General Description

The AGM318MAP 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	17mΩ	20A
-30V	23mΩ	-18A

PDFN3.3*3.3 Pin Configuration

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM318MAP	AGM318MAP	PDFN3.3*3.3	330mm	12mm	5000

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(T_C=25℃) (Note 1)	20	-18	A
	Drain Current-Continuous(TC=100℃)	13	-12	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	80	-72	A
P_D	Total Power Dissipation(T_C=25℃)	14	20	W
	Total Power Dissipation(TC=100℃)	5.5	8.0	W
EAS	Avalanche energy (Note 3)	36	56	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]	---	45		℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	9	6.2	℃/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	1.6	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=15A	--	17	22	mΩ
		VGS=4.5V, ID=10A	--	24	29	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=1MHZ	--	441	--	pF
Coss	Output Capacitance		--	70	--	pF
Crss	Reverse Transfer Capacitance		--	60	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	2.2	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VDS=15V,VGS=10V，RGEN=3Ω，	--	7.0	--	nS
tr	Turn-on Rise Time		--	10	--	nS
td(off)	Turn-Off Delay Time		--	22	--	nS
tf	Turn-Off Fall Time		--	7.0	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=8A	--	11	--	nC
Qgs	Gate-Source Charge		--	3.0	--	nC
Qgd	Gate-Drain Charge		--	4.3	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	20	A
VSD	Forward on Voltage	VGS=0V,IS=15A	--	--	1.2	V
trr	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , TJ=25℃	--	9.5	--	ns
Qrr	Reverse Recovery Charge		--	12	--	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=15V,Vgs=10V,ID=12A, 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=-10A	--	12	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-15A	--	23	30	mΩ
		VGS=-4.5V, ID=-10A	--	34	45	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-15V,VGS=0V, F=1MHZ	--	690	--	pF
Coss	Output Capacitance		--	104	--	pF
Crss	Reverse Transfer Capacitance		--	91	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	11	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-15V, RGEN=3Ω	--	6.0	--	nS
tr	Turn-on Rise Time		--	5.0	--	nS
td(off)	Turn-Off Delay Time		--	25	--	nS
tf	Turn-Off Fall Time		--	7.0	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-15V, ID=-8A	--	19	--	nC
Qgs	Gate-Source Charge		--	4.3	--	nC
Qgd	Gate-Drain Charge		--	6.5	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-18	A
VSD	Forward on Voltage	VGS=0V,IS=-15A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-15A , dI/dt=100A/μs , TJ=25℃	--	7.0	--	ns
Qrr	Reverse Recovery Charge		--	6.3	--	nc

Notes 1.The maximum current rating is packagelimited.

Notes2.RepetitiveRating: Pulsewidthlimitedbymaximumjunctiontemperature Notes

3.EAS condition: TJ=25℃， VDD=-15V,Vgs=-10V,ID=-15A, L=0.5mH,RG=25ohm

N-Channel Typical Characteristics

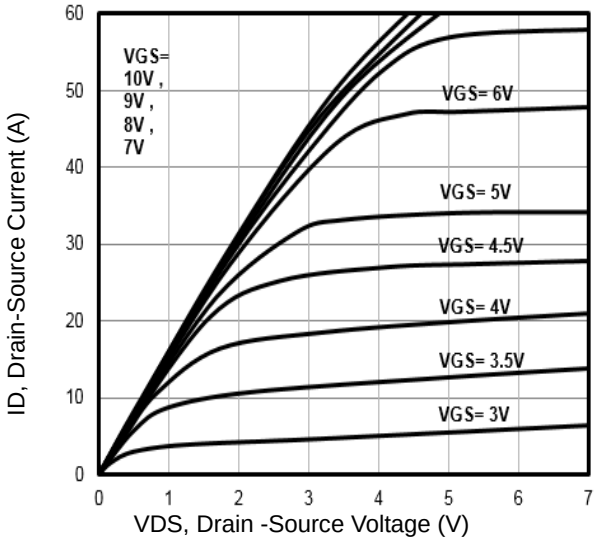


Fig1. Typical Output Characteristics

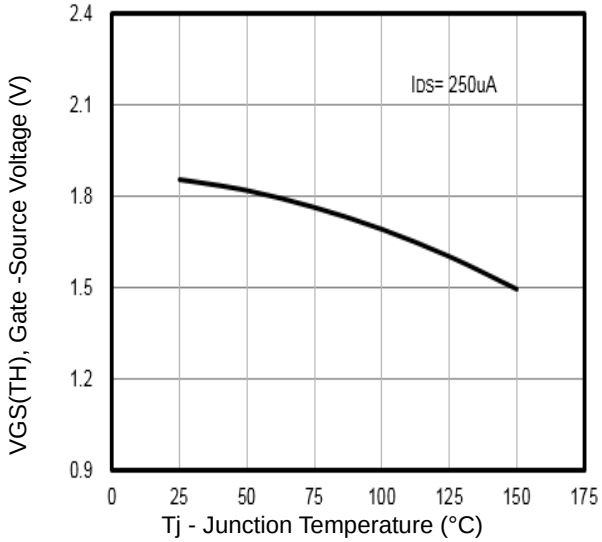


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

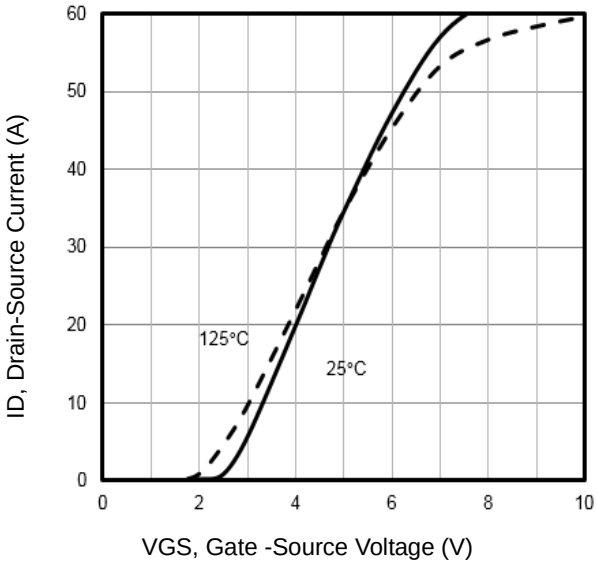


Fig3. Typical Transfer Characteristics

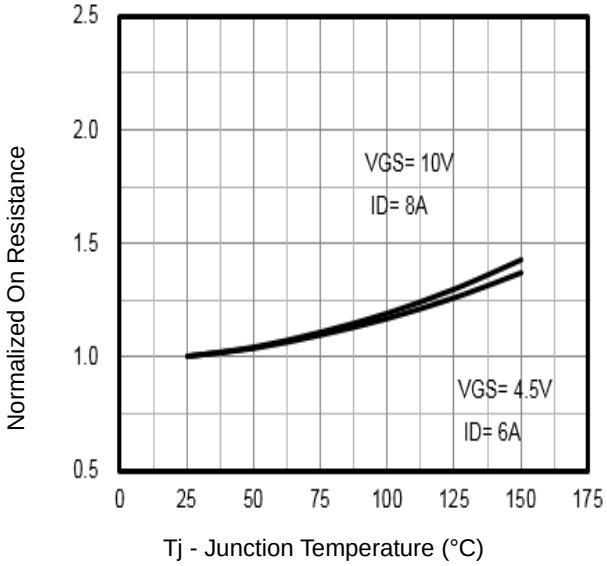


Fig4. Normalized On-Resistance Vs. Tj

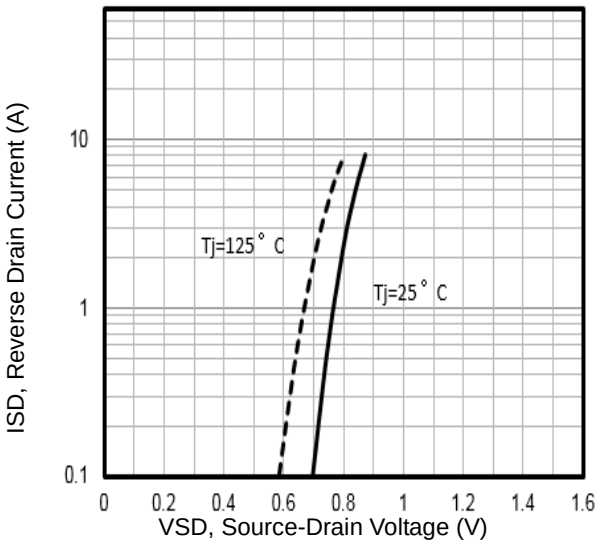


Fig5. Typical Source-Drain Diode Forward Voltage

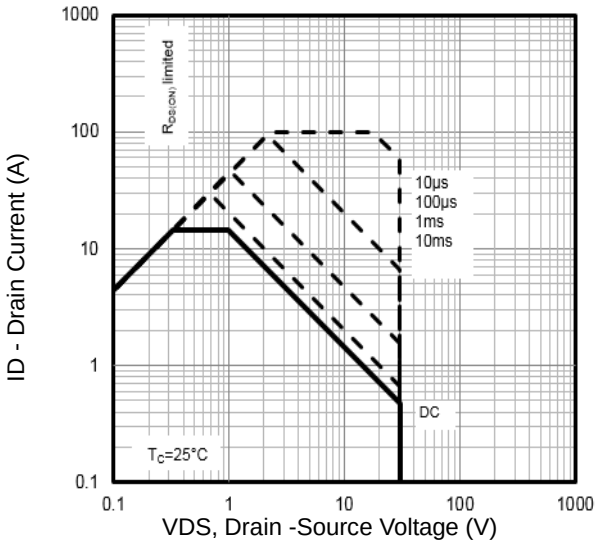


Fig6. Maximum Safe Operating Area

N-Channel Typical Characteristics

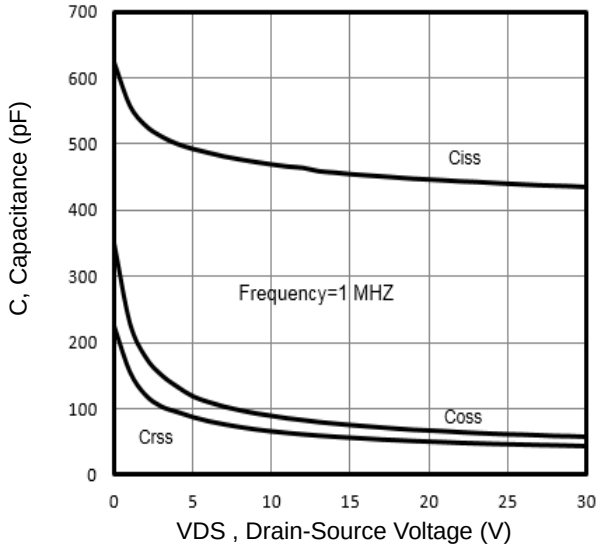


Fig7. Typical Capacitance Vs.Drain-Source Voltage

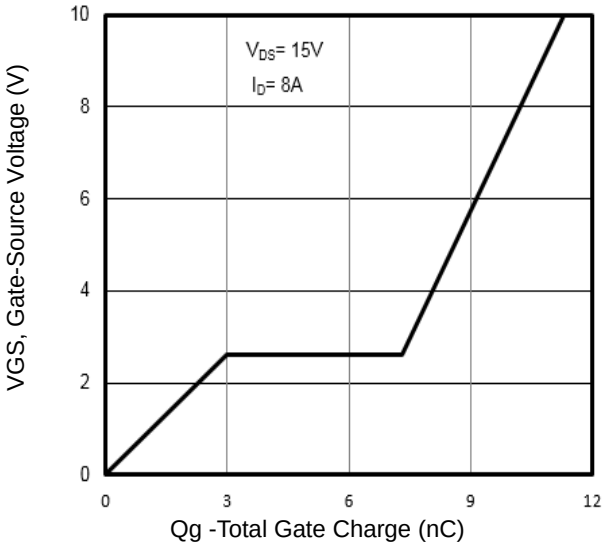


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

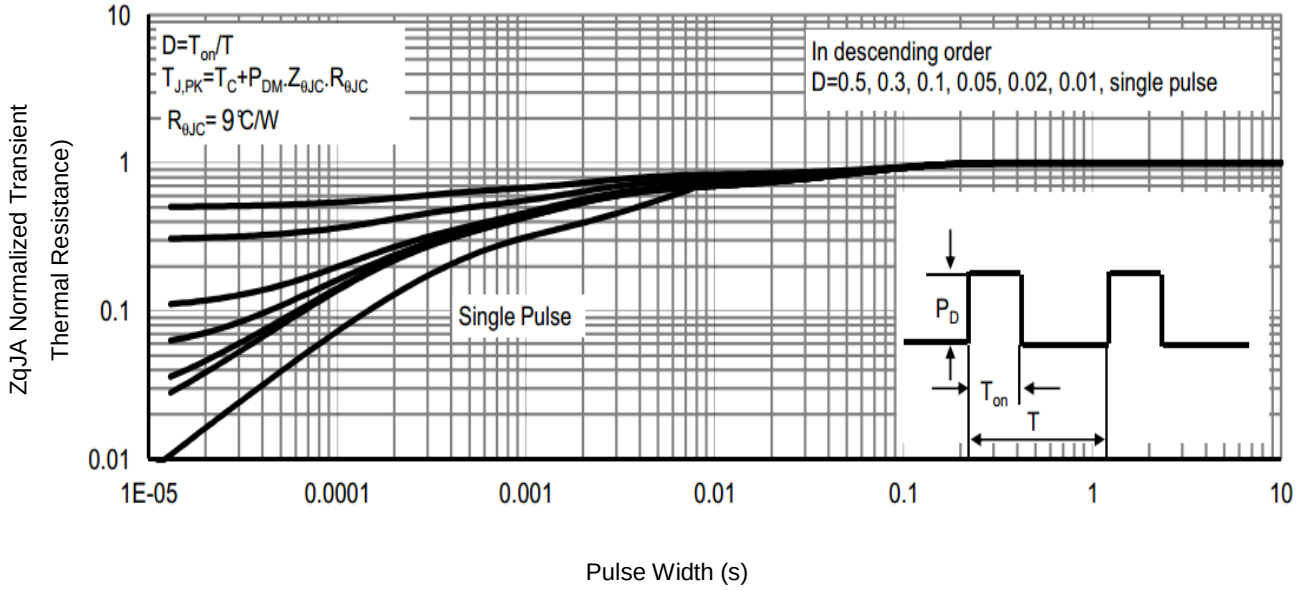


Fig 9 .Normalized Maximum Transient Thermal Impedance

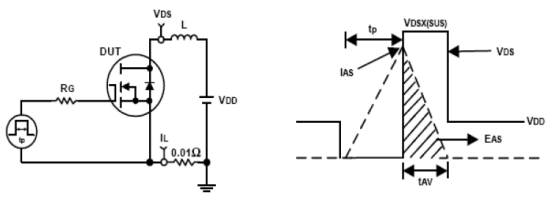


Fig10. Unclamped Inductive Test Circuit and waveforms

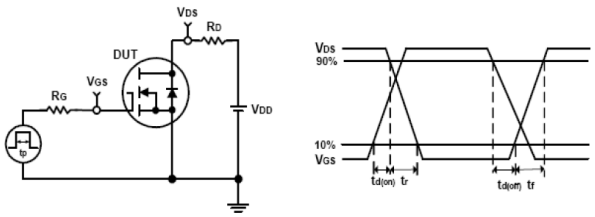


Fig11. Switching Time Test Circuit and waveforms

P-Channel Typical Characteristics

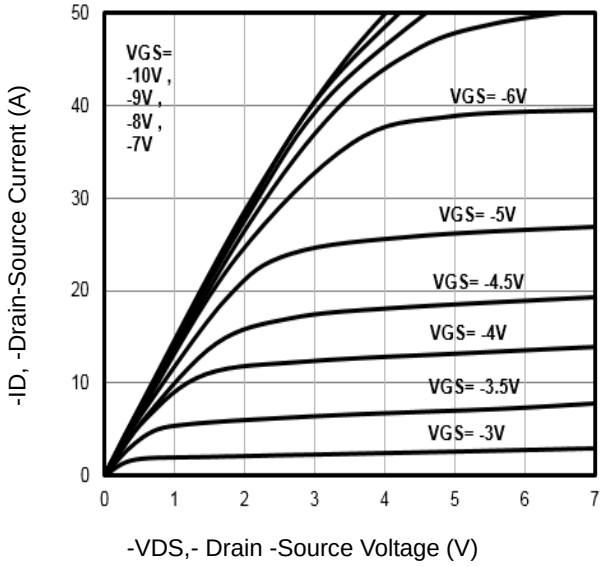


Fig1. Typical Output Characteristics

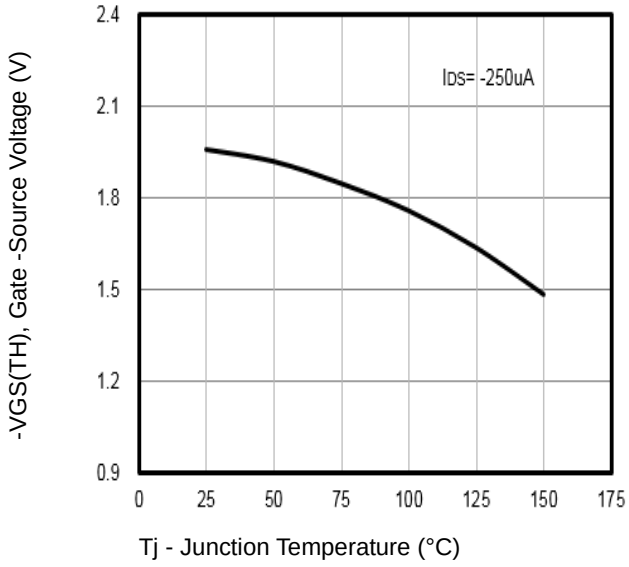


Fig2. $-V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

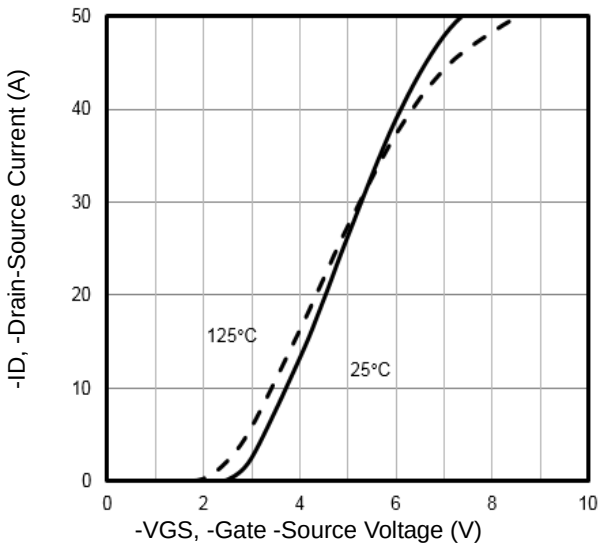


Fig3. Typical Transfer Characteristics

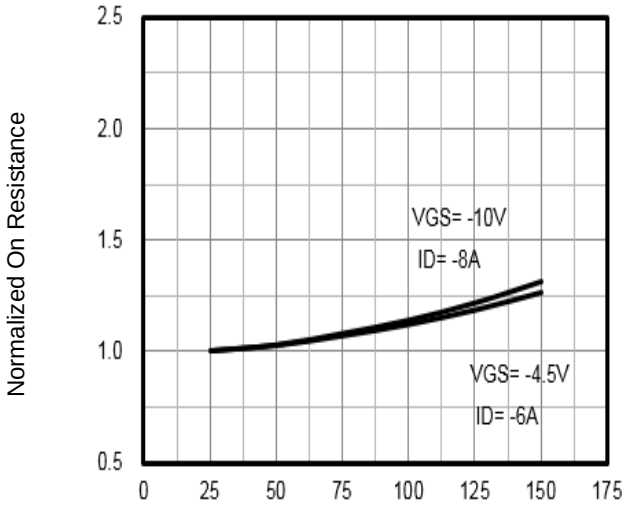


Fig4. Normalized On-Resistance Vs. Tj

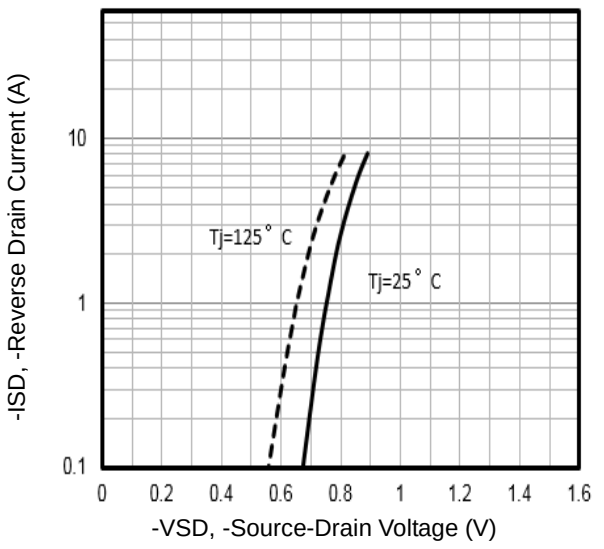


Fig5. Typical Source-Drain Diode Forward Voltage

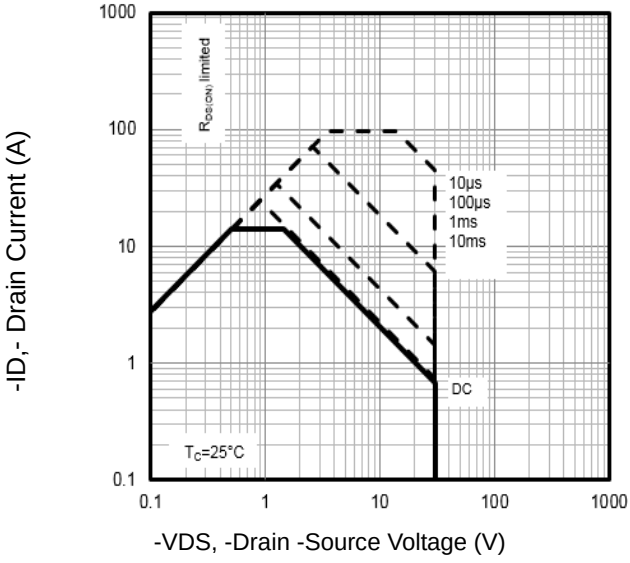


Fig6. Maximum Safe Operating Area

P-Channel Typical Characteristics

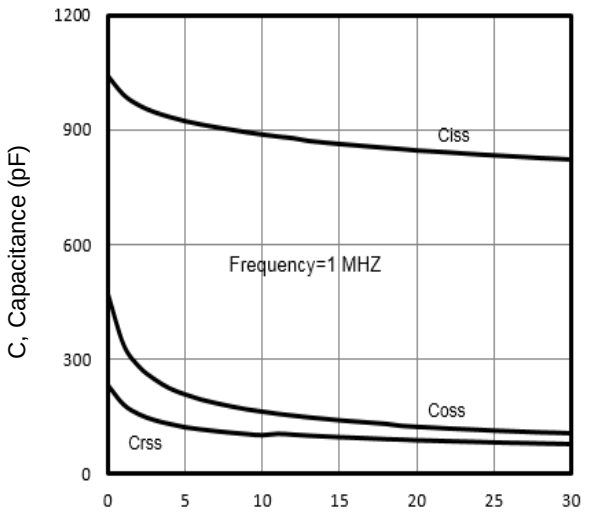


Fig7. Typical Capacitance Vs.Drain-Source Voltage

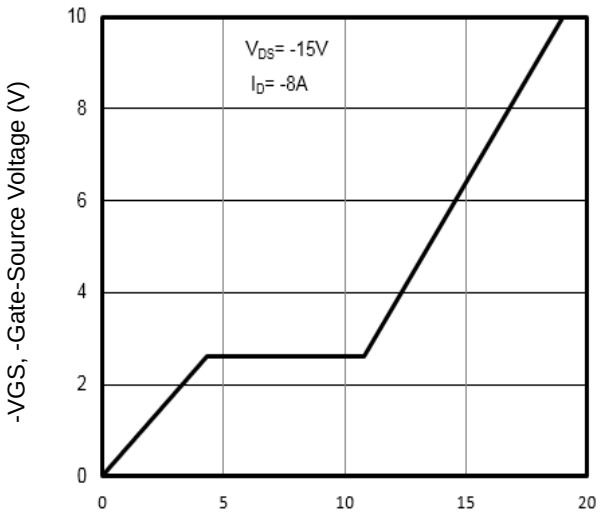


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

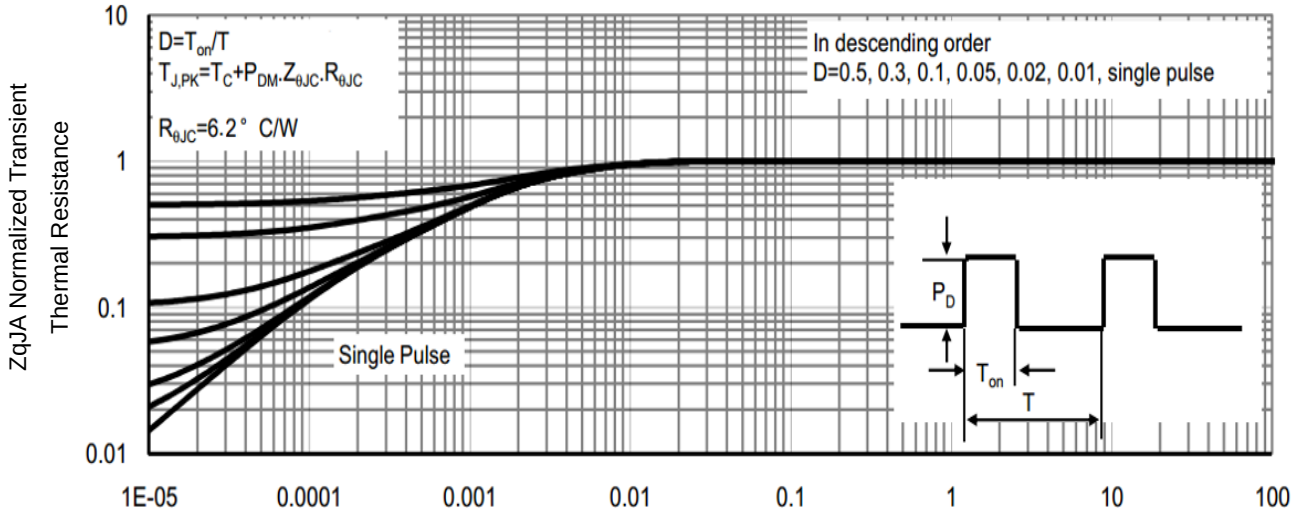


Fig9. Normalized Maximum Transient Thermal Impedance

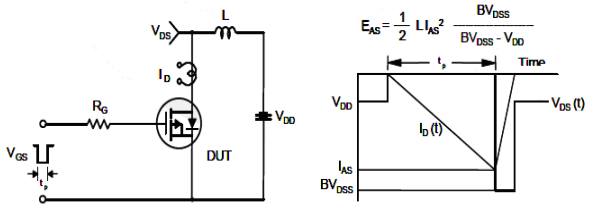


Fig10. Unclamped Inductive Test Circuit and Waveforms

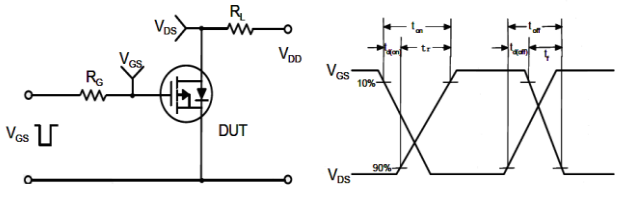
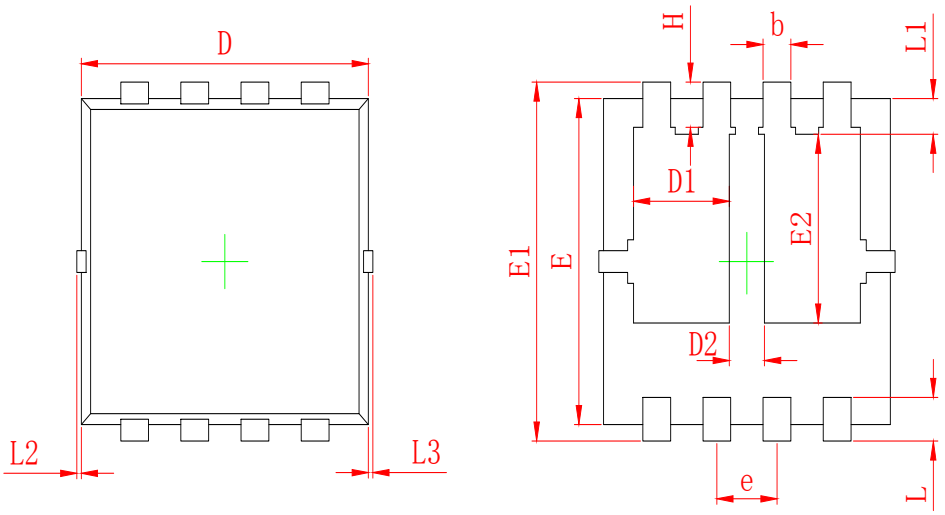
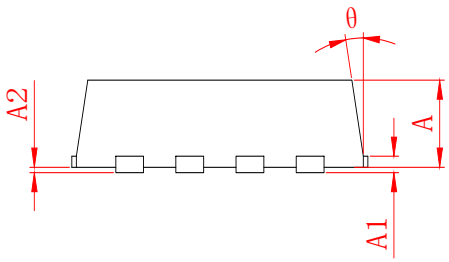


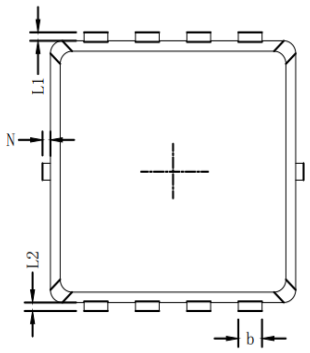
Fig11. Switching Time Test Circuit and waveforms

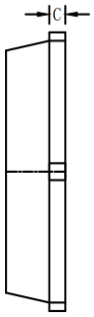
●Dimensions（PDFN3.3×3.3）

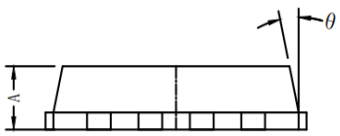


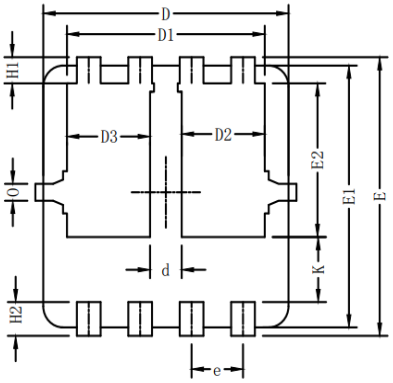
SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152 REF.	
A2	0~0.05	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0~0.100	
L3	0~0.100	
H	0.315	0.515
θ	8°	12°











Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
D2/D3	1.00	1.05	1.10
d	0.30	0.40	0.50
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.72	1.82	1.92
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.67	0.77	0.87
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
O	0.2 REF.		

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This document is the first version issued on Dec. 10, 2023. This document replaces all previously provided information.

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