

## 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	$\mu\text{A}$
		$V_R = 10\text{ kV}, T_j = 225\text{ °C}$			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	
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).

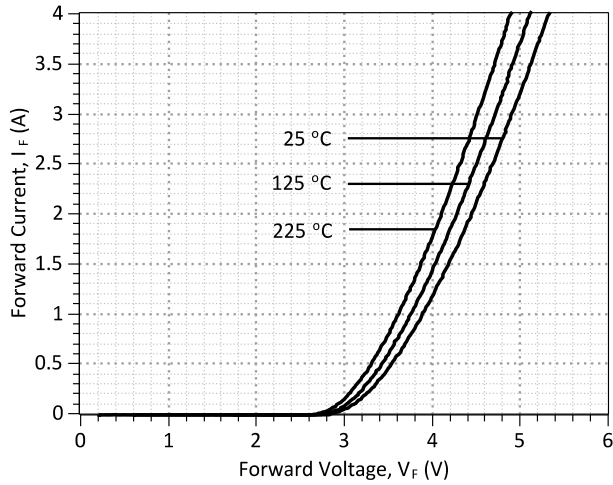


Figure 1: Typical Forward Characteristics

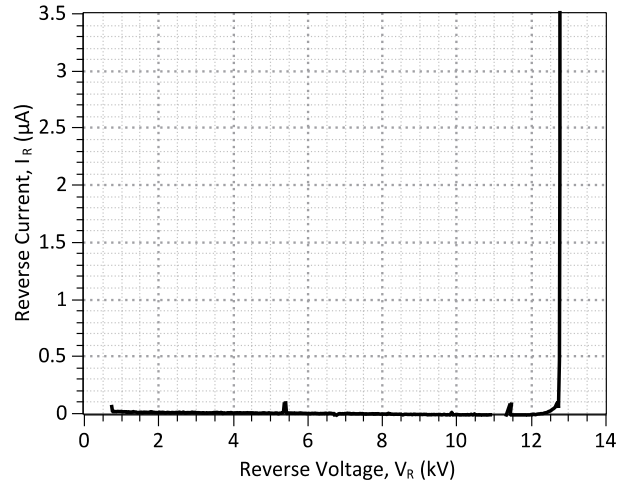


Figure 2: Typical Reverse Characteristics

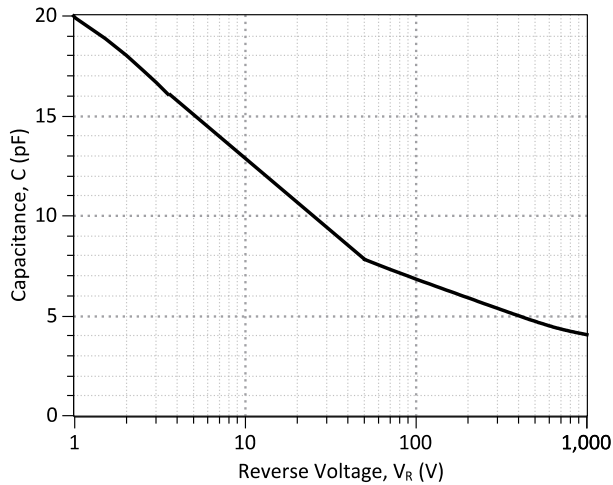


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

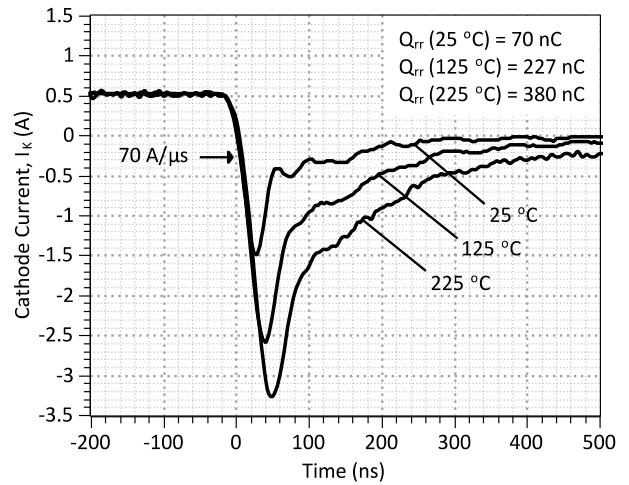


Figure 4: Typical Turn Off Characteristics at  $I_k = 0.5 \text{ A}$  and  $V_R = 1000 \text{ V}$

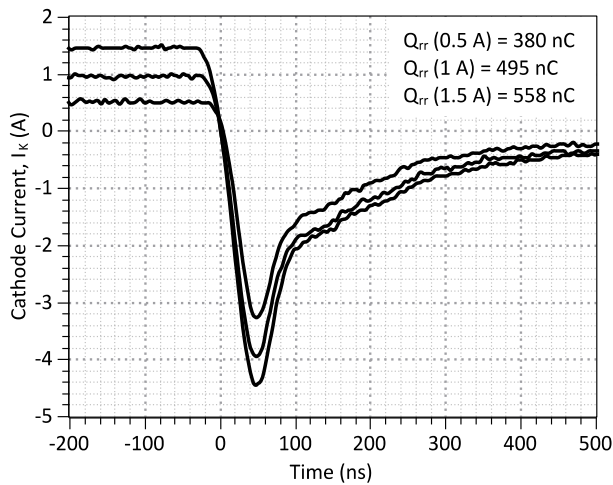


Figure 5: Typical Turn Off Characteristics at  $T_j = 225 \text{ °C}$  and  $V_R = 1000 \text{ V}$

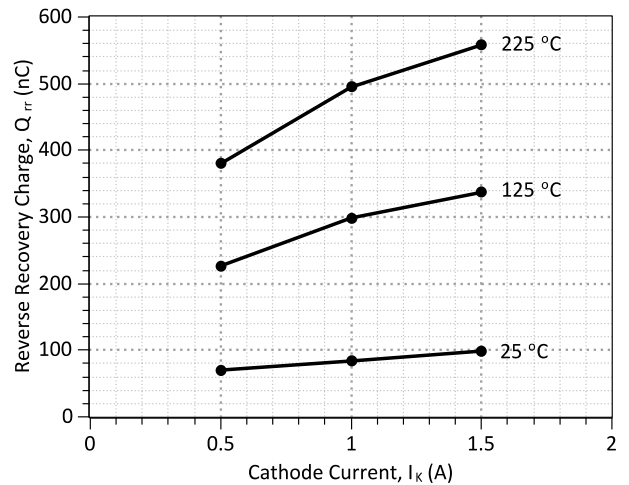
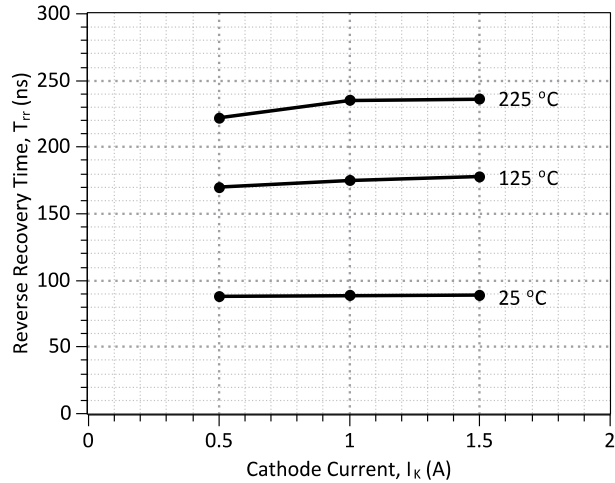


Figure 6: Reverse Recovery Charge vs Cathode Current


**Figure 7: Reverse Recovery Time vs Cathode Current**

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

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