



650V 3A SiC Schottky Diode – SiS650S03AS

Rev 1.0

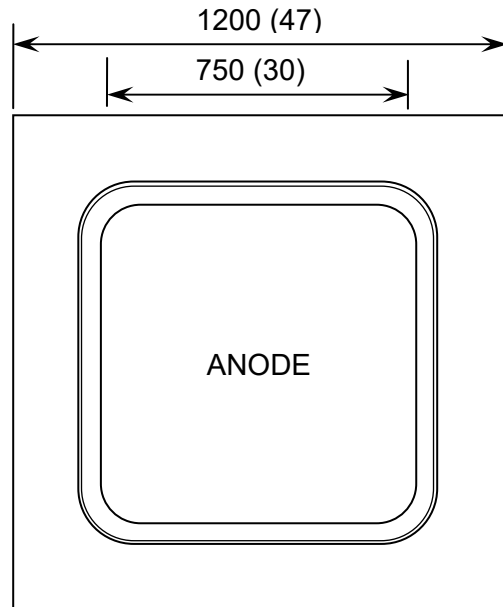
Silicon Carbide Schottky Barrier Rectifier diode in bare die form

30/10/23

Features:

- Capable of high temperature operation $\geq 175^{\circ}\text{C}$
- High Frequency Operation
- High Surge Current Capability
- No Reverse Recovery / No Forward Recovery
- Positive Temperature Coefficient

Die Dimensions in μm (mils)



Ordering Information:

The following part suffixes apply:

- No suffix - MIL-STD-750 /2073 Visual Inspection
- "H" - MIL-STD-750 /2073 Visual Inspection
+ MIL-PRF-38534 Class H LAT
- "K" - MIL-STD-750 /2073 Visual Inspection
+ MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

www.siliconsupplies.com/quality/bare-die-lot-qualification



CHIP BACKSIDE IS CATHODE

Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – By specific request
- Unsawn Wafer – By specific request
- With additional electrical selection – By specific request

Mechanical Specification

Die Size (Unsawn)	1200 x 1200 47 x 47	μm mils
Anode Pad Size	750 x 750 30 x 30	μm mils
Die Thickness	350 (± 20) 13.78 (0.79)	μm mils
Top Metal Composition	Al 4 μm	
Back Metal Composition	Ag 0.4 μm	





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Absolute Maximum Ratings $T_J = 25^\circ\text{C}$ unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Repetitive peak reverse voltage	V_{RRM}	650	V
Surge peak reverse voltage	V_{RSM}	650	V
DC Peak Blocking Voltage	V_{BR}	650	V
Average forward rectified current	$I_{F(AV)}$	3	A
Repetitive Peak Forward Surge Current	I_{FRM}	23	A
Peak Single-Cycle Non-Repetitive Surge Current	I_{FSM}	46	A
Operating Junction temperature	T_J	-55 to 175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to 175	$^\circ\text{C}$

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise stated

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Maximum instantaneous forward voltage ¹	V_{F1}	$V_{RWM} = 650\text{V}, I_{FM} = 3\text{A}$	-	1.40	1.70	V
	V_{F2}	$V_{RWM} = 650\text{V}, I_{FM} = 3\text{A}, T_J = 175^\circ\text{C}$	-	1.60	2.00	
Maximum reverse leakage current ¹	$I_{RM} @ V_{RM}$	$V_R = 650\text{V}$	-	0.03	2	μA
		$V_R = 650\text{V}, T_J = 175^\circ\text{C}$	-	0.3	20	
Junction Capacitance	C_T	$V_R = 0\text{V}, f = 1\text{MHz}$,	-	230	-	pF
Reverse Recovery Charge	Q_C	$V_R = 400\text{V}, I_F = 3\text{A}, di/dt = 200\text{A}/\mu\text{s}$	-	14.35	-	nC
Capacitance Stored Energy	E_C	$V_R = 400\text{V}$	-	3.51	-	μJ

1. Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise stated

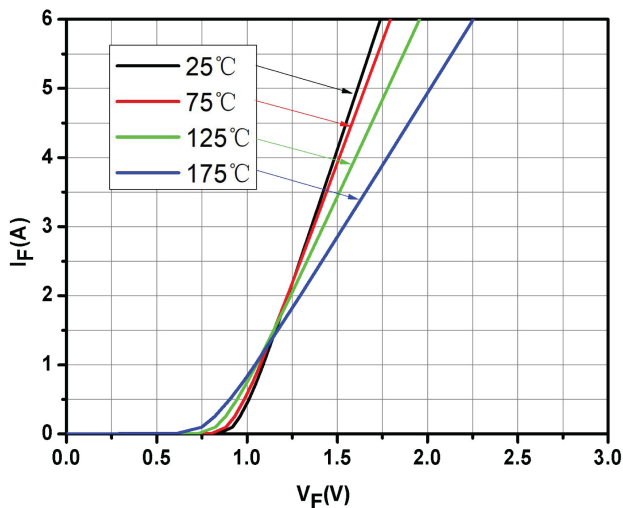


FIGURE 1. Forward Voltage Characteristics

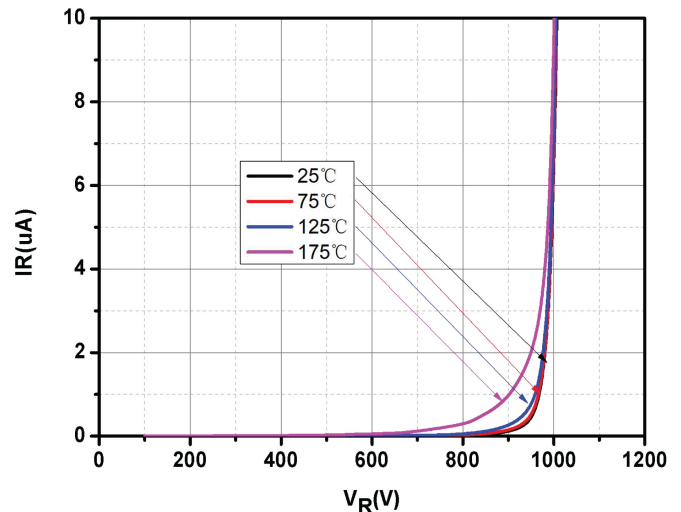


FIGURE 2. Reverse Characteristics





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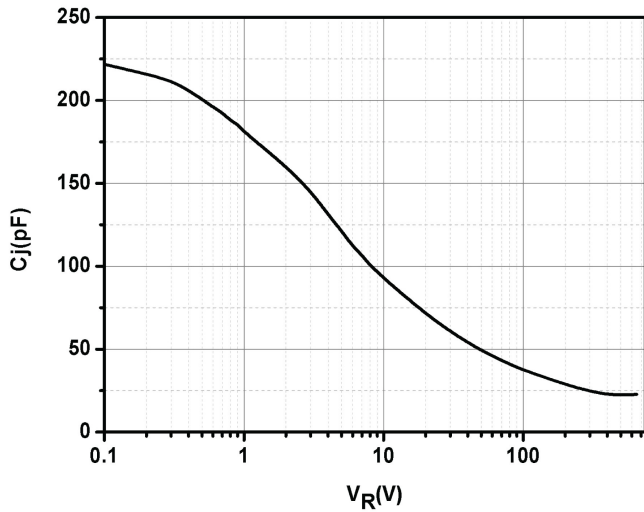


FIGURE 3. Capacitance Versus Reverse Voltage

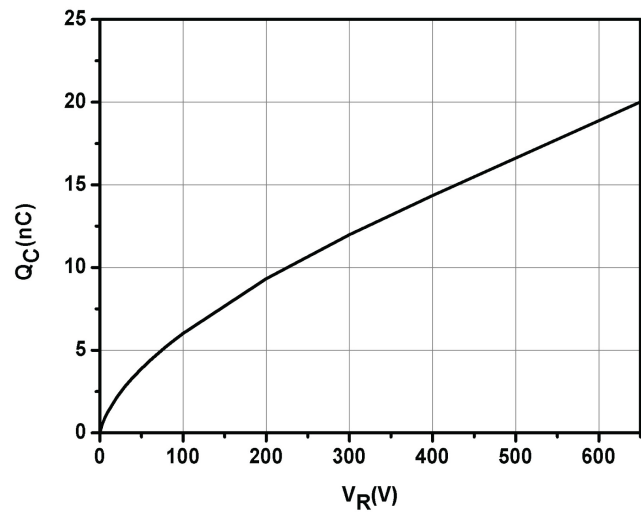


FIGURE 4. Total Capacitance Charge Versus Reverse Voltage

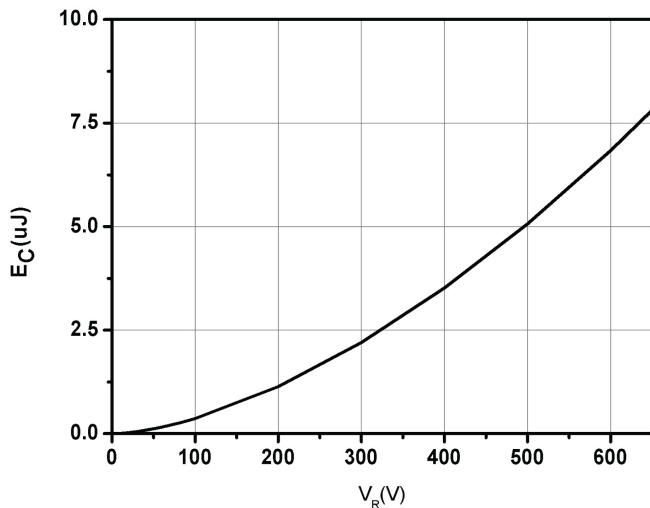


FIGURE 5. Capacitance Stored Energy

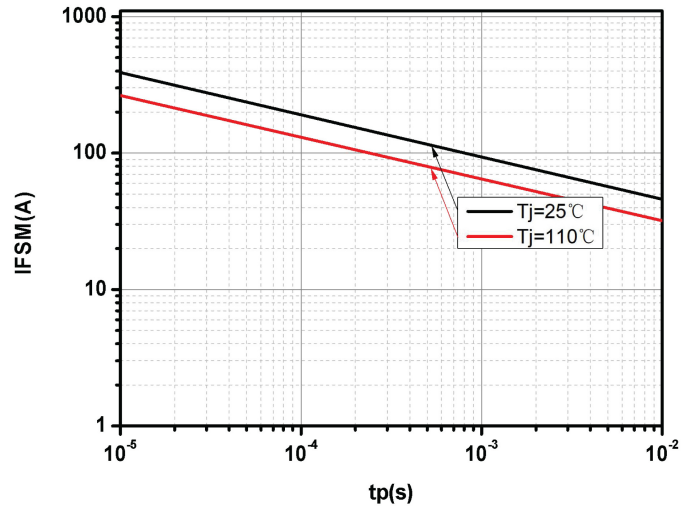


FIGURE 6. Non-repetitive Peak Forward Surge Current Versus Pulse Duration

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