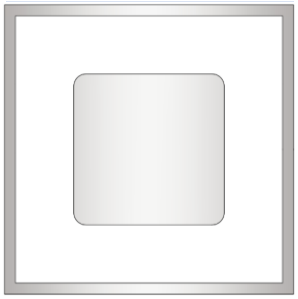
# CPW4-1200-S002B

## Gen 4 Silicon Carbide Schottky Diode



Package Type: Bare Die
PN's: CPW4-1200-S002B

### Description

This is the 4th generation of high voltage, high performance Z-Rec© silicon carbide Schottky diode in a packageless bare die format to be implemented into any custom module design. The lower forward voltage, smaller reverse leakage current, zero reverse recovery, and high thermal conductivity make this Schottky diode ideal for high frequency switching applications including solar inverter and motor drives. This Schottky diode can be used in conjunction with either IGBT or MOSFET as an anti-parallel diode, or as a rectifier.

### Features

- 1200V Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on $V_F$

### Applications

- Solar Inverters
- Motor Drives
- UPS
- Industrial Power Supplies

### Absolute Maximum Ratings

Stress beyond those listed under absolute maximum ratings may damage the device.

| Parameter | Symbol | | Rating | Unit |
|---|---|---|---|---|
| Repetitive Peak Reverse Voltage | $V_{RRM}$ | | 1200 | V |
| Continuous Forward Current | $I_F$ | $T_c$ = 175°C | 2 | A |
| Repetitive Peak Forward Surge Current, assumes $t_p$ = 10ms, Half Sine Wave Pulse | $I_{FRM}$ | $T_c$ = 25°C | 13 | A |
| | | $T_c$ = 110°C | 8.4 | |
| Non-Repetitive Forward Surge Current, assumes $t_p$ = 10ms, Half Sine Wave Pulse | $I_{FSM}$ | $T_c$ = 25°C | 19 | A |
| | | $T_c$ = 110°C | 16.5 | |
| Virtual Junction and Storage Temperature | $T_{VJ}$, $T_{stg}$ | | -55 to +175 | °C |
| Maximum Processing Temperature, in non-reactive ambient | $T_{proc}$ | | 325 | °C |

Note: All above notation to $T_c$ specifies case temperature from die packaged in TO-247, with Rth(j-c) < 2.5°C/W


4600 Silicon Drive | Durham, NC 27703 | Tel: +1.919.313.5300 | wolfspeed.com/power

## Electrical Characteristics ($T_{VJ}$ = 25˚C)

| Parameter | Symbol | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|
| Forward Voltage | $V_f$ | 1.4 | 1.8 | V | $I_F$ = 2 A |
| | | 1.9 | 3 | | $I_F$ = 2 A, $T_{VJ}$ = 175°C |
| Reverse Current | $I_R$ | 10 | 50 | µA | $V_R$ = 1200 V |
| | | 40 | 150 | | $V_R$ = 1200 V, $T_{VJ}$ = 175°C |
| Total Capacitive Charge | $Q_C$ | 11 | | nC | $V_R$ = 800 V, $I_F$ = 2 A, di/dt = 200 A/µs |
| Total Capacitance | C | 167 | | pF | $V_R$ = 0 V, f = 1Mhz |
| | | 11 | | | $V_R$ = 400 V, f = 1Mhz |
| | | 8 | | | $V_R$ = 800 V, f = 1Mhz |

## Thermal Characteristics

| Parameter | Symbol | Typical | Unit |
|---|---|---|---|
| Thermal Resistance from Junction to Case[1] | $R_{th(j-c)}$ | 2.5 | °C/W |

Note:
[1]Tested in TO-247 Package

## Typical Performance

All the graphs are based on a die placed in a TO-247 package.

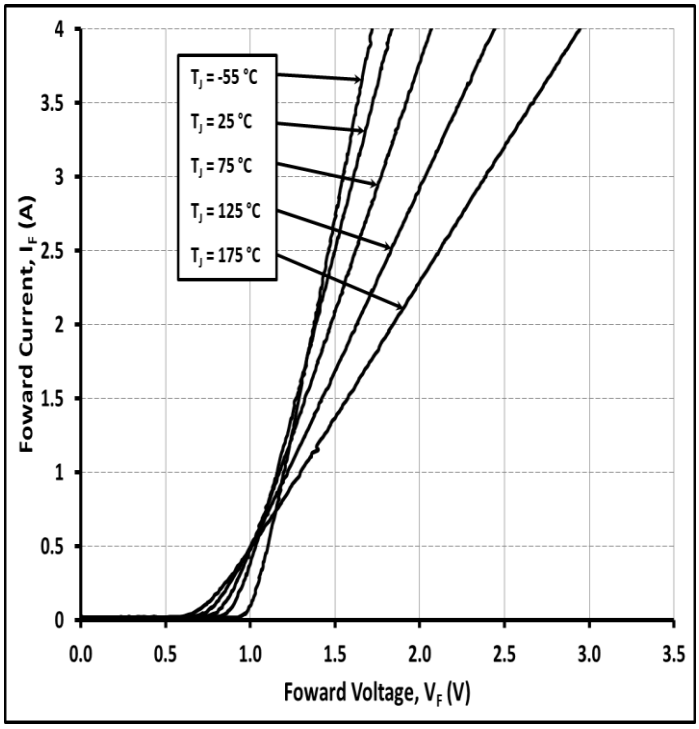



**Figure 1.**

Typical Forward Characteristics

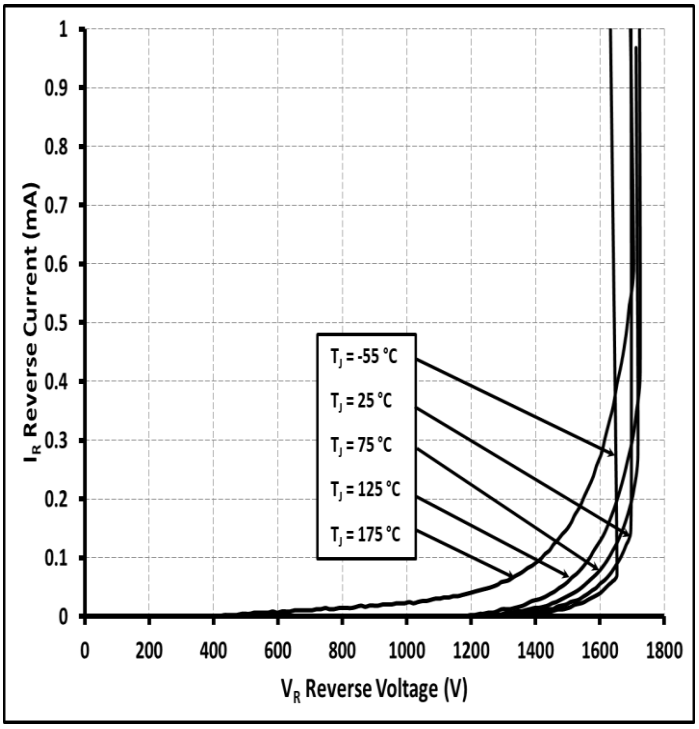



**Figure 2.**

Typical Reverse Characteristics

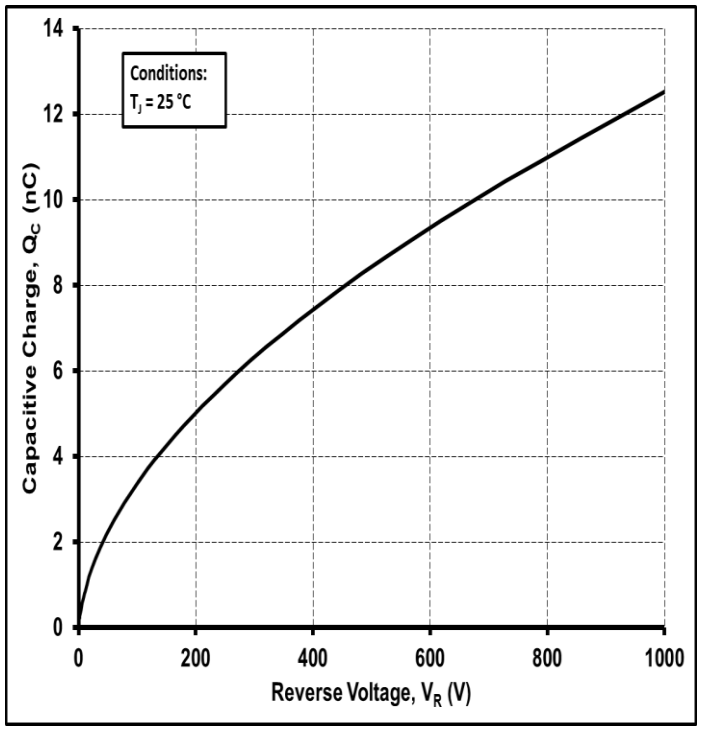



**Figure 3.**

Typical Capacitance vs Reverse Voltage

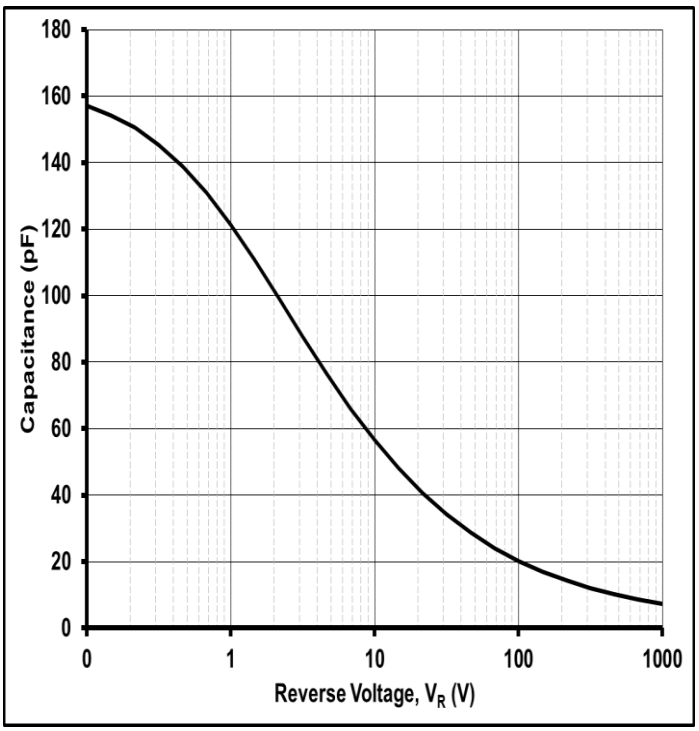
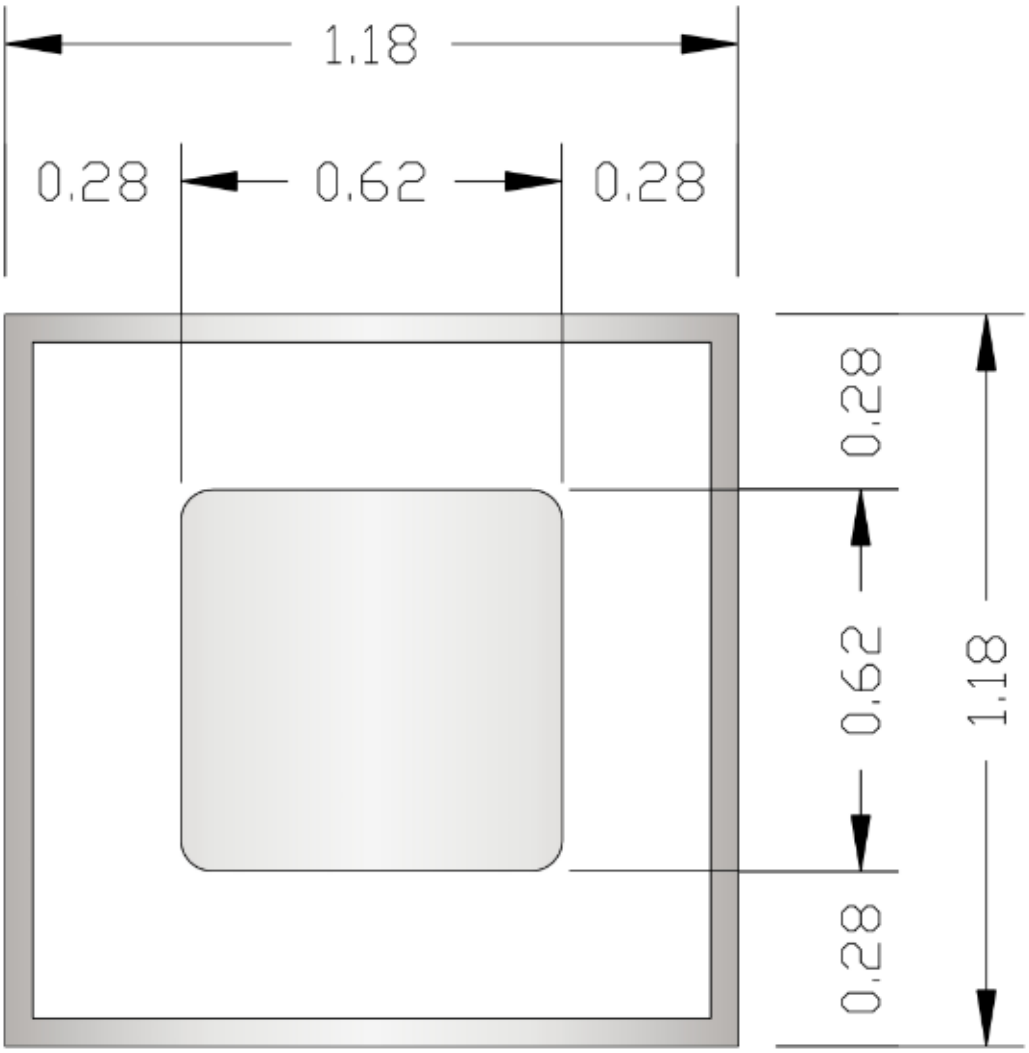



**Figure 4.**

Typical Recovery Charge vs Reverse Voltage

## Product Dimensions CPW4-1200-S002B




## Product Dimensions CPW4-1200-S002B

| Parameter | Typical | Units |
|---|---|---|
| Die Size (L x W) | 1.18 x 1.18 | mm |
| Anode Pad Opening | 0.62 x 0.62 | mm |
| Die Thickness[1] | 377 ± 10% | µm |
| Topside Anode Metalization (Al) | 4 | µm |
| Backside Cathode Metalization (Ni/Ag) | 1.8 | µm |
| Frontside Passivation (polymide) | Polyimide | |

[1]SiC Thickness

## Product Ordering Information

| Order Number | Description | Package |
|---|---|---|
| CPW4-1200-S002B-FU6 | SiC Diode G4 IND 1200V/2A FULL MLT | Bare Die Product |

## Revision History

| Revision History | Date of Change | Brief Summary |
|---|---|---|
| 2 | | Initial Release |
| 3 | 9/30/2023 | Template updated |

## Notes & Disclaimer

This document and the information contained herein are subject to change without notice. Any such change shall be evidenced by the publication of an updated version of this document by Wolfspeed. No communication from any employee or agent of Wolfspeed or any third party shall effect an amendment or modification of this document. No responsibility is assumed by Wolfspeed for any infringement of patents or other rights of third parties which may result from use of the information contained herein. No license is granted by implication or otherwise under any patent or patent rights of Wolfspeed.

Notwithstanding any application-specific information, guidance, assistance, or support that Wolfspeed may provide, the buyer of this product is solely responsible for determining the suitability of this product for the buyer's purposes, including without limitation for use in the applications identified in the next bullet point, and for the compliance of the buyers' products, including those that incorporate this product, with all applicable legal, regulatory, and safety-related requirements.

This product has not been designed or tested for use in, and is not intended for use in, applications in which failure of the product would reasonably be expected to cause death, personal injury, or property damage, including but not limited to equipment implanted into the human body, life-support machines, cardiac defibrillators, and similar emergency medical equipment, aircraft navigation, communication, and control systems, aircraft power and propulsion systems, air traffic control systems, and equipment used in the planning, construction, maintenance, or operation of nuclear facilities.

**RoHS Compliance**

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Wolfspeed representative or from the Product Documentation sections of www.Wolfspeed.com.

**REACh Compliance**

REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact your Wolfspeed representative to ensure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information is also available upon request.

**Contact info:**

4600 Silicon Drive
Durham, NC 27703 USA
Tel: +1.919.313.5300
www.wolfspeed.com/power




© 2023 Wolfspeed, Inc. All rights reserved. Wolfspeed® and the Wolfstreak logo are registered trademarks and the Wolfspeed logo is a trademark of Wolfspeed, Inc.
The information in this document is subject to change without notice.