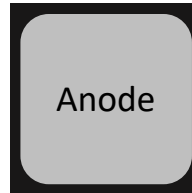


V_{DC}	650 V
Q_C	27 nC
I_F	10 A
$T_{j,max}$	175 °C

650V/10A 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_F

Chip Outline


Part #	Die Size	Anode	Cathode
GP3D010A065X	1.78 x 1.78 mm	Al	Ni/Ag

Maximum Ratings, at $T_j=25\text{ °C}$, unless otherwise specified

Characteristics	Symbol	Conditions	Values	Unit
Continuous forward current	I_F	$T_C=25\text{ °C}, T_j=175\text{ °C}$	31*	A
		$T_C=125\text{ °C}, T_j=175\text{ °C}$	16*	
		$T_C=150\text{ °C}, T_j=175\text{ °C}$	10*	
Surge non-repetitive forward current sine halfwave	I_{FSM}	$T_C=25\text{ °C}, t_p=8.3\text{ ms}$	75*	A
		$T_C=110\text{ °C}, t_p=8.3\text{ ms}$	65*	
Non-repetitive peak forward current	$I_{F,max}$	$T_C=25\text{ °C}, t_p=10\text{ }\mu\text{s}$	900	A
Repetitive peak reverse voltage	V_{RRM}	$T_j=25\text{ °C}$	650	V
Operating junction & storage temperature	$T_j, T_{storage}$	Continuous	-55...175	°C

Values will be verified on TO-220 packaged devices

*Assumes R_{thJC} thermal resistance of 1.39°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}	$T_j=25\text{ }^\circ\text{C}$	650**	-	-	V
Breakdown voltage	V_{BR}	$I_R=330\mu\text{A}$, $T_j=25\text{ }^\circ\text{C}$	715**	-	-	V
Diode forward voltage	V_F	$I_F=10\text{A}$, $T_j=25\text{ }^\circ\text{C}$	-	1.41	1.50	V
		$I_F=10\text{A}$, $T_j=125\text{ }^\circ\text{C}$	-	1.53	-	
		$I_F=10\text{A}$, $T_j=175\text{ }^\circ\text{C}$	-	1.65	1.90	
Reverse current	I_R	$V_R=650\text{V}$, $T_j=25\text{ }^\circ\text{C}$	-	1**	25**	μA
		$V_R=715\text{V}$, $T_j=25\text{ }^\circ\text{C}$	-	3**	-	
		$V_R=650\text{V}$, $T_j=125\text{ }^\circ\text{C}$	-	9	-	
		$V_R=650\text{V}$, $T_j=175\text{ }^\circ\text{C}$	-	30	250	
Total capacitive charge	Q_C	$V_R=400\text{V}$, $T_j=25\text{ }^\circ\text{C}$	-	27	-	nC
Total capacitance	C	$V_R=1\text{V}$, $f=1\text{ MHz}$	-	440	-	pF
		$V_R=200\text{V}$, $f=1\text{ MHz}$	-	53	-	
		$V_R=400\text{V}$, $f=1\text{ MHz}$	-	43	-	

Values will be verified on packaged devices

*Assumes R_{thJC} thermal resistance of $1.39\text{ }^\circ\text{C/W}$ with recommended wire bond

** Verified by 100% wafer test

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	1.78 x 1.78	mm
Anode Pad Opening	1.25 x 1.25	mm
Recommended Wire Bond (TO-220)	15 mil x 2	mil
Die Thickness	175 ± 25	μm
Wafer Size	150	mm
Anode Metalization (Al)	4	μm
Cathode Metalization (Ni/Ag)		μm
Frontside Passivation	Polyimide on Silicon Nitride	

Typical Performance in packaged device

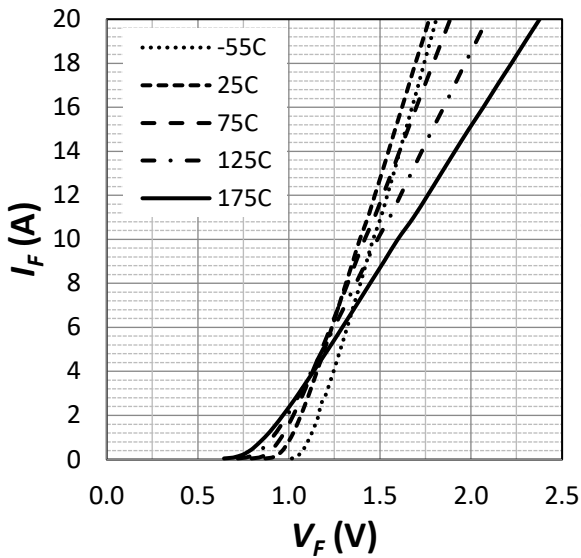


Fig. 1 Forward Characteristics

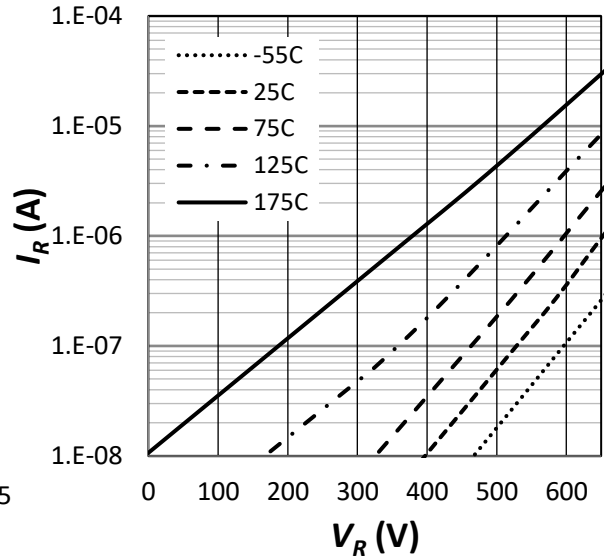


Fig. 2 Reverse Characteristics

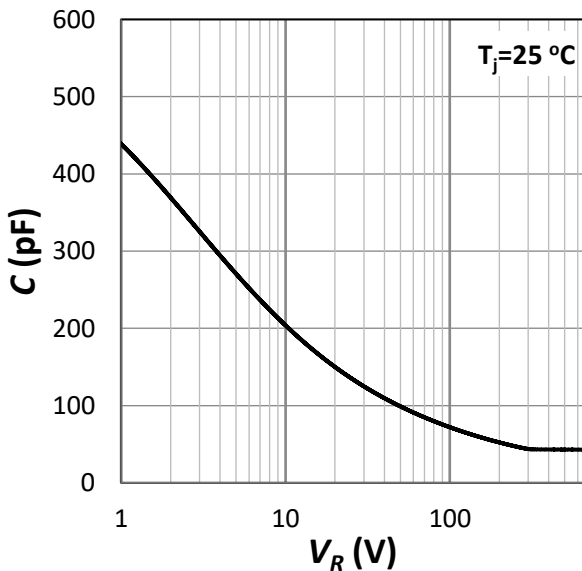


Fig. 3 Capacitance vs. Reverse Voltage

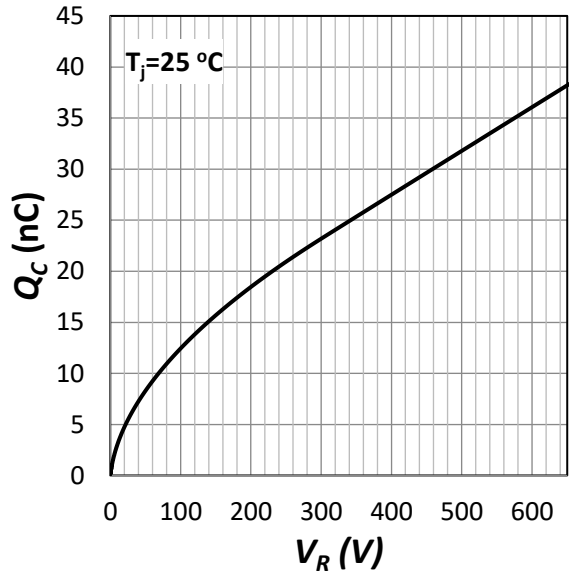


Fig. 4 Capacitive Charge vs. Reverse Voltage

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.

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REACH substances of high concern (SVHC) information is available for this product. Since the European Chemicals Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact our office at SemiQ Headquarters in Lake Forest, California to insure you get the most up-to-date REACH SVHC Declaration. REACH banned substance information (REACH Article 67) is also available upon request.

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