

Silicon Carbide Power Schottky Diode

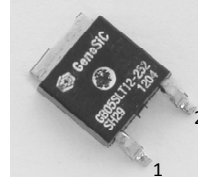
V_{RRM}	=	1200 V
V_F	=	1.8 V
I_F	=	5 A
Q_C	=	35 nC

Features

- 1200 V Schottky rectifier
- 175 °C maximum operating temperature
- Temperature independent switching behavior
- Superior surge current capability
- Positive temperature coefficient of V_F
- Extremely fast switching speeds
- Superior figure of merit Q_C/I_F

Package

- RoHS Compliant



TO – 252

Advantages

- Improved circuit efficiency (Lower overall cost)
- Low switching losses
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Low reverse recovery current
- Low device capacitance
- Low 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)
- 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	$T_C \leq 155\text{ °C}$	5	A
RMS forward current	$I_{F(RMS)}$	$T_C \leq 155\text{ °C}$	8	A
Surge non-repetitive forward current, Half Sine Wave	$I_{F,SM}$	$T_C = 25\text{ °C}$, $t_p = 10\text{ ms}$	32	A
		$T_C = 155\text{ °C}$, $t_p = 10\text{ ms}$	26	
Non-repetitive peak forward current	$I_{F,max}$	$T_C = 25\text{ °C}$, $t_p = 10\text{ }\mu\text{s}$	120	A
I^2t value	$\int i^2 dt$	$T_C = 25\text{ °C}$, $t_p = 10\text{ ms}$	5	A ² s
		$T_C = 155\text{ °C}$, $t_p = 10\text{ ms}$	3.4	
Power dissipation	P_{tot}	$T_C = 25\text{ °C}$	117	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	$I_F = 5\text{ A}$, $T_j = 25\text{ °C}$	1.63	1.79	1.83	V
		$I_F = 5\text{ A}$, $T_j = 175\text{ °C}$	2.59	2.84	2.91	
Reverse current	I_R	$V_R = 1200\text{ V}$, $T_j = 25\text{ °C}$	1.7	2.5	6.5	μA
		$V_R = 1200\text{ V}$, $T_j = 175\text{ °C}$	3.4	5.0	13.0	
Total capacitive charge	Q_C	$I_F \leq I_{F,MAX}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $T_j = 175\text{ °C}$	$V_R = 400\text{ V}$	21		nC
			$V_R = 960\text{ V}$	35		
Switching time	t_s		$V_R = 400\text{ V}$	< 25		ns
			$V_R = 960\text{ V}$			
Total capacitance	C	$V_R = 1\text{ V}$, $f = 1\text{ MHz}$, $T_j = 25\text{ °C}$		260		pF
		$V_R = 400\text{ V}$, $f = 1\text{ MHz}$, $T_j = 25\text{ °C}$		25		
		$V_R = 1000\text{ V}$, $f = 1\text{ MHz}$, $T_j = 25\text{ °C}$		20		

Thermal Characteristics

Thermal resistance, junction - case	R_{thJC}	1.4	°C/W
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Mechanical Properties

Mounting torque	M	0.6	Nm
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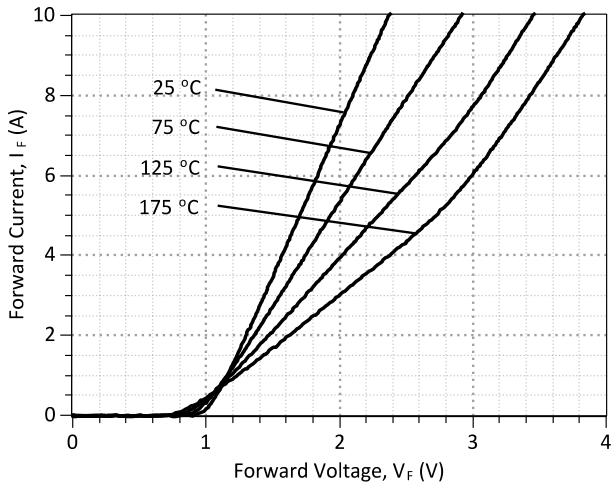


Figure 1: Typical Forward Characteristics

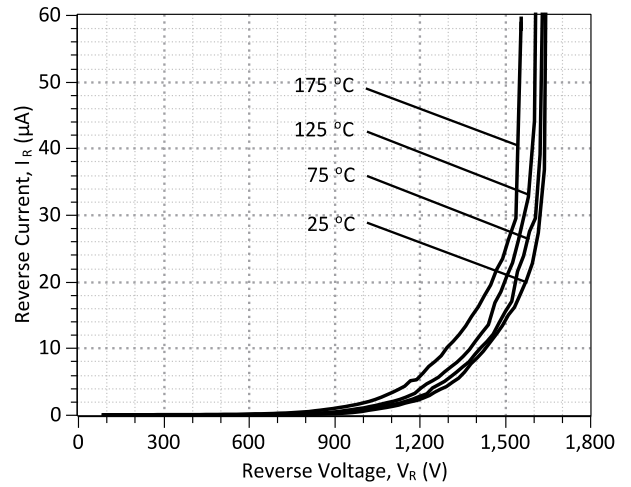


Figure 2: Typical Reverse Characteristics

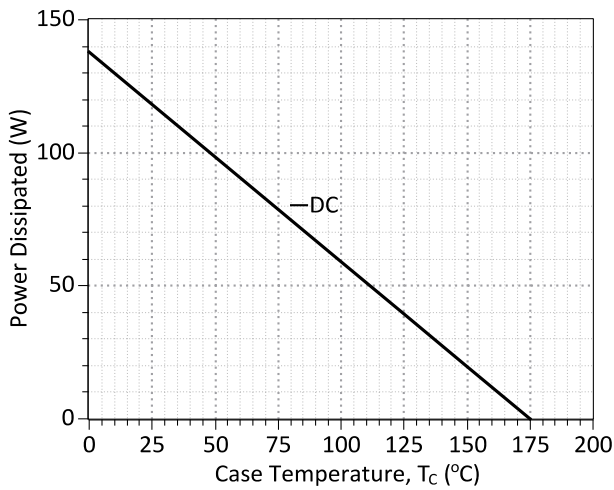
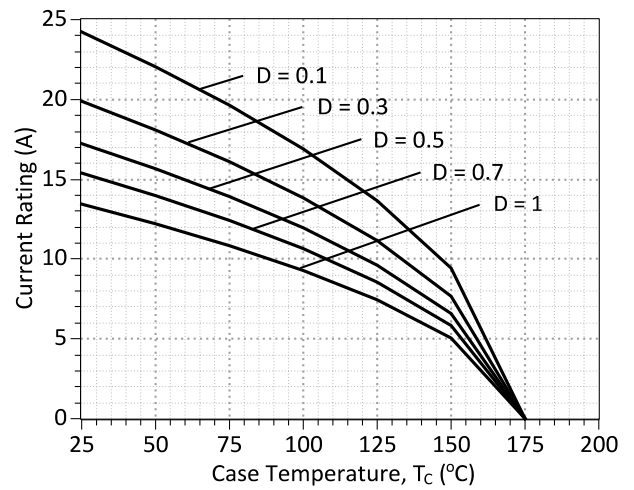


Figure 3: Power Derating Curve



**Figure 4: Current Derating Curves (D = t_p/T , $t_p = 400 \mu s$)
(Considering worst case Z_{th} conditions)**

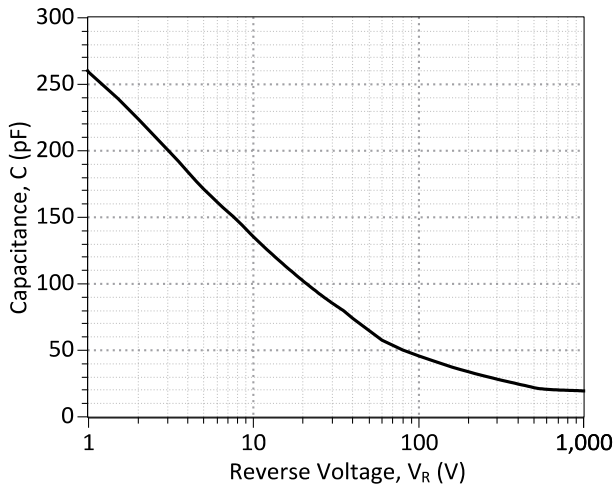


Figure 5: Typical Junction Capacitance vs Reverse Voltage Characteristics

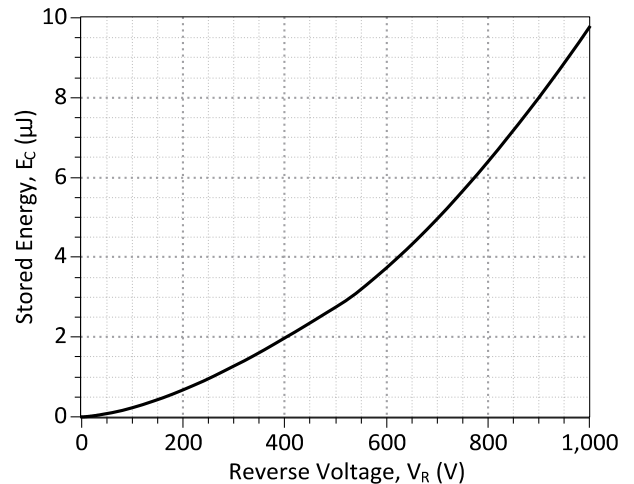


Figure 6: Typical Switching Energy vs Reverse Voltage Characteristics

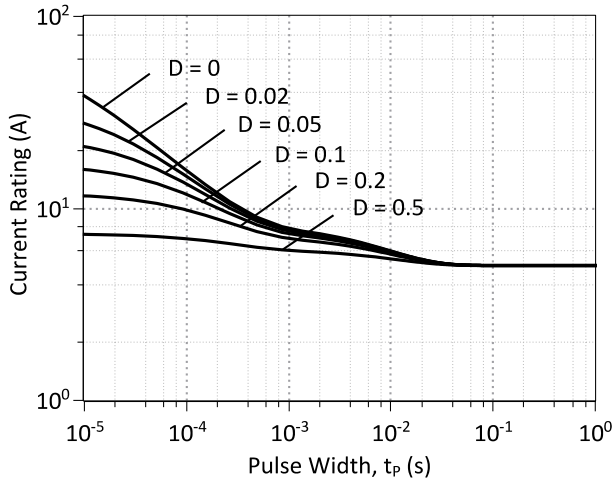


Figure 7: Current vs Pulse Duration Curves at $T_c = 155\text{ }^\circ\text{C}$

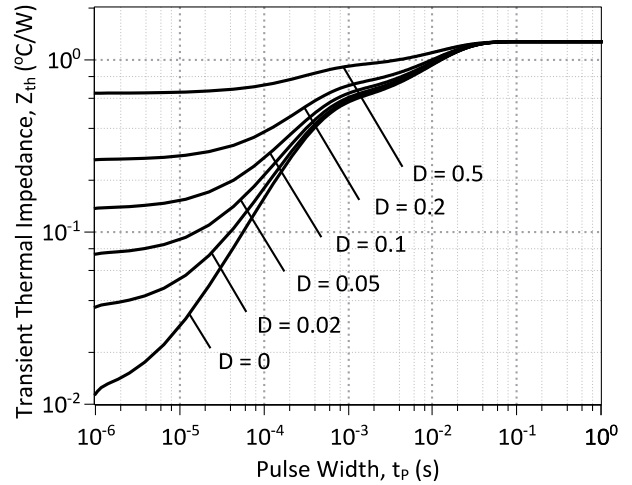
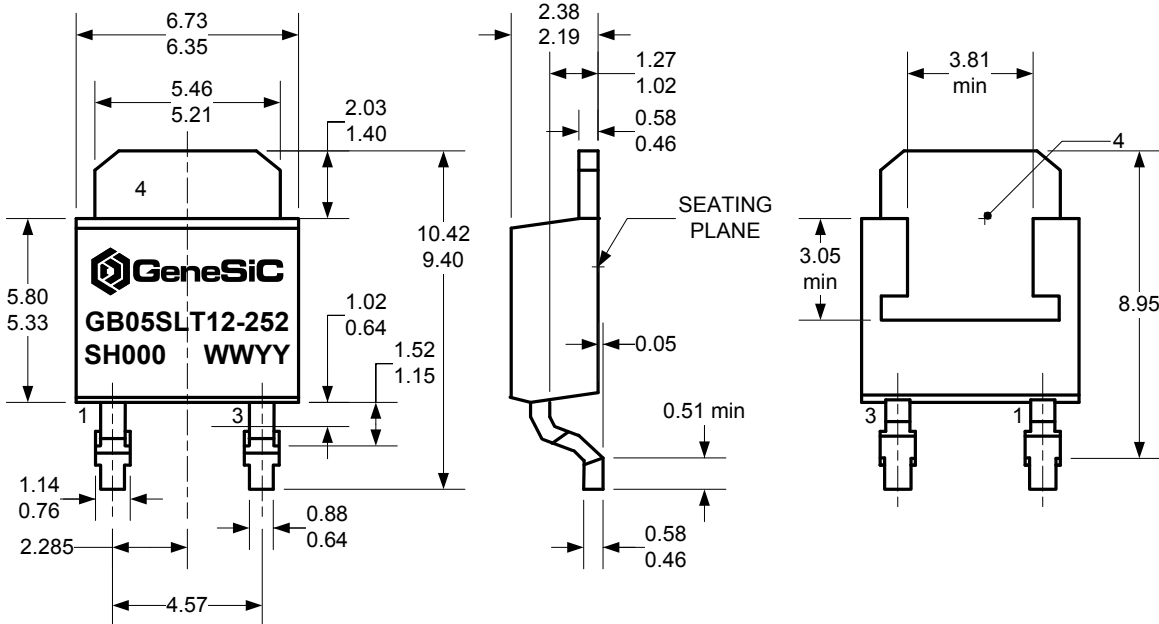


Figure 8: Transient Thermal Impedance

Package Dimensions:

TO-252

PACKAGE OUTLINE



NOTE

1. CONTROLLED DIMENSION IS INCH. DIMENSION IN BRACKET IS MILLIMETER.
2. DIMENSIONS DO NOT INCLUDE END FLASH, MOLD FLASH, MATERIAL PROTRUSIONS
3. CONTROLLED LEAD COPLANARITY $\langle D \rangle > 0.004$ INCH MAXIMUM

Revision History

Date	Revision	Comments	Supersedes
2013/02/05	2	Second generation update	
2012/05/22	1	Second generation release	
2010/12/14	0	Initial release	

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