

A2G300N1700ME3

1700V SiC MOSFET Module



Technical Features

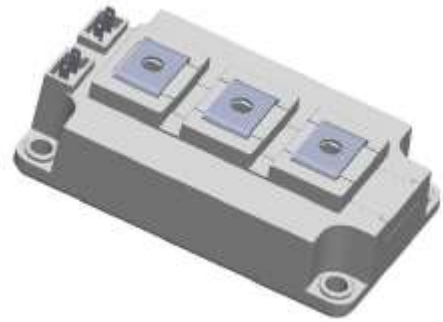
- Industry Standard 62 mm Footprint
- Ultra Low Loss, High-Frequency Operation
- Zero Reverse Recovery
- Zero Turn-off Tail Current from MOSFET
- Normally-off, Fail-safe Device Operation
- Copper Baseplate and Aluminum Nitride Insulator

Applications

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

Product Summary

V _{DS}	1700V
I _D	300A



Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	1700	V
V _{GS}	Gate-Source Voltage (dynamic)	-10/+22	V
I _D	Drain Current (continuous) V _{GS} =20V	300	A
I _{DM}	Drain Current (pulsed)	600	A
T _C , T _{stg}	Operating and Storage Temperature Range	-40 to +150	°C
T _J	Junction Temperature	175	°C
R _{θJC}	Thermal Resistance, Junction-to-heatsink	0.12	°C/W

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DS}	Drain-source Break down Voltage	V _{GS} =0V	1700			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =1700V, V _{GS} =0V			300	uA
I _{GSS}	Gate-body Leakage Current	V _{DS} =0V, V _{GS} =-10 to 20V			3	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =30mA	2.0		4.0	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} =18V, I _D =150A		8.7	10.0	mΩ
V _{GSon}	Recommended turn-on Voltage	Static		18		V
V _{GSoff}	Recommended turn-off Voltage			-5		V
R _G	Gate Resistance	V _{GS} =0V, f=1MHz		0.83		Ω
C _{iss}	Input Capacitance	V _{DS} =1200V, f=1MHz V _{AC} =25mV		19.4		nF
C _{oss}	Output Capacitance			0.59		
C _{rss}	Reverse Transfer Capacitance				48	pF
E _{on}	Turn-On Switching Energy	V _{DS} =1200V, V _{GS} =-5/+18V		2.15		mJ
E _{off}	Turn-Off Switching Energy	I _D =150A, Load=150uH		0.6		
Q _{GS}	Gate-Source Charge	V _{DD} =1200V		156		nC
Q _{GD}	Gate-Drain Charge	V _{GS} =-5/+18V		150		
Q _G	Total Gate Charge	I _D =150A		504		
t _{d(on)}	Turn-on Delay Time	V _{DD} =1200V		35		ns
t _r	Rise Time	V _{GS} =-5/+18V, I _D =150A		22		
t _{d(off)}	Turn-off Delay Time	Load=150uH, T _J =175°C		19		
t _f	Fall Time	R _{ext} =2.5Ω		15		

A2G300N1700ME3

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	$V_{GS}=0V, I_F=150A$		3.5	6	V
I_S	Continuous Diode Forward Current	$V_{GS}=0V, T_C=25^\circ\text{C}$		150		A
t_{rr}	Reverse Recovery Time	$V_{GS}=-5V, I_F=150A$		33		ns
Q_{rr}	Reverse Recovery Charge	$V_R=1200V$		2754		nC
I_{rrm}	Peak Reverse Recovery Current	$di/dt=1000A/\mu s, T_J=175^\circ\text{C}$		114		A

Module Physical Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
L_{Stray}	Stray Inductance			20		nH
W	Weight			340		g
M_s	Mounting Torque	M6 bolts	4.5		5.5	Nm
V_{isol}	Case Isolation Voltage	DC 1min	4.2			kV

A2G300N1700ME3

Typical Performance

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

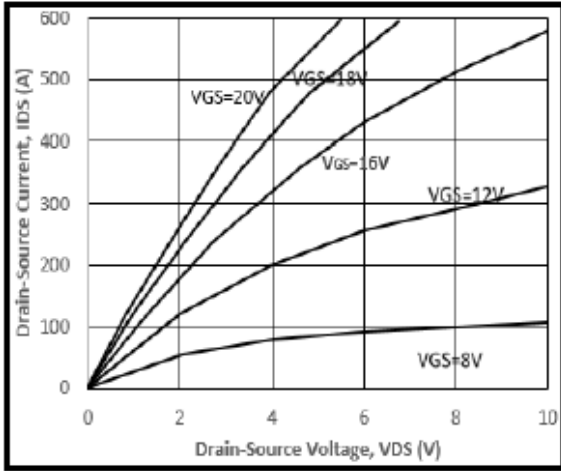


Fig 2. Normalized On-Resistance vs. T_J

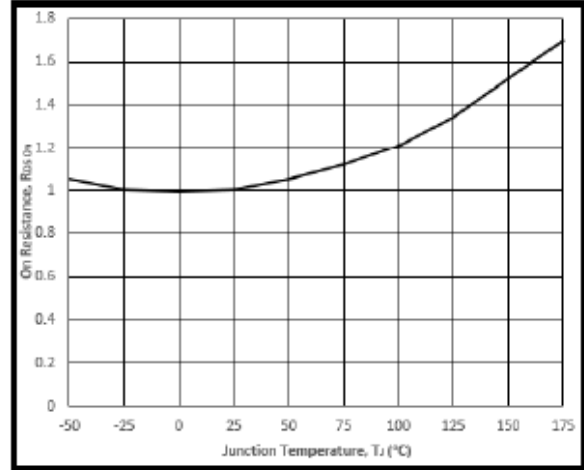


Figure 3. Threshold Voltage vs. Temperature

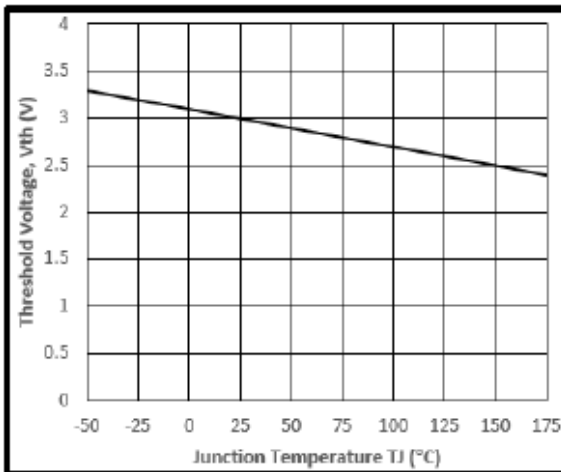


Figure 4. Transfer Characteristic for Various T_J

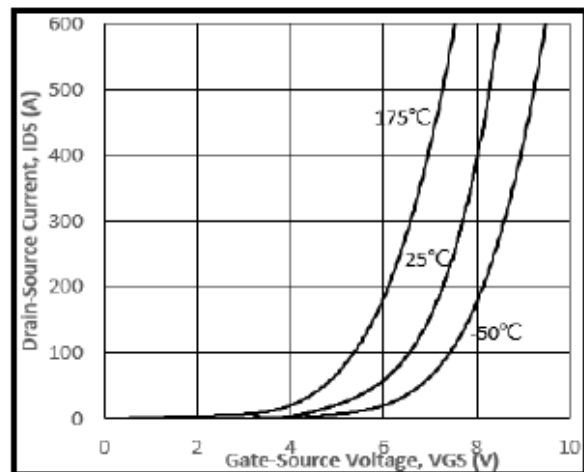


Figure 5. Diode Characteristic

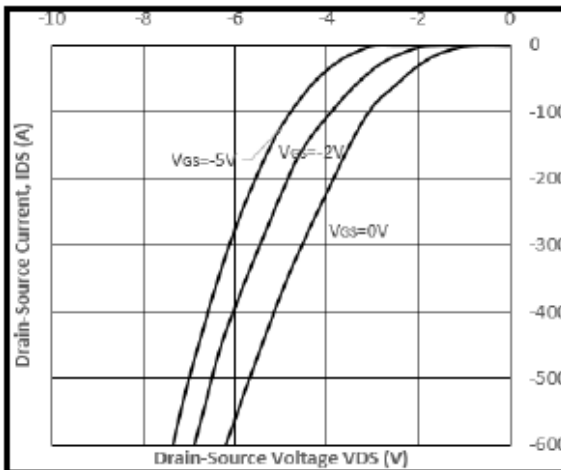
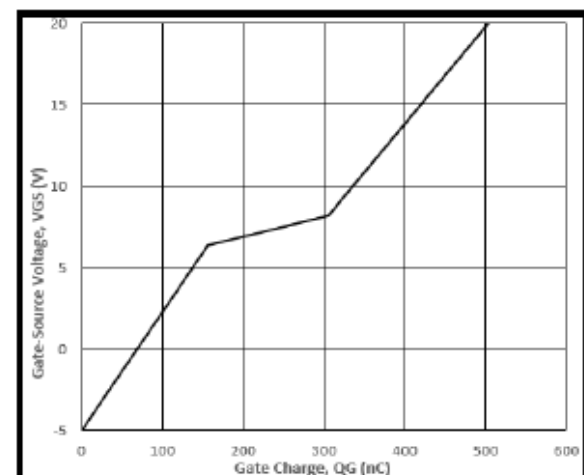


Figure 6. Gate Charge Characteristics



A2G300N1700ME3

Figure 7. Capacitances vs. VDS

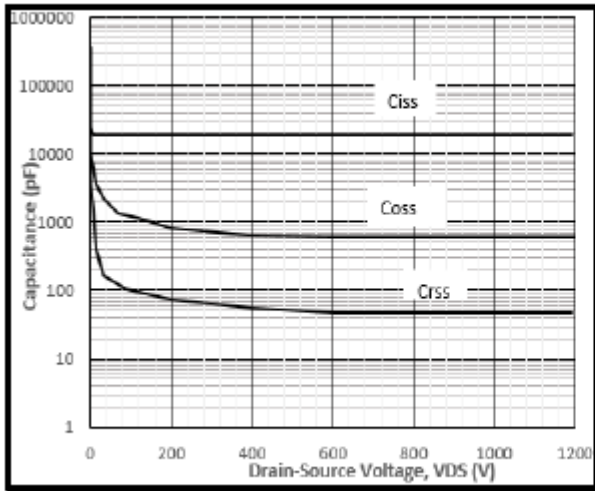


Figure 8. Inductive Switching Energy vs. Drain Current

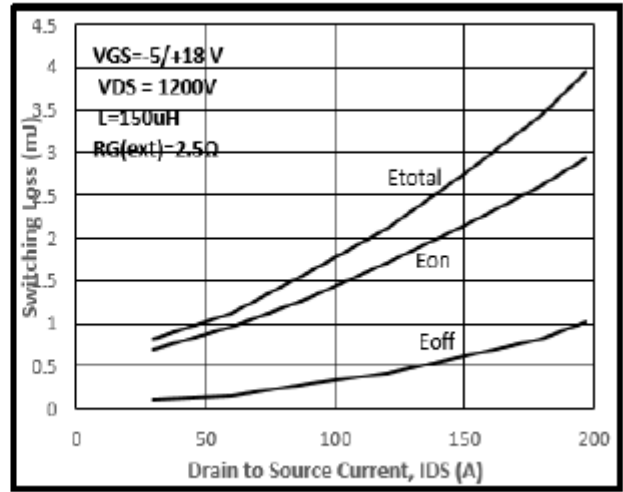


Figure 9. Switching Time Description

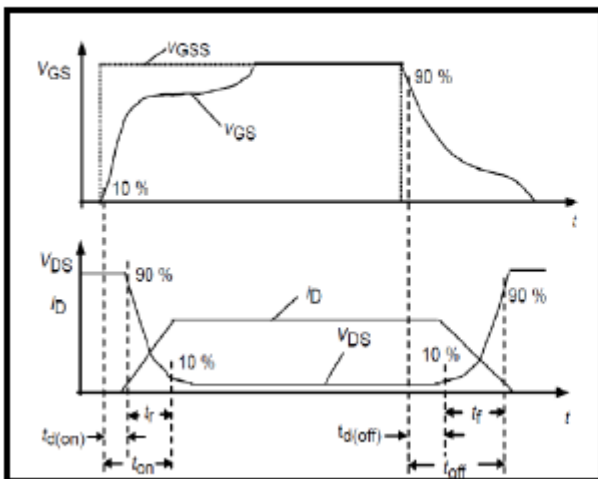
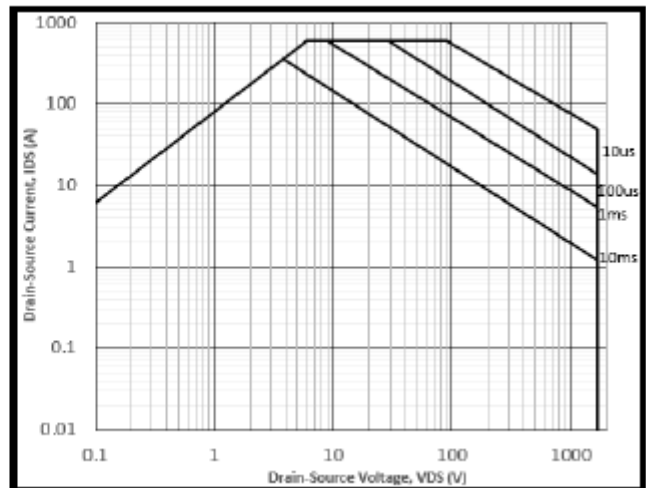
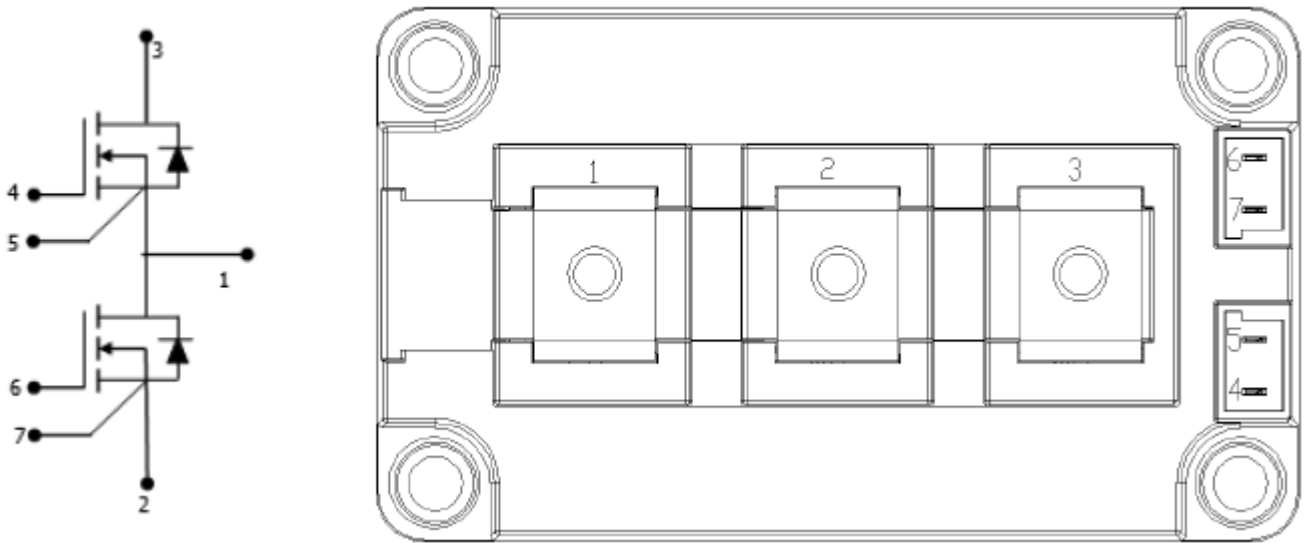


Figure 10. Safe Operating Area

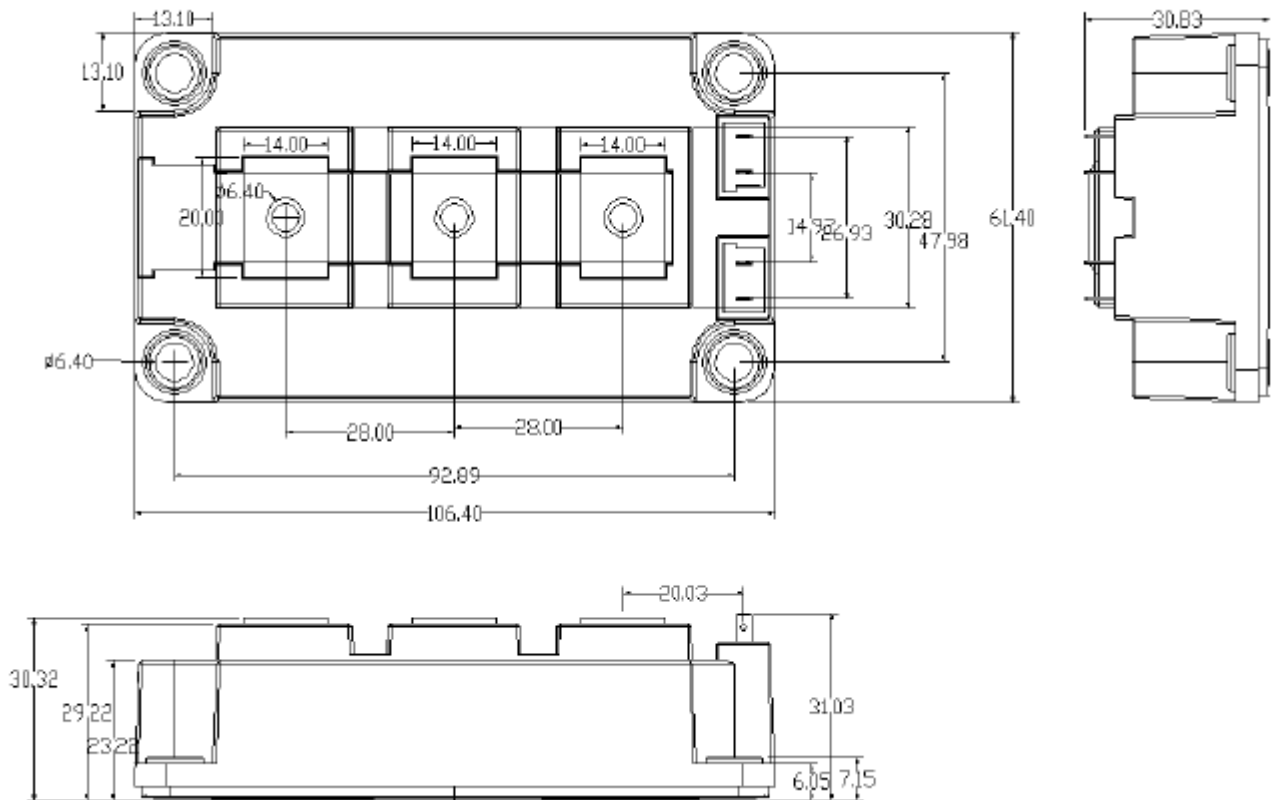


A2G300N1700ME3

Circuit Diagram Headline



Package Drawing (mm)



Revision version	Description	Date
1	Initial	02.2024