

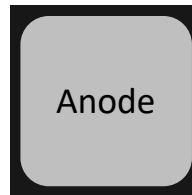
V <sub>DC</sub>	1200 V
Q <sub>C</sub>	269 nC
I <sub>F</sub>	50 A
T <sub>j,max</sub>	175 °C

## 1200V/50A SiC Schottky Diode Bare Die

### Amp+™ Features

- Unipolar rectifier with surge current
- Zero reverse recovery current
- Fast, temperature-independent switching
- Reduced temperature dependence of V<sub>F</sub>

### Chip Outline



Part #	Die Size	Anode	Cathode
GP3D050A120X	4.93 x 4.93 mm	Al	Ni/Ag

### Maximum Ratings, at T<sub>j</sub>=25 °C, unless otherwise specified

Characteristics	Symbol	Conditions	Values	Unit
Continuous forward current	I <sub>F</sub>	T <sub>C</sub> =25 °C, T <sub>j</sub> =175 °C	136*	A
		T <sub>C</sub> =125 °C, T <sub>j</sub> =175 °C	74*	
		T <sub>C</sub> =150 °C, T <sub>j</sub> =175 °C	48*	
Surge non-repetitive forward current sine halfwave	I <sub>FSM</sub>	T <sub>C</sub> =25 °C, t <sub>p</sub> =8.3 ms	390*	A
		T <sub>C</sub> =110 °C, t <sub>p</sub> =8.3 ms	340*	
Non-repetitive peak forward current	I <sub>F,max</sub>	T <sub>C</sub> =25 °C, t <sub>p</sub> =10 μs	2000	A
Repetitive peak reverse voltage	V <sub>RRM</sub>	T <sub>j</sub> =25 °C	1200**	V
Operating junction & storage temperature	T <sub>j</sub> , T <sub>storage</sub>	Continuous	-55...175	°C

Values have been verified on TO-247 packaged devices

\*Assumes R<sub>thJC</sub> thermal resistance of 0.19°C/W with recommended wire bond

\*\* Verified by 100% wafer test

Electrical Characteristics, at  $T_j=25\text{ }^\circ\text{C}$ , unless otherwise specified

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
DC blocking voltage	$V_{DC}$	$T_j=25\text{ }^\circ\text{C}$	1200**	-	-	V
Breakdown voltage	$V_{BR}$	$I_R=2.00\text{mA}$ , $T_j=25\text{ }^\circ\text{C}$	1400	-	-	
Diode forward voltage	$V_F$	$I_F=50\text{A}$ , $T_j=25\text{ }^\circ\text{C}$	-	1.43	1.63	V
		$I_F=50\text{A}$ , $T_j=125\text{ }^\circ\text{C}$	-	1.75	-	
		$I_F=50\text{A}$ , $T_j=175\text{ }^\circ\text{C}$	-	2.03	2.63	
Reverse current	$I_R$	$V_R=1200\text{V}$ , $T_j=25\text{ }^\circ\text{C}$	-	6**	100**	$\mu\text{A}$
		$V_R=1400\text{V}$ , $T_j=25\text{ }^\circ\text{C}$		35**	-	
		$V_R=1200\text{V}$ , $T_j=125\text{ }^\circ\text{C}$	-	49	-	
		$V_R=1200\text{V}$ , $T_j=175\text{ }^\circ\text{C}$	-	193	750	
Total capacitive charge	$Q_C$	$V_R=800\text{V}$ , $T_j=25\text{ }^\circ\text{C}$	-	269	-	nC
Total capacitance	C	$V_R=1\text{V}$ , $f=1\text{ MHz}$	-	3040	-	$\text{pF}$
		$V_R=400\text{V}$ , $f=1\text{ MHz}$	-	253	-	
		$V_R=800\text{V}$ , $f=1\text{ MHz}$	-	181	-	

Values have been verified on TO-247 packaged devices

\*Assumes  $R_{thJC}$  thermal resistance of  $0.19\text{ }^\circ\text{C/W}$  with recommended wire bond

\*\* Verified by 100% wafer test

## Mechanical Parameters

Parameter	Typ.	Unit
Die Size	4.93 x 4.93	mm
Anode Pad Opening	4.1 x 4.1	mm
Recommended Wire Bond (TO-247)	15 mil x 5	mil
Die Thickness	$200 \pm 25$	$\mu\text{m}$
Wafer Size	150	mm
Anode Metalization (Al)	4	$\mu\text{m}$
Cathode Metalization (Ni/Ag)		$\mu\text{m}$
Frontside Passivation	Polyimide on Silicon Nitride	

Typical Performance in packaged device

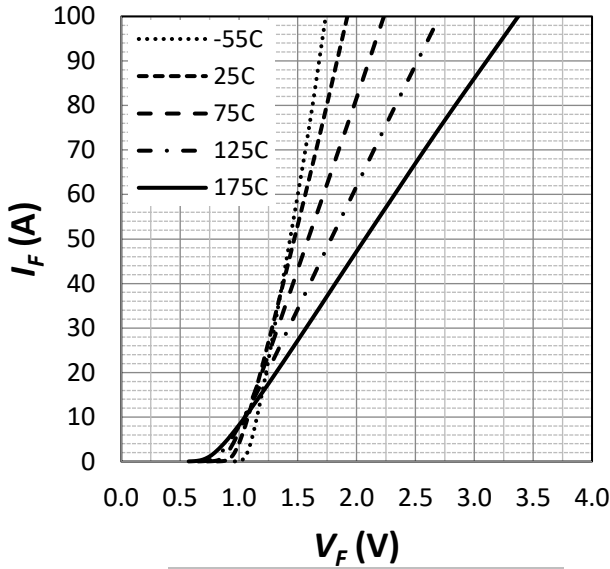


Fig. 1 Forward Characteristics

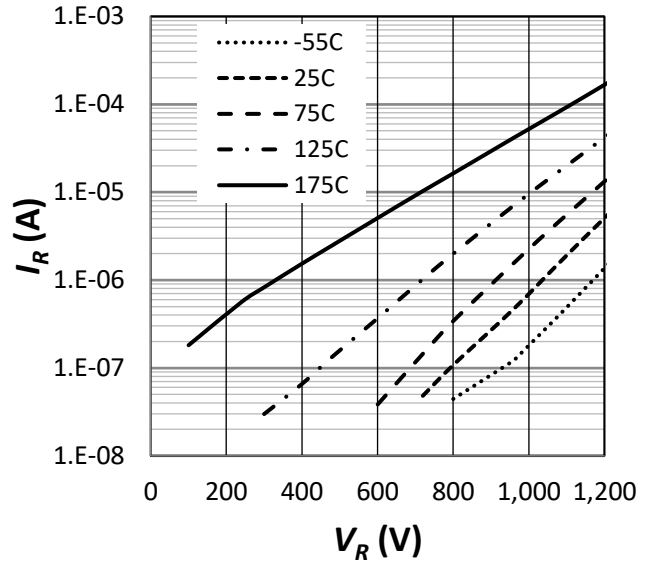


Fig. 2 Reverse Characteristics

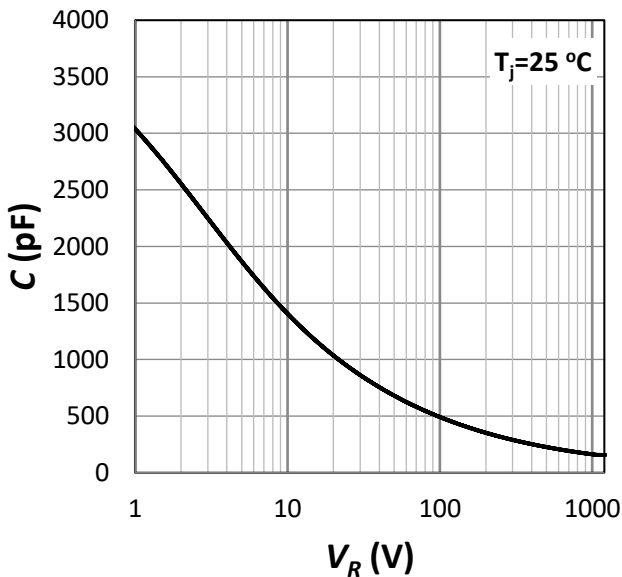


Fig. 3 Capacitance vs. Reverse Voltage

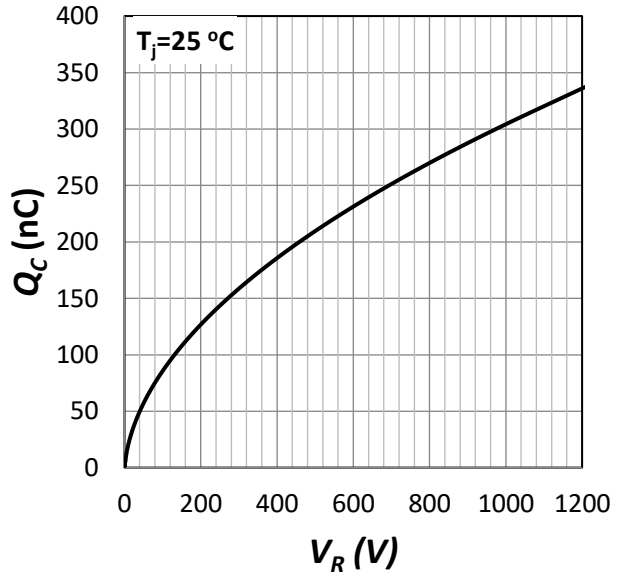


Fig. 4 Capacitive Charge vs. Reverse Voltage

**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 March, 2013. RoHS Declarations for this product can be obtained from the Product Documentation sections of [www.SemiQ.com](http://www.SemiQ.com).

**REACH Compliance**

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