

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}	$I_F \leq I_{F,MAX}$ $di_F/dt = 70\text{ A}/\mu\text{s}$ $T_j = 225\text{ °C}$		558		nC
Switching time	t_s	$V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$				ns
		$V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$		< 236		
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).

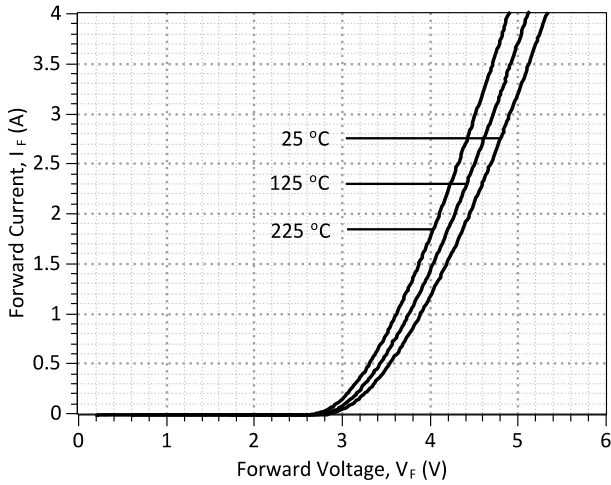


Figure 1: Typical Forward Characteristics

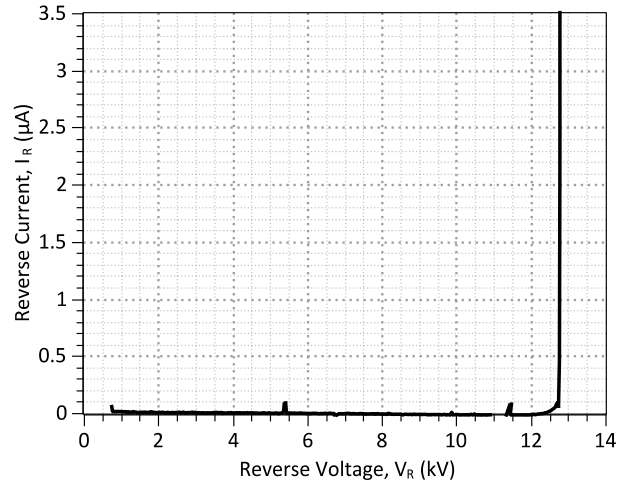


Figure 2: Typical Reverse Characteristics

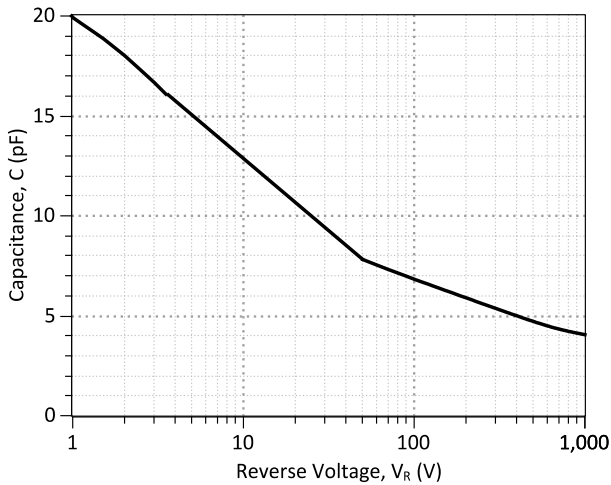


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

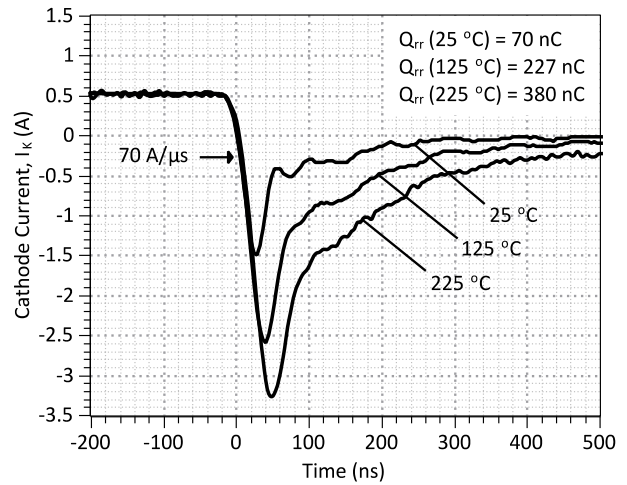


Figure 4: Typical Turn Off Characteristics at $I_k = 0.5 \text{ A}$ and $V_R = 1000 \text{ V}$

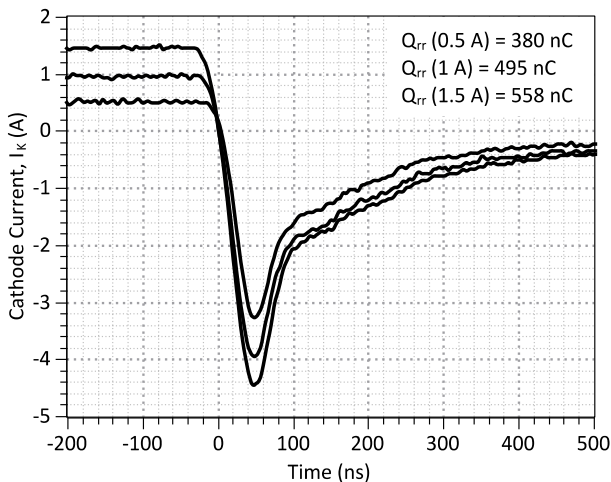


Figure 5: Typical Turn Off Characteristics at $T_j = 225 \text{ °C}$ and $V_R = 1000 \text{ V}$

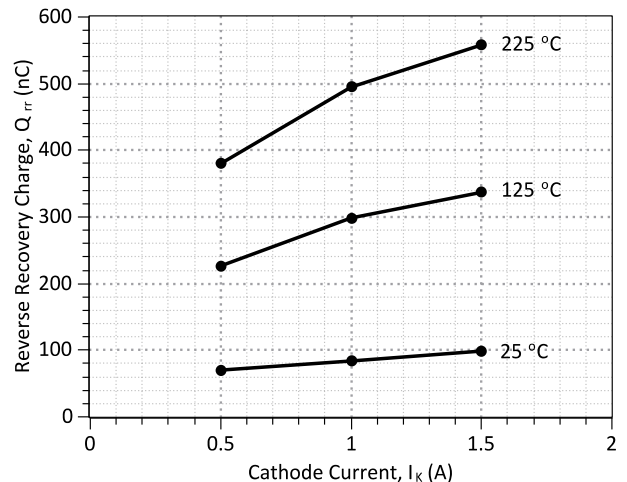


Figure 6: Reverse Recovery Charge vs Cathode Current

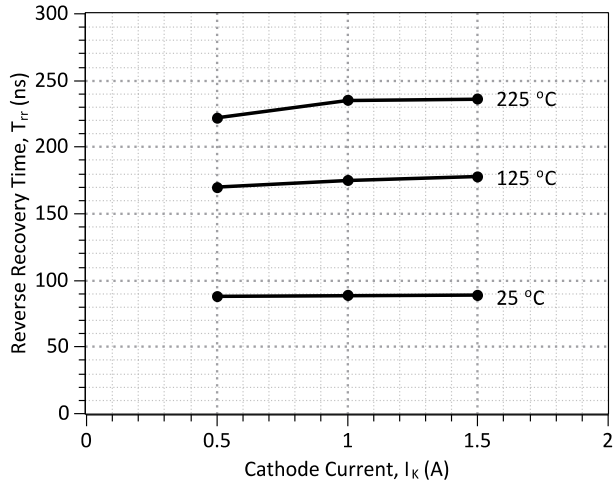


Figure 7: Reverse Recovery Time vs Cathode Current

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

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