650V 20A SiC Schottky Diode – SiS650S20AS

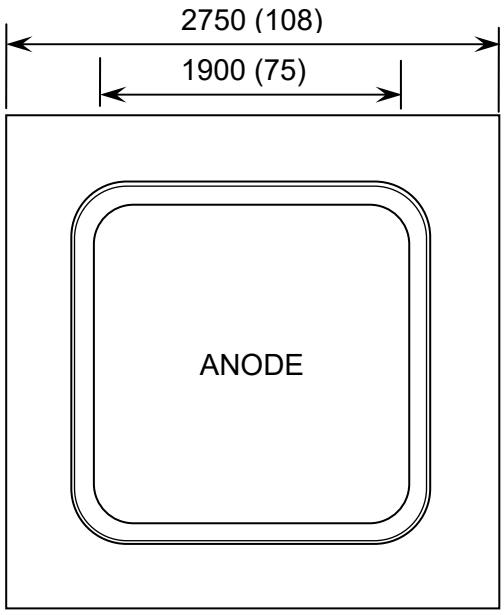
Rev 1.0
30/10/23

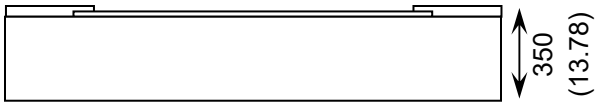
Silicon Carbide Schottky Barrier Rectifier diode in bare die form

Features:

- Capable of high temperature operation >= 175°C
- High Frequency Operation
- High Surge Current Capability
- No Reverse Recovery / No Forward Recovery
- Positive Temperature Coefficient

Die Dimensions in µm (mils)





CHIP BACKSIDE IS CATHODE

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

Supply Formats:

- Default – Die in Waffle Pack (100 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)	2750 x 2750 108 x 108	µm mils
Anode Pad Size	1900 x 1900 75 x 75	µm mils
Die Thickness	350 (±20) 13.78 (0.79)	µm mils
Top Metal Composition	Al 4µm	
Back Metal Composition	Ag 0.4µm	

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Absolute Maximum Ratings T_J = 25°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	$I_{F(AV)}$	20	A
Repetitive Peak Forward Surge Current	I_{FRM}	105	A
Peak Single-Cycle Non-Repetitive Surge Current	I_{FSM}	170	A
Operating Junction temperature	T_J	-55 to 175	°C
Storage Temperature Range	T_{STG}	-65 to 175	°C

Electrical Characteristics T_J = 25°C unless otherwise stated

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Maximum instantaneous forward voltage[1]	V_{F1}	V_{RRM} = 650V, I_{FM} = 20A	-	1.45	1.70	V
	V_{F2}	V_{RRM} = 650V, I_{FM} = 20A, T_J = 175°C	-	1.65	2.00	
Maximum reverse leakage current[1]	I_{RM} @ V_{RM}	V_R = 650V	-	1.5	50	μA
		V_R = 650V, T_J = 175°C	-	15	200	
Junction Capacitance	C_T	V_R = 0V, f = 1MHz,	-	1550	-	pF
Reverse Recovery Charge	Q_C	V_R = 400V , I_F = 20A, di/dt = 200A/μs	-	96.7	-	nC
Capacitance Stored Energy	E_C	V_R = 400V	-	23.69	-	μJ

1. Pulse Width≤ 300μs, Duty Cycle ≤ 2.0%

Typical Characteristics T_J = 25°C

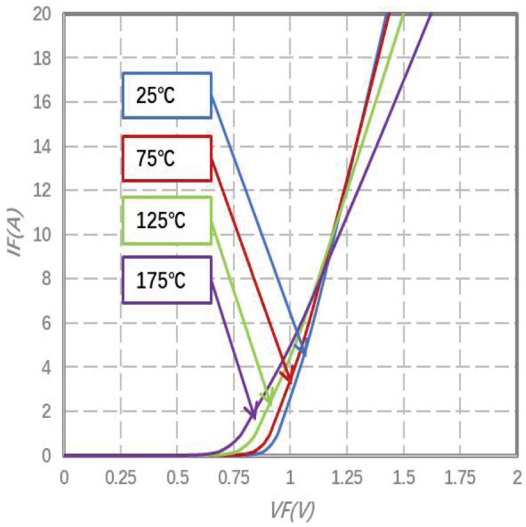

FIGURE 1. Forward Voltage Characteristics

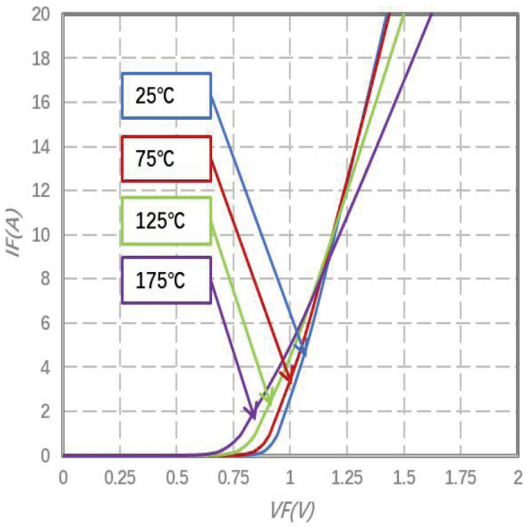

FIGURE 2. Reverse Characteristics

Typical Characteristics T_J = 25°C unless otherwise stated

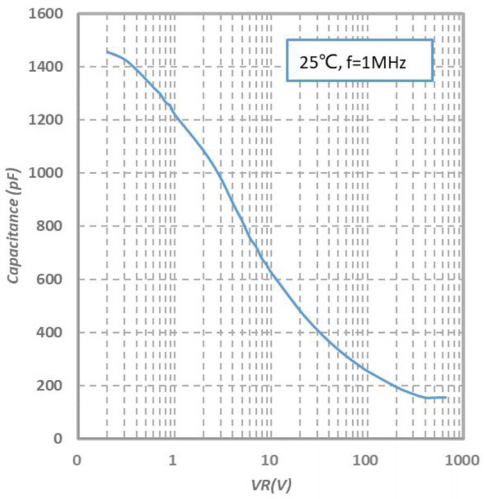

FIGURE 3. Capacitance Versus Reverse Voltage

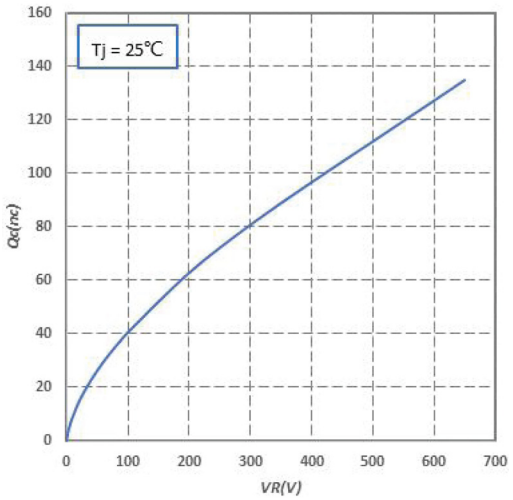

FIGURE 4. Total Capacitance Charge Versus Reverse Voltage

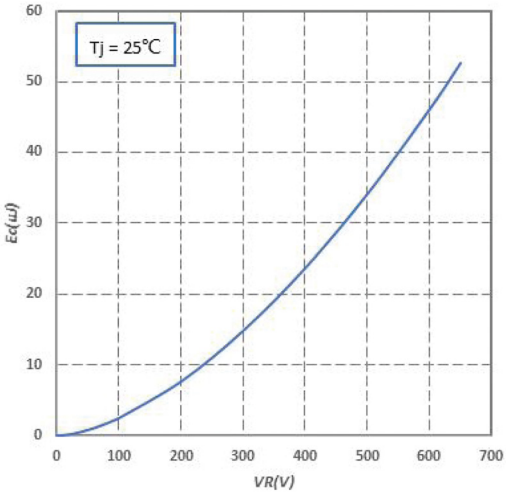

FIGURE 5. Capacitance Stored Energy

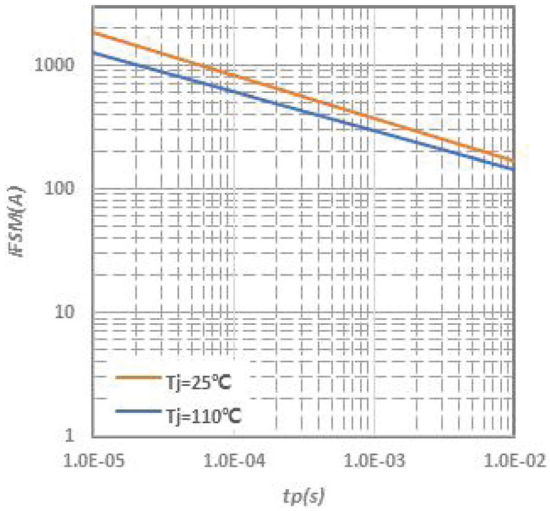

FIGURE 6. Non-repetitive Peak Forward Surge Current Versus Pulse Duration