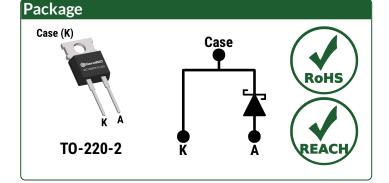
Silicon Carbide Schottky Diode



V _{RRM} =	1200 V
$I_{F(T_{c} = 159^{\circ}C)} =$	10 A
Qc =	53 nC

Features

- Low V_F for High Temperature Operation
- Enhanced Surge and Avalanche Robustness
- Superior Figure of Merit Q_C/I_F
- Low Thermal Resistance
- Low Reverse Leakage Current
- Temperature Independent Fast Switching
- Positive Temperature Coefficient of V_F
- High dV/dt Ruggedness



Advantages

- Improved System Efficiency
- High System Reliability
- Optimal Price Performance
- Reduced Cooling Requirements
- Increased System Power Density
- Zero Reverse Recovery Current
- Easy to Parallel without Thermal Runaway
- Enables Extremely Fast Switching

Applications

- Power Factor Correction (PFC)
- Solar Inverters
- Battery Chargers
- High Frequency Converters
- Switched Mode Power Supply (SMPS)
- AC/DC Power Supplies
- Anti-Parallel / Free-Wheeling Diode
- LED and HID Lighting

Absolute Maximum Ratings	(At T _C = 25°C Unless Otherwise Stated)
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Parameter	Symbol	Conditions	Values	Unit	Note
Repetitive Peak Reverse Voltage	V _{RRM}		1200	٧	
		T _C = 100°C, D = 1	25		
Continuous Forward Current	IF	T _C = 135°C, D = 1	18	Α	Fig. 4
		T _C = 159°C, D = 1	10		
Non-Repetitive Peak Forward Surge Current, Half Sine	l=	T _C = 25°C, t _P = 10 ms	100	٨	
Wave	IF,SM	T _C = 150°C, t _P = 10 ms	80	A	
Repetitive Peak Forward Surge Current, Half Sine Wave		T _C = 25°C, t _P = 10 ms	60	Α	
Repetitive Feak Forward Surge Current, Hall Sille Wave	IF,RM	T _C = 150°C, t _P = 10 ms	42	A	
Non-Repetitive Peak Forward Surge Current	I _{F,MAX}	T _C = 25°C, t _P = 10 μs	500	Α	
i ² t Value	∫i²dt	T _C = 25°C, t _P = 10 ms	50	A ² s	
Non-Repetitive Avalanche Energy	E _{AS}	L = 3.6 mH, I _{AS} = 10 A	180	mJ	
Diode Ruggedness	dV/dt	V _R = 0 ~ 960 V	200	V/ns	
Power Dissipation	Ртот	T _C = 25°C	181	W	Fig. 3
Operating and Storage Temperature	Tj, Tstg		-55 to 175	°C	



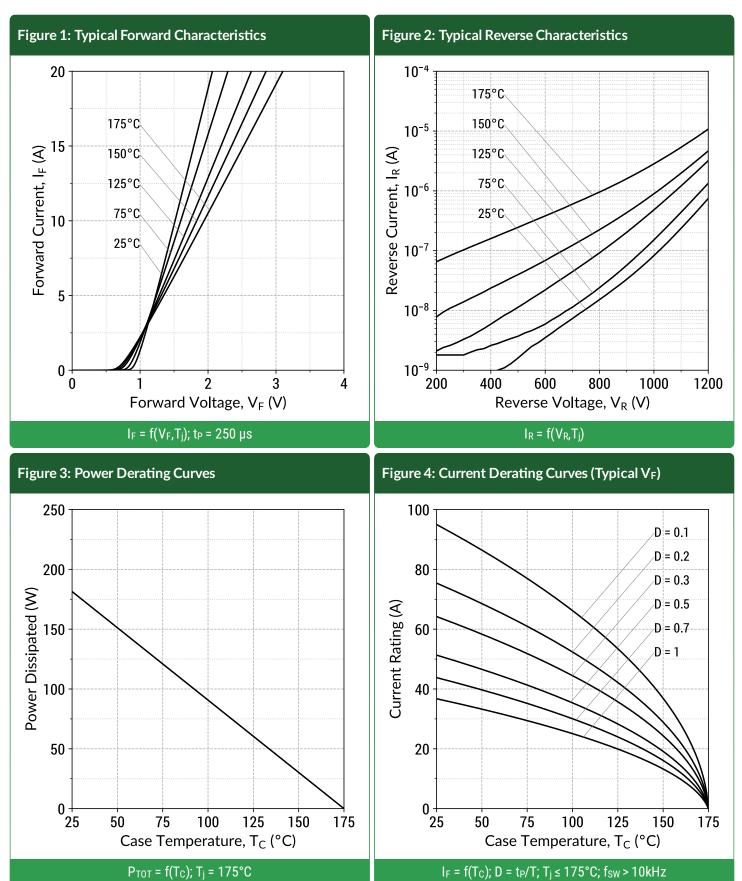
Electrical Characteristics

Parameter	Symbol	Conditions		Values			11	Note
Parameter	Symbol			Min.	Тур.	Max.	Unit	Note
Diode Forward Voltage	VF	I _F = 10 A, T _j = 25°C			1.5	1.8	۷	Fig. 1
	VF	I _F = 10 A, T _j = 175°C			1.9			
Reverse Current	la la	V _R = 1200 V, T _j = 25°C			1	5		Fig. 2
	IR	V _R = 1200 V, T _j = 175°C			11		μA	
Total Capacitive Charge	0-	V _R = 400 V			37		-0	Fig. 7
	Qc	I _F ≤ I _{F,MAX}	V _R = 800 V		53		nC	Fig. 7
Switching Time	+-	dl _F /dt = 200 A/µs	V _R = 400 V		< 10		no	
	ts		V _R = 800 V		< 10		ns	
Total Capacitance	0	V _R = 1 V, f = 1MHz			609			Fig. 6
	С	V _R = 800 V, f = 1MHz			36	pF		Fig. 6

Thermal/Package Characteristics

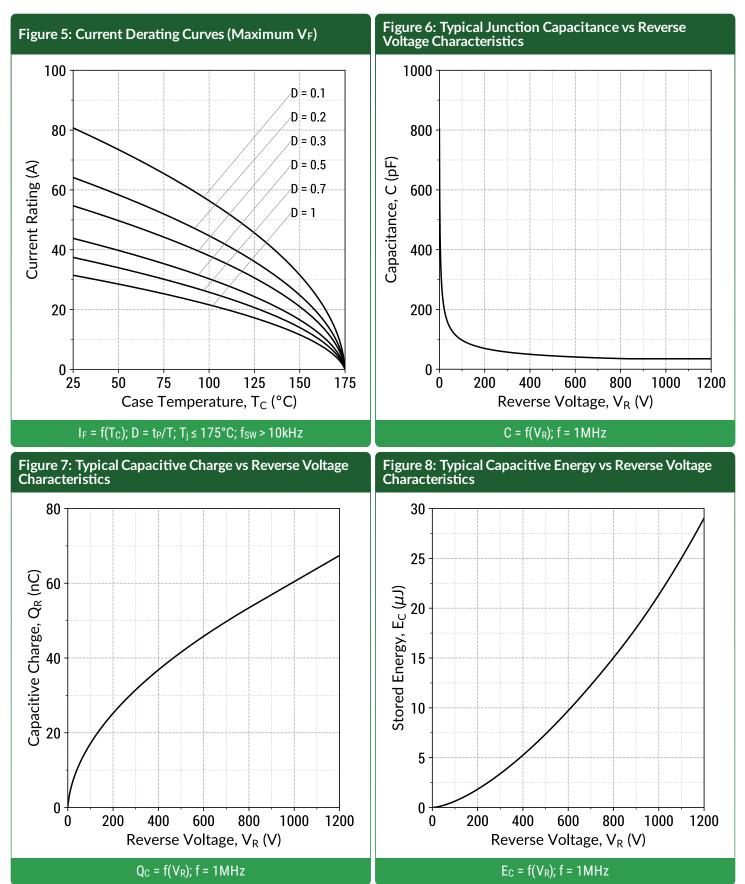
Devementer	Symbol	Conditions	Values			l Init	Noto
Parameter			Min.	Тур.	Max.	Unit	Note
Thermal Resistance, Junction - Case	RthJC			0.83		°C/W	Fig. 9
Weight	WT			2.0		g	
Mounting Torque	T _M	Screws to Heatsink			1.0	Nm	



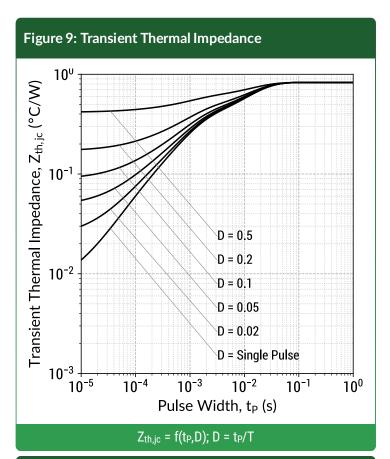


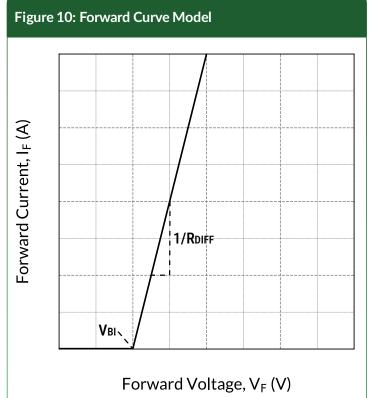
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 $I_F = f(V_F, T_j)$

Forward Curve Model Equation:

 $I_F = (V_F - V_{BI})/R_{DIFF} (A)$

Built-In Voltage (V_{BI}):

 $V_{BI}(T_j) = m \times T_j + n (V)$ m = -0.00123 (V/°C)

n = 0.995 (V)

Differential Resistance (RDIFF):

 $R_{DIFF}(T_j) = a \times T_j^2 + b \times T_j + c (\Omega)$ a = 1.19e-06 (\Omega/\circ{C}^2) b = 0.000169 (\Omega/\circ{C}) c = 0.0502 (\Omega)

Forward Power Loss Equation:

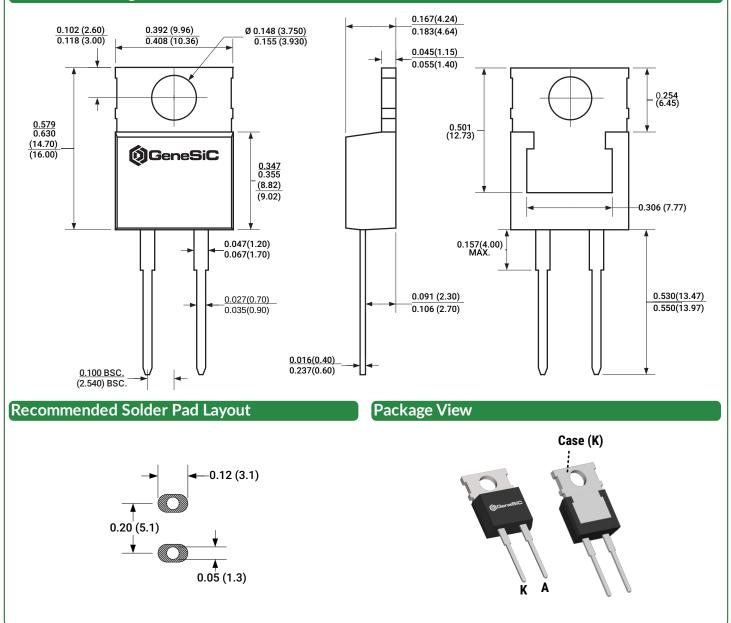
 $P_{LOSS} = V_{BI}(T_j) \times I_{AVG} + R_{DIFF}(T_j) \times I_{RMS}^2$





Package Dimensions

TO-220-2 Package Outline



NOTE

- 1. CONTROLLED DIMENSION IS INCH. DIMENSION IN BRACKET IS MILLIMETER.
- 2. DIMENSIONS DO NOT INCLUDE END FLASH, MOLD FLASH, MATERIAL PROTRUSIONS.

GC10MPS12-220 1200V 10A SiC Schottky MPS™ Diode



Compliance

RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS 2), as adopted by EU member states on January 2, 2013 and amended on March 31, 2015 by EU Directive 2015/863. RoHS Declarations for this product can be obtained from your GeneSiC representative.

REACH Compliance

REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a GeneSiC representative to insure you get the most up-to-date REACH SVHC Declaration. REACH banned substance information (REACH Article 67) is also available upon request.

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Related Links

SPICE Models:	https://www.genesicsemi.com/sic-schottky-mps/GC10MPS12-220/GC10MPS12-220_SPICE.zip
• PLECS Models:	https://www.genesicsemi.com/sic-schottky-mps/GC10MPS12-220/GC10MPS12-220_PLECS.zip
CAD Models:	https://www.genesicsemi.com/sic-schottky-mps/GC10MPS12-220/GC10MPS12-220_3D.zip
Evaluation Boards	: https://www.genesicsemi.com/technical-support
• Reliability:	https://www.genesicsemi.com/reliability
Compliance:	https://www.genesicsemi.com/compliance
• Quality Manual:	https://www.genesicsemi.com/quality

Revision History

- Rev 21/Jul: Updated with most recent test data
- Supersedes: Rev 19/Apr, Rev 20/Apr, Rev 20/Aug



www.genesicsemi.com/sic-schottky-mps/



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