

A2G100N1200EP

1200V SiC MOSFET Module

Features

- High current density
- Low inductive design
- Low switching losses
- Integrated NTC temperature sensor
- Rugged mounting due to integrated mounting clamps

Potential Applications

- High Frequency Switching application
- DC/DC converter
- Solar applications
- UPS systems

Product Summary

V_{DS}	1200V
I_D	100A



Package

Symbol	Parameter	Value	Unit
V_{isol}	Isolation test voltage (DC 2mA 5s)	4.2	kV
	Internal isolation	ZTA	
L_{sCE}	Stray inductance	12	nH
T_J, T_{stg}	Junction and Storage Temperature Range	-40 to +150	°C
M_s	Mounting force per clamp (M4)	20 – 50	N
$R_{\theta JC}$	Thermal Resistance, Junction-to-heatsink	0/3	°C/W
M	Weight	23	g

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)	100	A
I_{DM}	Drain Current (pulsed)	200	A

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source Break down Voltage	$V_{GS}=0V$	1200			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=1200V, V_{GS}=0V$		5	100	uA
I_{GSS}	Gate-body Leakage Current	$V_{DS}=0V, V_{GS}=20V$			1	uA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=20mA$	2	3	4	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS}=20V, I_D=50A$		16	22	mΩ
$V_{GS(on)}$	Recommended turn-on Voltage	Static		18		V
$V_{GS(off)}$	Recommended turn-off Voltage			-5		V
R_G	Gate Resistance			2.2		Ω
C_{iss}	Input Capacitance	$V_{DS}=1000V, f=1MHz$ $V_{AC}=25mV$		6878		pF
C_{oss}	Output Capacitance			288		
C_{rss}	Reverse Transfer Capacitance			13		

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E_{on}	Turn-On Switching Energy	$V_{DD}=800V, V_{GS}=-5/+20V$		2.6		mJ
E_{off}	Turn-Off Switching Energy	$I_D=50A, Load=68\mu H$		0.7		mJ
Q_{GS}	Gate-Source Charge	$V_{DD}=800V$		76.7		nC
Q_{GD}	Gate-Drain Charge	$V_{GS}=-5/+20V$		78.3		
Q_G	Total Gate Charge	$I_D=50A$		238		
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=800V$		52		ns
t_r	Rise Time	$V_{GS}=-5/+20V, I_D=50A$		38		
$t_{d(off)}$	Turn-off Delay Time	$Load=150\mu H, T_J=175^\circ C$		81		
t_f	Fall Time	$R_{Gext}=2.5\Omega, R_L=68\mu H$		17		

Typical Performance-Reverse Diode ($T_J=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{FSD}	Forward Voltage	$V_{GS}=0V, I_F=50A$		3.5	6	V
I_S	Continuous Diode Forward Current	$V_{GS}=0V, T_C=25^\circ C$		50		A
t_{rr}	Reverse Recovery Time	$V_{GS}=-5V, I_F=50A$ $V_R=800V$		98		ns
Q_{rr}	Reverse Recovery Charge			613		nC
I_{rrm}	Peak Reverse Recovery Current			18		A

NTC-Thermistor

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
R_{25}	Rated resistance	$T_{NTC}=25^\circ C$		5.00		k Ω
$\Delta R/R$	Deviation of R_{100}	$T_{NTC}=25^\circ C, R_{100}=493.3\Omega$	-5		5	%
$B_{25/50}$	B-value	$R_2=R_{25} \exp [B_{25/50}(1/T_2 - 1(298,15 K))]$		3375		k
$B_{25/80}$	B-value	$R_2=R_{25} \exp [B_{25/80}(1/T_2 - 1(298,15 K))]$		3414		k
$B_{25/100}$	B-value	$R_2=R_{25} \exp [B_{25/100}(1/T_2 - 1(298,15 K))]$		3436		k

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Typical Performance

Figure 1. Output Characteristics

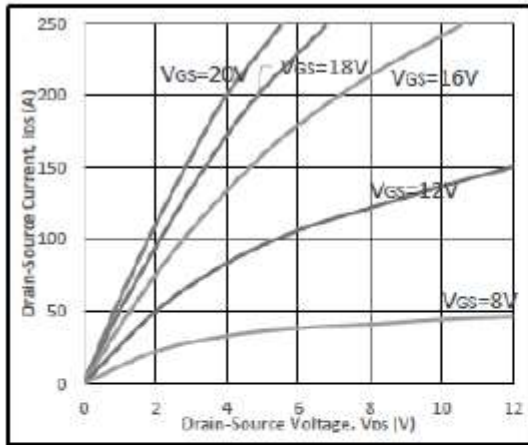


Figure 2. Normalized On-Resistance vs. Temperature

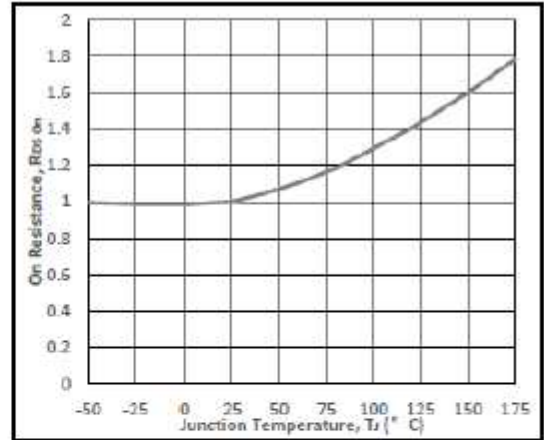


Figure 3. Threshold Voltage vs. Temperature

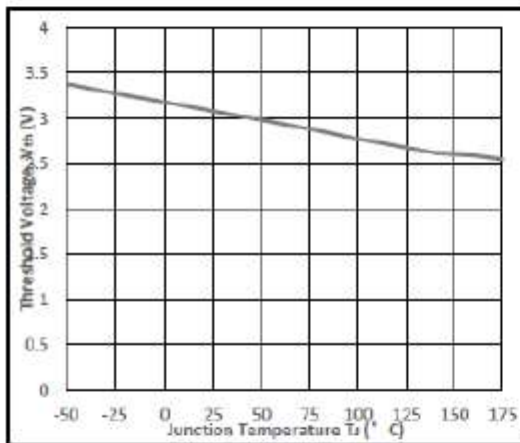


Figure 4. Transfer Characteristic for Various T_J

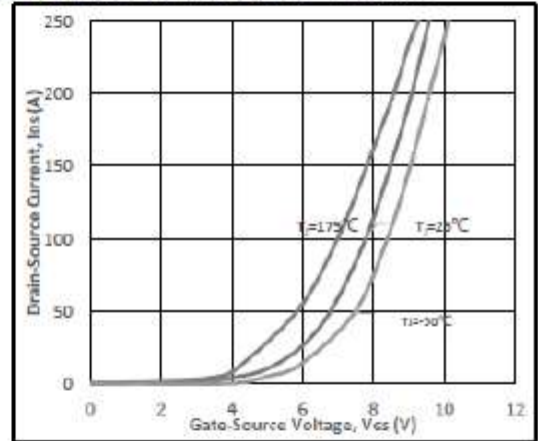


Figure 5. Diode Characteristic at 25 °C

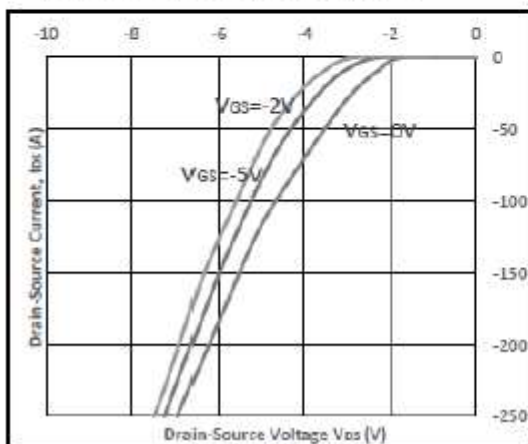
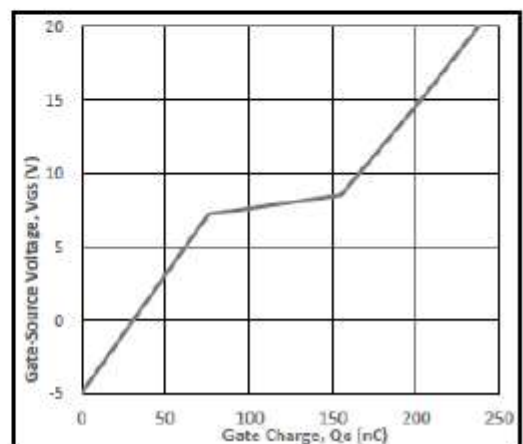


Figure 6. Typical Gate Charge Characteristics



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Figure 7. Typical Capacitances vs. Drain-Source Voltage

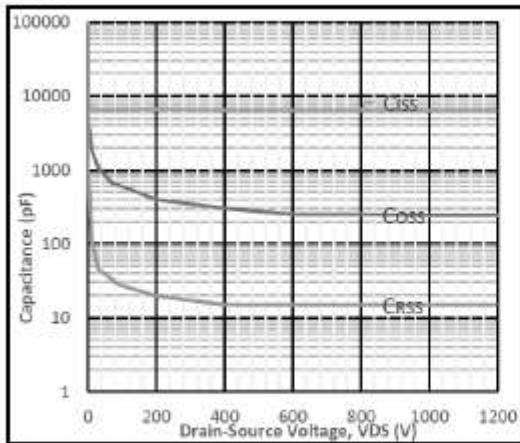


Figure 8. Inductive Switching Energy vs. Drain Current

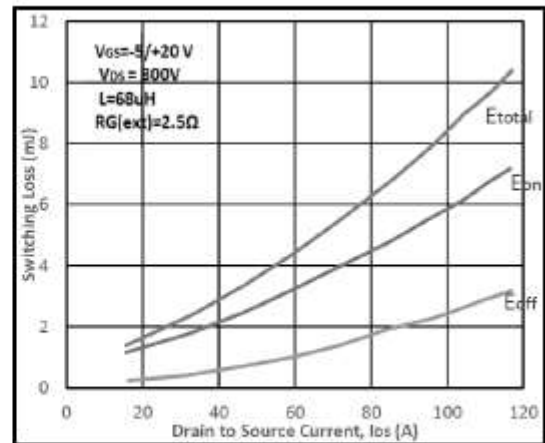


Figure 9. Switching Energy vs. RG(ext)

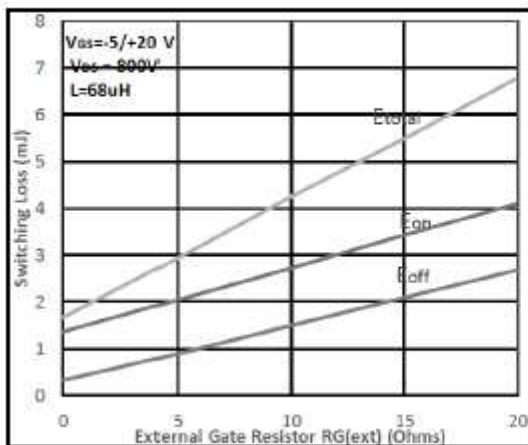
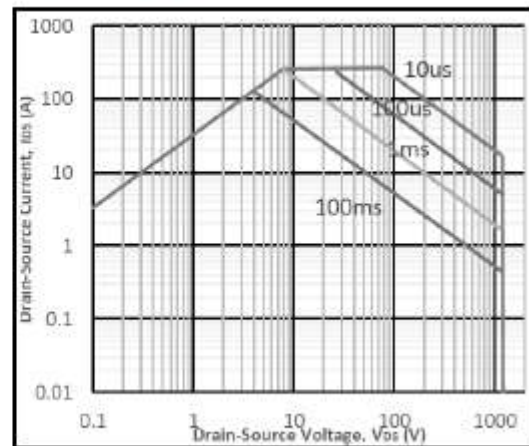
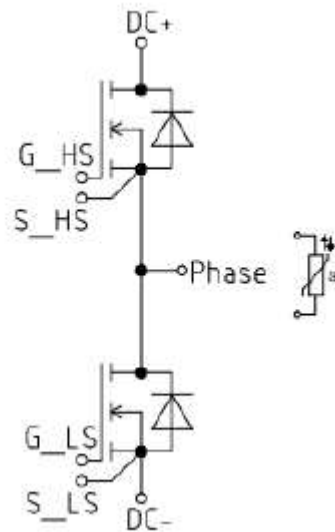


Figure 10. Safe Operating Area

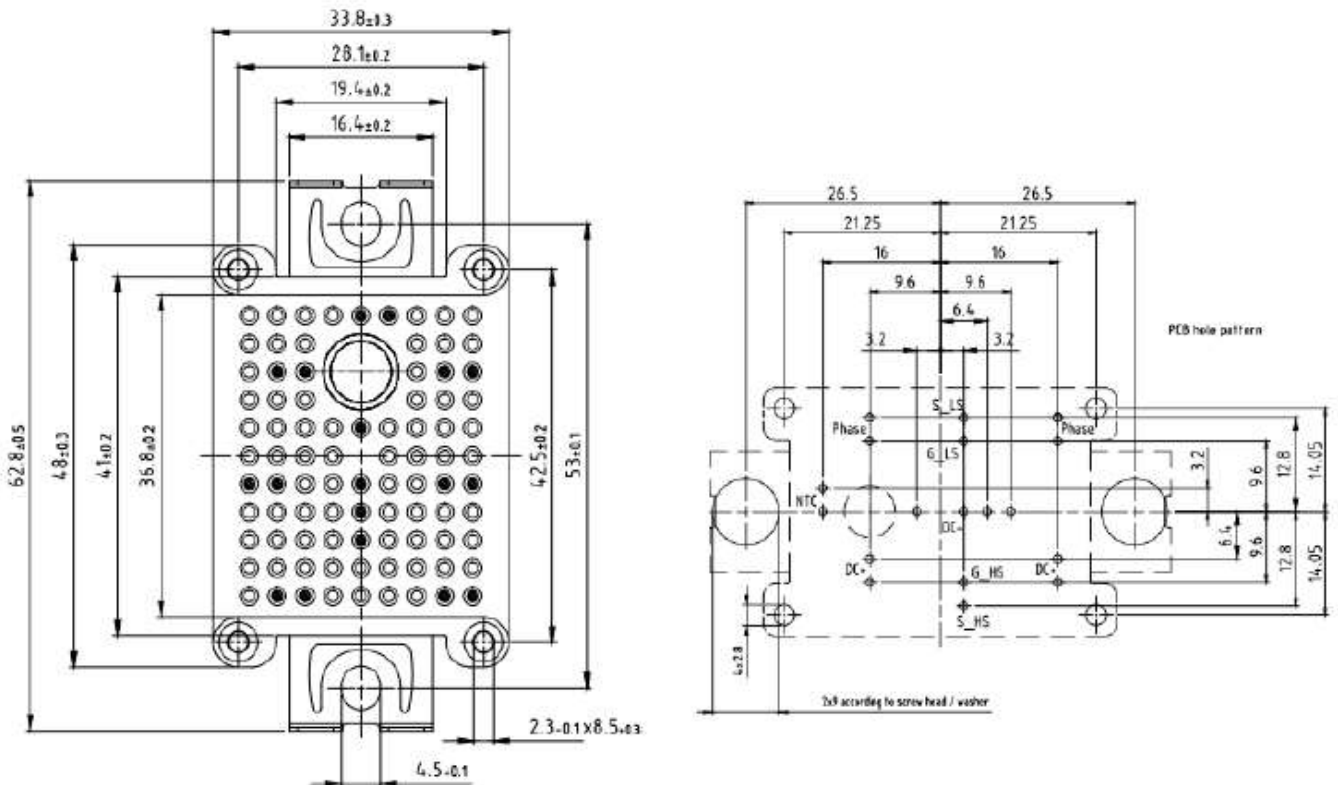


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Circuit Diagram



Package Drawing (mm)



Revision version	Description	Date
1.4	Figures update	02.2024