Normally – OFF Silicon Carbide Super Junction Transistor

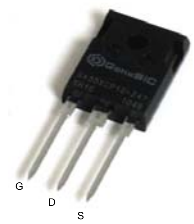
V_{DS}	=	1700 V
I_D	=	16 A
$R_{DS(ON)}$	=	110 mΩ

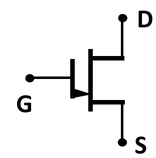
Features

- 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

Package

- RoHS Compliant





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Advantages

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

Applications

- Ideal for Aerospace and Defense 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	1700	V
Continuous Drain Current	I_D	T_C = 90 °C	16	A
Gate Peak Current	I_{GM}		5	A
Reverse Gate – Source Voltage	V_{SG}		50	V
Reverse Drain – Source Voltage	V_{SD}		40	V
Power Dissipation	P_{tot}	T_C = 25 °C	31	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			Unit
			min.	typ.	max.	
On Characteristics						
Drain – Source On Voltage	$V_{DS(ON)}$	I_D = 16 A, I_G = 1000 mA, T_j = 25 °C		2		V
		I_D = 16 A, I_G = 1000 mA, T_j = 125 °C		3.3		
		I_D = 16 A, I_G = 1000 mA, T_j = 175 °C		4.5		
Drain – Source On Resistance	$R_{DS(ON)}$	I_D = 16 A, I_G = 1000 mA, T_j = 25 °C		110		mΩ
		I_D = 16 A, I_G = 1000 mA, T_j = 125 °C		210		
		I_D = 16 A, I_G = 1000 mA, T_j = 175 °C		280		
Gate Forward Voltage	$V_{GS(FWD)}$	I_G = 500 mA, T_j = 25 °C		3		V
		I_G = 500 mA, T_j = 175 °C		2.7		
DC Current Gain	β	V_{DS} = 5 V, I_D = 16 A, T_j = 25 °C		69		
		V_{DS} = 5 V, I_D = 16 A, T_j = 175 °C		47		
Off Characteristics						
Drain Leakage Current	I_{DSS}	V_R = 1700 V, V_{GS} = 0 V, T_j = 25 °C		0.1		μA
		V_R = 1700 V, V_{GS} = 0 V, T_j = 125 °C		0.5		
		V_R = 1700 V, V_{GS} = 0 V, T_j = 175 °C		1		

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

Parameter	Symbol	Conditions	Values min.	Values typ.	Values max.	Unit
Switching Characteristics						
Turn On Delay Time	$t_{d(on)}$	V_{DD} = 1100 V, I_D = 16 A, $R_{G(on)}$ = $R_{G(off)}$ = 22 Ω, V_{GS} = -8/15 V, L = 1.1 mH, FWD = GB20SLT12, T_j = 25 °C Refer to Figure 11 for gate current waveform		tbd		ns
Rise Time	t_r			tbd		ns
Turn Off Delay Time	$t_{d(off)}$			tbd		ns
Fall Time	t_f			tbd		ns
Turn-On Energy Per Pulse	E_{on}			tbd		µJ
Turn-Off Energy Per Pulse	E_{off}			tbd		µJ
Total Switching Energy	E_{ts}			tbd		µJ
Turn On Delay Time	$t_{d(on)}$	V_{DD} = 1100 V, I_D = 16 A, $R_{G(on)}$ = $R_{G(off)}$ = 22 Ω, V_{GS} = -8/15 V, L = 1.1 mH, FWD = GB20SLT12, T_j = 175 °C Refer to Figure 11 for gate current waveform		tbd		
Rise Time	t_r			tbd		ns
Turn Off Delay Time	$t_{d(off)}$			tbd		ns
Fall Time	t_f			tbd		ns
Turn-On Energy Per Pulse	E_{on}			tbd		µJ
Turn-Off Energy Per Pulse	E_{off}			tbd		µJ
Total Switching Energy	E_{ts}			tbd		µJ

Thermal Characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
Thermal resistance, junction - case	R_{thJC}			0.64		°C/W

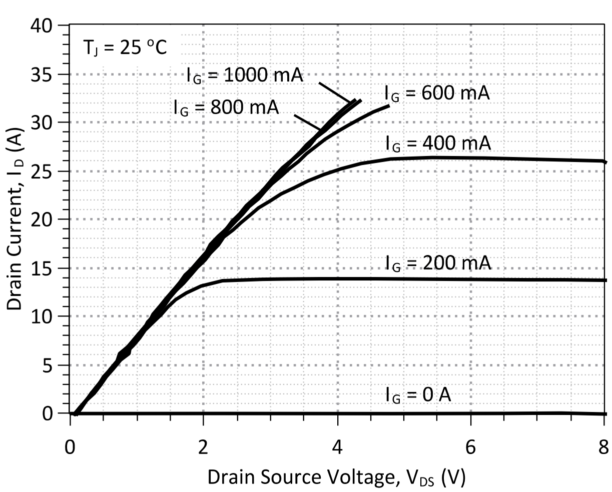


Figure 1: Typical Output Characteristics at 25 °C

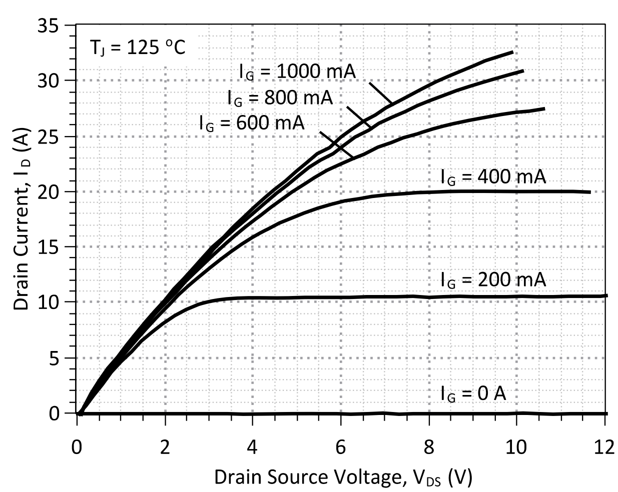


Figure 2: Typical Output Characteristics at 125 °C

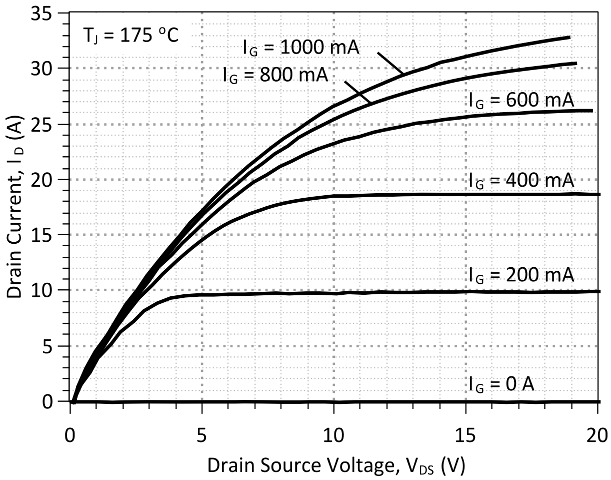


Figure 3: Typical Output Characteristics at 175 °C

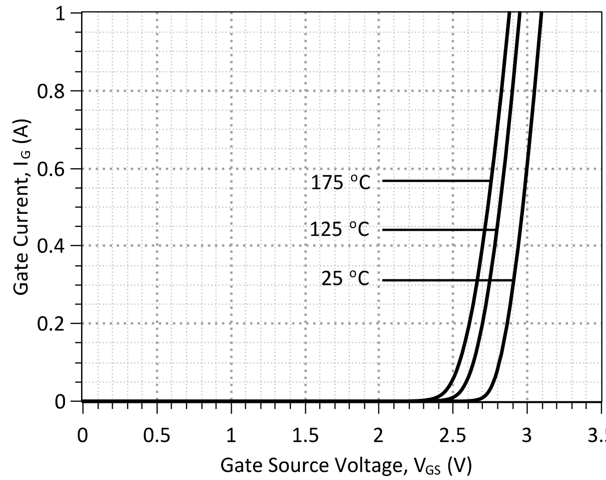


Figure 4: Typical Gate Source I-V Characteristics vs. Temperature

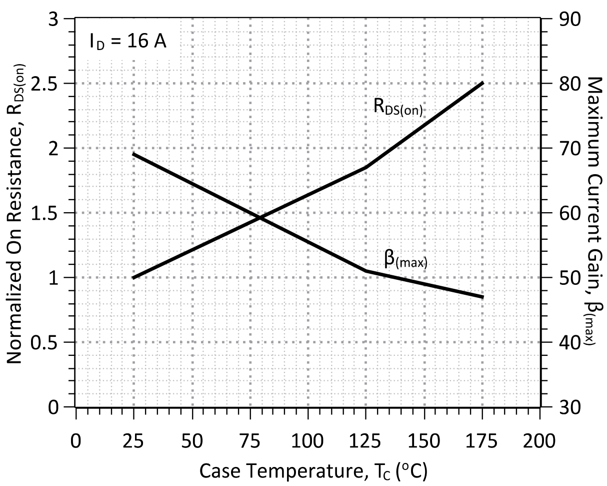


Figure 5: Normalized On-Resistance and Current Gain vs. Temperature

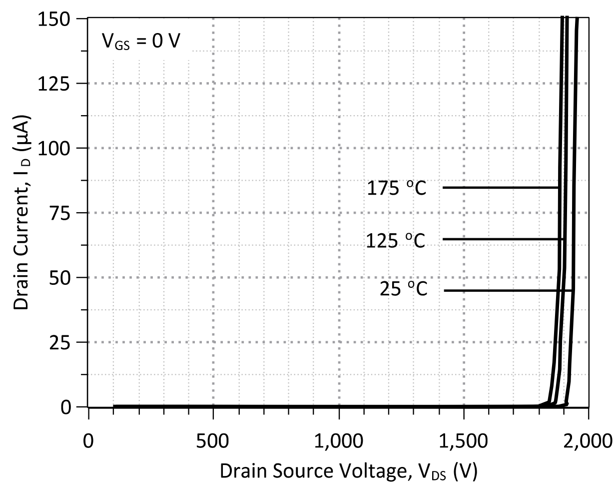


Figure 6: Typical Blocking Characteristics

TBD

TBD

Figure 7: Typical Hard-switched Turn On Waveforms

Figure 8: Typical Hard-switched Turn Off Waveforms

TBD

Figure 9: Typical Turn On Energy Losses and Switching Times vs. Temperature

TBD

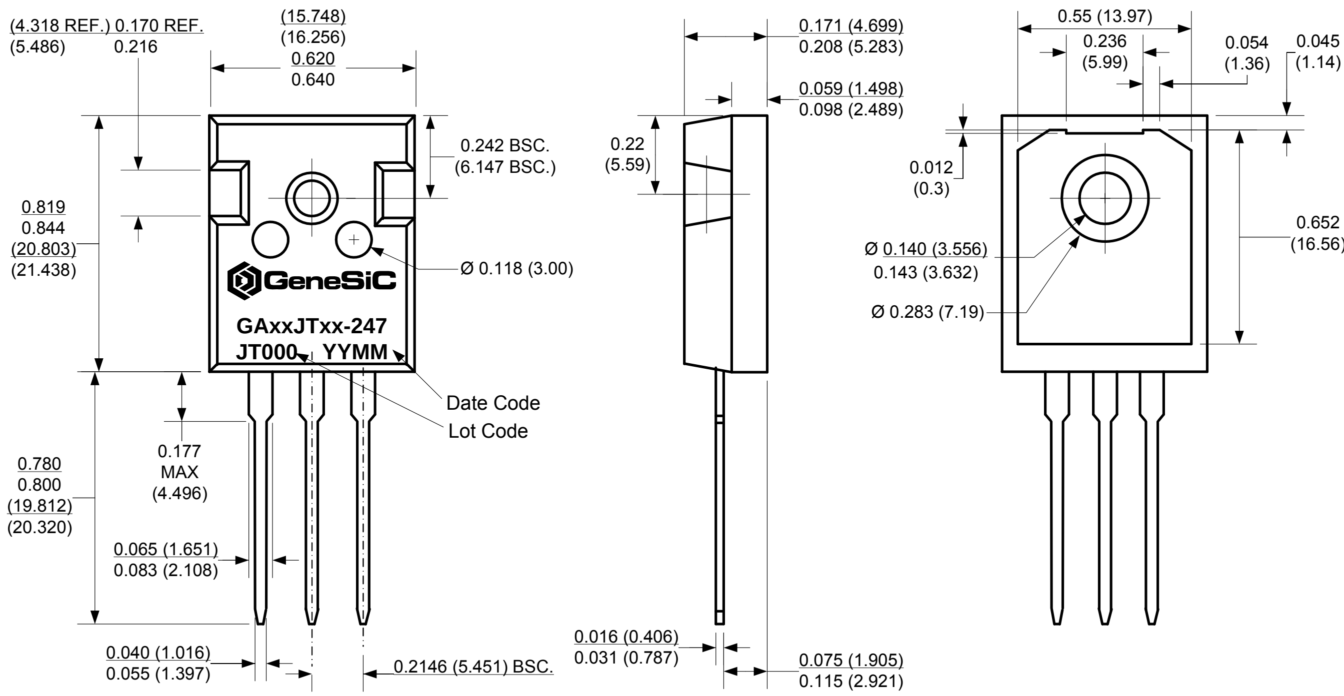
Figure 10: Typical Turn Off Energy Losses and Switching Times vs. Temperature

TBD

Figure 11: Typical Gate Current Waveform

Package Dimensions:

TO-247AB **PACKAGE OUTLINE**



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
2012/09/26	0	Initial release	

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