

V _{DC}	650 V
Q _C	53 nC
I _F	20 A
T _{j,max}	175 °C

650V/20A 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
GP3D020A065X	2.39 x 2.39 mm	Al	Ni/Ag

Maximum Ratings, at T_j=25 °C, unless otherwise specified

Characteristics	Symbol	Conditions	Values	Unit
Continuous forward current	I _F	T _C =25 °C, T _j =175 °C	55*	A
		T _C =125 °C, T _j =175 °C	28*	
		T _C =150 °C, T _j =175 °C	18*	
Surge non-repetitive forward current sine halfwave	I _{FSM}	T _C =25 °C, t _p =8.3 ms	135*	A
		T _C =110 °C, t _p =8.3 ms	125*	
Non-repetitive peak forward current	I _{F,max}	T _C =25 °C, t _p =10 μs	1100	A
Repetitive peak reverse voltage	V _{RRM}	T _j =25 °C	650**	V
Operating junction & storage temperature	T _j , T _{storage}	Continuous	-55...175	°C

Values have been verified on TO-247 packaged devices

*Assumes R_{thJC} thermal resistance of 0.88°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}	$I_R=660\mu\text{A}$, $T_j=25\text{ }^\circ\text{C}$	715	-	-	V
Diode forward voltage	V_F	$I_F=20\text{A}$, $T_j=25\text{ }^\circ\text{C}$	-	1.40	1.55	V
		$I_F=20\text{A}$, $T_j=125\text{ }^\circ\text{C}$	-	1.51	-	
		$I_F=20\text{A}$, $T_j=175\text{ }^\circ\text{C}$	-	1.64	1.90	
Reverse current	I_R	$V_R=650\text{V}$, $T_j=25\text{ }^\circ\text{C}$	-	2**	50**	μA
		$V_R=715\text{V}$, $T_j=25\text{ }^\circ\text{C}$	-	7	-	
		$V_R=650\text{V}$, $T_j=125\text{ }^\circ\text{C}$	-	19	-	
		$V_R=650\text{V}$, $T_j=175\text{ }^\circ\text{C}$	-	72	500	
Total capacitive charge	Q_C	$V_R=400\text{V}$, $T_j=25\text{ }^\circ\text{C}$	-	53	-	nC
Total capacitance	C	$V_R=1\text{V}$, $f=1\text{ MHz}$	-	866	-	pF
		$V_R=200\text{V}$, $f=1\text{ MHz}$	-	102	-	
		$V_R=400\text{V}$, $f=1\text{ MHz}$	-	78	-	

Values have been verified on TO-247 packaged devices

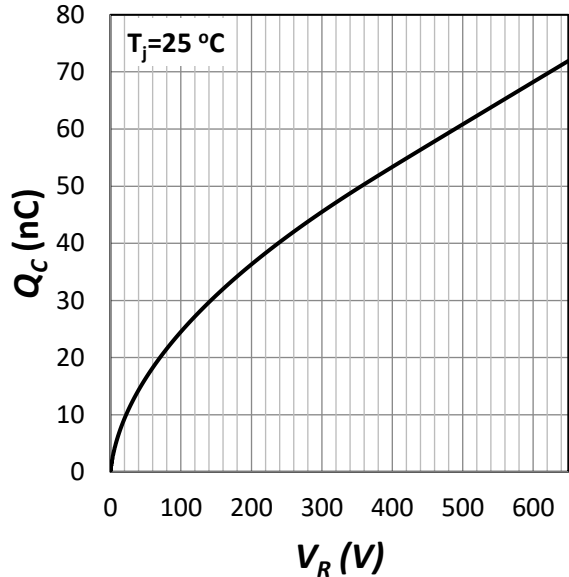
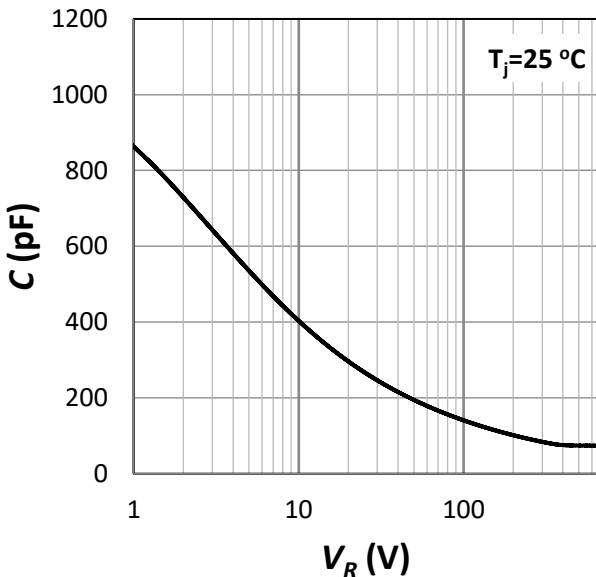
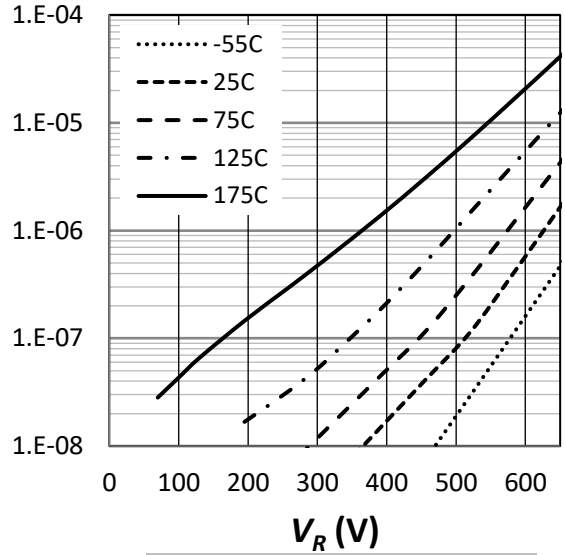
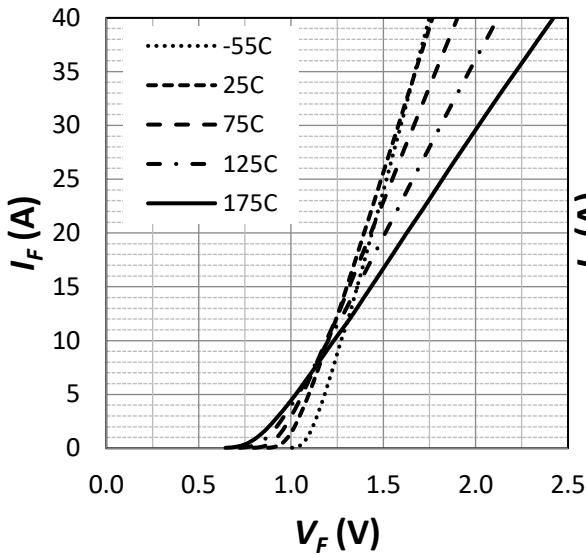
*Assumes R_{thJC} thermal resistance of $0.88\text{ }^\circ\text{C/W}$ with recommended wire bond

** Verified by 100% wafer test

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	2.39 x 2.39	mm
Anode Pad Opening	1.78 x 1.78	mm
Recommended Wire Bond (TO-247)	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



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.

REACH Compliance

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.

SemiQ Inc., reserves the right to make changes to the product specifications and data in this document without notice. SemiQ products are sold pursuant to SemiQ's terms and conditions of sale in place at the time of order acknowledgement.

This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control.

SemiQ makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SemiQ assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using SemiQ products.

To obtain additional technical information or to place an order for this product, please contact us. The information in this datasheet is provided by SemiQ. SemiQ reserves the right to make changes, corrections, modifications, and improvements of datasheet without notice.