

Silicon Carbide PiN Diode Chip

Features

- 10 kV blocking
- 250 °C operating temperature
- Fast turn off characteristics
- Soft reverse recovery characteristics
- Ultra-Fast high temperature switching



Advantages

- Industry's lowest conduction losses
- Reduced stacking
- Reduced system complexity/Increased reliability

Applications

- Voltage Multiplier
- Ignition/Trigger Circuits
- Oil/Downhole
- Lighting
- Defense

Maximum Ratings at $T_j = 250\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V_{RRM}		10	kV
Continuous forward current	I_F	$T_C \leq 150\text{ °C}$	2	A
RMS forward current	$I_{F(RMS)}$	$T_C \leq 150\text{ °C}$	1	A
Operating and storage temperature	T_j, T_{stg}		-55 to 250	°C

Electrical Characteristics at $T_j = 250\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	V_F	$I_F = 2\text{ A}, T_j = 25\text{ °C}$		4.4	4.8	V
		$I_F = 2\text{ A}, T_j = 225\text{ °C}$		4.1	4.5	
Reverse current	I_R	$V_R = 10\text{ kV}, T_j = 25\text{ °C}$		0.1	3	μA
		$V_R = 10\text{ kV}, T_j = 225\text{ °C}$			50	
Total reverse recovery charge	Q_{rr}	$I_F \leq I_{F,MAX}$ $di_F/dt = 70\text{ A}/\mu\text{s}$ $T_j = 225\text{ °C}$	$V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$	558		nC
Switching time	t_s		$V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$	< 236		ns
Total capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$		20		pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$		5		
		$V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$		4		
Total capacitive charge	Q_C	$V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$		5.34		nC

*For chip size and metallization, please refer to the mechanical datasheet (must have a non-disclosure agreement with GeneSiC Semiconductor).

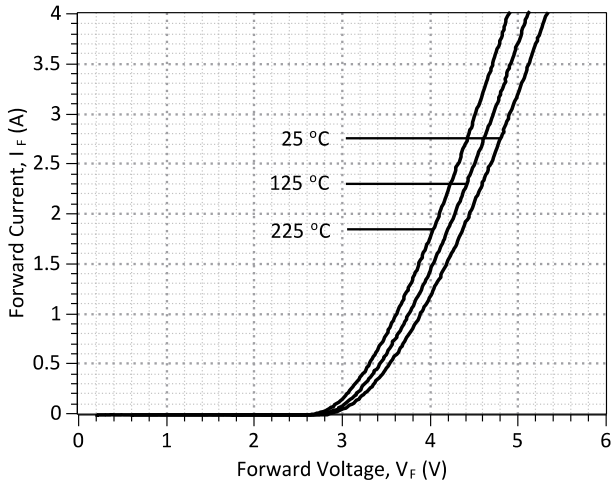


Figure 1: Typical Forward Characteristics

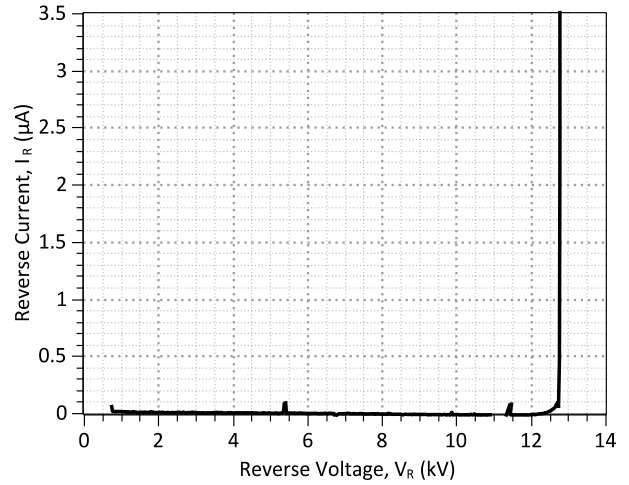


Figure 2: Typical Reverse Characteristics

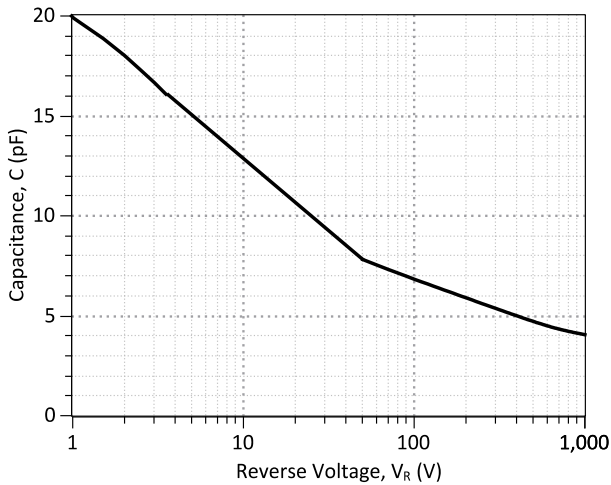


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

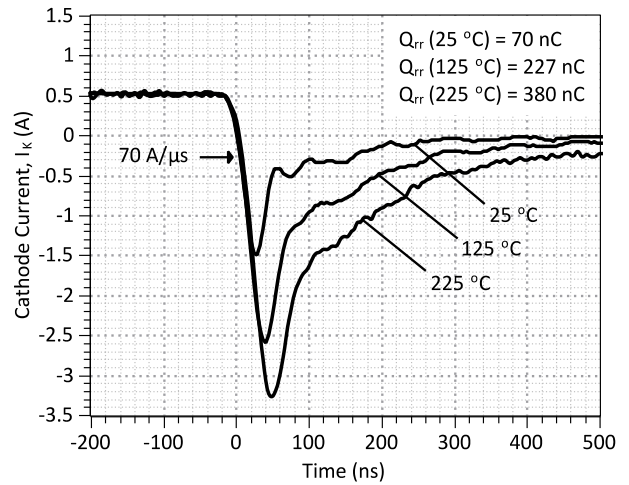


Figure 4: Typical Turn Off Characteristics at $I_k = 0.5 \text{ A}$ and $V_R = 1000 \text{ V}$

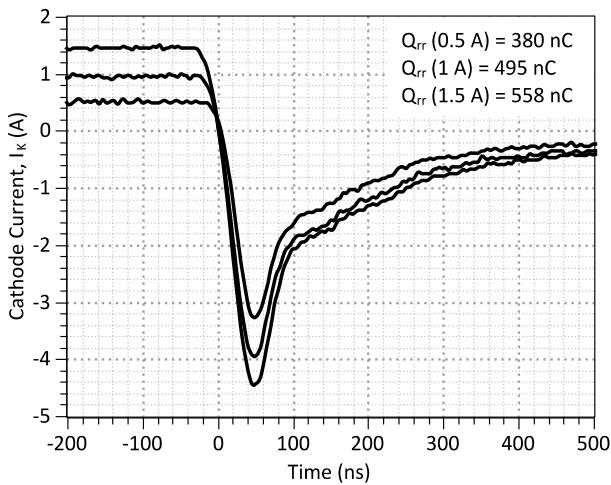


Figure 5: Typical Turn Off Characteristics at $T_j = 225 \text{ °C}$ and $V_R = 1000 \text{ V}$

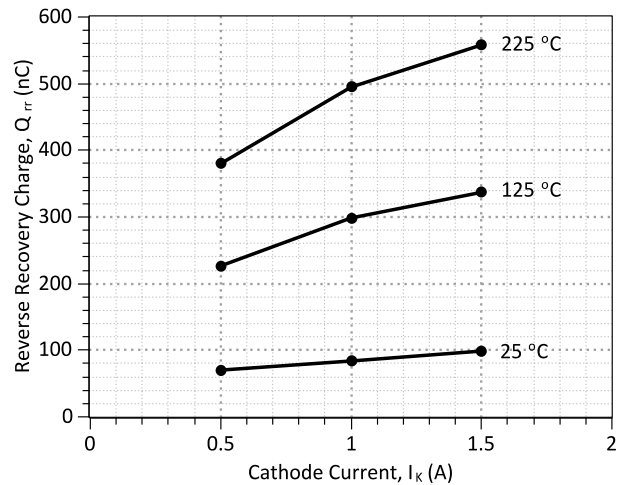


Figure 6: Reverse Recovery Charge vs Cathode Current

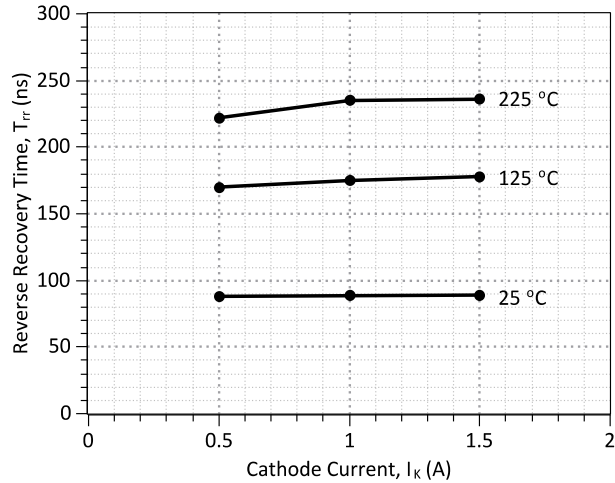


Figure 7: Reverse Recovery Time vs Cathode Current

Revision History

Date	Revision	Comments	Supersedes
2012/08/15	0	Initial release	

Published by

GeneSiC Semiconductor, Inc.
 43670 Trade Center Place Suite 155
 Dulles, VA 20166

GeneSiC Semiconductor, Inc. reserves right to make changes to the product specifications and data in this document without notice.

GeneSiC disclaims all and any warranty and liability arising out of use or application of any product. No license, express or implied to any intellectual property rights is granted by this document.

Unless otherwise expressly indicated, GeneSiC products are not designed, tested or authorized for use in life-saving, medical, aircraft navigation, communication, air traffic control and weapons systems, nor in applications where their failure may result in death, personal injury and/or property damage.