

Silicon Carbide Power Schottky Diode

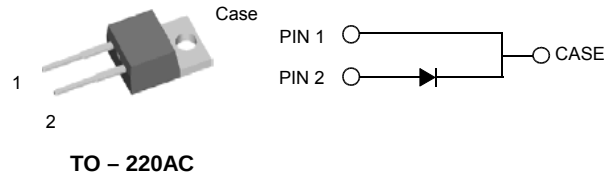
V_{RRM}	=	1200 V
I_F	=	3 A
Q_C	=	11 nC

Features

- 1200 V Schottky rectifier
- 175 °C maximum operating temperature
- Zero reverse recovery charge
- Positive temperature coefficient of V_F
- Extremely fast switching speeds
- Temperature independent switching behavior
- Lowest figure of merit Q_C/I_F

Package

- RoHS Compliant



Advantages

- Improved circuit efficiency (Lower overall cost)
- Low switching losses
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Industry's lowest reverse recovery charge
- Industry's lowest device capacitance
- Ideal for output switching of power supplies
- Best in class reverse leakage current at operating temperature

Applications

- Power Factor Correction (PFC)
- Switched-Mode Power Supply (SMPS)
- Solar Inverters
- Wind Turbine Inverters
- Motor Drives
- Induction Heating
- Uninterruptible Power Supply (UPS)
- Voltage Clamping
- High Voltage Multipliers

Maximum Ratings, at $T_J = 175\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V_{RRM}		1200	V
Continuous forward current	I_F	$T_C \leq 150\text{ °C}$	3	A
RMS forward current	$I_{F(RMS)}$	$T_C \leq 150\text{ °C}$	5	A
Surge non-repetitive forward current, Half Sine Wave	$I_{F,SM}$	$T_C = 25\text{ °C}$, $t_p = 10\text{ ms}$	10	A
Non-repetitive peak forward current	$I_{F,max}$	$T_C = 25\text{ °C}$, $t_p = 10\text{ }\mu\text{s}$	45	A
i^2t value	$\int i^2 dt$	$T_C = 25\text{ °C}$, $t_p = 10\text{ ms}$	0.5	A ² s
Power dissipation	P_{tot}	$T_C = 25\text{ °C}$	85	W
Operating and storage temperature	T_J, T_{stg}		-55 to 175	°C

Electrical Characteristics, at $T_J = 175\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	V_F	$I_F = 3\text{ A}$, $T_J = 25\text{ °C}$		1.65		V
		$I_F = 3\text{ A}$, $T_J = 175\text{ °C}$		2.90		
Reverse current	I_R	$V_R = 1200\text{ V}$, $T_J = 25\text{ °C}$		3		μA
		$V_R = 1200\text{ V}$, $T_J = 175\text{ °C}$		10		
Total capacitive charge	Q_C	$V_R = 950\text{ V}$, $I_F \leq I_{F,max}$		11		nC
Switching time	t_b	$di_F/dt = 330\text{ A}/\mu\text{s}$, $T_J = 150\text{ °C}$		< 15		ns
Total capacitance	C	$V_R = 3\text{ V}$, $f = 1\text{ kHz}$, $T_J = 25\text{ °C}$		102		pF
		$V_R = 200\text{ V}$, $f = 1\text{ kHz}$, $T_J = 25\text{ °C}$		18		

Thermal Characteristics

Thermal resistance, junction - case	R_{thJC}	1.76	°C/W
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Mechanical Properties

Mounting torque	M	0.6	Nm
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1. Considering worst case Z_{th} conditions

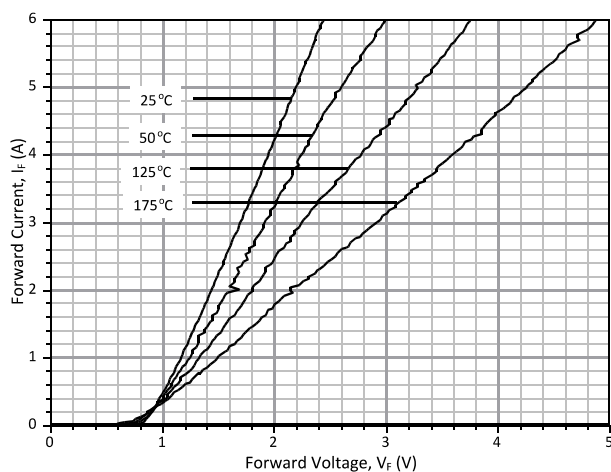


Figure 1: Typical Forward Characteristics

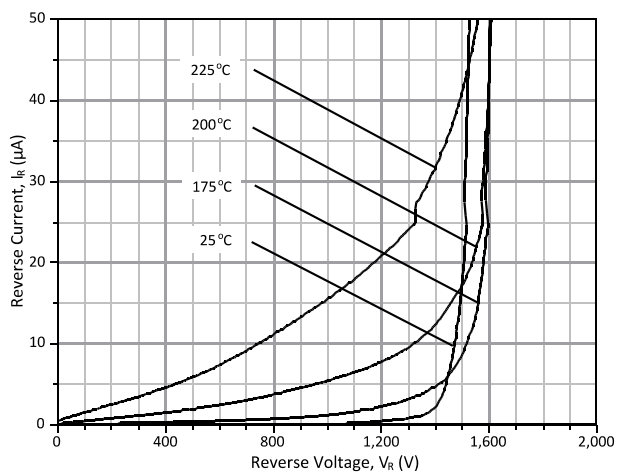


Figure 2: Typical Reverse Characteristics

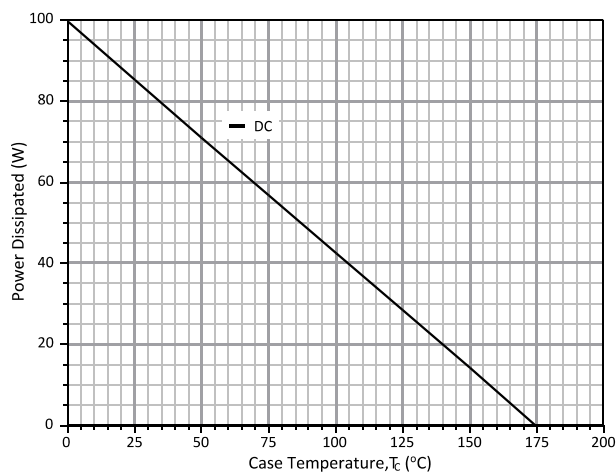


Figure 3: Typical Power Derating Curve

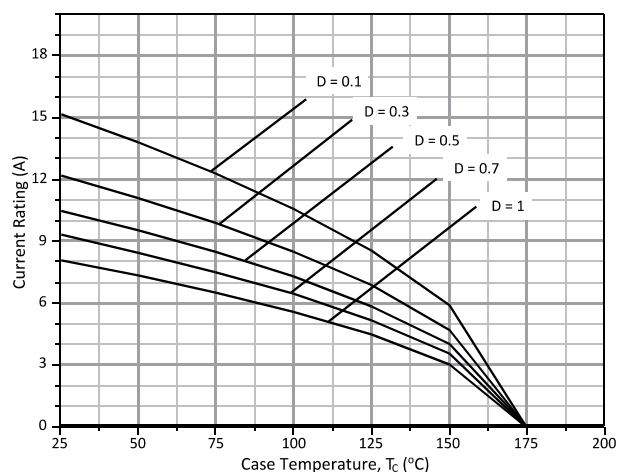


Figure 4: Typical Current Derating Curves ($D = t_p/T, t_p = 400 \mu s$)

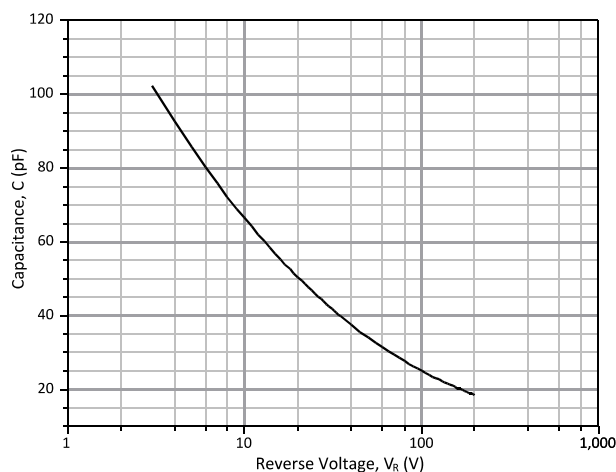


Figure 5: Typical Junction Capacitance versus Reverse Voltage Characteristics

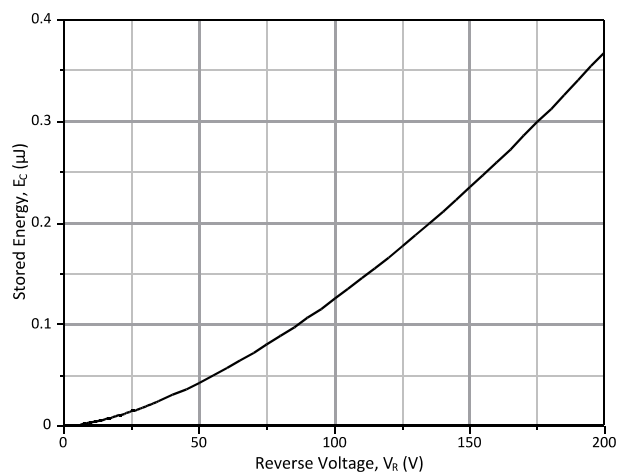


Figure 6: Typical Switching Energy versus Reverse Voltage Characteristics

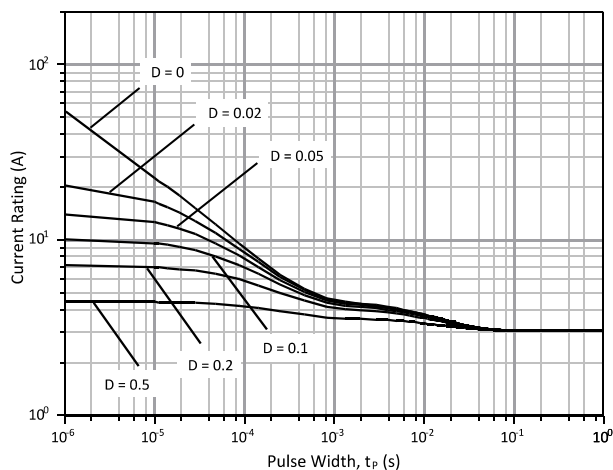


Figure 7: Typical Current versus Pulse Duration Curves at $T_c = 150\text{ }^{\circ}\text{C}$

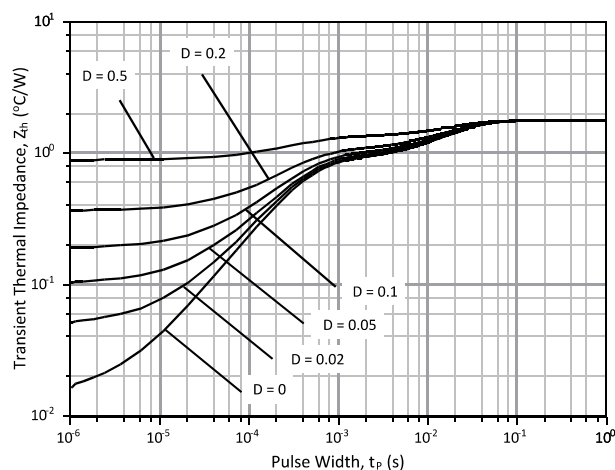
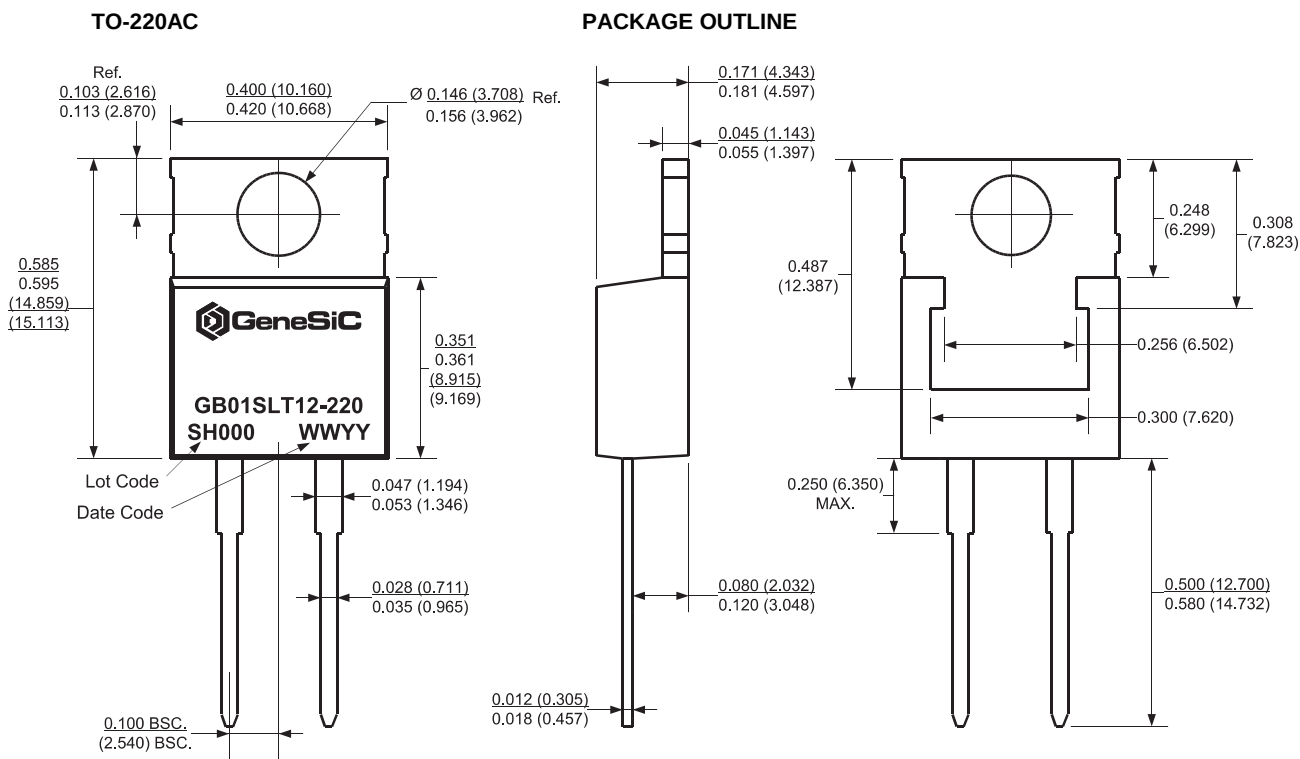


Figure 8: Typical Transient Thermal Impedance

Package Dimensions:



NOTE

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

Revision History

Date	Revision	Comments	Supersedes
2010/11/20	1	Second generation release	GA03SLT12-220

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