POWER SEMICONDUCTORS

650V/8A SiC Schottky Diode Bare Die

GP3D008A065X

V_{DC}	650 V
Q_C	20 nC
I_F	8 A
T_j,max	175 °C

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
GP3D008A065X	1.54 x 1.54 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	27*	A
		T_C=125 °C, T_j=175 °C	15*	
		T_C=150 °C, T_j=175 °C	9*	
Surge non-repetitive forward current sine halfwave	I_{FSM}	T_C=25 °C, t_p=8.3 ms	74*	A
		T_C=110 °C, t_p=8.3 ms	70*	
Non-repetitive peak forward current	$I_{F,max}$	T_C=25 °C, t_p=10 µs	700	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-220 packaged devices
*Assumes R_{thJC} thermal resistance of 1.40°C/W with recommended wire bond
** Verified by 100% wafer test

Electrical Characteristics, at T_j=25 °C, unless otherwise specified

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
DC blocking voltage	V_{DC}	T_j=25 °C	650**	-	-	V
Breakdown voltage	V_{BR}	I_R=264µA, T_j=25 °C	715			
Diode forward voltage	V_F	I_F=8A, T_j=25 °C	-	1.38	1.50	V
		I_F=8A, T_j=125 °C	-	1.49	-	
		I_F=8A, T_j=175 °C	-	1.61	1.80	
Reverse current	I_R	V_R=650V, T_j=25 °C	-	3**	20**	µA
		V_R=715V, T_j=25 °C	-	9**	-	
		V_R=650V, T_j=125 °C	-	15	-	
		V_R=650V, T_j=175 °C	-	46	200	
Total capacitive charge	Q_C	V_R=400V, T_j=25 °C	-	20	-	nC
Total capacitance	C	V_R=1V, f=1 MHz	-	321	-	pF
		V_R=200V, f=1 MHz	-	38	-	
		V_R=400V, f=1 MHz	-	31	-	

Values have been verified on TO-220 packaged devices
*Assumes R_{thJC} thermal resistance of 1.40°C/W with recommended wire bond
** Verified by 100% wafer test

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	1.54 x 1.54	mm
Anode Pad Opening	1.14 x 1.14	mm
Recommended Wire Bond (TO-220)	12 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

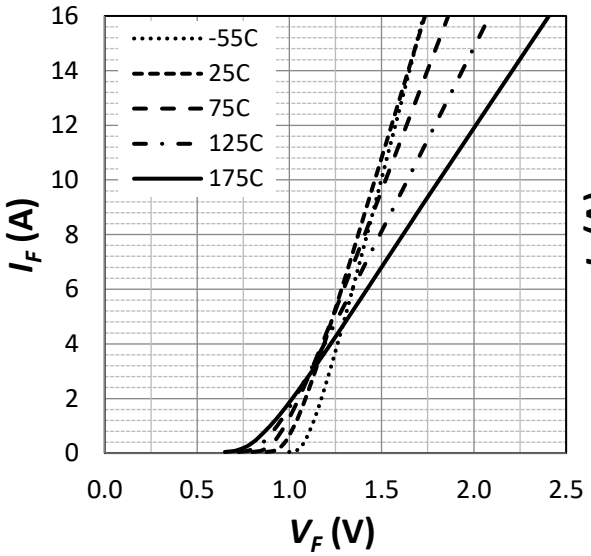

Fig. 1 Forward Characteristics

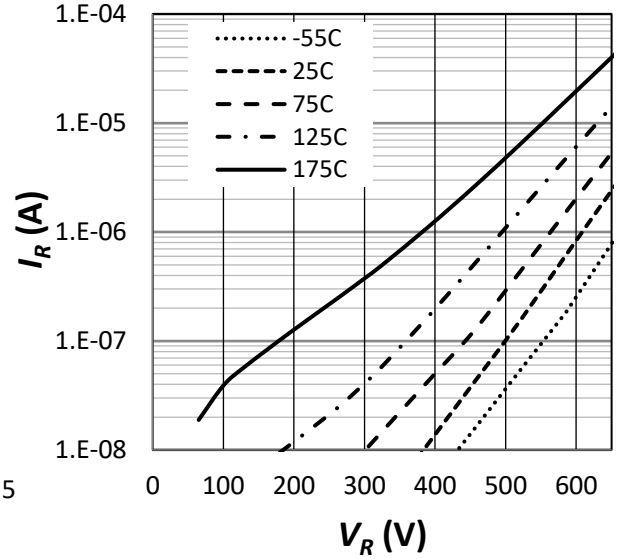

Fig. 2 Reverse Characteristics

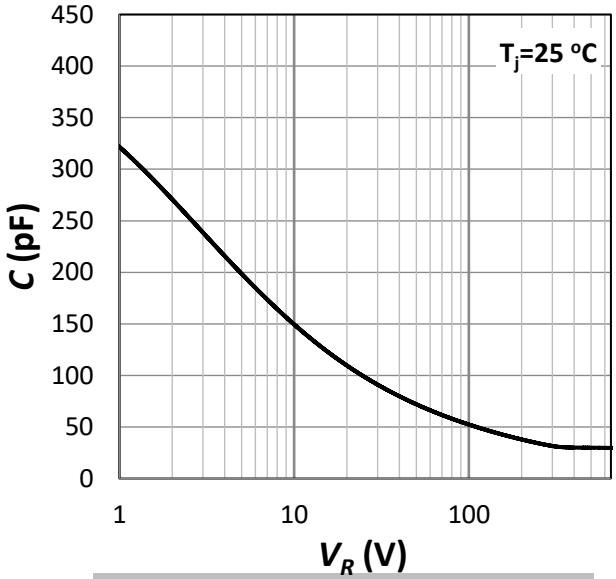

Fig. 3 Capacitance vs. Reverse Voltage

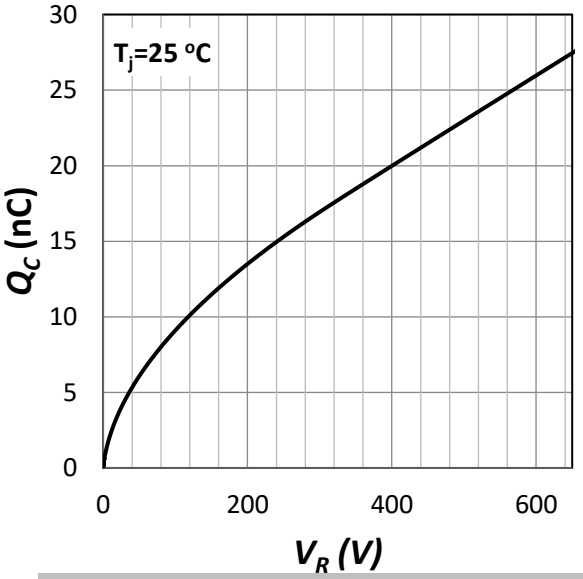

Fig. 4 Capacitive Charge vs. Reverse Voltage

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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