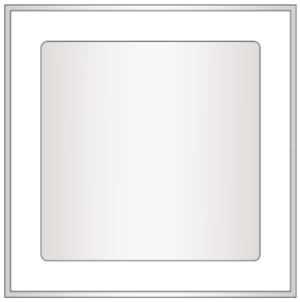
EPW4-1200-S020A

Automotive Gen 4 Silicon Carbide Schottky Diode

Description

This is the 4th generation of high voltage, high performance automotive 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 AC to DC converters. 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: EPW4-1200-S020A

Features

- Zero Reverse Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- AEC-Q101 Qualified and PPAP Capable

Applications

- Boost diodes in PFC or DC/DC Stages
- Free Wheeling Diodes in Inverter Stages
- AC/DC Converters
- Traction Power Conversion
- PV inverters

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}		1200	V
Continuous Forward Current	I_F	T_c = 175°C	20	A
Repetitive Peak Forward Surge Current, assumes t_p = 10ms, Half Sine Wave Pulse	I_{FRM}	T_c = 25°C	91	A
		T_c = 110°C	61	
Virtual Junction and Storage Temperature	T_{VJ}, T_{stg}		-55 to +175	°C
Maximum Processing Temperature, in non-reactive ambient	T_{proc}		325	°C

Note: All above notation to T_c specifies case temperature from die packaged in TO-247, with Rth(j-c) < 0.6°C/W

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Electrical Characteristics (T_{VJ} = 25˚C)

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions
Forward Voltage	V_f	1.5	1.8	V	I_F = 20 A
		2.2			I_F = 20 A, T_{VJ} = 175°C
Reverse Current	I_R	35	200	µA	V_R = 1200 V
		65			V_R = 1200 V, T_{VJ} = 175°C
Total Capacitive Charge	Q_C	99		nC	V_R = 800 V, I_F = 20 A, di/dt = 200 A/µs
Total Capacitance	C	1500		pF	V_R = 0 V, f = 1Mhz
		93			V_R = 400 V, f = 1Mhz
		67			V_R = 800 V, f = 1Mhz
Capacitance Stored Energy	E_C	28		µJ	V_R = 800 V

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance from Junction to Case[1]	$R_{th(j-c)}$	0.6	°C/W

Note:
[1]Tested in TO-247 Package

Typical Performance

All the graphs are based on a die placed in a TO-247 package.

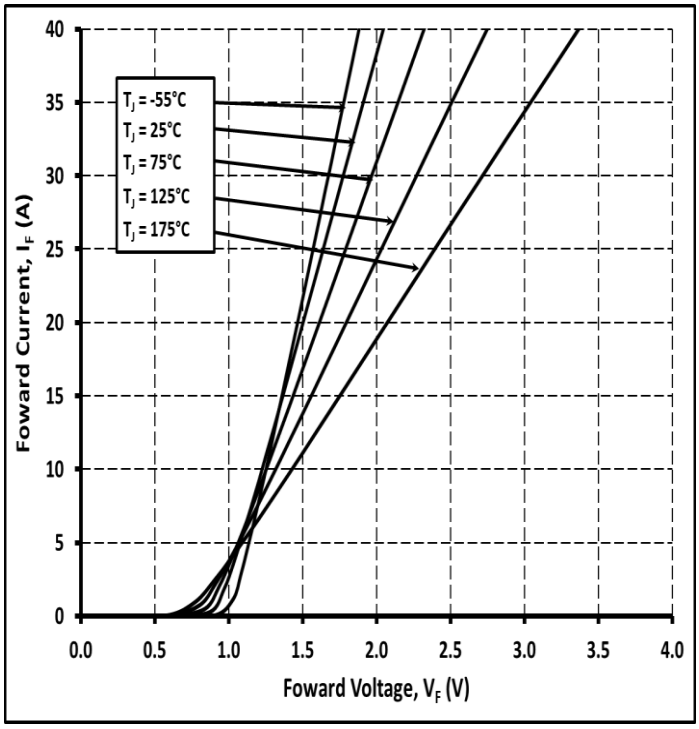


Figure 1.

Typical Forward Characteristics

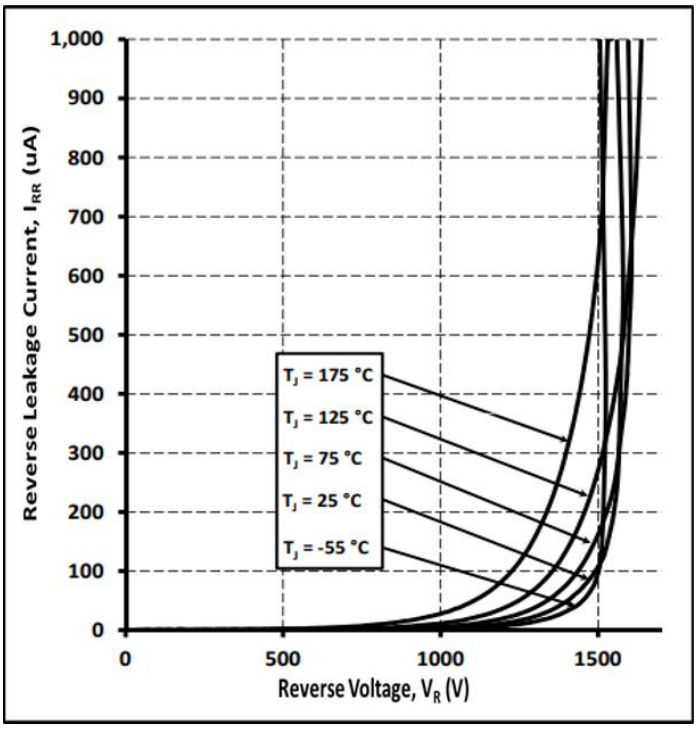


Figure 2.

Typical Reverse Characteristics

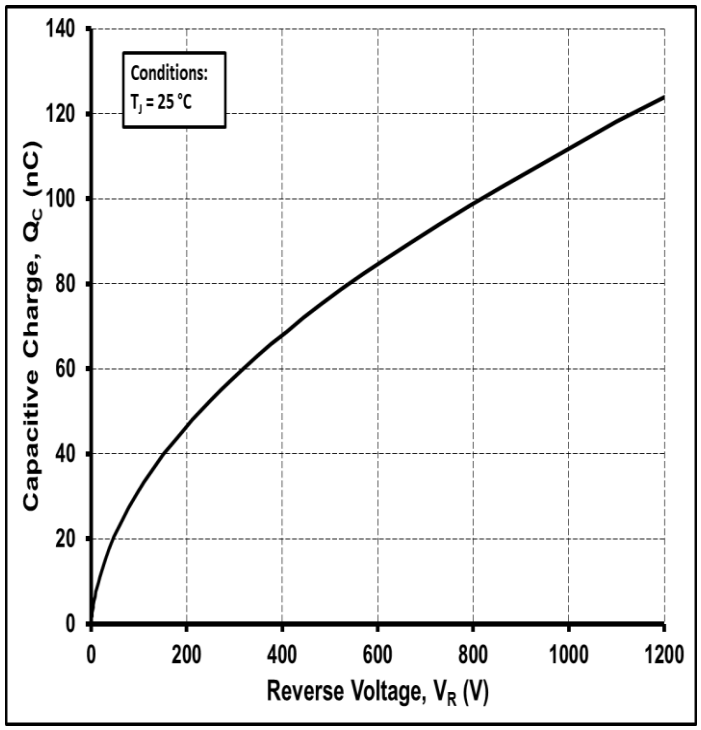


Figure 3.

Typical Capacitance vs Reverse Voltage

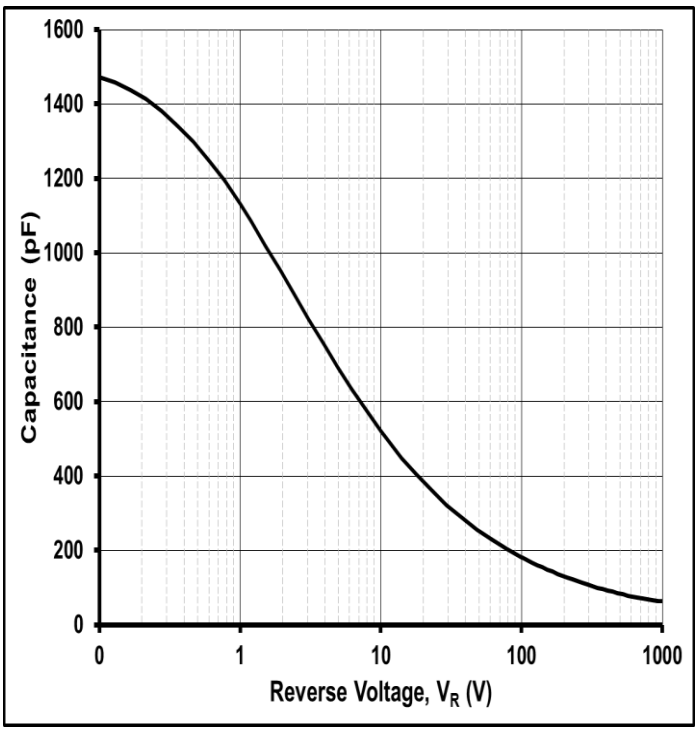
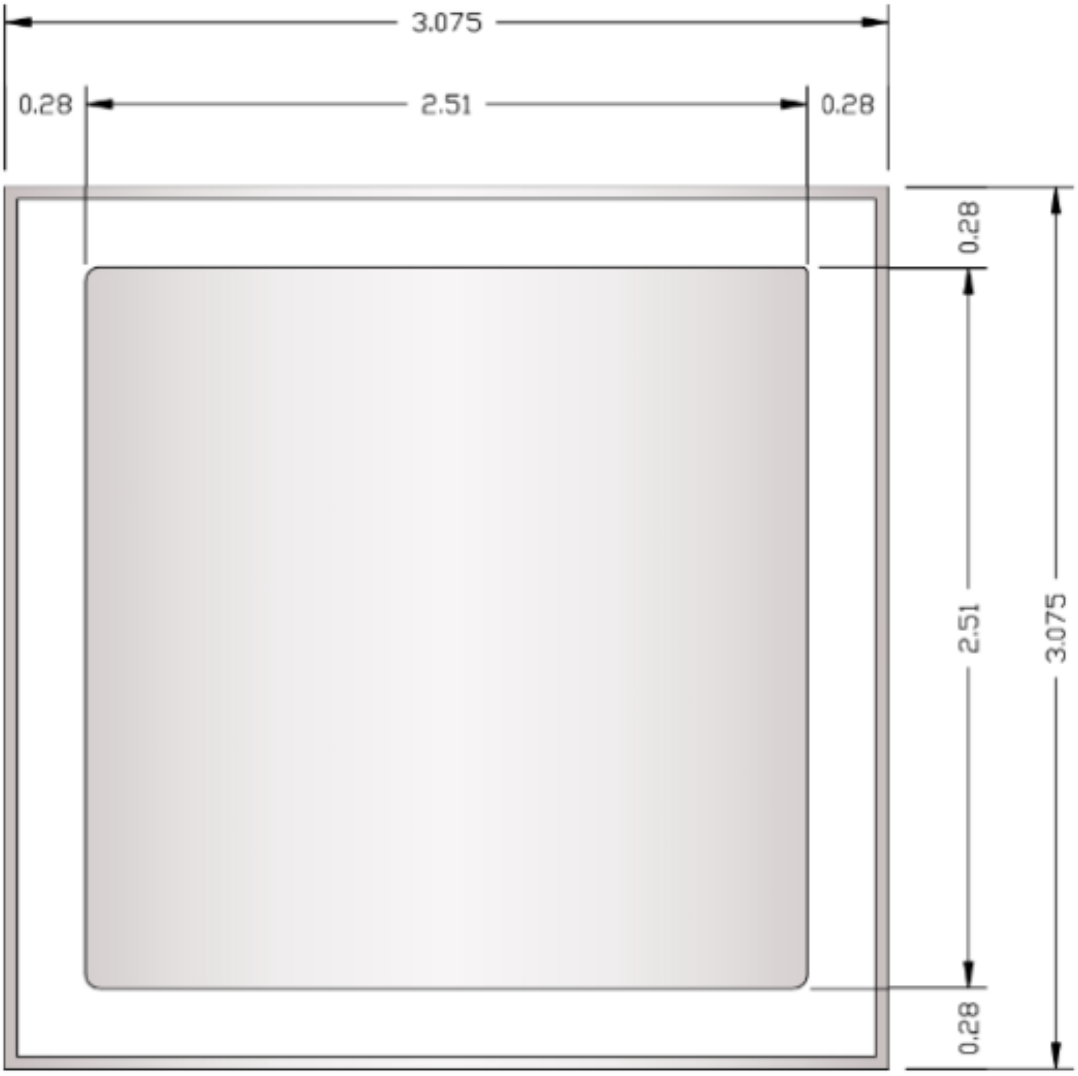


Figure 4.

Typical Recovery Charge vs Reverse Voltage

Product Dimensions EPW4-1200-S020A



Product Dimensions EPW4-1200-S020A

Parameter	Typical	Units
Die Size (L x W)	3.08 x 3.08	mm
Anode Pad Opening	2.51 x 2.51	mm
Die Thickness[1]	377 ± 10%	µm
Topside Anode Metalization (Al)	4	µm
Backside Cathode Metalization (Ni/Ag)	1.8	µm
Frontside Passivation (polymide)	Polyimide	

[1]SiC Thickness

Product Ordering Information

Order Number	Description	Package
EPW4-1200-S020A-FU6	SiC Diode G4 AUTO 1200V/20A FULL MLT	Bare Die Product

Revision History

Revision History	Date of Change	Brief Summary
0		Initial Release
1	1/23/2024	Template updated

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