

## Silicon Carbide Power Schottky Diode

$V_{RRM}$	=	3300 V
$I_F (T_C \leq 125^\circ\text{C})$	=	0.3 A
$Q_C$	=	20 nC

### Features

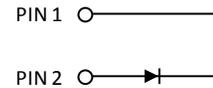
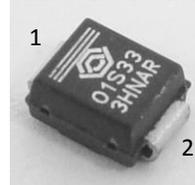
- Industry's leading low leakage currents
- 175 °C maximum operating temperature
- Electrically isolated base-plate
- Positive temperature coefficient of  $V_F$
- Fast switching speeds
- Superior figure of merit  $Q_C/I_F$

### Advantages

- Low reverse leakage current at operating temperature
- Improved circuit efficiency (Lower overall cost)
- Significantly reduced switching losses compare to Si PiN diodes
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Low reverse recovery current
- Low device capacitance

### Package

- RoHS Compliant



**SMB / DO – 214AA**

### Applications

- Down Hole Oil Drilling, Geothermal Instrumentation
- High Voltage Multipliers
- Military Power Supplies

### Maximum Ratings at $T_j = 175^\circ\text{C}$ , unless otherwise specified

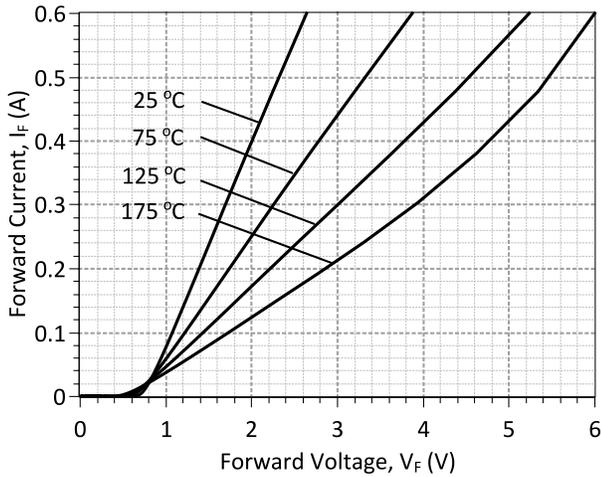
Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	$V_{RRM}$		3300	V
Continuous forward current	$I_F$	$T_C \leq 125^\circ\text{C}$	0.3	A
RMS forward current	$I_{F(RMS)}$	$T_C \leq 125^\circ\text{C}$	0.35	A
Surge non-repetitive forward current, Half Sine Wave	$I_{F,SM}$	$T_C = 25^\circ\text{C}$ , $t_p = 10\text{ ms}$	2	A
		$T_C = 125^\circ\text{C}$ , $t_p = 10\text{ ms}$	1	
Non-repetitive peak forward current	$I_{F,max}$	$T_C = 25^\circ\text{C}$ , $t_p = 10\ \mu\text{s}$	10	A
$\int i^2 dt$ value	$\int i^2 dt$	$T_C = 25^\circ\text{C}$ , $t_p = 10\text{ ms}$	0.1	A <sup>2</sup> S
Power dissipation	$P_{tot}$	$T_C = 25^\circ\text{C}$	25	W
Operating and storage temperature	$T_j, T_{stg}$		-55 to 175	°C

### Electrical Characteristics at $T_j = 175^\circ\text{C}$ , unless otherwise specified

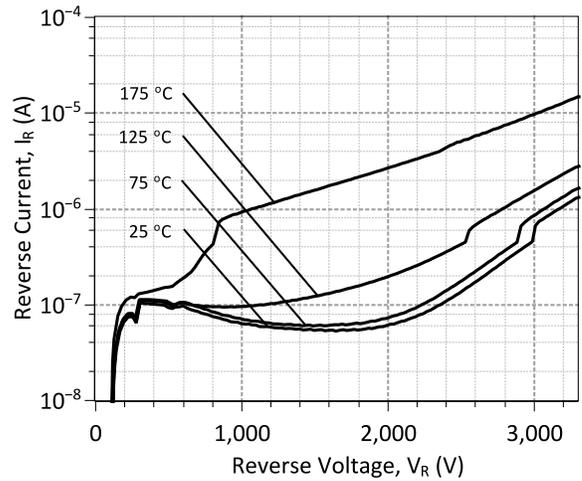
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	$V_F$	$I_F = 0.3\text{ A}$ , $T_j = 25^\circ\text{C}$	1.7	2.2	V	
		$I_F = 0.3\text{ A}$ , $T_j = 175^\circ\text{C}$	4.0	5.0		
Reverse current	$I_R$	$V_R = 3300\text{ V}$ , $T_j = 25^\circ\text{C}$	1	10	$\mu\text{A}$	
		$V_R = 3300\text{ V}$ , $T_j = 175^\circ\text{C}$	10	100		
Total capacitive charge	$Q_C$	$I_F \leq I_{F,MAX}$ $di_F/dt = 35\text{ A}/\mu\text{s}$ $T_j = 175^\circ\text{C}$		20	nC	
Switching time	$t_s$	$V_R = 1500\text{ V}$ $V_R = 1500\text{ V}$		< 60	ns	
Total capacitance	C	$V_R = 1\text{ V}$ , $f = 1\text{ MHz}$ , $T_j = 25^\circ\text{C}$		42	pF	
		$V_R = 400\text{ V}$ , $f = 1\text{ MHz}$ , $T_j = 25^\circ\text{C}$		8		
		$V_R = 1000\text{ V}$ , $f = 1\text{ MHz}$ , $T_j = 25^\circ\text{C}$		7		

### Thermal Characteristics

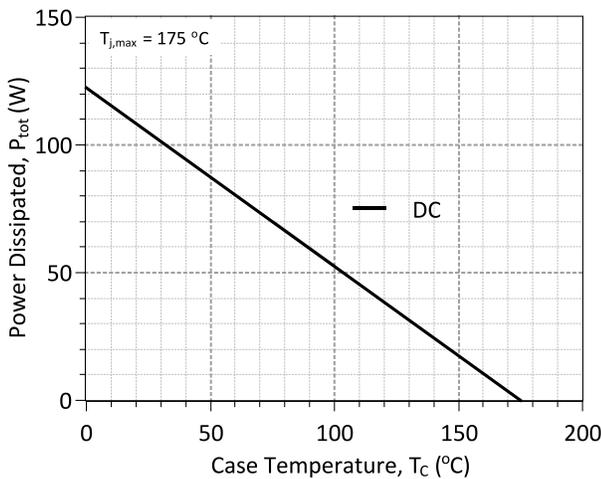
Thermal resistance, junction – Cu lead frame	$R_{thJC}$	1.42	°C/W
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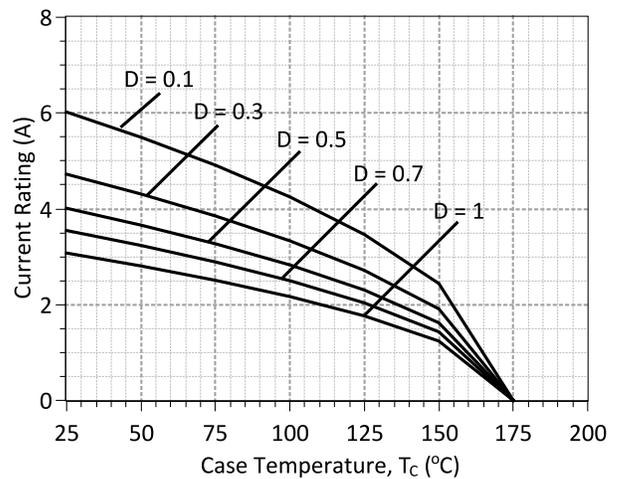
**Figure 1: Typical Forward Characteristics**



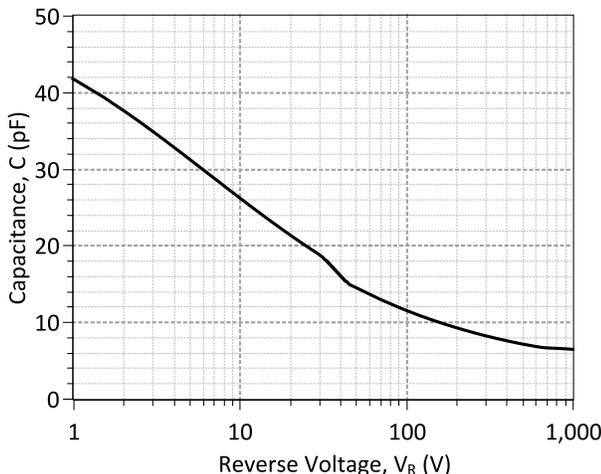
**Figure 2: Typical Reverse Characteristics**



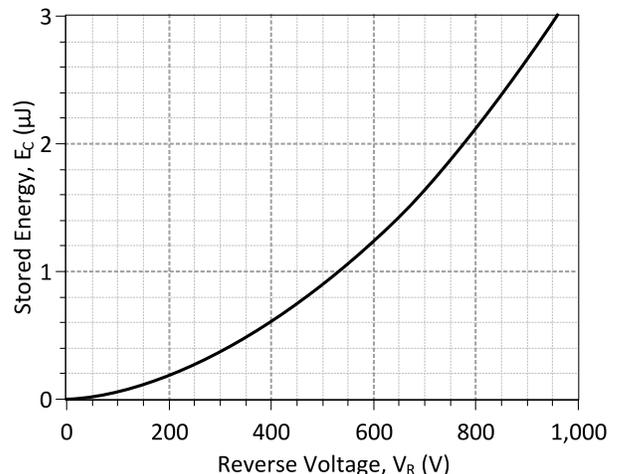
**Figure 3: Power Derating Curve**



**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 Capacitive Energy vs Reverse Voltage Characteristics**

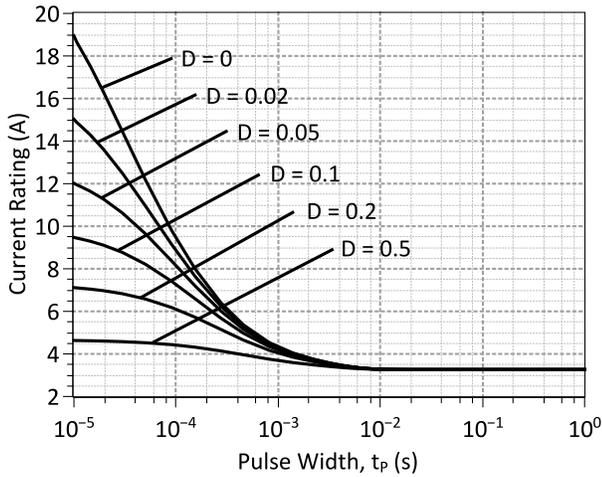


Figure 7: Current vs Pulse Duration Curves at  $T_C = 150\text{ }^\circ\text{C}$

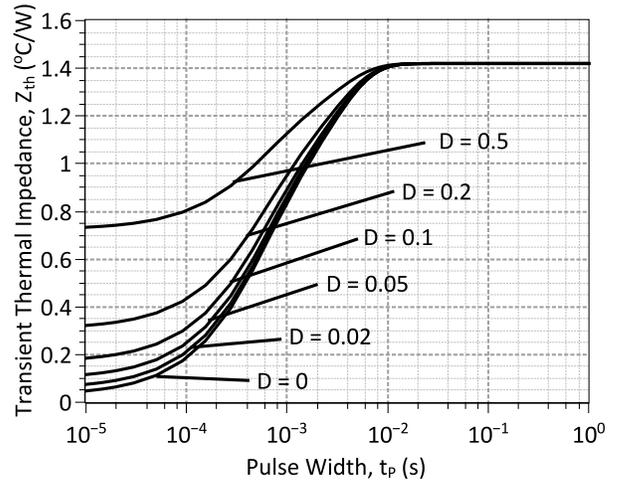
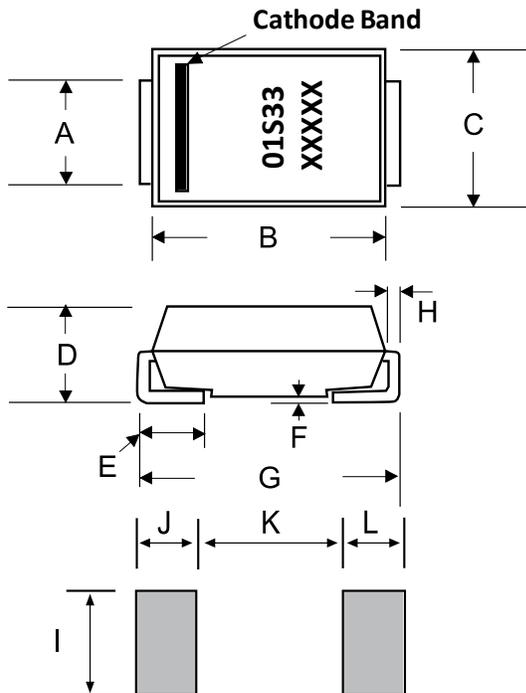


Figure 8: Transient Thermal Impedance

**Package Dimensions:**

**SMB / DO-214AA**

**PACKAGE OUTLINE**



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.086	1.950	2.200
B	0.160	0.180	4.060	4.570
C	0.130	0.155	3.300	3.940
D	0.084	0.096	2.130	2.440
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.205	0.220	5.210	5.590
H	0.006	0.012	0.152	0.305
I	0.089	-	2.260	-
J	0.085	-	2.160	-
K	-	0.107	-	2.740
L	0.085	-	2.160	-

**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 <D> 0.004 INCH MAXIMUM

<b>Revision History</b>			
Date	Revision	Comments	Supersedes
2014/12/19	2	Updated Electrical Characteristics	
2014/08/26	1	Updated Electrical Characteristics	
2013/09/09	0	Initial Release	

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## SPICE Model Parameters

This is a secure document. Please copy this code from the SPICE model PDF file on our website ([http://www.genesicsemi.com/images/products\\_sic/rectifiers/GAP3SLT33-214\\_SPICE.pdf](http://www.genesicsemi.com/images/products_sic/rectifiers/GAP3SLT33-214_SPICE.pdf)) into LTSPICE (version 4) software for simulation of the GAP3SLT33-214.

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*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.0           $
*      $Date:      09-SEP-2013   $
*
*      GeneSiC Semiconductor Inc.
*      43670 Trade Center Place Ste. 155
*      Dulles, VA 20166
*
*      COPYRIGHT (C) 2013 GeneSiC Semiconductor Inc.
*      ALL RIGHTS RESERVED
*
* These models are provided "AS IS, WHERE IS, AND WITH NO WARRANTY
* OF ANY KIND EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED
* TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A
* PARTICULAR PURPOSE."
* Models accurate up to 2 times rated drain current.
*
* Start of GAP3SLT33-214 SPICE Model
*
.SUBCKT GAP3SLT33 ANODE KATHODE
R1 ANODE INT R=((TEMP-24)*0.0535); Temperature Dependant Resistor
D1 INT KATHODE GAP3SLT33_25C; Call the 25C Diode Model
D2 ANODE KATHODE GAP3SLT33_PIN; Call the PiN Diode Model
.MODEL GAP3SLT33_25C D
+ IS      1.39E-14      RS      2.88
+ N      1.0120127     IKF     36.05007504
+ EG     1.2           XTI     -3
+ CJO    6.01E-11     VJ     0.924257443
+ M      0.3084545     FC     0.5
+ TT     1.00E-10     BV     3300
+ IBV    1.00E-03     VPK    3300
+ IAVE   3.00E-01     TYPE   SiC_Schottky
+ MFG    GeneSiC_Semiconductor
.MODEL GAP3SLT33_PIN D
+ IS      178.99E-18   RS      15
+ N      5            EG     3.23
+ XTI    50          FC     0.5
+ TT     0           BV     3300
+ IBV    1.00E-03     VPK    3300
+ IAVE   3.00E-01     TYPE   SiC_PiN
.ENDS
* End of GAP3SLT33-214 SPICE Model

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.