● General Description

The AGM308MAR combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

This device is ideal for load switch and battery protection applications.

● Features

- ■ Advance high cell density Trench technology
- ■ Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Low Thermal resistance
- ■100% Avalanche tested
- ■100% DVDS tested

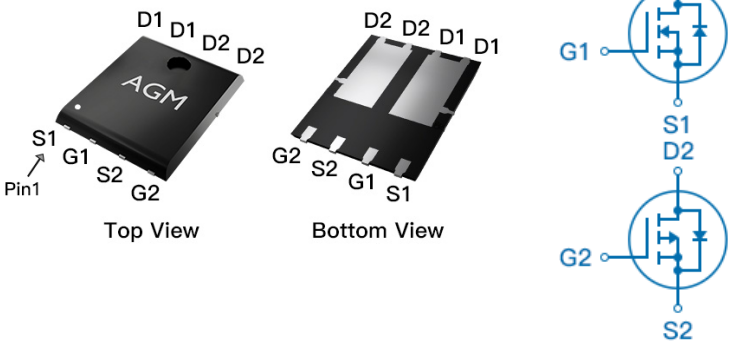
● Application

- ■MB/VGA Vcore
- ■SMPS 2nd Synchronous Rectifier
- ■POL application
- ■BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
30V	7mΩ	42A
-30V	10mΩ	-42A

PDFN5*6 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM308MAR	AGM308MAR	PDFN5*6	330mm	12mm	3000

Table 1. Absolute Maximum Ratings (T_A=25°C)

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	30	-30	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	±20	V
I_D	Drain Current-Continuous(TC=25℃) (Note 1)	42	-42	A
	Drain Current-Continuous(TC=100℃)	25	-25	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	168	-168	A
P_D	Total Power Dissipation(TC=25℃)	27	27	W
	Total Power Dissipation(TC=100℃)	11	11	W
EAS	Avalanche energy (Note 3)	81	144	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State)[1]	---	20	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	4.5	℃/W

Table 3. N- Channel Electrical Characteristics (TJ=25℃unless otherwisenoted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=30V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.5	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	15	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=15A	--	7.0	10	mΩ
		VGS=4.5V, ID=10A	--	10	15	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=1MHZ	--	1140	--	pF
Coss	Output Capacitance		--	158	--	pF
Crss	Reverse Transfer Capacitance		--	135	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	2.0	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=15V, ID=20A,RGEN=3Ω	--	8.5	--	nS
tr	Turn-on Rise Time		--	4.0	--	nS
td(off)	Turn-Off Delay Time		--	19	--	nS
tf	Turn-Off Fall Time		--	5.5	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=20A	--	22	--	nC
Qgs	Gate-Source Charge		--	4.7	--	nC
Qgd	Gate-Drain Charge		--	7.0	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	42	A
VSD	Forward on Voltage	VGS=0V,IS=15A	--	--	1.2	V
trr	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , TJ=25℃	--	10.7	--	ns
Qrr	Reverse Recovery Charge		--	15.5	--	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃,VDD=20V,Vgs=10V,ID=18A,L=0.5mH,RG=25ohm

Table 3. P-Channel Electrical Characteristics (Tj=25℃unless otherwisenoted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-30V,VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1.2	-1.5	-2.2	V
gFS	Forward Transconductance	VDS=-5V,ID=-15A	--	24	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-20A	--	10	14	mΩ
		VGS=-4.5V, ID=-15A	--	13	17	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-15V,VGS=0V, F=1MHZ	--	2605	--	pF
Coss	Output Capacitance		--	300	--	pF
Crss	Reverse Transfer Capacitance		--	262	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	6.1	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-15V, ID=-20A,RGEN=3Ω	--	11.4	--	nS
tr	Turn-on Rise Time		--	22	--	nS
td(off)	Turn-Off Delay Time		--	57	--	nS
tf	Turn-Off Fall Time		--	32	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-15V, ID=-20A	--	44	--	nC
Qgs	Gate-Source Charge		--	9.0	--	nC
Qgd	Gate-Drain Charge		--	10.6	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-42	A
VSD	Forward on Voltage	VGS=0V,IS=-20A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-20A , dI/dt=100A/μs , TJ=25℃	--	27	--	ns
Qrr	Reverse Recovery Charge		--	77	--	nc

Notes 1.The maximum current rating is packagelimited.

Notes2.RepetitiveRating:Pulsewidthlimitedbymaximumjunctiontemperature Notes

3.EAS condition: TJ=25℃,VDD=-20V,Vgs=-10V,ID=-24A,L=0.5mH,RG=25ohm

N-Channel Typical Characteristics

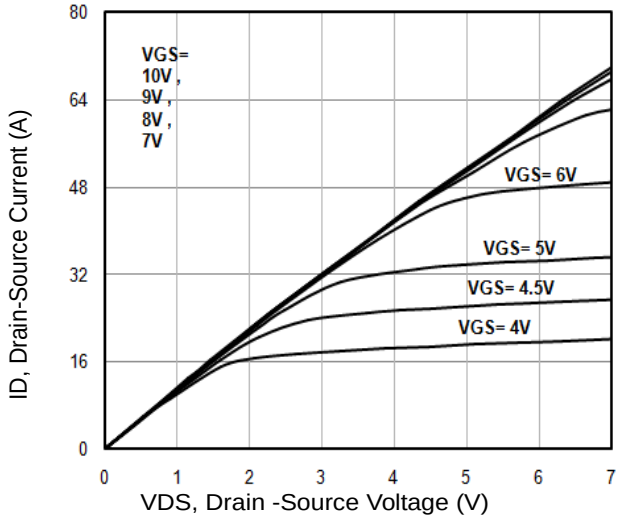


Fig1. Typical Output Characteristics

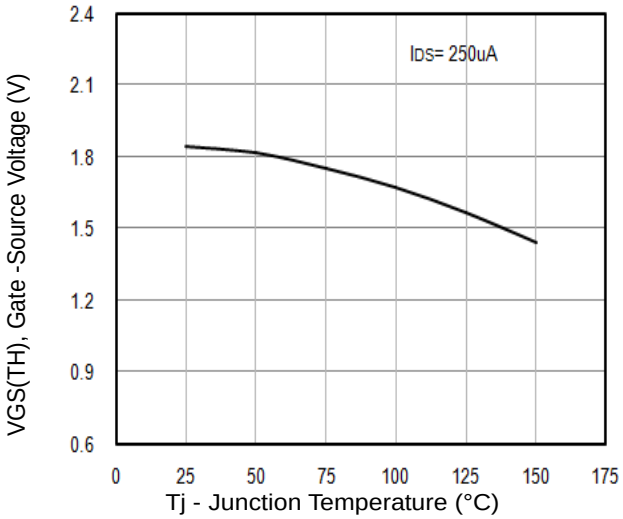


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

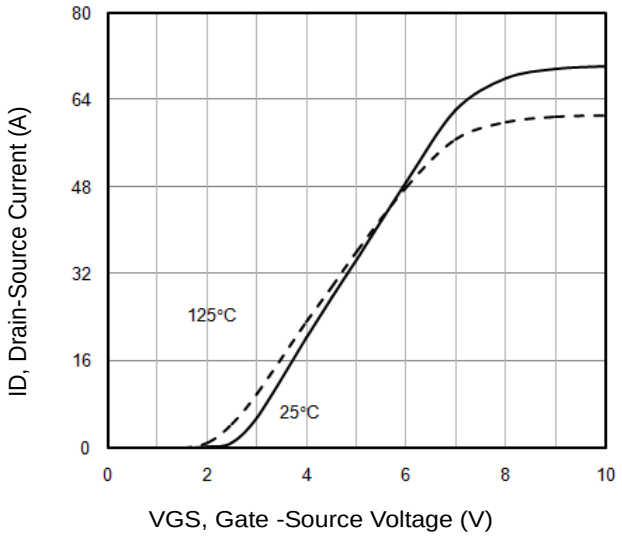


Fig3. Typical Transfer Characteristics

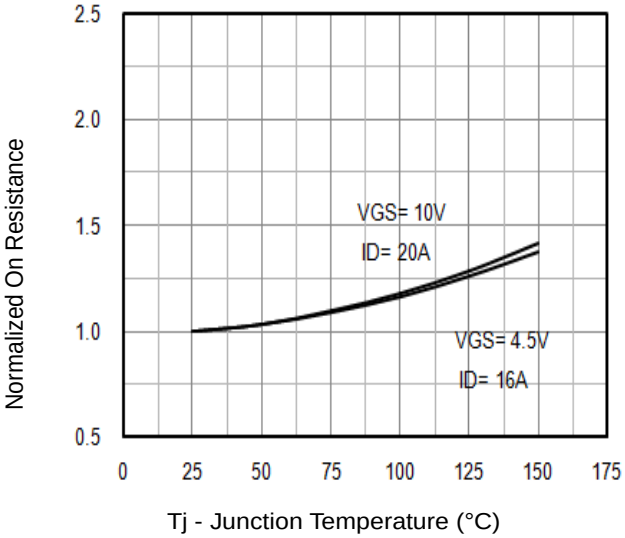


Fig4. Normalized On-Resistance Vs. Tj

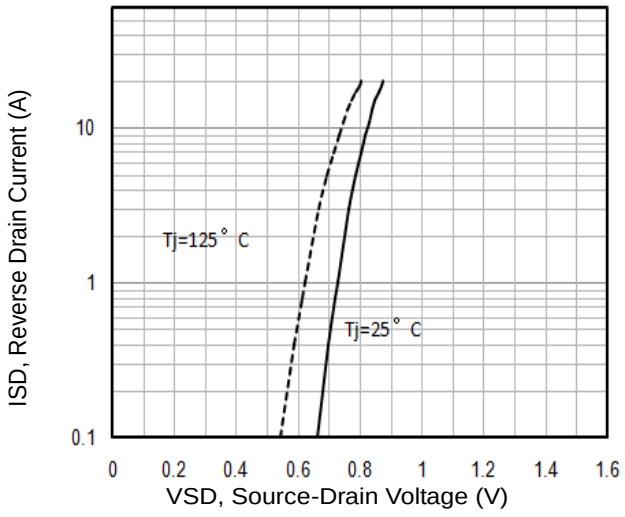


Fig5. Typical Source-Drain Diode Forward Voltage

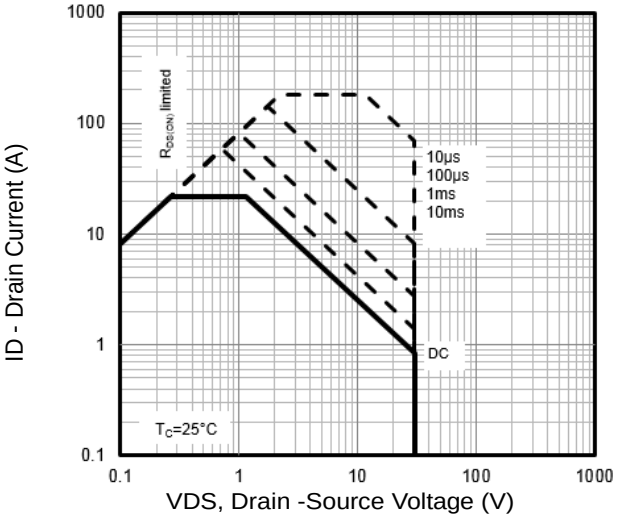


Fig6. Maximum Safe Operating Area

N-Channel Typical Characteristics

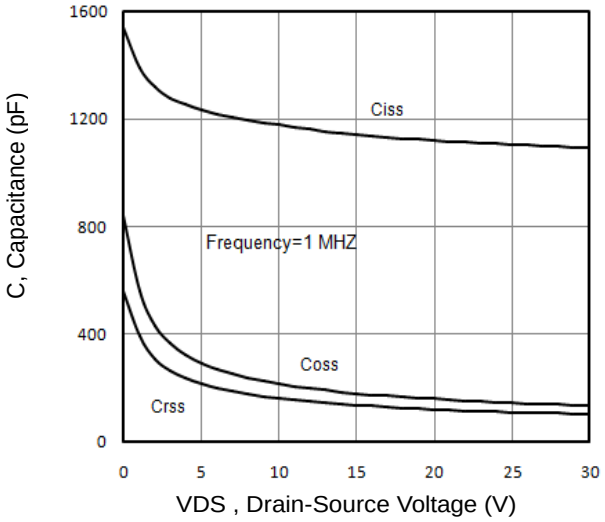


Fig7. Typical Capacitance Vs.Drain-Source Voltage

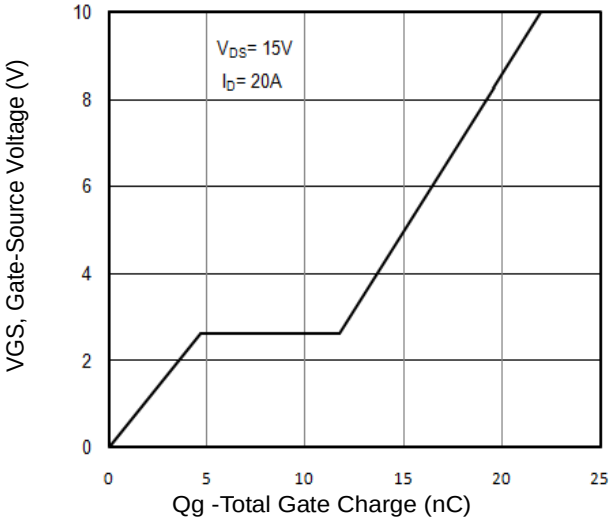


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

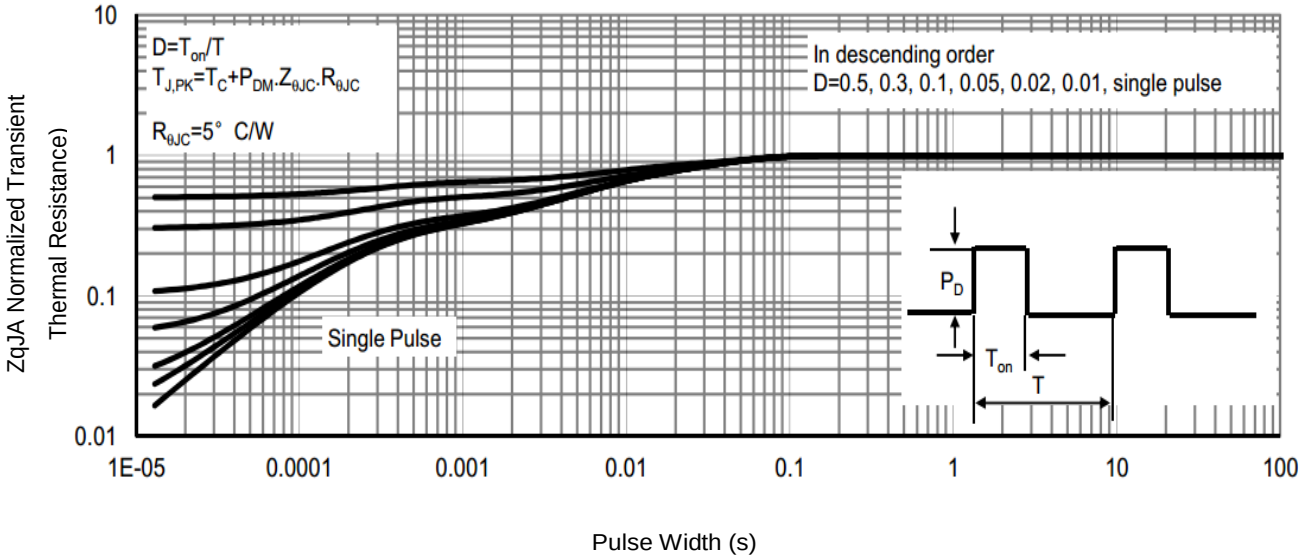


Fig 9 .Normalized Maximum Transient Thermal Impedance

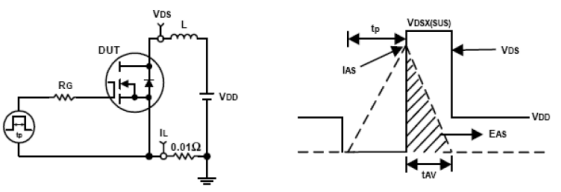


Fig10. Unclamped Inductive Test Circuit and waveforms

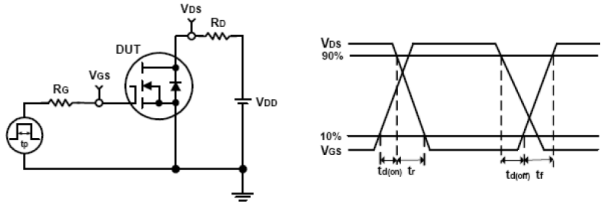


Fig11. Switching Time Test Circuit and waveforms

P-Channel Typical Characteristics

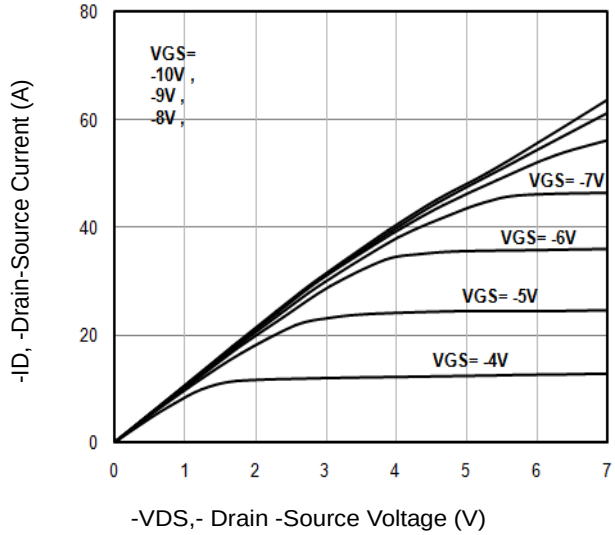


Fig1. Typical Output Characteristics

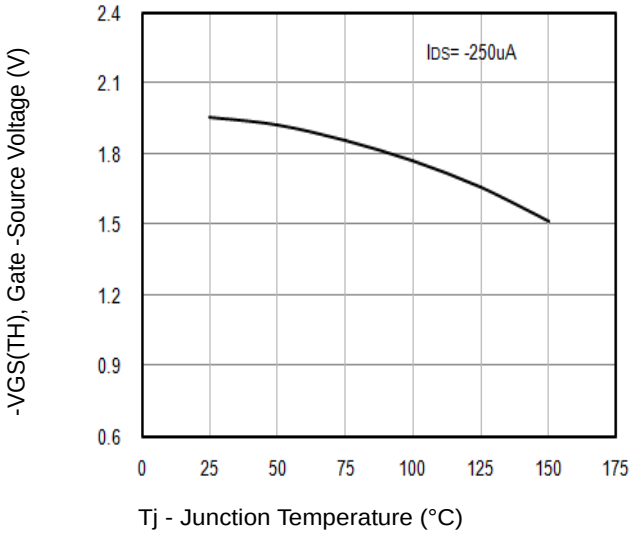


Fig2. $-V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

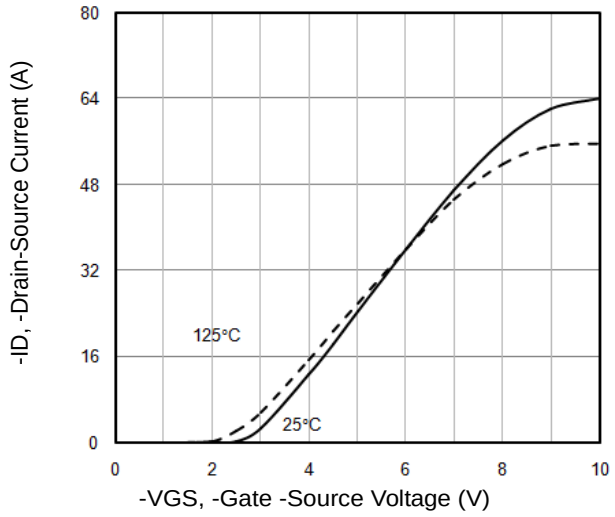


Fig3. Typical Transfer Characteristics

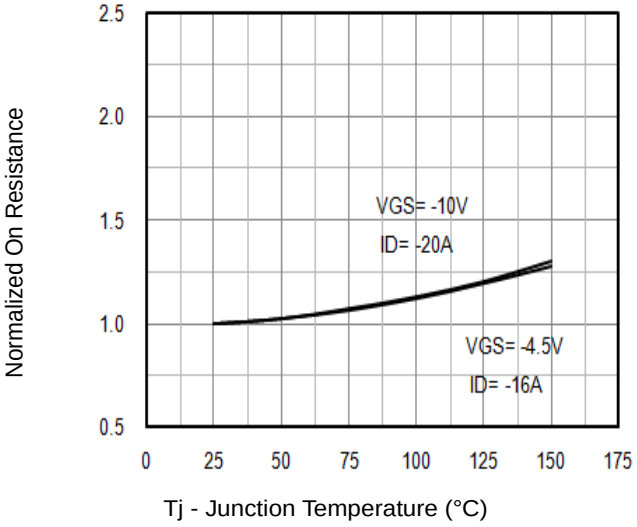


Fig4. Normalized On-Resistance Vs. Tj

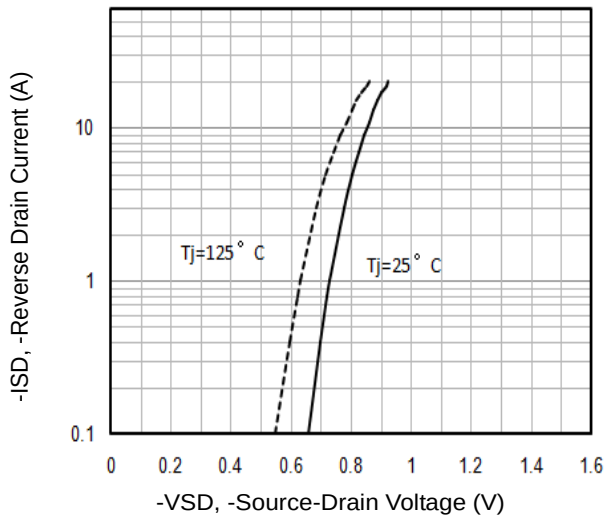


Fig5. Typical Source-Drain Diode Forward Voltage

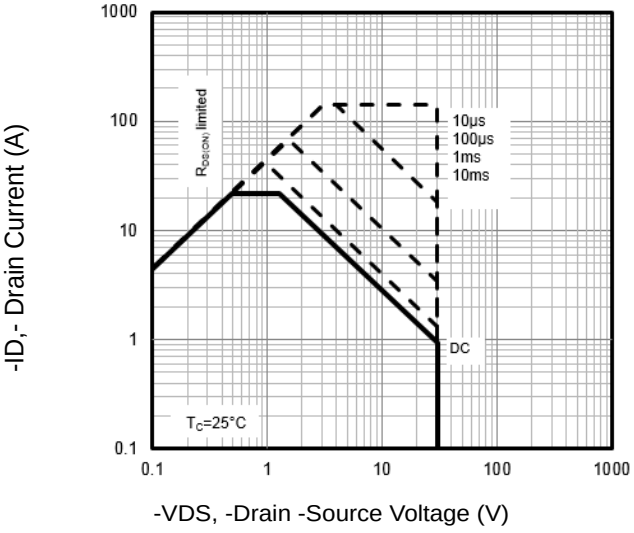


Fig6. Maximum Safe Operating Area

P-Channel Typical Characteristics

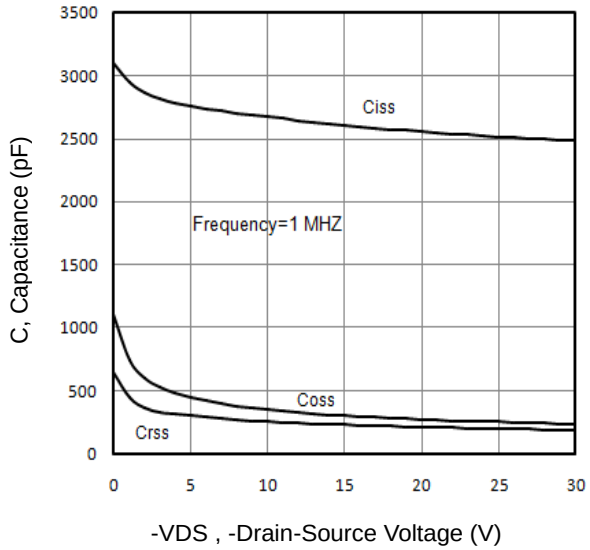


Fig7. Typical Capacitance Vs.Drain-Source Voltage

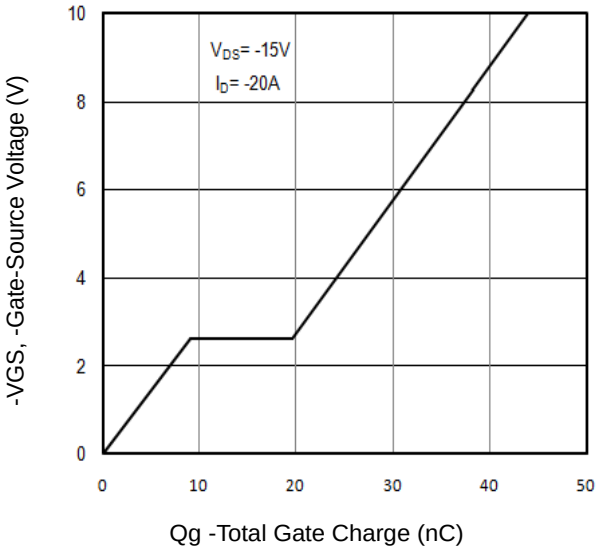


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

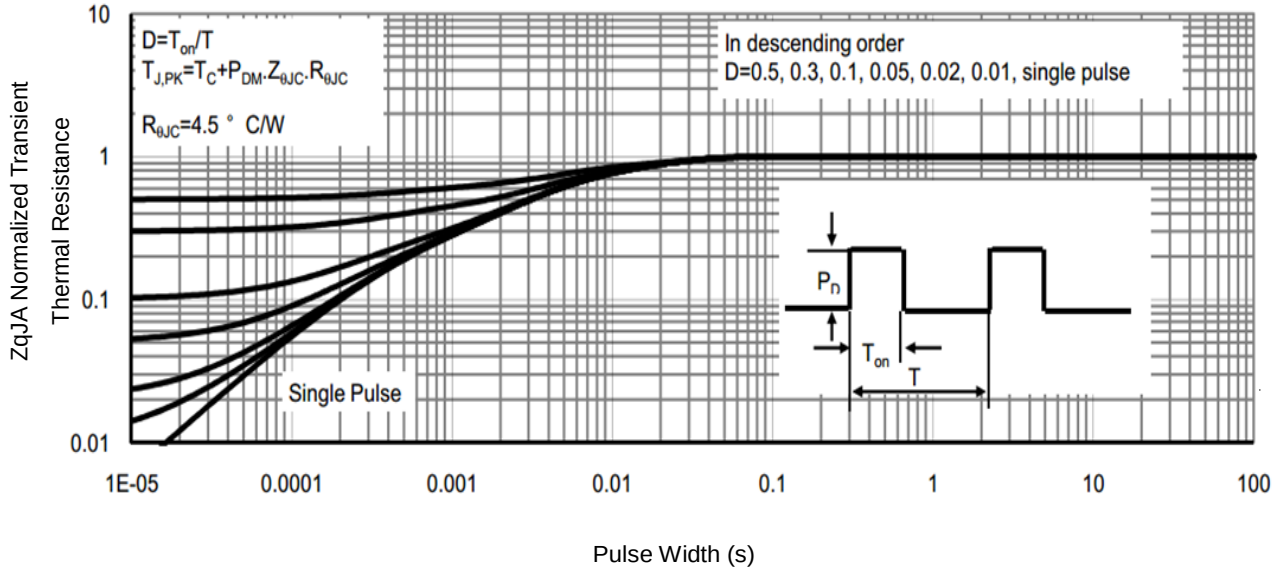


Fig9. Normalized Maximum Transient Thermal Impedance

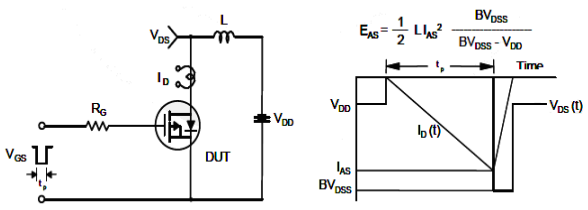


Fig10. Unclamped Inductive Test Circuit and Waveforms

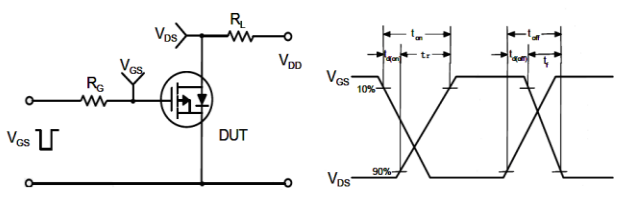
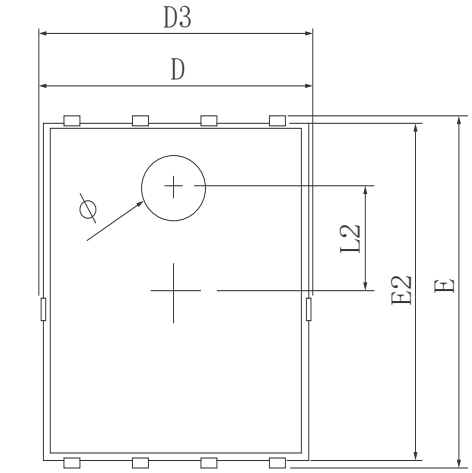
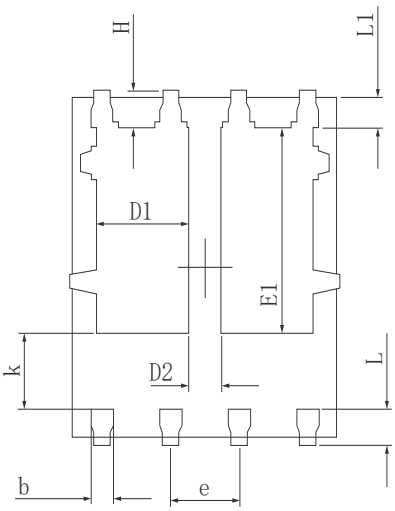
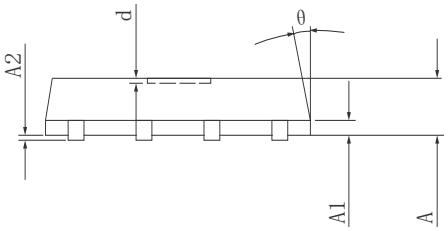


Fig11. Switching Time Test Circuit and waveforms

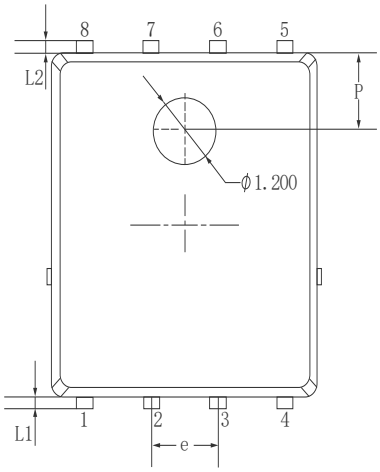
●Dimensions（PDFN5*6）

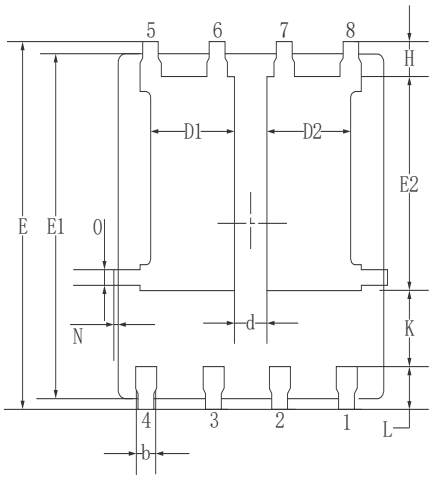


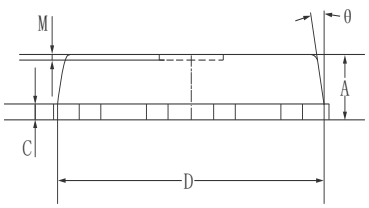




SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0~0.05		
D	4.824	4.900	4.976
D1	1.605	1.705	1.805
D2	0.500	0.600	0.700
D3	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100





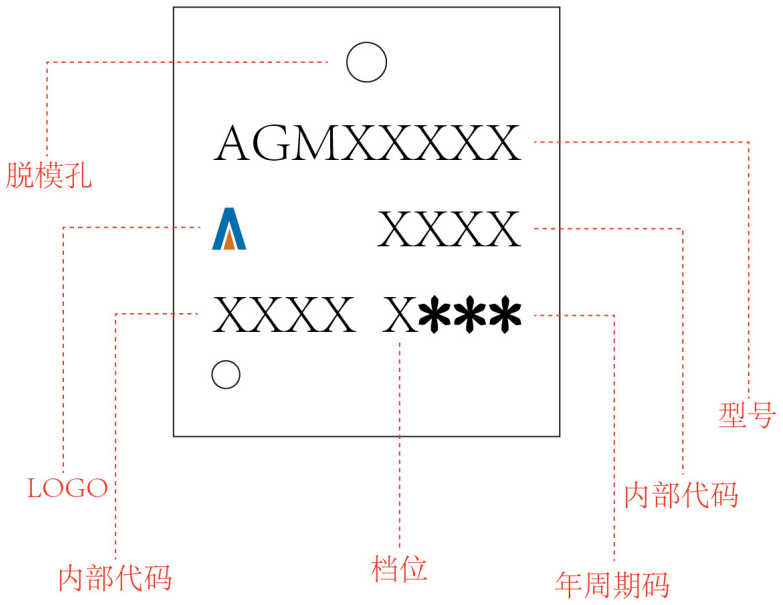


Symbol	Millitmeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.35	0.40	0.50
C	0.20	0.25	0.35
D	4.90	5.05	5.20
D1/D2	1.51	1.61	1.71
d	0.50	0.60	0.70
E	6.00	6.15	6.30
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.74	0.84
L1/L2	0.20 REF.		
θ	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		
P	1.28 REF.		

PDFN5*6

Marking Instructions:

Model1:



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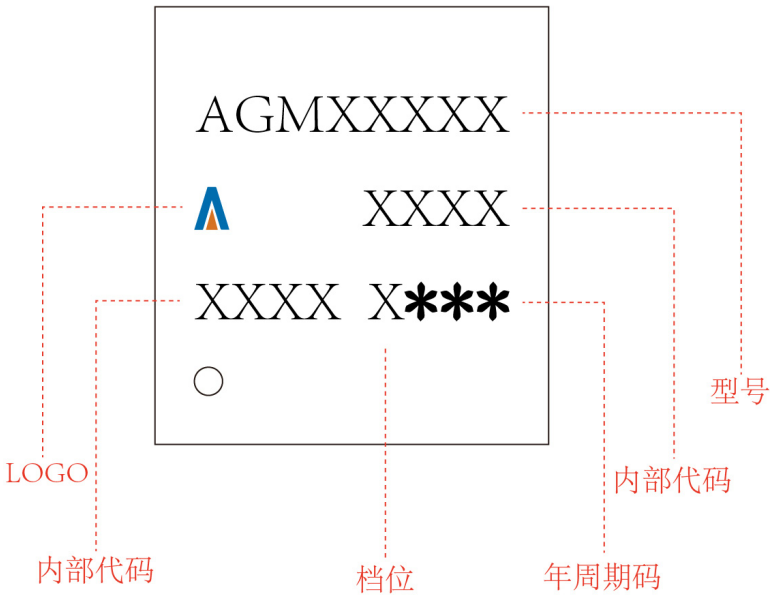

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This document is the fifth version issued on March 10th, 2024. This document replaces all previously provided information.