

# CPW4-1200-S020B

## Silicon Carbide Schottky Diode Chip

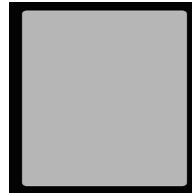
### Z-REC<sup>®</sup> RECTIFIER

$V_{RRM}$	=	1200 V
$I_{F(AVG)}$	=	20 A
$Q_c$	=	130 nC

#### Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on  $V_F$

#### Chip Outline



Part Number	Die Size	Anode	Cathode
CPW4-1200S020B	3.08 x 3.08 mm <sup>2</sup>	Al	Ni/Ag

#### Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{RRM}$	Repetitive Peak Reverse Voltage	1200	V		
$V_{RSM}$	Surge Peak Reverse Voltage	1300	V		
$V_R$	DC Peak Blocking Voltage	1200	V		
$I_F$	Continuous Forward Current	20	A	$T_J=175^\circ\text{C}$	1
$I_{FRM}$	Repetitive Peak Forward Surge Current	91 61	A	$T_c=25^\circ\text{C}, t_p=10\text{ ms}, \text{Half Sine Pulse}$ $T_c=110^\circ\text{C}, t_p=10\text{ ms}, \text{Half Sine Pulse}$	1
$I_{FSM}$	Non-Repetitive Forward Surge Current	130 110	A	$T_c=25^\circ\text{C}, t_p=10\text{ ms}, \text{Half Sine Pulse}$ $T_c=110^\circ\text{C}, t_p=10\text{ ms}, \text{Half Sine Pulse}$	1
$I_{F,Max}$	Non-Repetitive Peak Forward Current	1150 950	A	$T_c=25^\circ\text{C}, t_p=10\ \mu\text{s}, \text{Pulse}$ $T_c=110^\circ\text{C}, t_p=10\ \mu\text{s}, \text{Pulse}$	
$T_J, T_{stg}$	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		
$T_{Proc}$	Maximum Processing Temperature	325	$^\circ\text{C}$	10 min. maximum	

1. Assumes  $R_{\theta JC}$  Thermal Resistance of 0.62 $^\circ\text{C}/\text{W}$  or less

## Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$V_F$	Forward Voltage	1.5 2.2	1.8 3	V	$I_F = 20\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 20\text{ A}$ $T_J = 175^\circ\text{C}$	Fig. 1
$I_R$	Reverse Current	35 65	200 400	$\mu\text{A}$	$V_R = 1200\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 1200\text{ V}$ $T_J = 175^\circ\text{C}$	Fig. 2
$Q_C$	Total Capacitive Charge	99		nC	$V_R = 800\text{ V}$ , $I_F = 20\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$	Fig. 3
C	Total Capacitance	1500 93 67		pF	$V_R = 0\text{ V}$ , $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$ $V_R = 400\text{ V}$ , $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$ $V_R = 800\text{ V}$ , $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$	Fig. 4

## Mechanical Parameters

Parameter	Typ.	Unit
Die Size	3.08 x 3.08	mm
Anode Pad Size	2.79 x 2.79	mm
Anode Pad Opening	2.51 x 2.51	mm
Thickness	377 $\pm$ 10%	$\mu\text{m}$
Wafer Size	100	mm
Anode Metalization (Al)	4	$\mu\text{m}$
Cathode Metalization (Ni/Ag)	1.4	$\mu\text{m}$
Frontside Passivation	Polyimide	

## Typical Characteristics

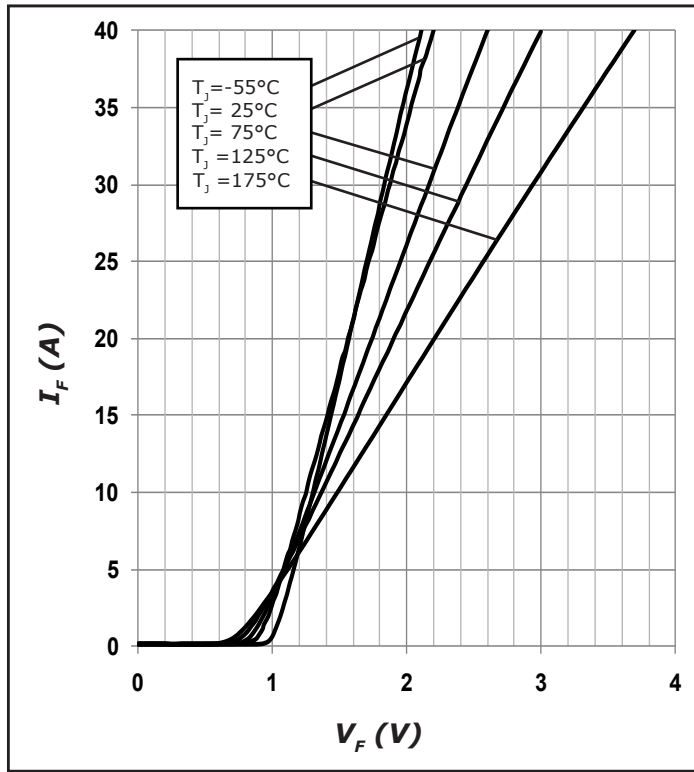


Figure 1. Forward Characteristics

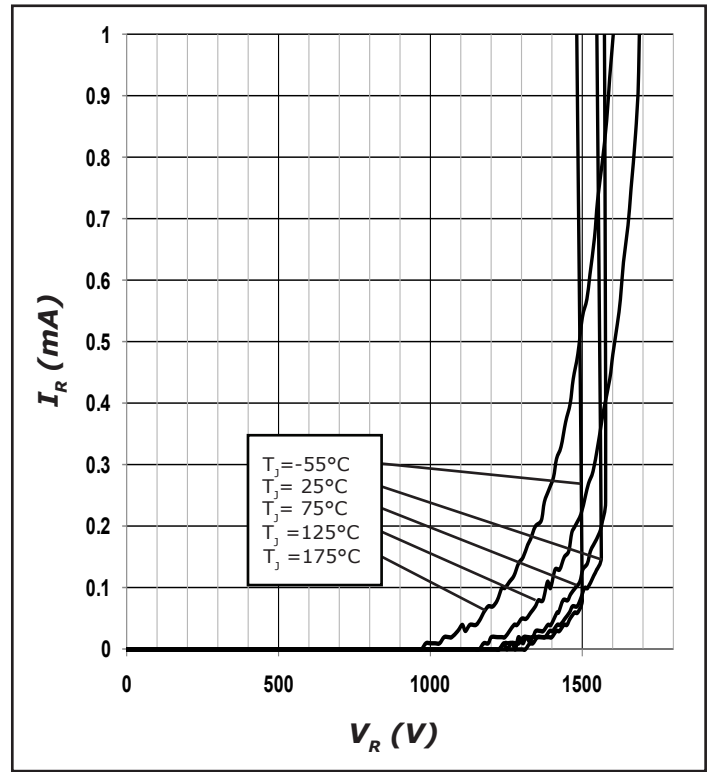


Figure 2. Reverse Characteristics

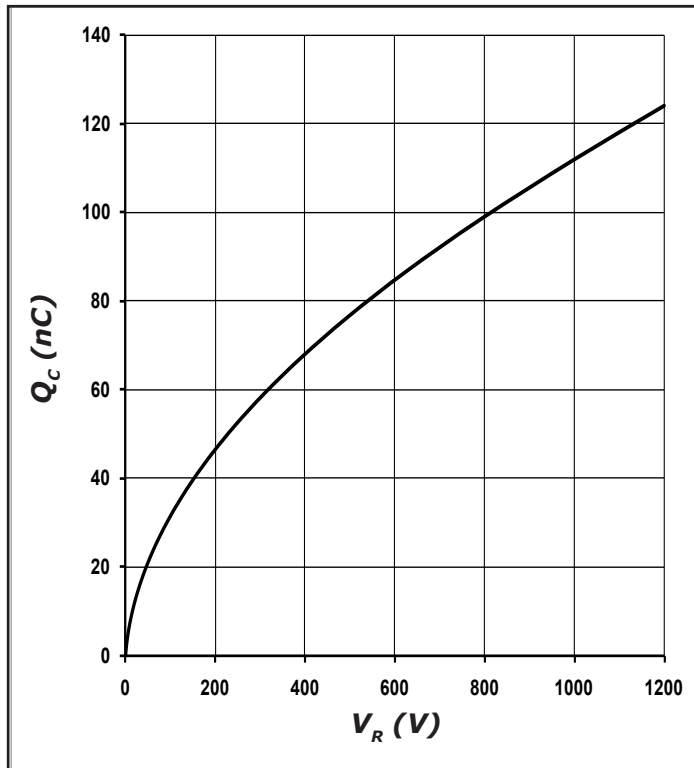


Figure 3. Total Capacitance Charge vs. Reverse Voltage

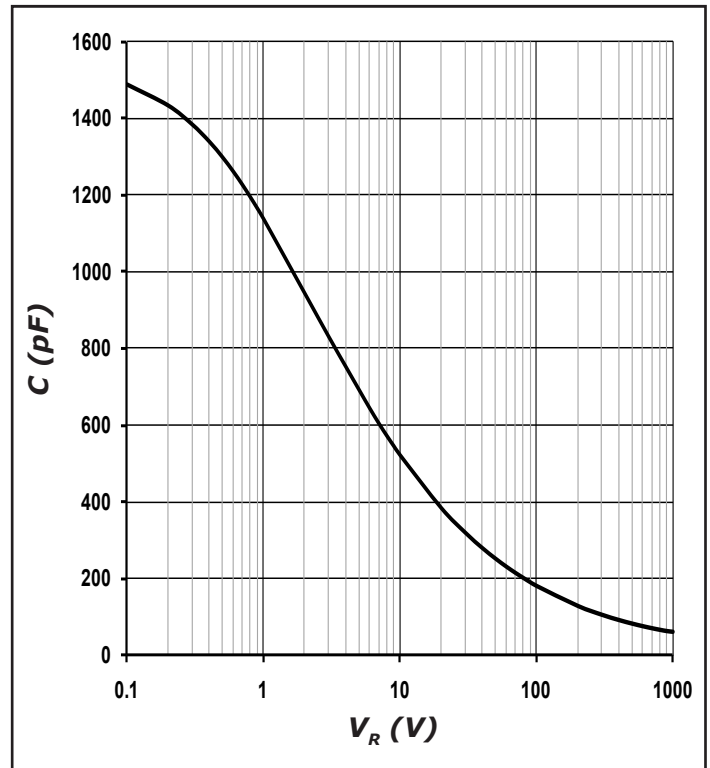
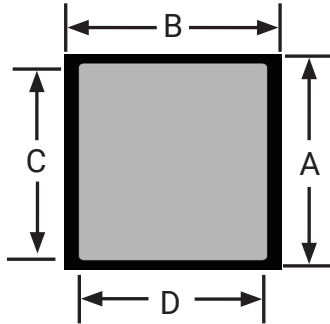


Figure 4. Capacitance vs. Reverse Voltage

## Chip Dimensions



symbol	dimension	
	mm	inch
A	3.08	0.121
B	3.08	0.121
C	2.51	0.099
D	2.51	0.099

## Notes

- 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 Cree representative or from the Product Documentation sections of [www.cree.com](http://www.cree.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 a Cree representative to insure you get the most up-to-date REACH SVHC Declaration. REACH banned substance information (REACH Article 67) is also available upon request.
- This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control systems.

## Related Links

- Cree SiC Schottky diode portfolio: <http://www.cree.com/diodes>
- CPW4 Spice models: [http://response.cree.com/Request\\_Diode\\_model](http://response.cree.com/Request_Diode_model)
- SiC MOSFET and diode reference designs: [http://response.cree.com/SiC\\_RefDesigns](http://response.cree.com/SiC_RefDesigns)