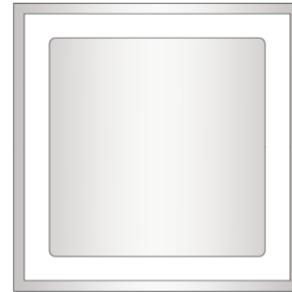


CPW3-0650-S004B

Gen 3 Silicon Carbide Schottky Diode

Description

This is the 3rd generation of high voltage, high performance Z-Rec[®] silicon carbide Schottky diode in a packageless bare die format to be implemented into any custom module design. The lower forward voltage, smaller reverse leakage current, zero reverse recovery, and high thermal conductivity make this Schottky diode ideal for high frequency switching applications including solar inverters and UPS. This Schottky diode can be used in conjunction with either IGBT or MOSFET as an anti-parallel diode, or as a rectifier.



Package Type: Bare Die
PN's: CPW3-0650-S004B

Features

- 650V Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F

Applications

- Switch mode power supply
- Solar inverter
- Power Correction
- UPS

Absolute Maximum Ratings

Stress beyond those listed under absolute maximum ratings may damage the device.

Parameter	Symbol		Rating	Unit
Repetitive Peak Reverse Voltage	V_{RRM}		650	V
Continuous Forward Current	I_F	$T_c = 175^\circ\text{C}$	4	A
Repetitive Peak Forward Surge Current, assumes $t_p = 10\text{ms}$, Half Sine Wave Pulse	I_{FRM}	$T_c = 25^\circ\text{C}$	22	A
Virtual Junction and Storage Temperature	T_{VJ}, T_{stg}		-55 to +175	$^\circ\text{C}$
Maximum Processing Temperature, in non-reactive ambient	T_{proc}		325	$^\circ\text{C}$

Note: All above notation to T_c specifies case temperature from die packaged in TO-247, with $R_{th(j-c)} < 2.02^\circ\text{C/W}$



Electrical Characteristics ($T_{VJ} = 25^{\circ}\text{C}$)

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions
Forward Voltage	V_F	1.5	1.8	V	$I_F = 4\text{ A}$
		1.8	2.4		$I_F = 4\text{ A}$, $T_{VJ} = 175^{\circ}\text{C}$
Reverse Current	I_R	10	50	μA	$V_R = 650\text{ V}$
		20	100		$V_R = 650\text{ V}$, $T_{VJ} = 175^{\circ}\text{C}$
Total Capacitive Charge	Q_C	8.5		nC	$V_R = 650\text{ V}$, $I_F = 4\text{ A}$, $di/dt = 500\text{ A}/\mu\text{s}$
Total Capacitance	C	251		pF	$V_R = 0\text{ V}$, $f = 1\text{ Mhz}$
		22			$V_R = 200\text{ V}$, $f = 1\text{ Mhz}$
		21			$V_R = 400\text{ V}$, $f = 1\text{ Mhz}$

Thermal Characteristics

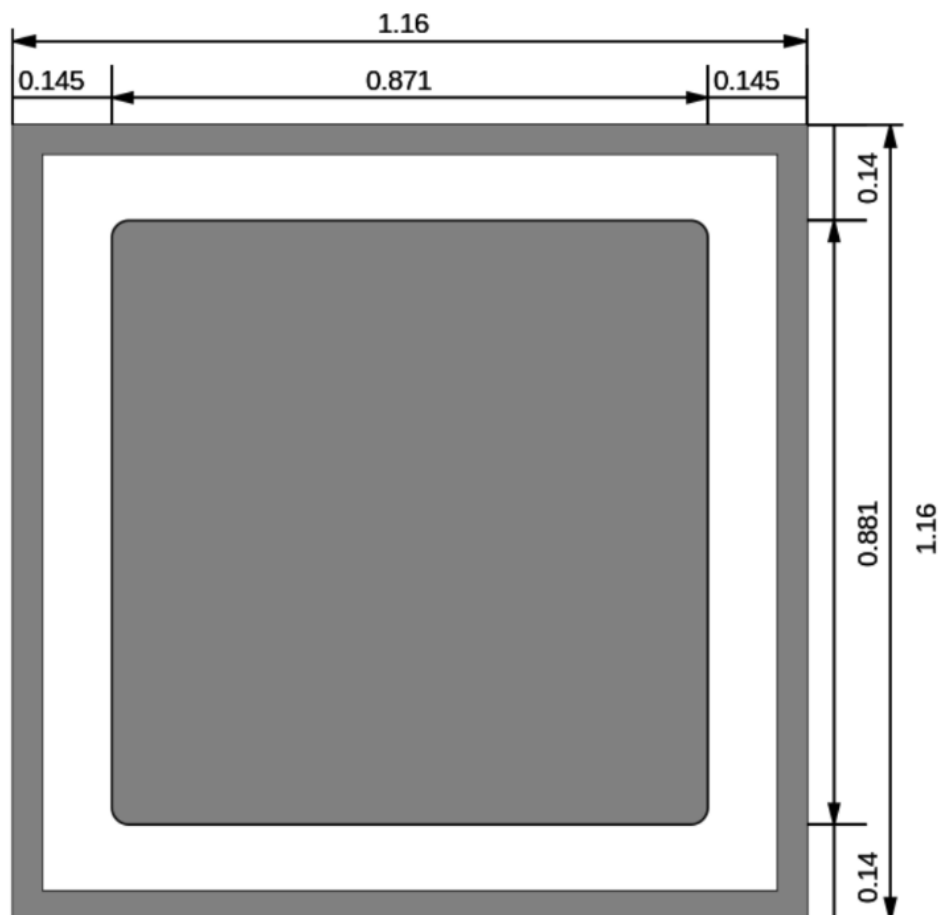
Parameter	Symbol	Typical	Unit
Thermal Resistance from Junction to Case ¹	$R_{th(j-c)}$	2.02	$^{\circ}\text{C}/\text{W}$

Note:

¹Tested in TO-247 Package



Product Dimensions CPW3-0650-S004B



Product Dimensions CPW3-0650-S004B

Parameter	Typical	Units
Die Size (L x W)	1.16 x 1.16	mm
Anode Pad Opening	0.87 x 0.88	mm
Die Thickness ¹	377 ± 10%	μm
Topside Anode Metalization (Al)	4	μm
Backside Cathode Metalization (Ni/Ag)	1.8	μm
Frontside Passivation (polyimide)	Polyimide	

¹SiC Thickness



Product Ordering Information

Order Number	Description	Package
CPW3-0650-S004B-FU6	SiC Diode G3 IND 650V/4A FULL MLT	Bare Die Product

Revision History

Revision History	Date of Change	Brief Summary
0		Initial release
1	9/12/2023	Template updated



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