

A2G200N1200ME3

1200V SiC MOSFET module

Technical Features

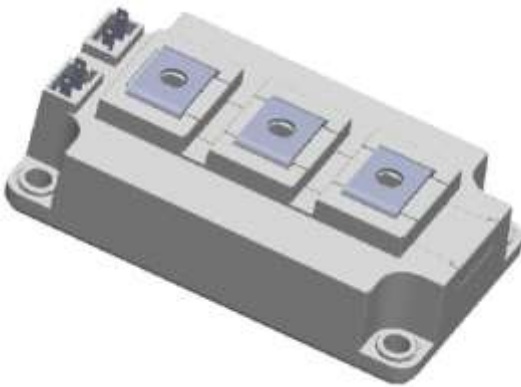
- Industry Standard 62mm Footprint
- Ultra Low Loss, High-Frequency Operation
- Zero Reverse Recovery from Diodes
- Zero Turn-off Tail Current from MOSFET
- Normally-off, Fail-safe Device Operation
- Copper Baseplate and Aluminum Nitride Insulator

Applications

- High Frequency Switching application
- DC/DC converter
- Solar and Wind Inverters
- UPS and SMPS
- Traction

Product Summary

V_{DS}	1200V
I_D	200A



1. Package

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
L_{Stray}	Stray Inductance			20		nH
W	Weight			340		g
Ms	Mounting Torque	M6-1.0 bolts	4		5.5	N*m
Visol	Case Isolation Voltage	DC 1min	5.8			kV
	Clearance Distance	Terminal to Terminal		9		mm
		Terminal to Baseplate		30		mm
	Creepage Distance	Terminal to Terminal		30		mm
		Terminal to Baseplate		40		mm

2. SiC-MOS

2.1. Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	1200	V
V_{GS}	Gate-Source Voltage	-10/+22	V
I_D	Drain Current (continuous)	200	A
I_{DM}	Drain Current (pulsed)	400	A

A2G200N1200ME3

2.2. Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source Breakdown Voltage	$V_{GS}=0V$	1200			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=1200V, V_{GS}=0V$			200	μA
I_{GSS}	Gate-body Leakage Current	$V_{DS}=0V, V_{GS}=-10/+20V$			2	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=20mA$	2		4	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS}=20V, I_D=100A, T_{VJ}=25^\circ\text{C}$		8	11	$m\Omega$
$V_{GS(on)}$	Recommended turn-on Voltage	Static		18		V
$V_{GS(off)}$	Recommended turn-off Voltage			-5		V
R_G	Gate Resistance	$V_{GS}=0V, f=1MHz$		1.1		Ω
C_{iss}	Input Capacitance	$V_{DS}=1000V, f=1MHz$ $V_{AC}=25mV$		13.7		nF
C_{oss}	Output Capacitance			0.58		
C_{rss}	Reverse Transfer Capacitance			26		pF
E_{on}	Turn-On Energy	$V_{DD}=800V, V_{GS}=-5/+20V$		5.2		mJ
E_{off}	Turn-Off Energy	$I_D=100A, \text{Load}=68\mu H$		1.4		mJ
Q_{GS}	Gate-Source Charge	$V_{DD}=800V$		153		nC
Q_{GD}	Gate-Drain Charge	$V_{GS}=-4/+20V$		156		
Q_G	Total Gate Charge	$I_D=100A$		476		
$t_{d(on)}$	Turn-on delay time	$V_{DD}=800V$ $V_{GS}=-4/+20V, I_D=100A$ $R_G(\text{ext}=2.5\Omega)$		52		ns
t_r	Rise Time			38		
$t_{d(off)}$	Turn-off delay time			81		
t_f	Fall Time			17		

3. Typical Performance-Reverse Diode ($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{FSD}	Forward Voltage	$V_{GS}=0V, I_F=100A$		3.5	6	V
I_S	Continuous Diode Forward Current	$V_{GS}=0V, T_C=25^\circ\text{C}$		100		A
t_{rr}	Reverse Recovery Time	$V_{GS}=-5V, I_F=100A$ $V_R=800V, T_J=25^\circ\text{C}$		98		ns
Q_{rr}	Reverse Recovery Charge			1226		nC
I_{rrm}	Peak Reverse Recovery Current			36		A

A2G200N1200ME3

Typical Performance

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

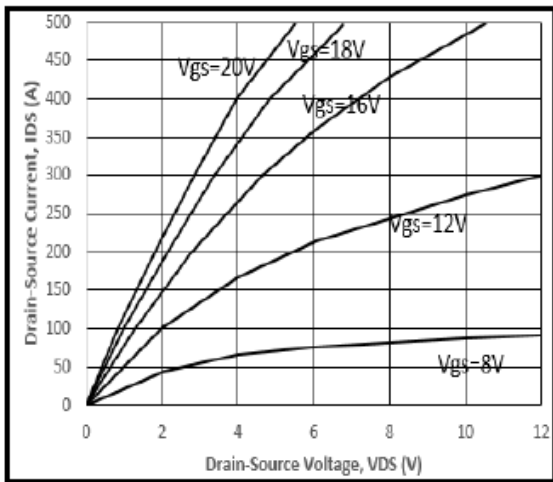


Fig.2 Typical Output Characteristics ($T_J = 150^\circ\text{C}$)

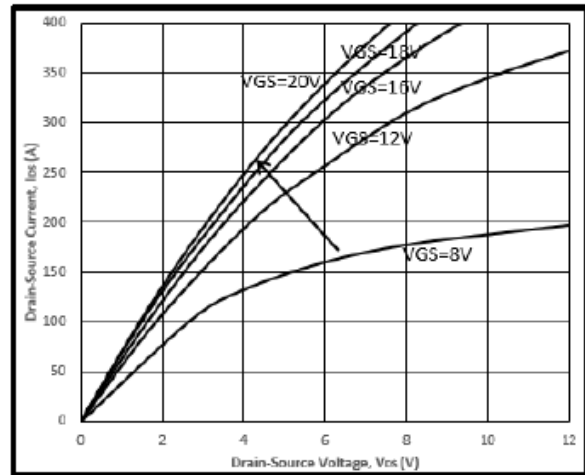


Figure 3. Normalized On-Resistance vs. T_J

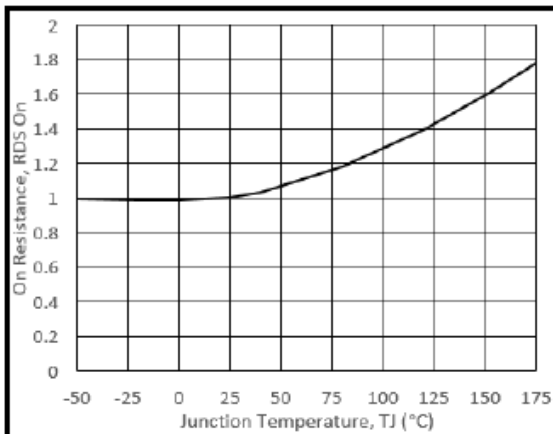


Figure 4. Threshold Voltage vs. Temperature

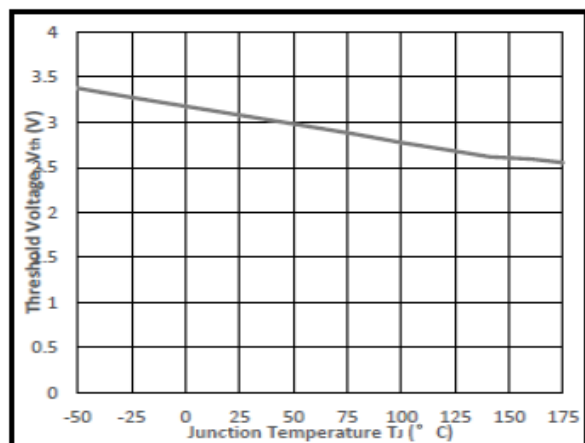


Figure 5. Transfer Characteristic for Various T_J

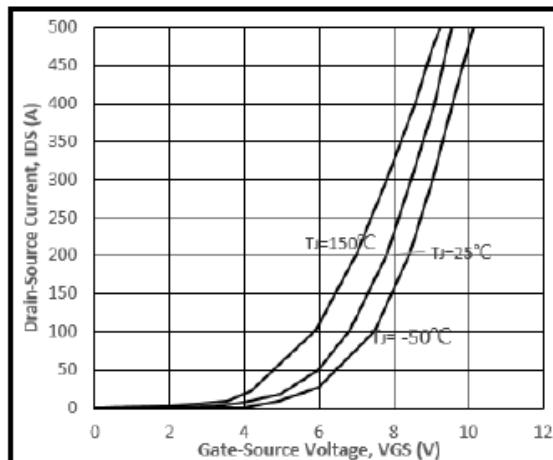
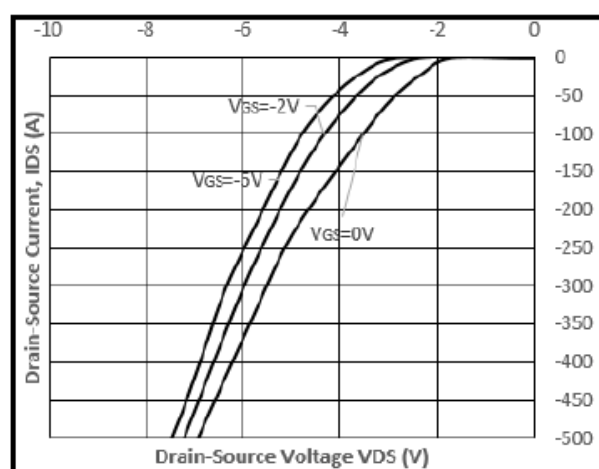


Figure6. Body Diode Characteristic



A2G200N1200ME3

Figure 7. Gate Charge Characteristics

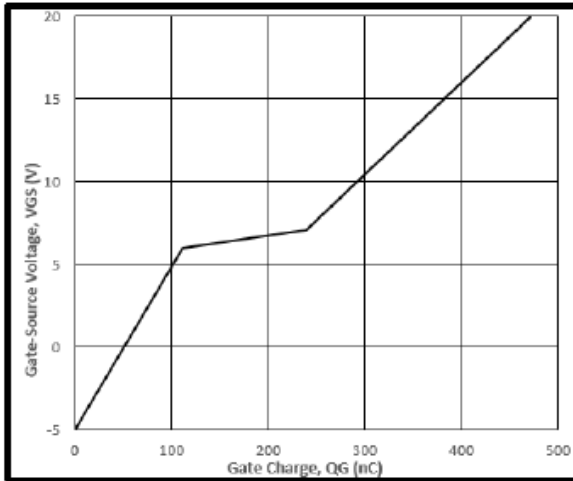


Figure 8. Capacitances vs. VDS

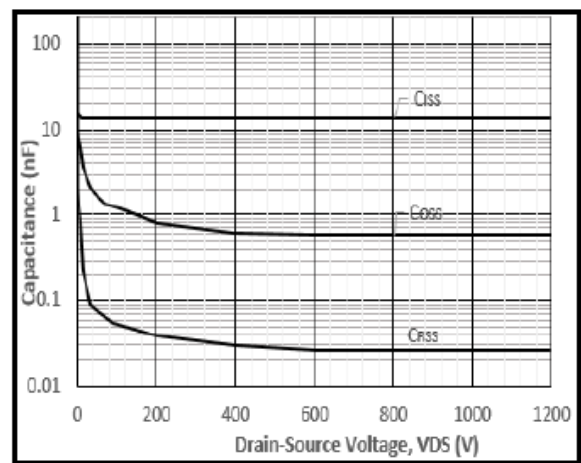


Figure 9. Inductive Switching Energy vs. Drain Current

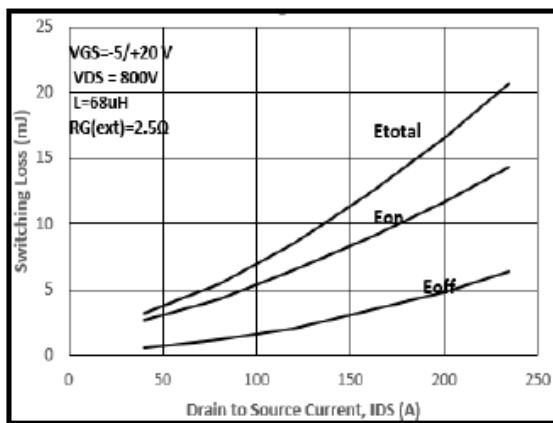
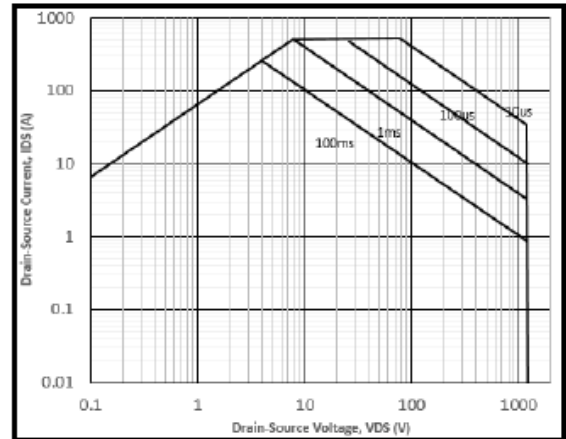
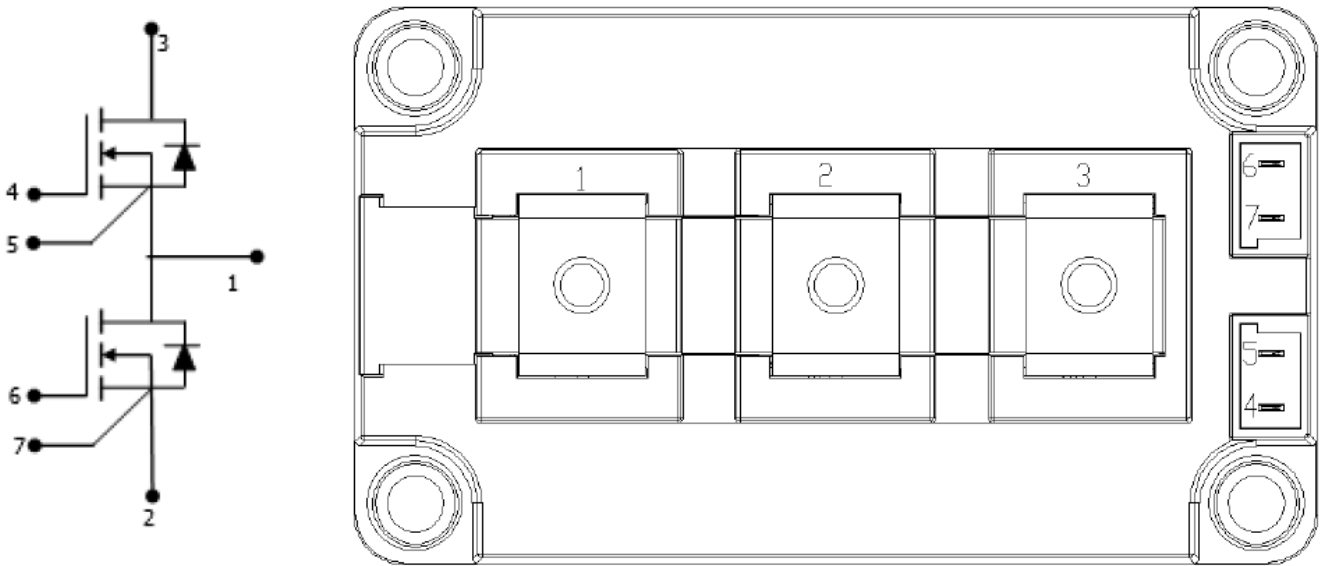


Figure 10. Safe Operating Area

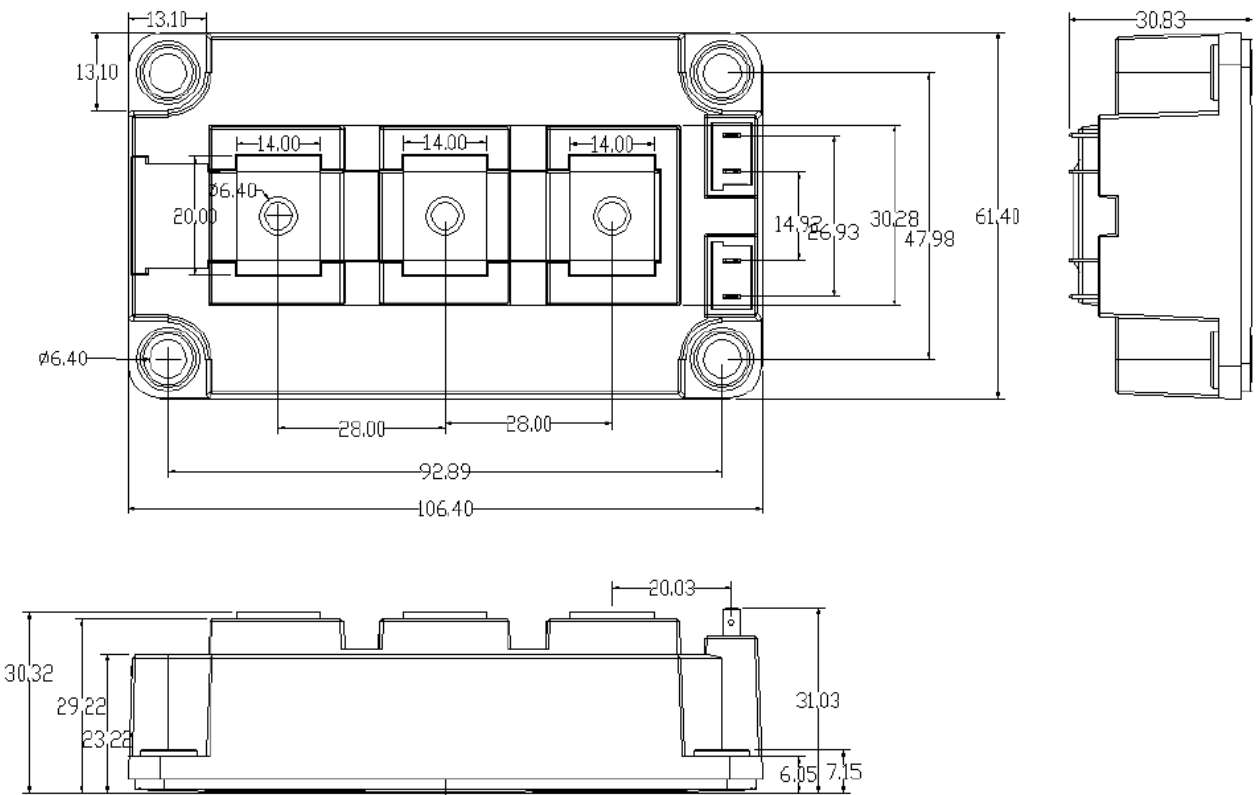


A2G200N1200ME3

Circuit schematic



Package Dimension (mm)



Revision version	Description	Date
1.4	Figures update	04.2024