A2G20N3300MT4

3300V N-Channel MOSFET

Features

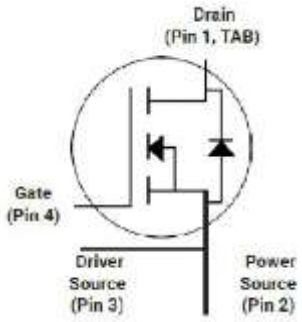
- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Optimized package with separate driver source pin
- Easy to parallel and simple to drive
- ROHS Compliant, Halogen free

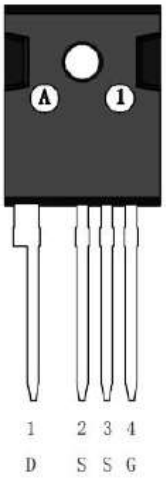
Application

- EV motor drive
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- Solar inverters
- EV charging

Product Summary

V_{DS}	3300V
I_D	20A





Ordering Information

Part Number	Marking	Package	Packaging
A2G20N3300MT4	A2G20N3300MT4	TO-247-4	Tube

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	3300	V
I_D	Drain Current (continuous) at T_C=25°C	20	A
I_D	Drain Current (continuous) at T_C=100°C	12	A
I_{DM}	Drain Current (pulsed)	80	A
V_{GS}	Gate-Source Voltage	-10/+22	V
P_D	Power Dissipation T_C=25°C	230	W
T_J, T_{stg}	Junction and Storage Temperature Range	-55 to +175	°C

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

Typical Performance-Static

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source Breakdown Voltage	I_D=250uA, V_{GS}=0V	3300			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=3300V, V_{GS}=0V, T_J=25°C			100	uA
I_{GSS}	Gate-body Leakage Current	V_{DS}=0V, V_{GS}=-10 to 22V			150	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=20mA	2	3	4	V
V_{GSon}	Recommended turn-on Voltage	Static		18		V
V_{GSoff}	Recommended turn-off Voltage			-5		V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS}=18V, I_D=20A		160	200	mΩ
		V_{GS}=18V, I_D=20A, T_J=175°C		288		mΩ

Typical Performance-Dynamic

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{DS}=1000V, f=1MHz V_{AC}=25mV		2068		pF
C_{oss}	Output Capacitance			38		pF
C_{rss}	Reverse Transfer Capacitance			3.5		pF
g_{fs}	Transconductance	V_{DS}=10V, I_D=10A		5		S
E_{OSS}	C_{OSS} Stored Energy	V_{DS}=1000V, f=1MHz		25		uJ
E_{ON}	Turn-On Energy (Body Diode)	V_{DS}=1700V V_{GS}=-5/18V, I_D=10A L=200uH, T_J=25°C		186		uJ
E_{OFF}	Turn-Off Energy (Body Diode)			55		uJ
Q_g	Total Gate Charge	V_{DS}=1000V V_{GS}=-5/18V I_D=10A		110		nC
Q_{gs}	Gate-source Charge			20		nC
Q_{gd}	Gate-Drain Charge			22		nC
$R_{G(int)}$	Internal Gate Resistance	f=1MHz, V_{AC}=25mV		1.5		Ω
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=1700V V_{GS}=-5/18V, I_D=10A L=200uH, R_{ext}=5Ω		26		ns
t_r	Rise Time			20		ns
$t_{d(off)}$	Turn-off Delay Time			23		ns
t_f	Fall Time			15		ns

Typical Performance-Reverse Diode (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{FSD}	Forward Voltage	V_{GS}=0V, I_F=10A, T_J=25°C		3.3	6	V
		V_{GS}=0V, I_F=10A, T_J=175°C		3.1	6	V
I_S	Continuous Diode Forward Current	V_{GS}=0V, T_C=25°C		20		A
t_{rr}	Reverse Recovery Time	V_{GS}=-5V, I_F=10A V_R=1700V di/dt=500A/μs, T_J=175°C		62		ns
Q_{rr}	Reverse Recovery Charge			850		nC
I_{rrm}	Peak Reverse Recovery Current			12		A

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.65	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	°C/W

The values are based on the junction-to case thermal impedance which is measured with the device mounted to a large heat sink assuming maximum junction temperature of T_j(max)=175°C.

Electrical Characteristics

Fig1. Output characteristics (T_J = 25 °C)

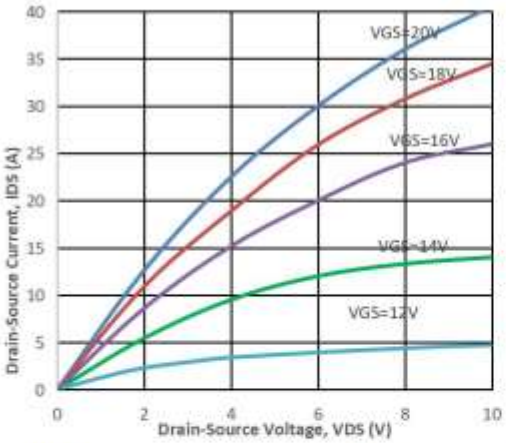


Fig2. Output characteristics (T_J = 175 °C)

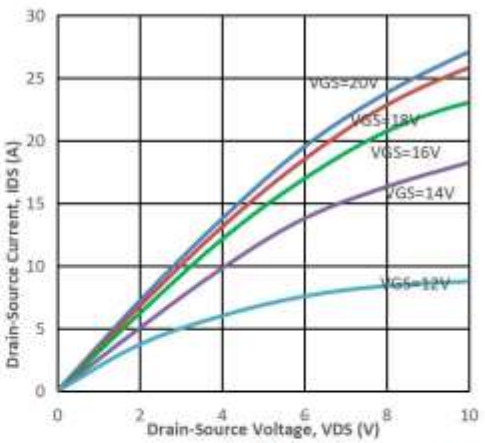


Fig3.Normalized On-Resistance vs. Temperature

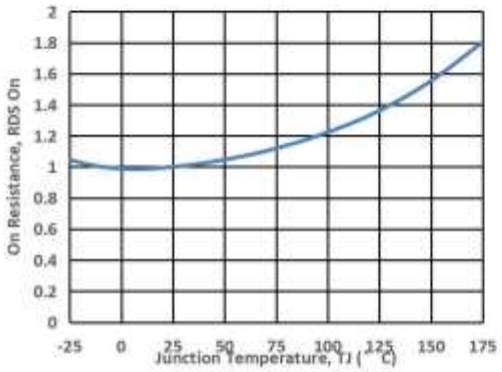


Fig4. On-Resistance vs.Temperature

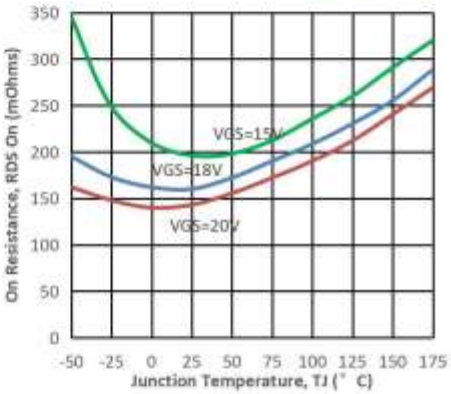


Fig5.Transfer Characteristic

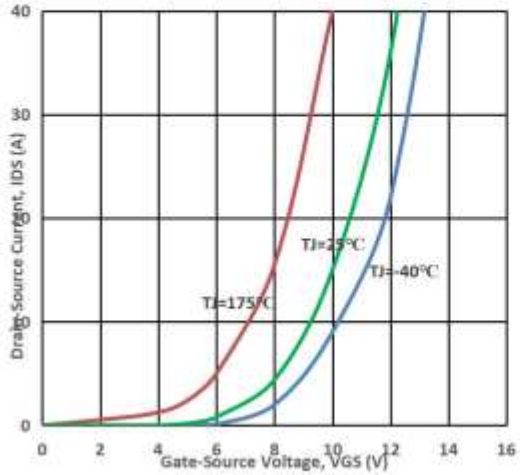


Fig6. Body Diode Characteristic at 25 °C

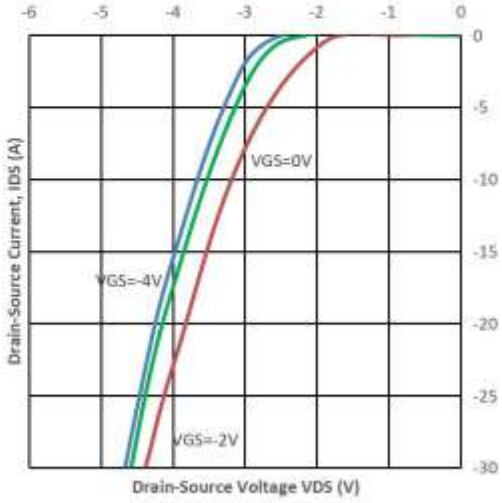


Fig7.Threshold Voltage vs. Temperature

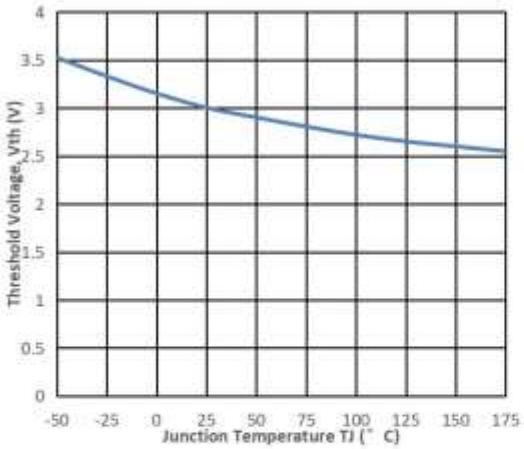


Fig8. Gate Charge Characteristics

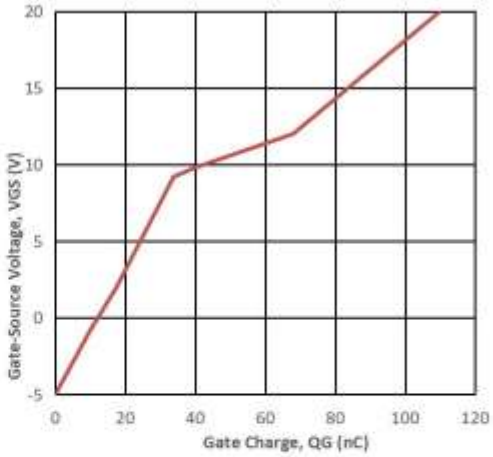


Fig9. 3rd Quadrant Characteristic at 25 °C

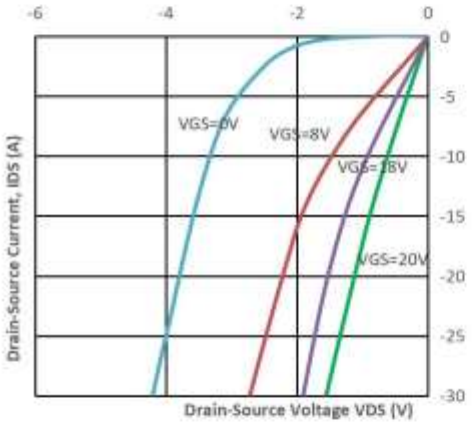


Fig10. Output Capacitor Stored Energy

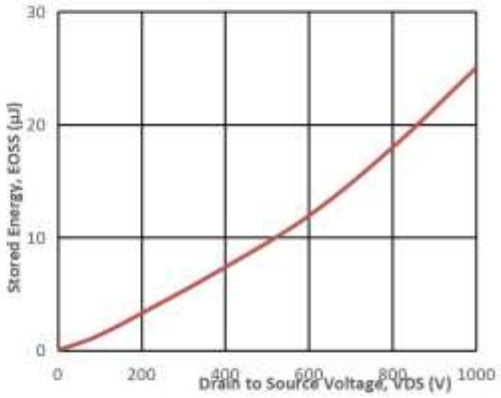


Fig11. Capacitances vs. Drain-Source

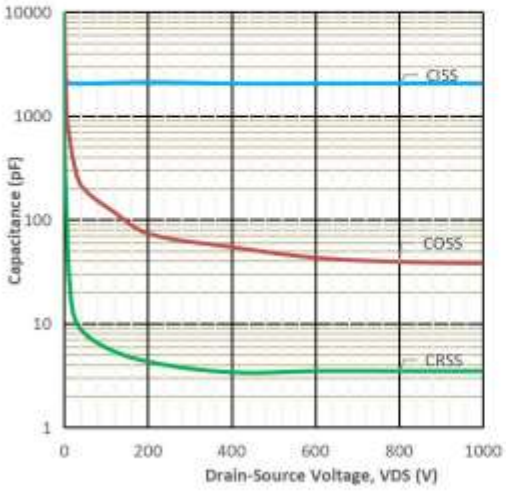


Fig12. Max Power Dissipation Derating Vs Tc

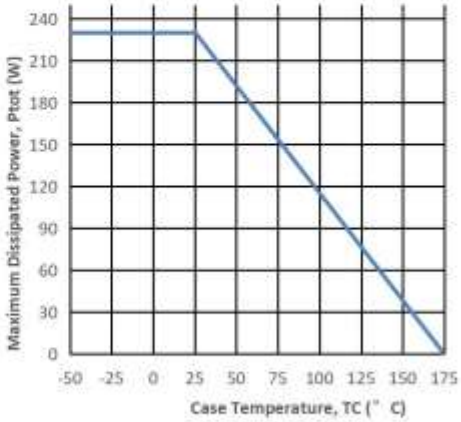


Fig13. Switching Energy vs. Drain Current

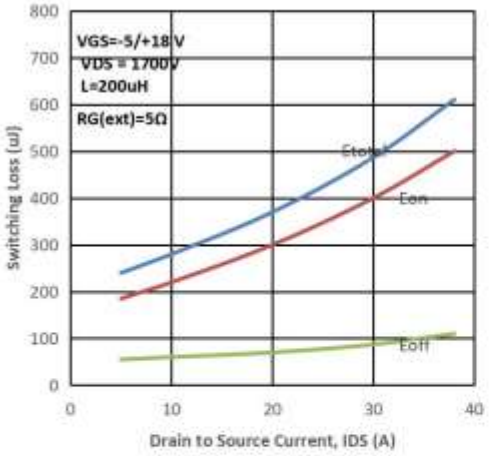


Fig14. Switching Energy vs. RG(ext)

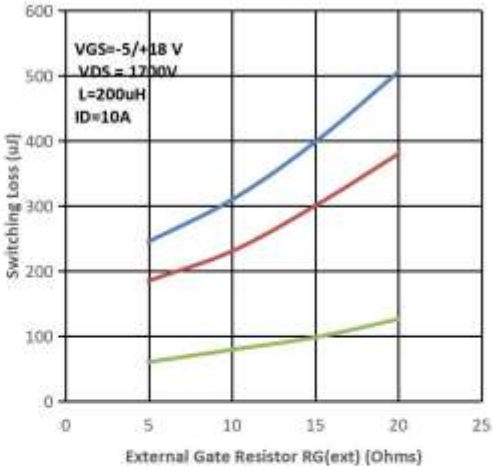


Fig15. Switching Energy vs. Temperature

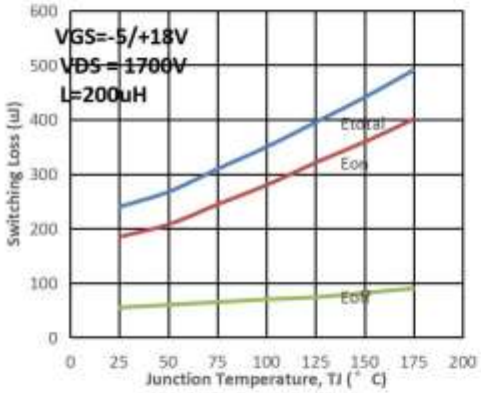


Fig16. Switching Times vs. RG(ext)

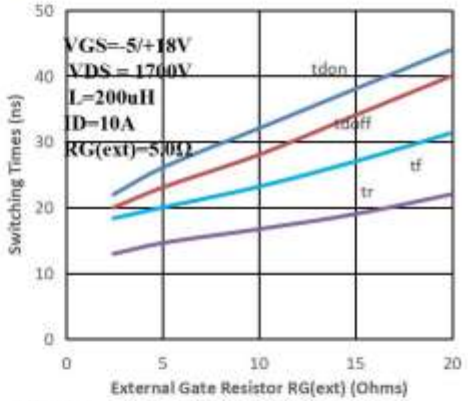


Fig17.Transient Thermal Impedance

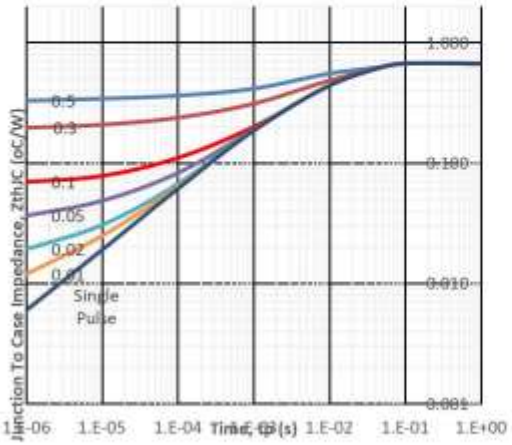
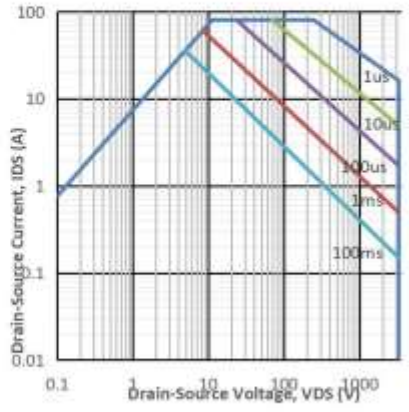
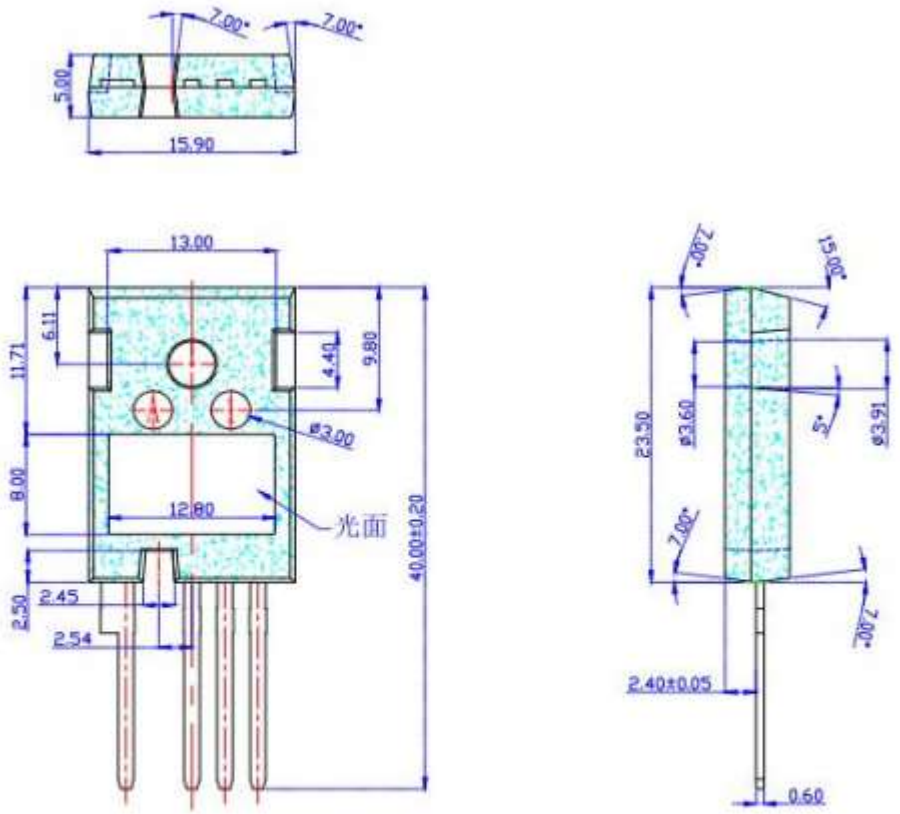


Fig18. Safe Operating Area



Package Drawing (Unit: mm)



Revision version	Description	Date
1	Initial	05.2024