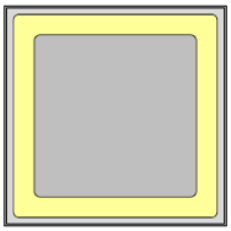
CPW6-1700-Z005A

Gen 6 Silicon Carbide Schottky Diode



Topside View
(Anode)

Package Type: Bare Die
PN: CPW6-1700-Z005A

Description

This is the 6th generation of high voltage, high performace 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 high density DC 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.

Features

- 1700V 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

- Solar Inverters
- Motor Drives
- EV Chargers
- UPS
- Industrial Power Supplies

Absolute Maximum Ratings (T_j = 25˚C unless otherwise specified)

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

Parameter	Symbol	Rating	Unit	Comments
Repetitive Peak Reverse Voltage	V_{RRM}	1700	V	
Continuous Forward Current	I_F	21	A	T_c = 25°C
		12	A	T_c = 125°C
		8	A	T_c = 150°C
Repetitive Peak Forward Surge Current	I_{FRM}	33	A	T_c = 25°C, t_p = 10ms, Half Sine Pulse
		19	A	T_c = 110°C, t_p = 10ms, Half Sine Pulse
Non-repetitive Forward Surge Current	I_{FSM}	87	A	T_c = 25°C, t_p = 10ms, Half Sine Pulse
		73	A	T_c = 110°C, t_p = 10ms, Half Sine Pulse
Operating Junction and Storage Temperature	T_{vj}, T_{stg}	-55 to +175	°C	
Processing Temperature	T_{proc}	325	°C	Non-reactive ambient

Note -All above notation to T_c specifies case temperature from die packaged in TO-247, with $R_{th(j-c)}$ < 1.36°C/W

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Electrical Characteristics

Parameter	Symbol	Typical	Max	Unit	Test Conditions
Forward Voltage	V_F	1.5		V	I_F = 5A, T_{vj} = 25°C
		1.9			I_F = 5A, T_{vj} = 175°C
Reverse Current	I_R	0.42		µA	**V_R = 1700V, T_{vj} = 25°C**
		4.18			V_R = 1700V, T_{vj} = 175°C
Total Capacitive Charge	Q_C	79		nC	**V_R = 1700V, T_{vj} = 25°C**
Total Capacitance	C	639		pF	**V_R = 0V, T_{vj} = 25°C, f = 1MHz**
		35			**V_R = 800V, T_{vj} = 25°C, f = 1MHz**
		34			**V_R = 1700V, T_{vj} = 25°C, f = 1MHz**
Capacitance Stored Energy	E_C	52		µJ	V_R = 1700V

Note:
All 175°C values are guaranteed by design and characterization

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance from Junctin to Case[1]	$R_{th(j-c)}$	0.95	°C/W

Note:
[1]Tested in TO-247 package

Mechanical Parameters

Parameter	Typical	Units
Die Size	2.25 x 2.25	mm
Anode Pad Opening	1.35 x 1.35	mm
Die Thickness	360	µm
Topside Anode Metalization (Al)	4	µm
Backside Cathode Metalization (Ni)	0.8	µm
Backside Cathode Metalization (Au)	0.01	µm
Frontside Passivation (polymide)	7.3	µm

Typical Performance

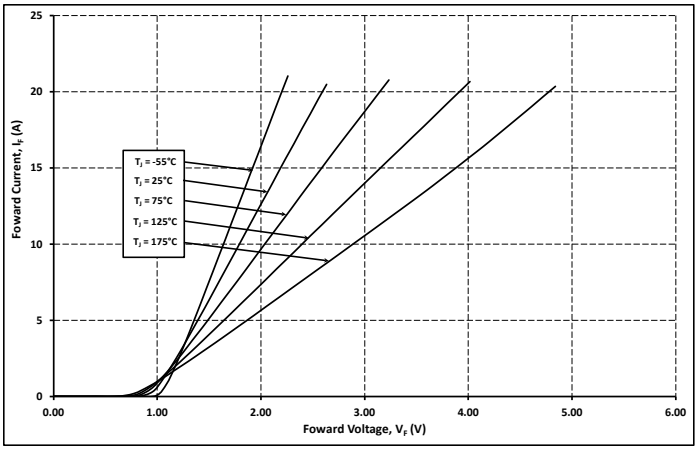


Figure 1
Typical Forward Characteristics

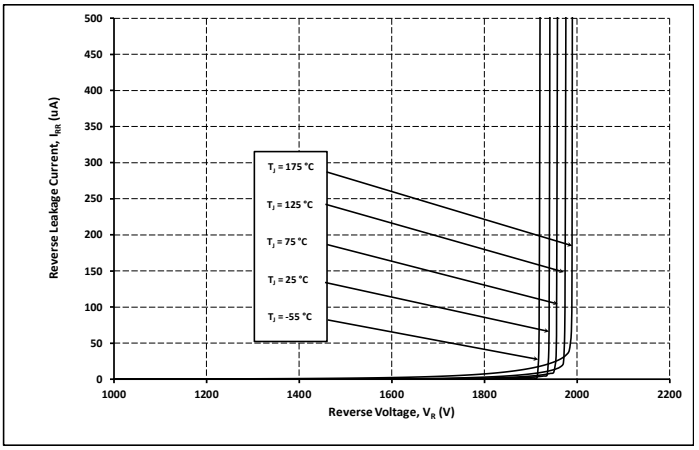


Figure 2
Typical Reverse Characteristics

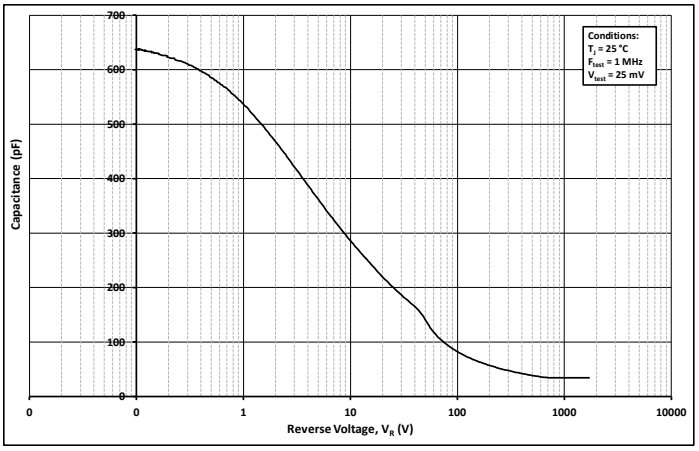


Figure 3
Typical Capacitance vs Reverse Voltage

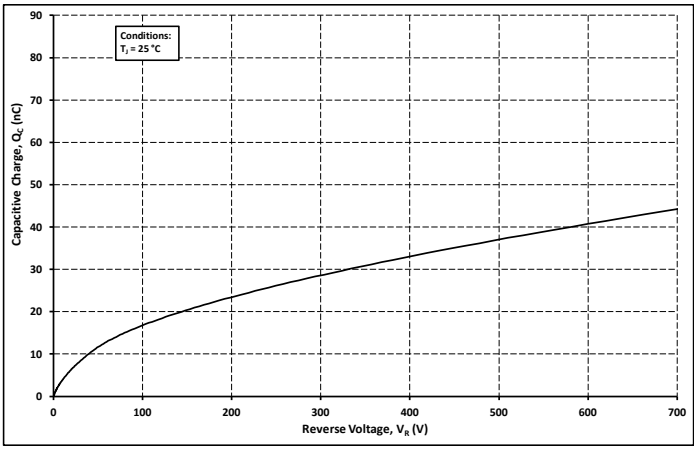


Figure 4
Typical Recovery Charge vs Reverse Voltage

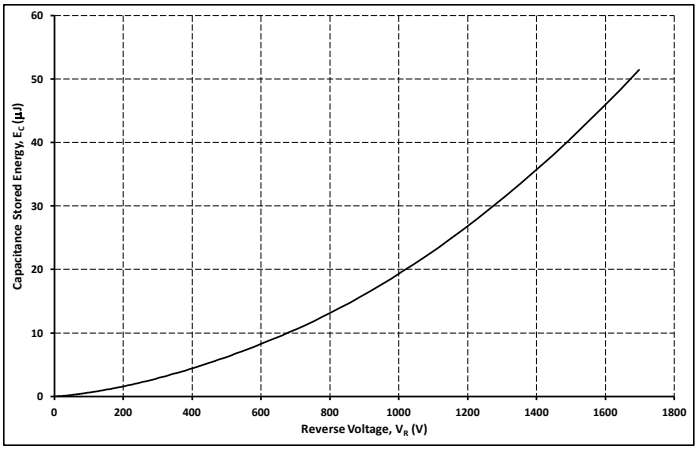


Figure 5
Typical Capacitance Stored Energy vs Reverse Voltage

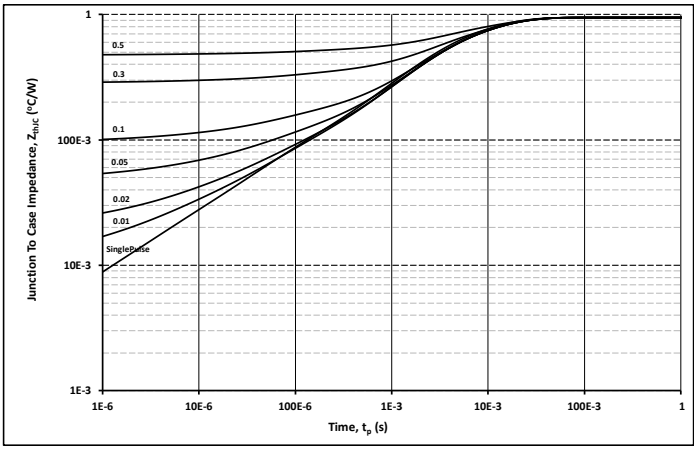
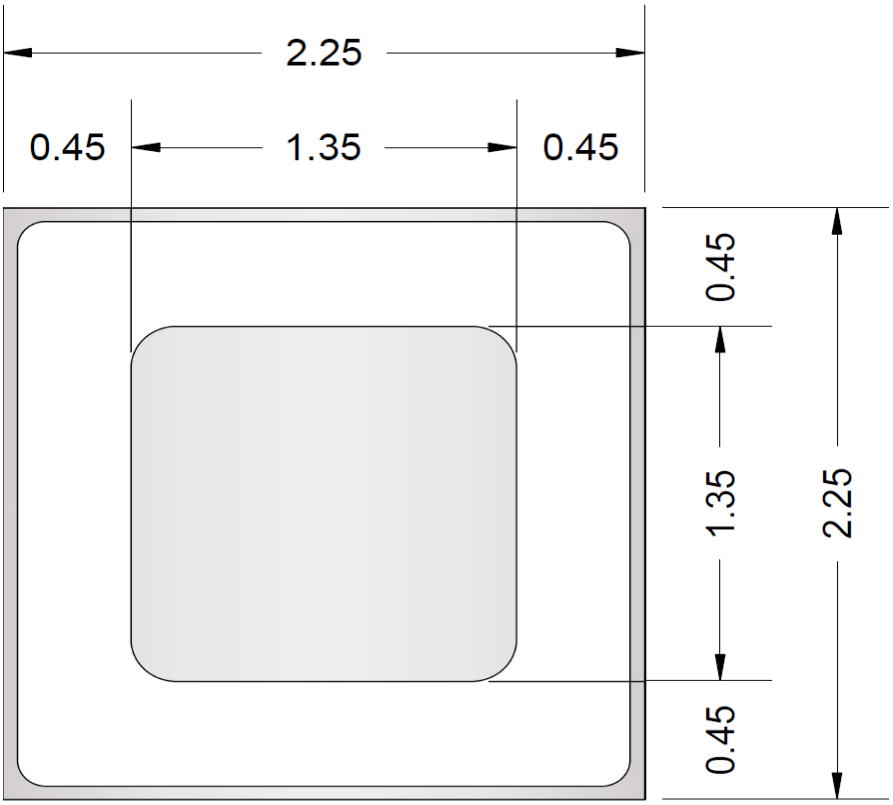


Figure 6
Typical Thermal Impedance Characteristics

Product Dimensions CPW6-1700-Z005A (Package Type — Bare Die)



Product Ordering Information

Order Number	Description	Package
CPW6-1700-Z005A-FA6	Gen6 1700V 5A Schottky Diode, Full Wafer, Multiple Fab	Bare Die Product

Revision History

Revision History	Date of Change	Brief Summary
1	07/01/2022	Initial Release

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