

A2G50N3300MT4

3300V N-Channel MOSFET



Features

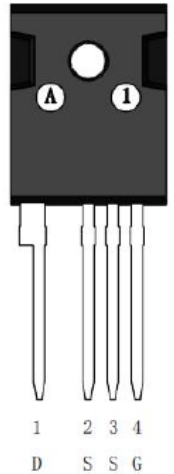
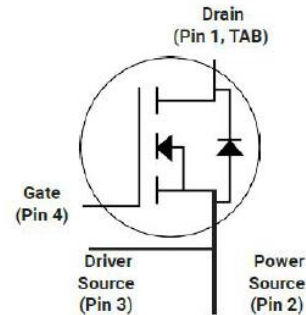
- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Optimized package with separate driver source pin
- Easy to parallel and simple to drive
- ROHS Compliant, Halogen free

Application

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

Product Summary

V_{DS}	3300V
I_D	50A



Ordering Information

Part Number	Marking	Package	Packaging
A2G50N3300MT4	A2G50N3300MT4	TO-247-4	Tube

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	3300	V
I_D	Drain Current (continuous) at $T_C=25^\circ\text{C}$	50	A
I_D	Drain Current (continuous) at $T_C=100^\circ\text{C}$	40	A
I_{DM}	Drain Current (pulsed)	230	A
V_{GS}	Gate-Source Voltage	-10/+22	V
P_D	Power Dissipation $T_C=25^\circ\text{C}$	536	W
T_J, T_{stg}	Junction and Storage Temperature Range	-55 to +175	$^\circ\text{C}$

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

Typical Performance-Static

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source Breakdown Voltage	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	3300			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=3300\text{V}, V_{GS}=0\text{V}, T_J=25^\circ\text{C}$			100	μA
I_{GSS}	Gate-body Leakage Current	$V_{DS}=0\text{V}, V_{GS}=-10$ to 22V			150	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=20\text{mA}$	2		4	V
$V_{GS(on)}$	Recommended turn-on Voltage	Static		18		V
$V_{GS(off)}$	Recommended turn-off Voltage			-5		V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS}=18\text{V}, I_D=20\text{A}$		48	55	$\text{m}\Omega$
		$V_{GS}=18\text{V}, I_D=20\text{A}, T_J=175^\circ\text{C}$		80		$\text{m}\Omega$

A2G50N3300MT4

Typical Performance-Dynamic						
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C _{iss}	Input Capacitance	V _{DS} =1000V, f=1MHz V _{AC} =25mV		7305		pF
C _{oss}	Output Capacitance			128		pF
C _{rss}	Reverse Transfer Capacitance			12.5		pF
g _{fs}	Transconductance	V _{DS} =10V, I _D =40A		15.7		S
E _{oss}	C _{oss} Stored Energy	V _{DS} =1000V, f=1MHz		83.7		uJ
E _{on}	Turn-On Energy (Body Diode)	V _{DS} =1700V V _{GS} =-5/20V, I _D =50A L=60uH, T _J =25°C		1234		uJ
E _{off}	Turn-Off Energy (Body Diode)			538		uJ
Q _g	Total Gate Charge	V _{DS} =1000V		339		nC
Q _{gs}	Gate-source Charge	V _{GS} =-5/20V		123		nC
Q _{gd}	Gate-Drain Charge	I _D =40A		101		nC
R _{G(int)}	Internal Gate Resistance	f=1MHz, V _{AC} =25mV		1.3		Ω
t _{d(on)}	Turn-on Delay Time	V _{DS} =1700V V _{GS} =-5/20V, I _D =50A L=60uH, R _{ext} =3Ω		76		ns
t _r	Rise Time			38		ns
t _{d(off)}	Turn-off Delay Time			31		ns
t _f	Fall Time			17		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 =20A, T _J =25°C		4.2	6	V
		V _{GS} =0V, I _F =20A, T _J =175°C		3.5	6	V
I _S	Continuous Diode Forward Current	V _{GS} =0V, T _C =25°C		55		A
t _{rr}	Reverse Recovery Time	V _{GS} =-5V, I _F =50A		202		ns
Q _{rr}	Reverse Recovery Charge	V _R =1700V		2838		nC
I _{rrm}	Peak Reverse Recovery Current	di/dt=500A/μs, T _J =175°C		38		A

Thermal Characteristics			
Symbol	Parameter	Value	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	0.28	°C/W
R _{θJA}	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.

A2G50N3300MT4

Electrical Characteristics

Fig1. Output characteristics ($T_J = 25\text{ }^\circ\text{C}$)

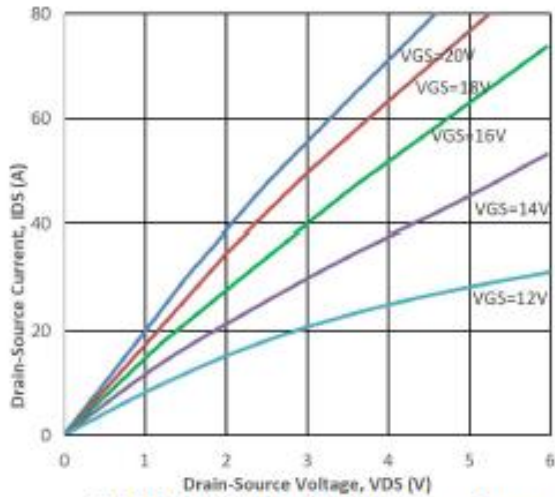


Fig3. Normalized On-Resistance vs. Temperature

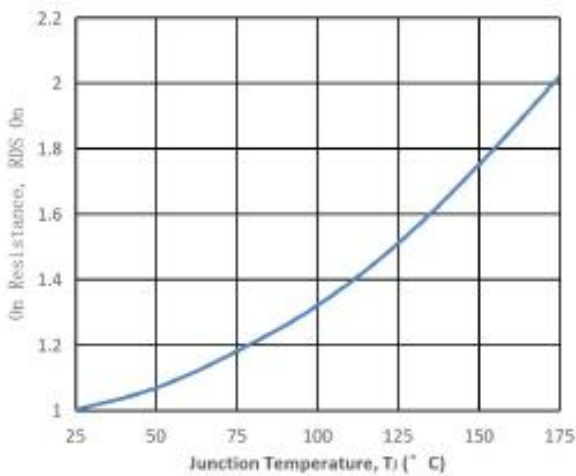


Fig5. Transfer Characteristic

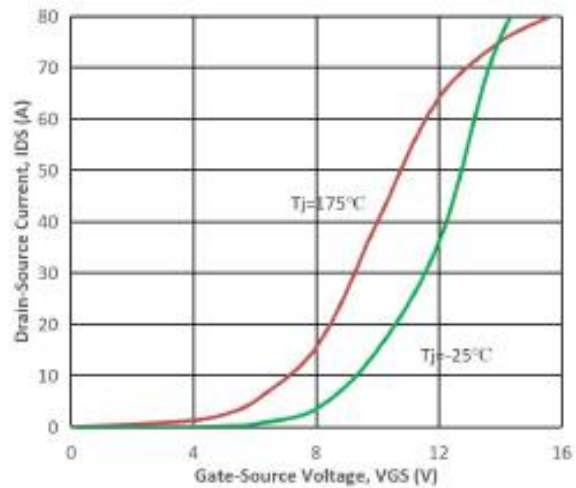


Fig2. Output characteristics ($T_J = 175\text{ }^\circ\text{C}$)

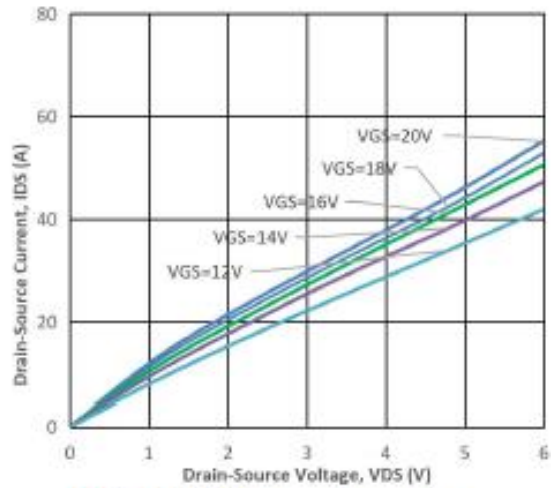


Fig4. On-Resistance vs. Temperature

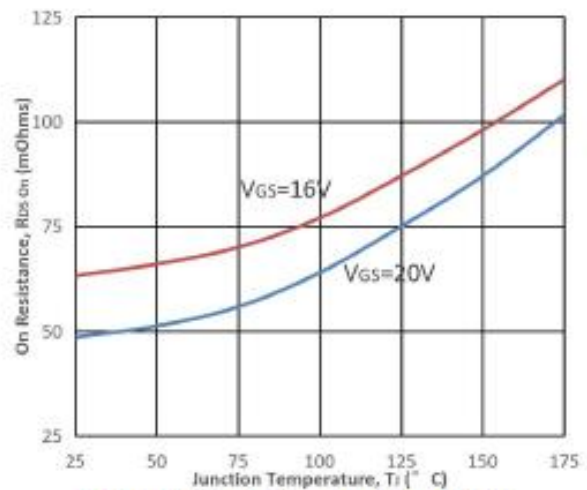
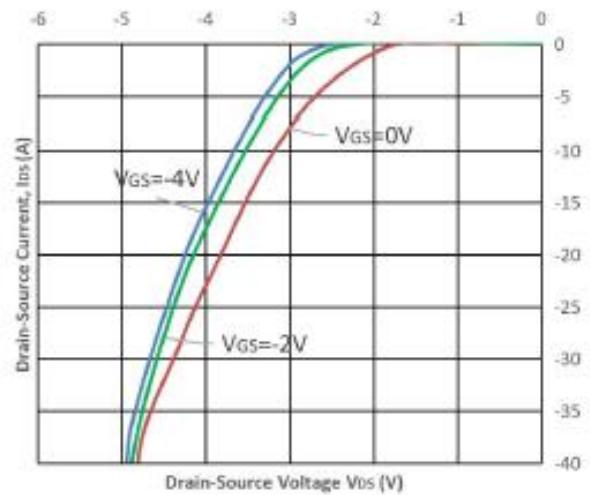


Fig6. Body Diode Characteristic at 25 °C



A2G50N3300MT4

Fig7. Threshold Voltage vs. Temperature

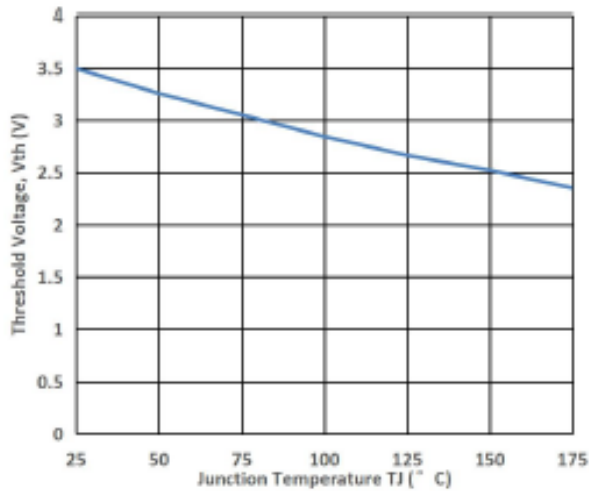


Fig8. Gate Charge Characteristics

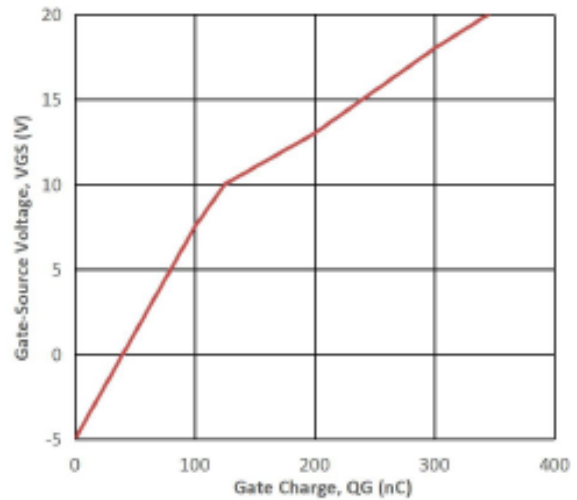


Fig9. 3rd Quadrant Characteristic at 25 °C

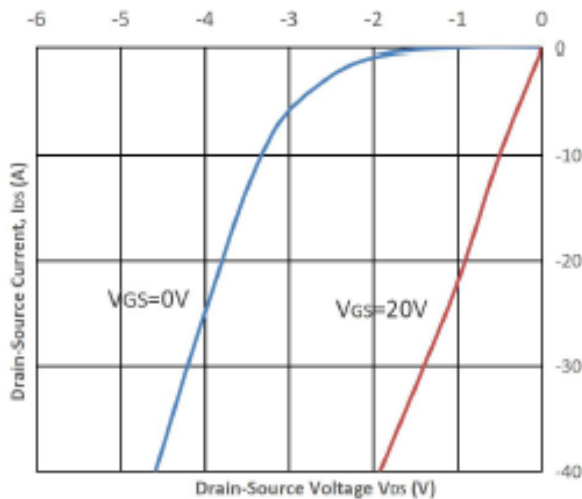


Fig10. Output Capacitor Stored Energy

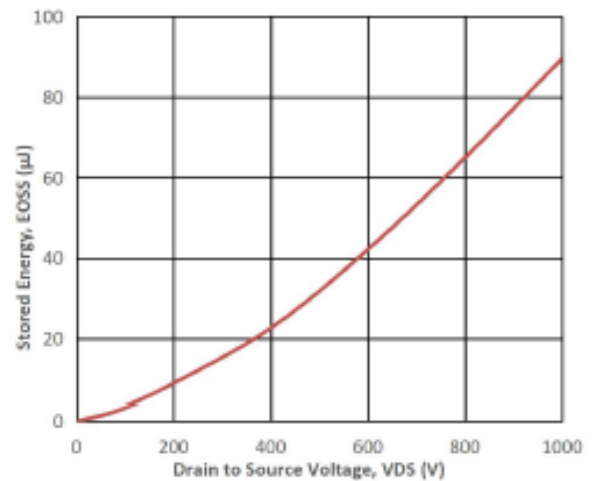


Fig11. Capacitances vs. Drain-Source

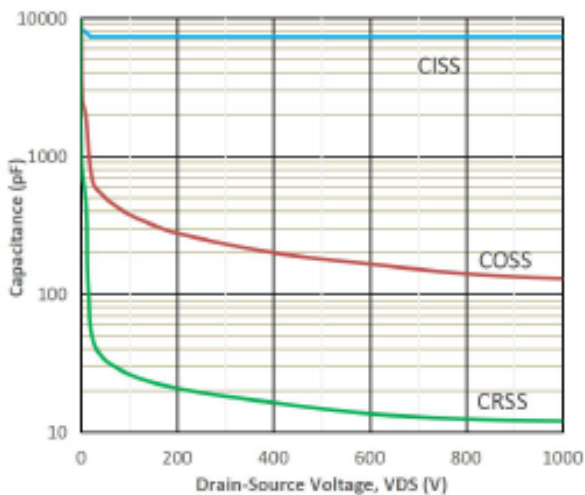
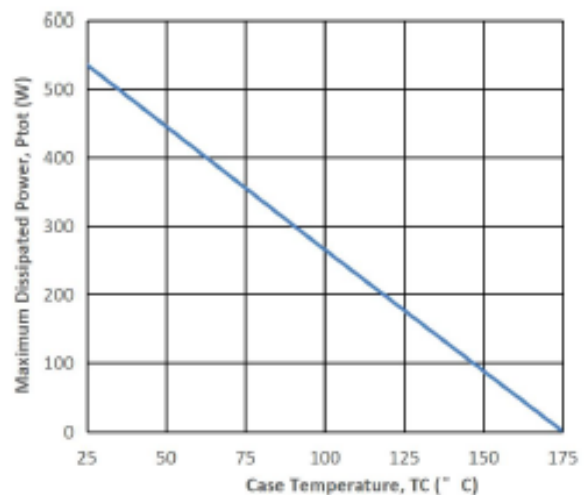


Fig12. Max Power Dissipation Derating Vs T_c



A2G50N3300MT4

Fig13. Switching Energy vs. Drain Current

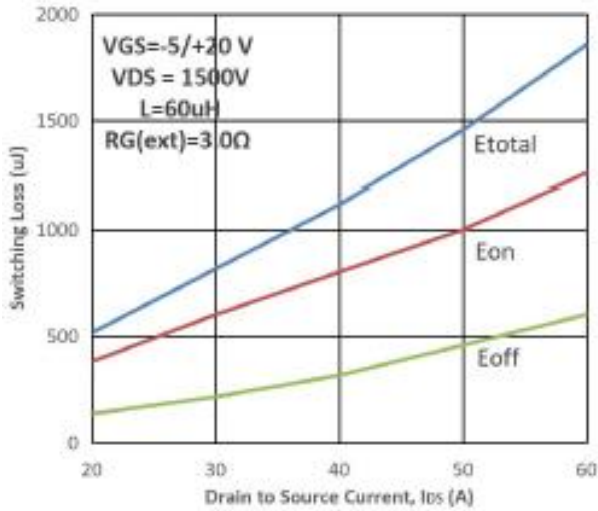


Fig14. Switching Energy vs. RG(ext)

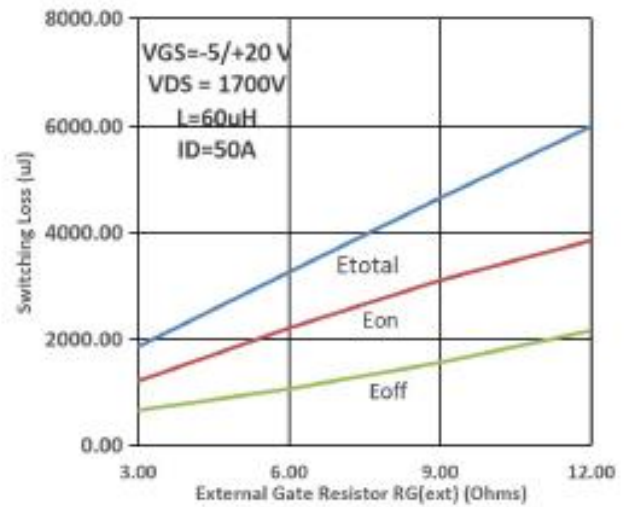


Fig15. Switching Energy vs. Temperature

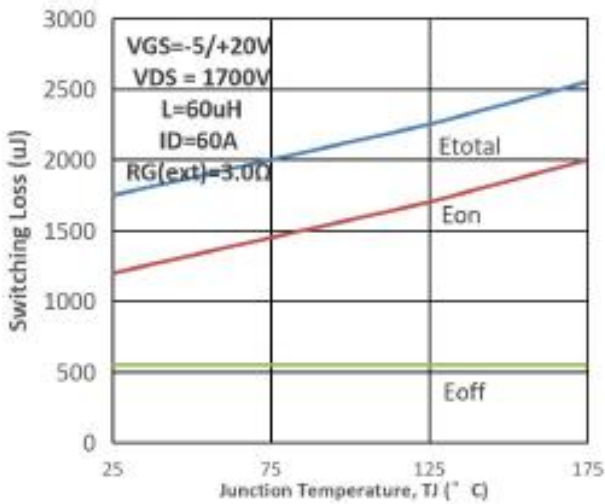


Fig16. Switching Times vs. RG(ext)

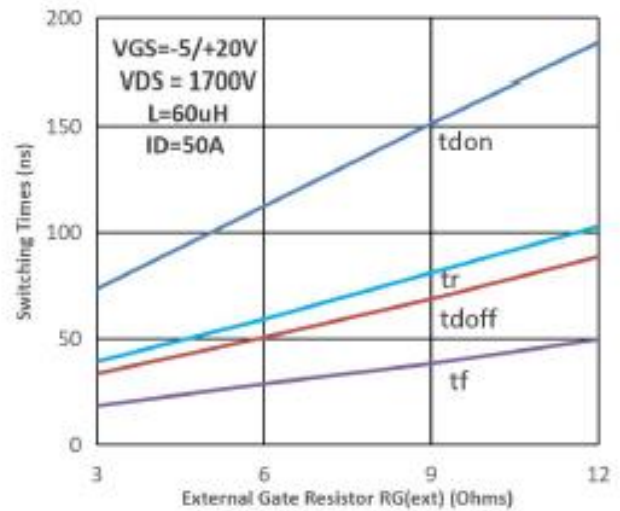


Fig17. Transient Thermal Impedance

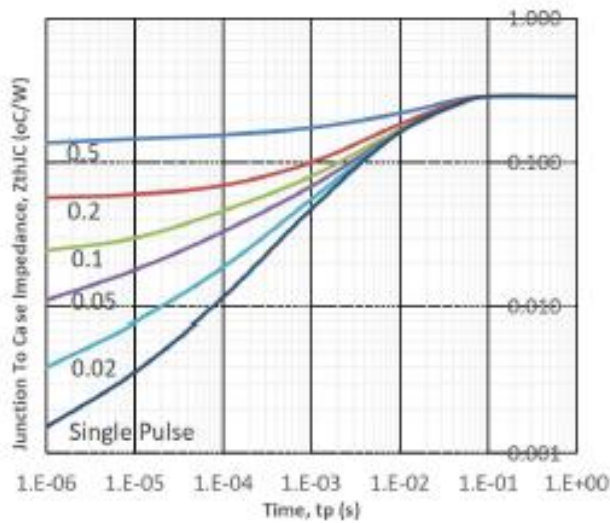
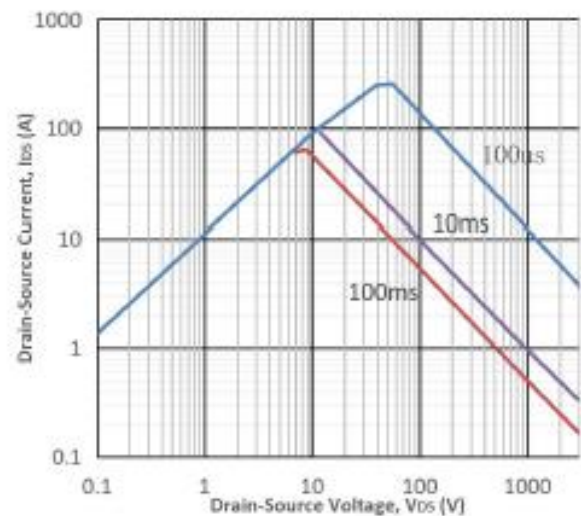
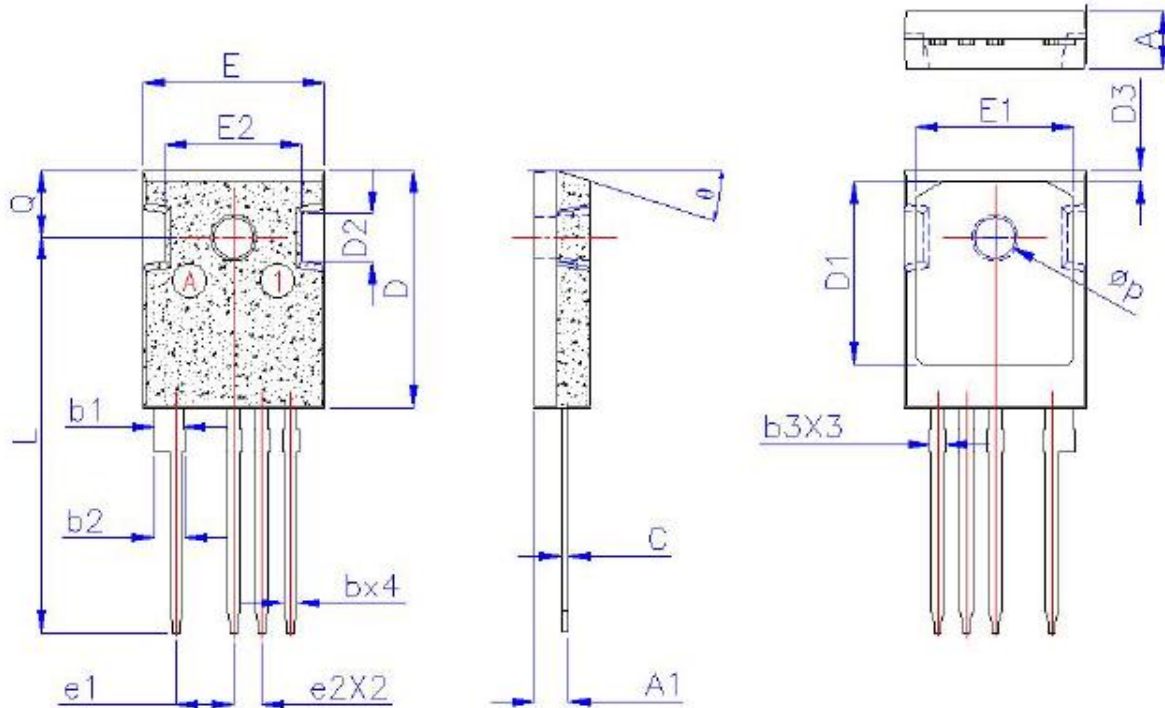


Fig18. Safe Operating Area



A2G50N3300MT4

Package Drawing



Dimensions (Unit: mm)

Symbols	Dimensions in millimeters			Dimensions in inches		
	Min.	Type	Max.	Min.	Type	Max.
A	4.80	5.00	5.20	0.189	0.197	0.205
A1	2.85	3.00	3.15	0.112	0.118	0.124
b	1.15	1.20	1.25	0.045	0.047	0.049
b1	2.40	2.50	2.60	0.094	0.098	0.102
b2	2.61	2.76	2.91	0.103	0.109	0.115
b3	1.30	1.42	1.57	0.051	0.056	0.062
C	0.55	0.60	0.65	0.022	0.024	0.026
D	20.80	21.00	21.20	0.819	0.827	0.835
D1	15.94	16.24	16.54	0.628	0.639	0.651
D2	4.3TYPE			0.169TYPE		
e1	4.93	5.08	5.23	0.194	0.200	0.206
e2	2.39	2.54	2.69	0.094	0.100	0.106
E	15.95	16.15	16.35	0.628	0.636	0.644
E1	13.82	14.02	14.26	0.544	0.552	0.561
E2	12.00	12.20	12.40		0.480	0.488
L	34.65	35.05	35.45	1.364	1.380	1.396
Q	5.85	5.95	6.05	0.230	0.234	0.238
ϕP	3.45	3.60	3.75	0.136	0.142	0.148
θ	17.5°			0.689°		

Revision version	Description	Date
1	Initial	03.2024