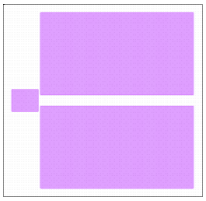
Normally – OFF Silicon Carbide Junction Transistor

V_{DS}	=	1200 V
$V_{DS(ON)}$	=	1.4 V
I_D	=	50 A
$R_{DS(ON)}$	=	28 mΩ

Features

- 175 °C maximum operating temperature
- Temperature independent switching performance
- Gate oxide free SiC switch
- Suitable for connecting an anti-parallel diode
- Positive temperature coefficient for easy paralleling
- Low gate charge
- Low intrinsic capacitance



Advantages

- Low switching losses
- Higher efficiency
- High temperature operation
- High short circuit withstand capability

Applications

- Down Hole Oil Drilling, Geothermal Instrumentation
- Hybrid Electric Vehicles (HEV)
- Solar Inverters
- Switched-Mode Power Supply (SMPS)
- Power Factor Correction (PFC)
- Induction Heating
- Uninterruptible Power Supply (UPS)
- Motor Drives

Maximum Ratings at T_j = 175 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Drain – Source Voltage	V_{DS}	V_{GS} = 0 V	1200	V
Continuous Drain Current	I_D	$T_C \leq$ 95 °C, R_{thJC} = 0.26 °C/W	50	A
Gate Peak Current	I_{GM}		10	A
Reverse Gate – Source Voltage	V_{GS}		30	V
Reverse Drain – Source Voltage	V_{DS}		25	V
Power Dissipation	P_{tot}	T_C = 25 °C	577	W
Operating and Storage Temperature	T_j, T_{stg}		-55 to 175	°C

Electrical Characteristics at T_j = 175 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values min.	Values typ.	Values max.	Unit
On Characteristics						
Drain – Source On Voltage	$V_{DS(ON)}$	I_D = 50 A, I_G = 1000 mA, T_j = 25 °C		1.4		V
		I_D = 50 A, I_G = 2000 mA, T_j = 125 °C		1.6		
		I_D = 50 A, I_G = 4000 mA, T_j = 175 °C		2.2		
Drain – Source On Resistance	$R_{DS(ON)}$	I_D = 50 A, I_G = 1000 mA, T_j = 25 °C		28		mΩ
		I_D = 50 A, I_G = 2000 mA, T_j = 125 °C		32		
		I_D = 50 A, I_G = 4000 mA, T_j = 175 °C		44		
Gate Forward Voltage	$V_{GS(FWD)}$	I_G = 500 mA, T_j = 25 °C		3.3		V
		I_G = 500 mA, T_j = 175 °C		3.1		
Off Characteristics						
Drain Leakage Current	I_{DSS}	V_R = 1200 V, V_{GS} = 0 V, T_j = 25 °C		18		μA
		V_R = 1200 V, V_{GS} = 0 V, T_j = 125 °C		26		
		V_R = 1200 V, V_{GS} = 0 V, T_j = 175 °C		35		
Gate – Source Leakage Current	I_{GSS}	V_{GS} = -20 V, T_j = 25 °C		20		nA

Figure 1: Typical Output Characteristics at 25 °C

Figure 2: Typical Output Characteristics at 125 °C

Figure 3: Typical Output Characteristics at 175 °C

Figure 4: Typical Gate Source I-V Characteristics vs. Temperature

Figure 5: Normalized On-Resistance vs. Temperature

Figure 6: Typical Blocking Characteristics

Revision History			
Date	Revision	Comments	Supersedes
2013/09/18	0	Initial release	

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43670 Trade Center Place Suite 155
Dulles, VA 20166

SPICE Model Parameters

Copy the following code into a SPICE software program for simulation of the GA50JT12-CAL device.

```
*     MODEL OF GeneSiC Semiconductor Inc.
*
*     $Revision:   1.0           $
*     $Date:   26-AUG-2013       $
*
*     GeneSiC Semiconductor Inc.
*     43670 Trade Center Place Ste. 155
*     Dulles, VA 20166
*     http://www.genesicsemi.com/index.php/sic-products/sjt
*
*     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.
*
.model GA50JT12 NPN
+ IS       5.00E-47
+ ISE      1.26E-28
+ EG       3.2
+ BF       100
+ BR       0.55
+ IKF      3500
+ NF       1
+ NE       2
+ RB       0.26
+ RE       0.01
+ RC       0.011
+ CJC      1.75E-9
+ VJC      3
+ MJC      0.5
+ CJE      5.57E-9
+ VJE      3
+ MJE      0.5
+ XTI      3
+ XTB      -1.2
+ TRC1     7.00E-3
+ VCEO     1200
+ ICRATING 50
+ MFG      GeneSiC_Semiconductor
*
* End of GA50JT12-CAL SPICE Model
```