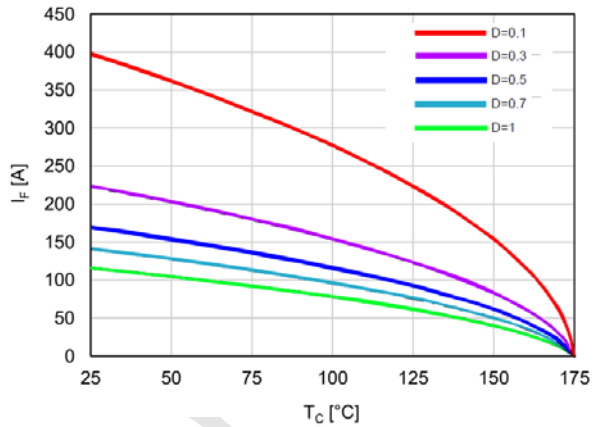


Figure 3. Forward Characteristics

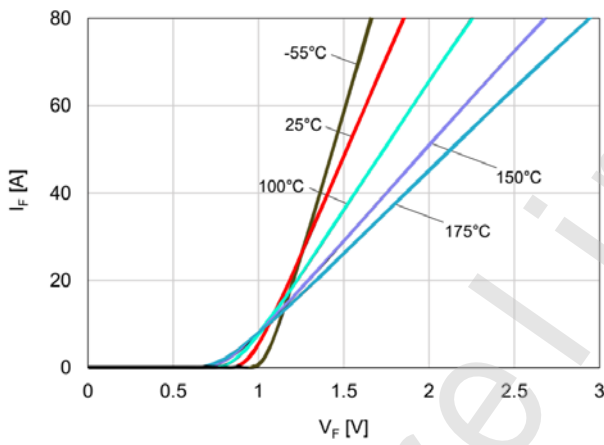


Figure 4. Reverse Characteristics

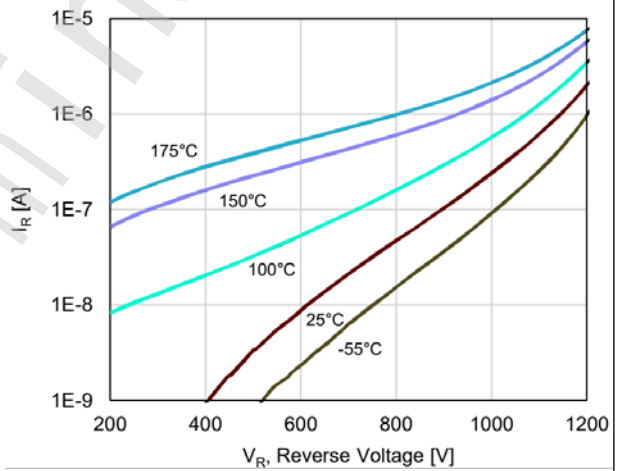


Figure 5. Capacitive Charge Characteristics

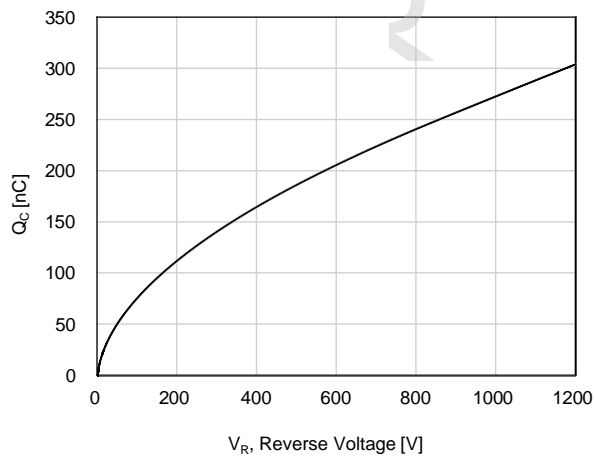
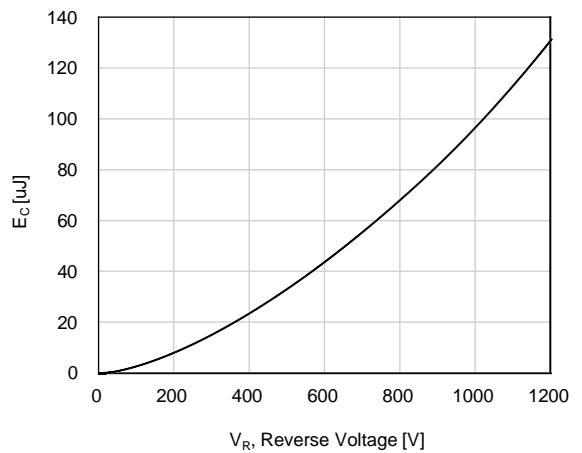


Figure 6. Capacitance Stored Energy



Typical Performance Characteristics

Figure 7. Capacitance Characteristics

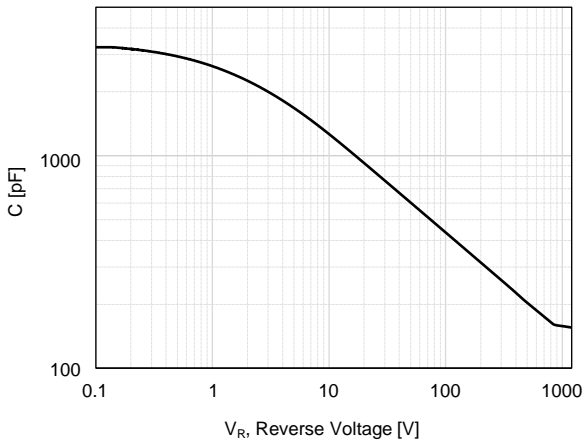
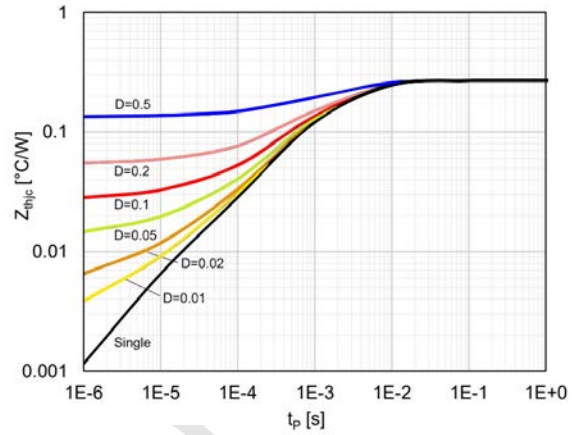


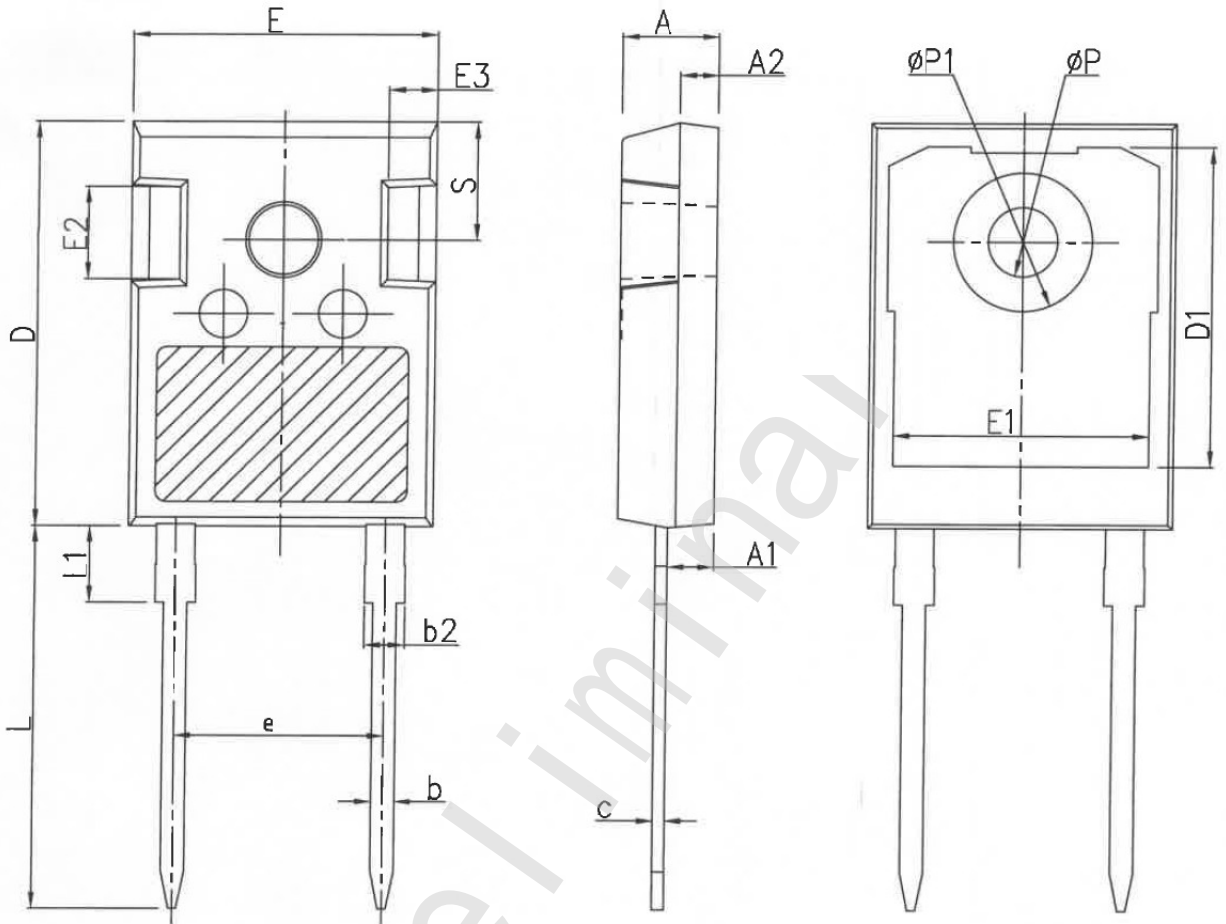
Figure 8. Transient Thermal Response Curve



preliminary

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 |
| ΦP | 3.40 | 3.60 | 3.80 |
| ΦP1 | - | - | 7.30 |
| S | 6.15BSC | | |

* Dimensions in millimeters

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