● General Description

The AGM312ME 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%Avalanchetested

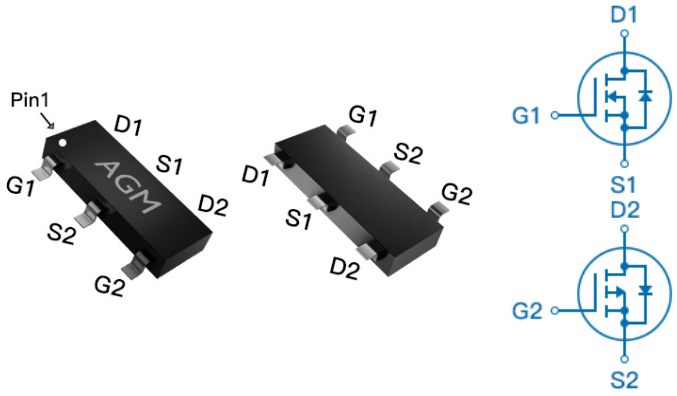
● Application

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

Product Summary

BVDSS	RDSON	ID
30V	24mΩ	5.5A
-30V	38mΩ	-4.4A

SOT23-6L Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM312	AGM312ME	SOT23-6L	178mm	8mm	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)	±12	±12	V
I_D	Drain Current-Continuous(TA=25℃) (Note 1)	5.5	-4.4	A
	Drain Current-Continuous(TA=100℃)	3.3	-2.6	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	22	-17.6	A
P_D	Total Power Dissipation(TA=25℃)	1.0	1.0	W
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]	--	125	℃/W

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

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=±12V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	0.5	--	1.3	V
gFS	Forward Transconductance	VDS=5V,ID=5A	--	8	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=4.2A	--	24	30	mΩ
		VGS=4.5V, ID=4A	--	26	35	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=1MHZ	--	390	--	pF
Coss	Output Capacitance		--	54.5	--	pF
Crss	Reverse Transfer Capacitance		--	41	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=15V, ID=4A,RGEN=6Ω	--	4	--	nS
tr	Turn-on Rise Time		--	2	--	nS
td(off)	Turn-Off Delay Time		--	22	--	nS
tf	Turn-Off Fall Time		--	3	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=4A	--	4.5	--	nC
Qgs	Gate-Source Charge		--	1.4	--	nC
Qgd	Gate-Drain Charge		--	0.6	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	5.5	A
VSD	Forward on Voltage	VGS=0V,IS=4A	--	0.7	0.95	V
trr	Reverse Recovery Time	IF=4A , dI/dt=100A/μs , TJ=25℃	--	11	--	ns
Qrr	Reverse Recovery Charge		--	5.5	--	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℃

Table 3. P-Channel Electrical Characteristics (TJ=25℃unless otherwise noted)

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=±12V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.5	--	-1.3	V
gFS	Forward Transconductance	VDS=-5V,ID=-4A	--	8	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-4.2A	--	38	50	mΩ
		VGS=-4.5V, ID=-4A	--	45	55	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-15V,VGS=0V, F=1MHZ	--	409	--	pF
Coss	Output Capacitance		--	55	--	pF
Crss	Reverse Transfer Capacitance		--	42	--	pF
Rg	Gate resistance	VGS=0V, VDS=-0V,f=1.0MHz	--	12	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-15V,VDS=-10V, ID=-4A,RGEN=3Ω	--	13	--	nS
tr	Turn-on Rise Time		--	10	--	nS
td(off)	Turn-Off Delay Time		--	28	--	nS
tf	Turn-Off Fall Time		--	13	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-15V, ID=-4A	--	4.8	--	nC
Qgs	Gate-Source Charge		--	1.4	--	nC
Qgd	Gate-Drain Charge		--	0.72	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-4.4	A
VSD	Forward on Voltage	VGS=0V,IS=-4A	--	-0.7	-1.0	V
trr	Reverse Recovery Time	IF=-4A , dI/dt=100A/μs , TJ=25℃	--	26	--	ns
Qrr	Reverse Recovery Charge		--	15.6	--	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℃

N Channel Typical Characteristics

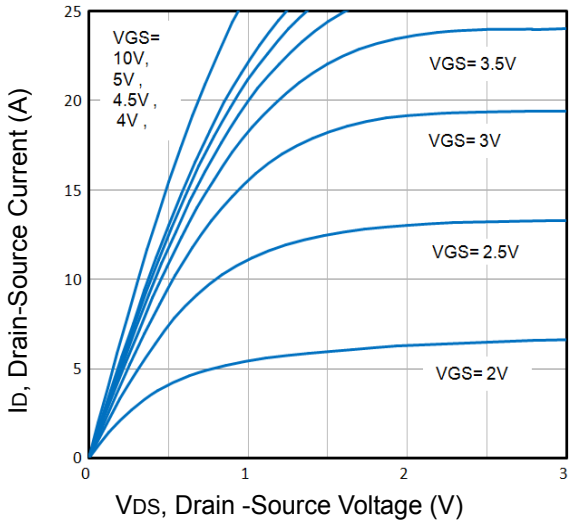


Fig1. Typical Output Characteristics

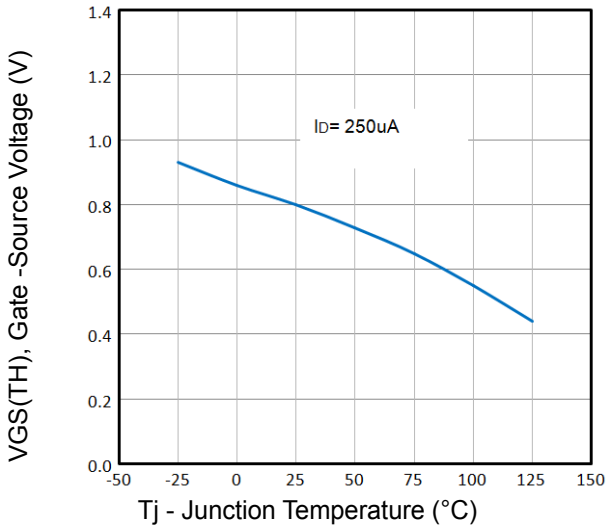


Fig2. Normalized Threshold Voltage Vs. Temperature

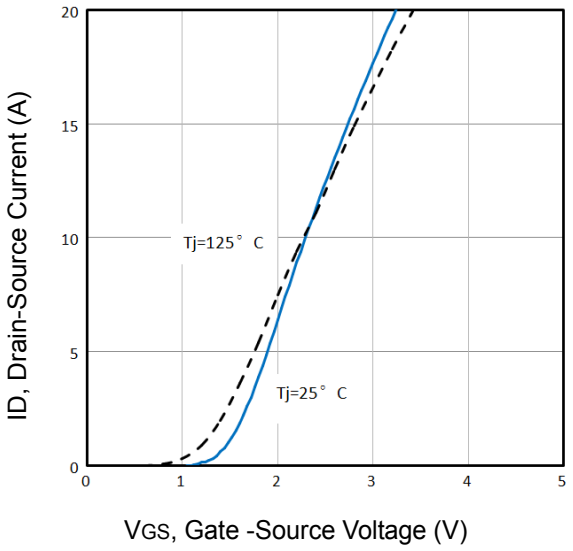


Fig3. Typical Transfer Characteristics

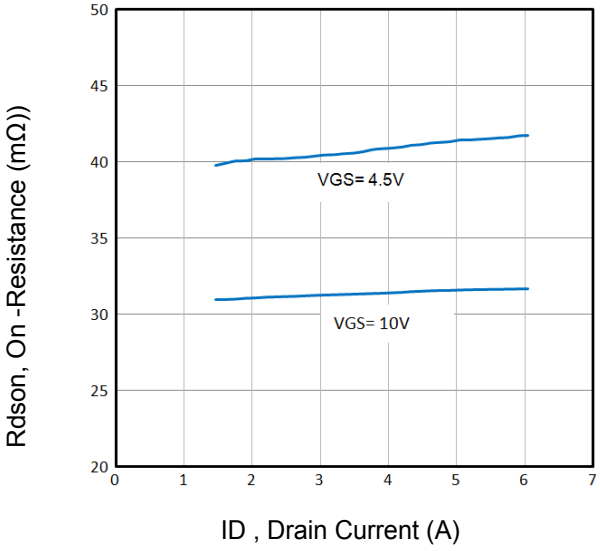


Fig4. On-Resistance vs. Drain Current and Gate

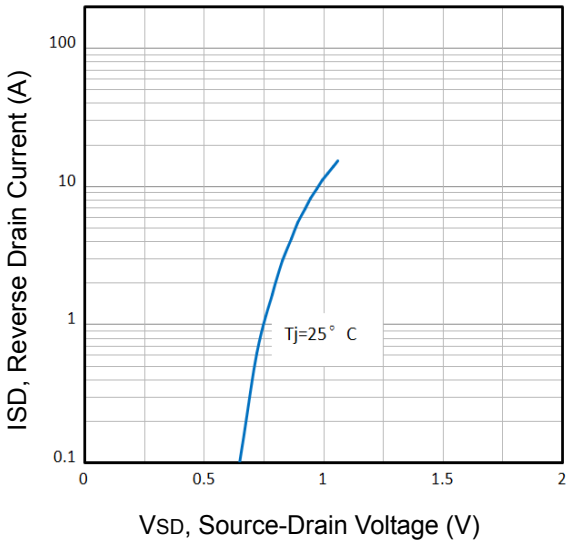


Fig5. Typical Source-Drain Diode Forward Voltage

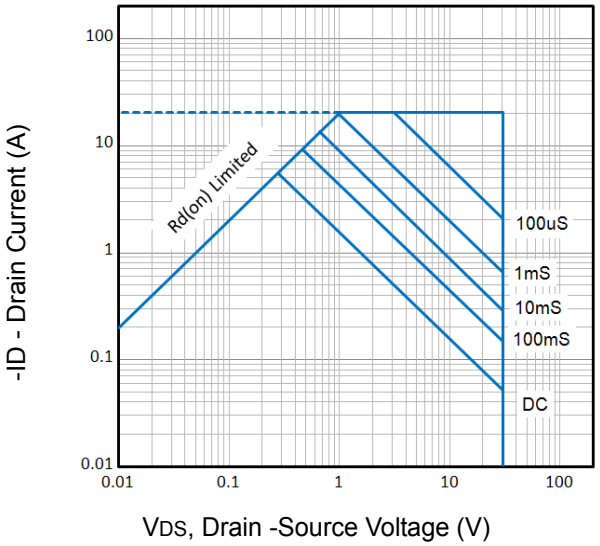


Fig6. Maximum Safe Operating Area

N Channel Typical Characteristics

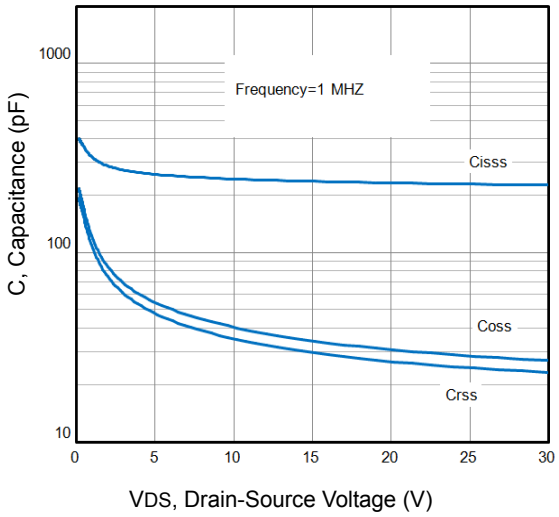


Fig7. Typical Capacitance Vs. Drain-Source Voltage

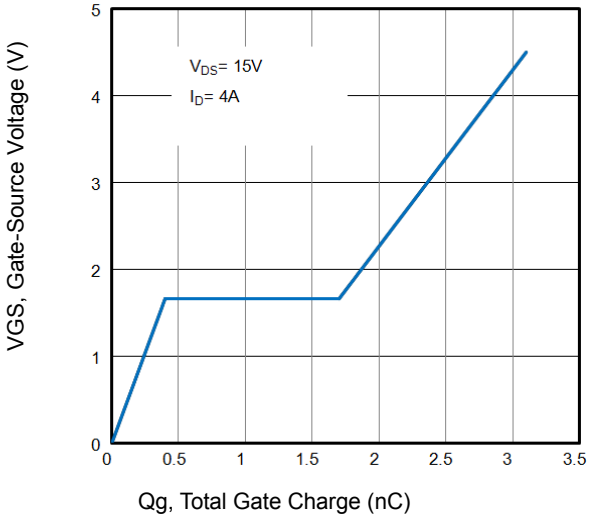


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

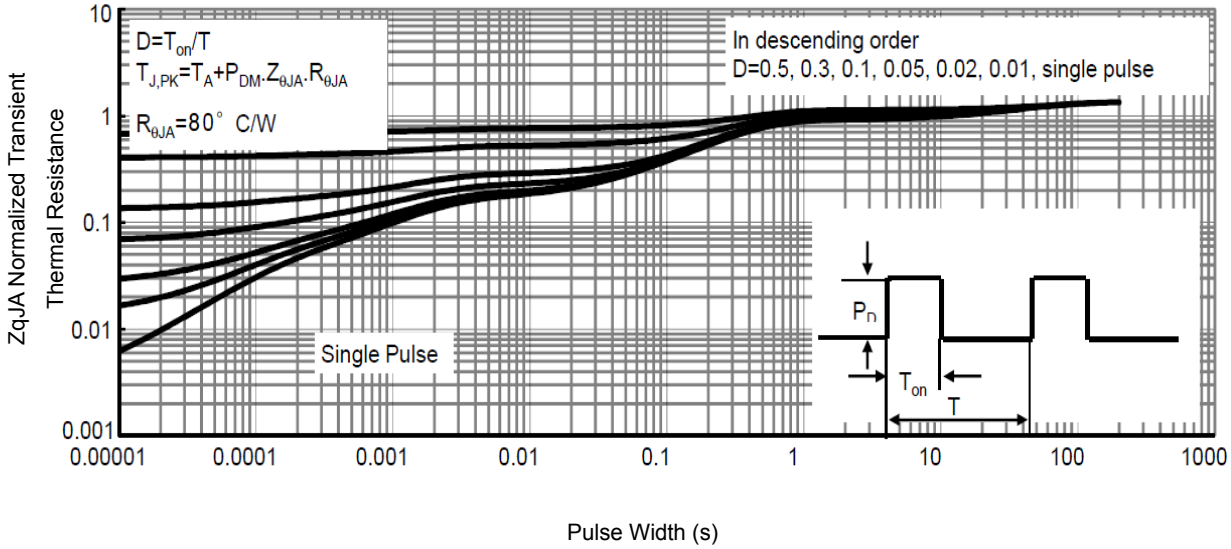


Fig9. Normalized Maximum Transient Thermal Impedance

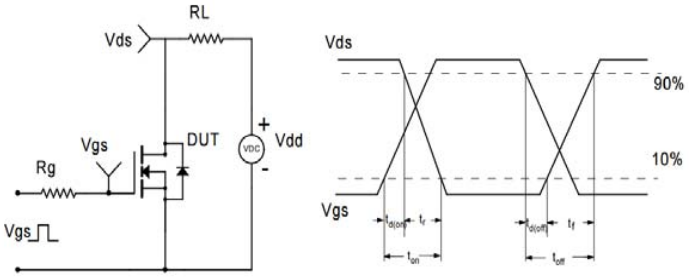


Fig10. Switching Time Test Circuit and waveforms

P Channel Typical Characteristics

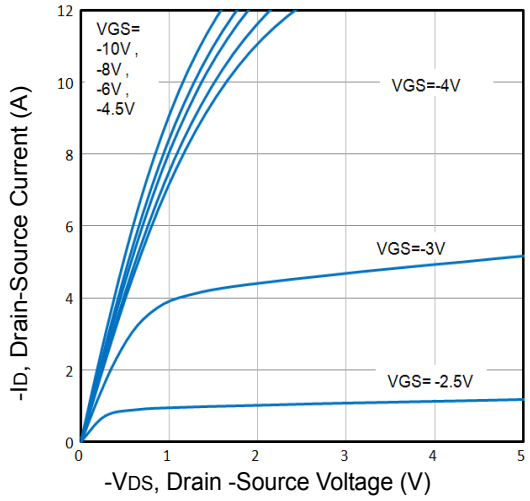


Fig11. Typical Output Characteristics

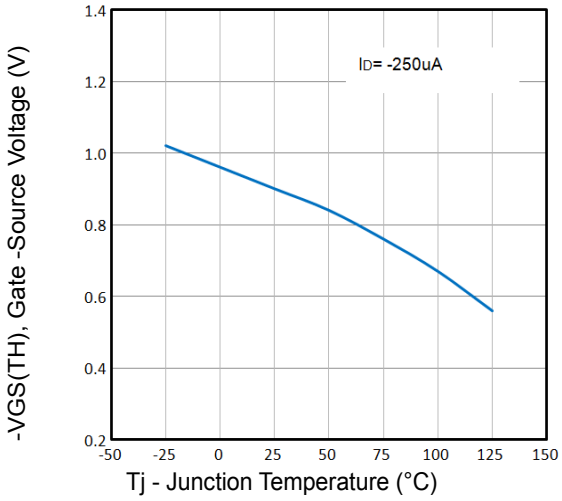


Fig12. Normalized Threshold Voltage Vs. Temperature

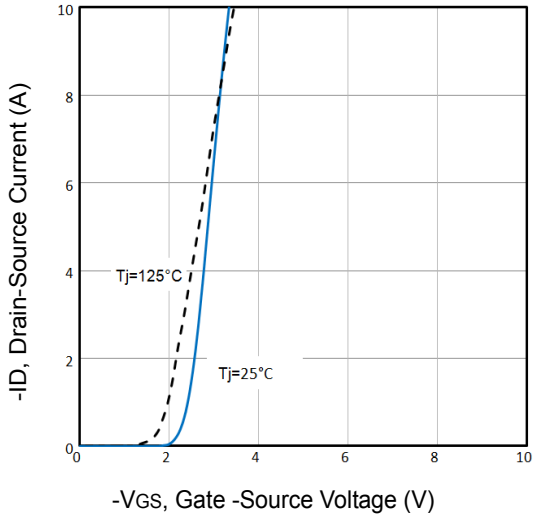


Fig13. Typical Transfer Characteristics

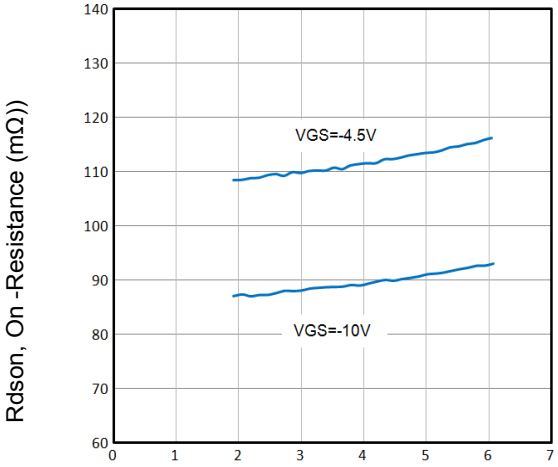


Fig14. On-Resistance vs. Drain Current and Gate

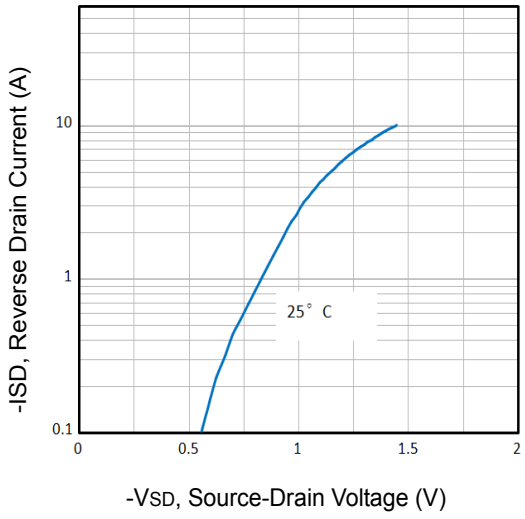


Fig15. Typical Source-Drain Diode Forward Voltage

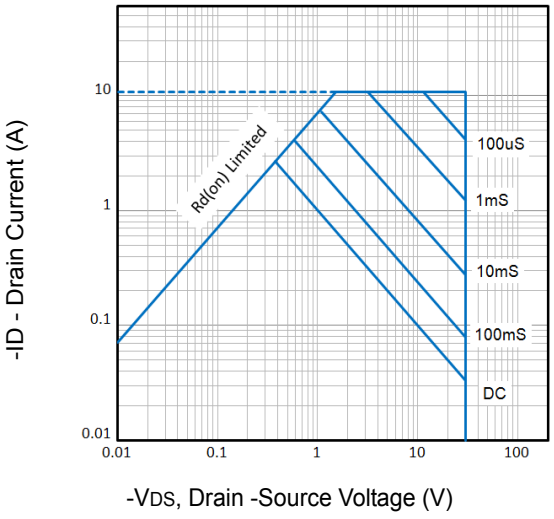


Fig16. Maximum Safe Operating Area

P Channel Typical Characteristics

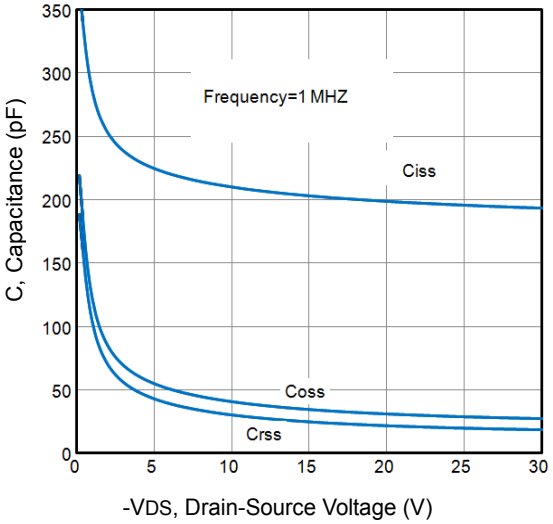


Fig17. Typical Capacitance Vs. Drain-Source Voltage

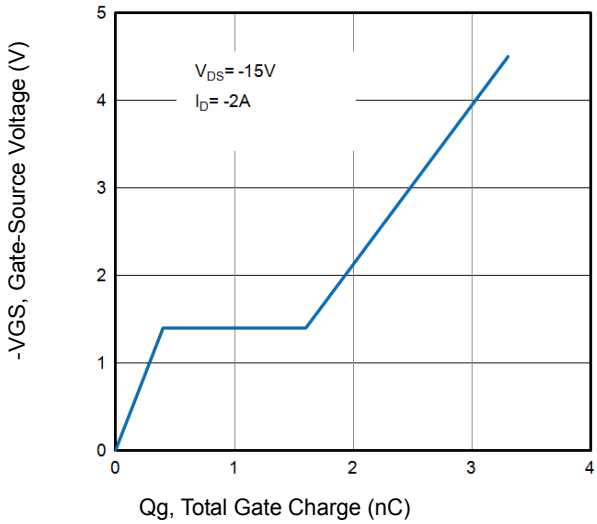


Fig18. Typical Gate Charge Vs. Gate-Source Voltage

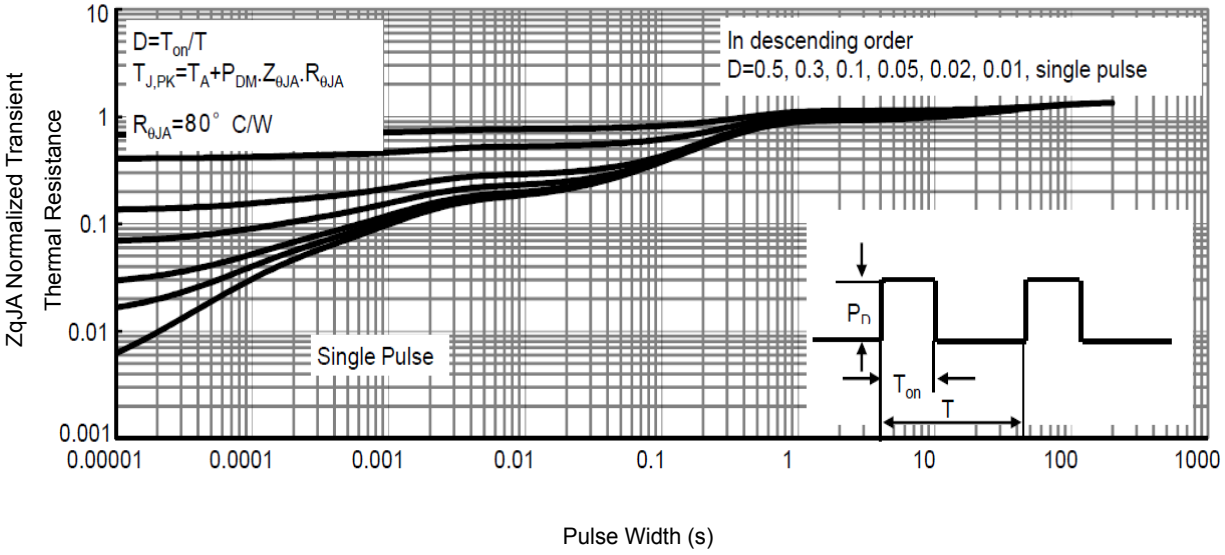


Fig19. Normalized Maximum Transient Thermal Impedance

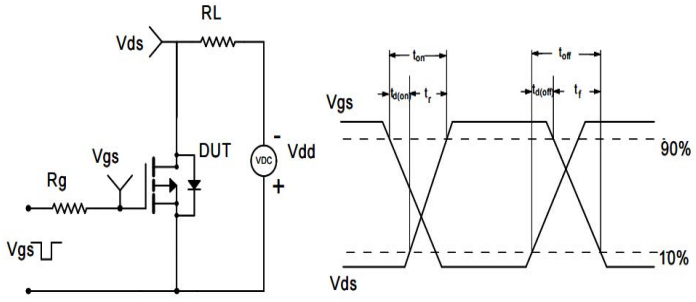
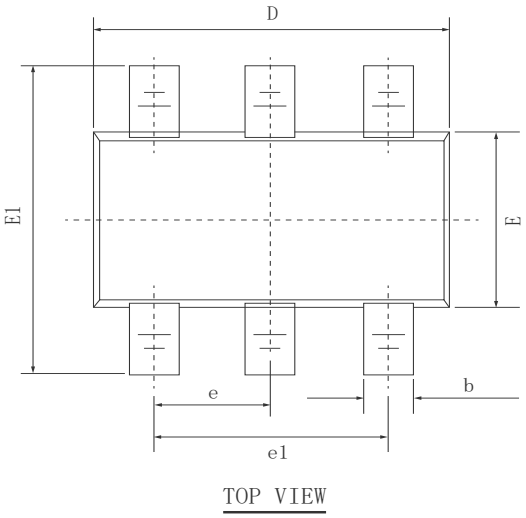
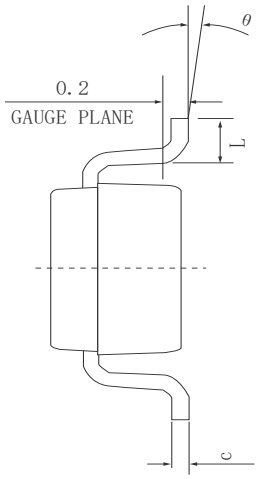


Fig20. Switching Time Test Circuit and waveforms

●Dimensions（SOT23-6L）

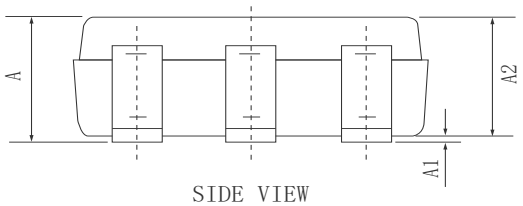


TOP VIEW

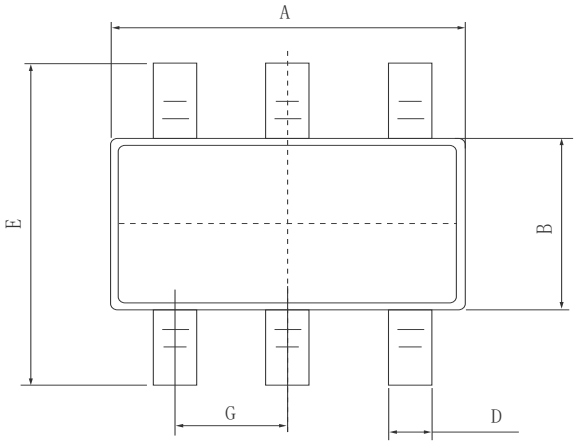


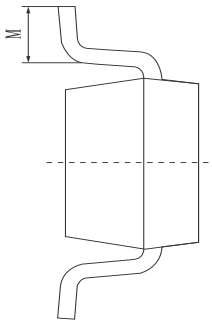
SIDE VIEW

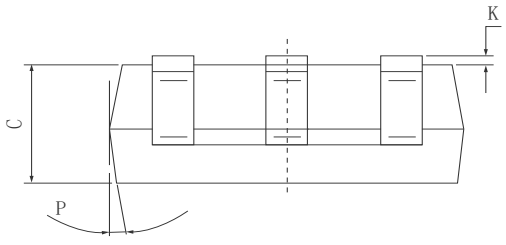
SYMBOL	MIN	NOM	MAX
A	—	—	1.20
A1	0.00	0.05	0.10
A2	1.00	1.10	1.20
b	0.30	0.40	0.50
c	0.10	0.125	0.15
e1	1.80	1.90	2.00
D	2.80	2.90	3.00
E	1.50	1.60	1.70
E1	2.60	2.80	3.00
L	0.30	0.45	0.60
θ	0°	4°	8°
e	0.95BSC		



SIDE VIEW

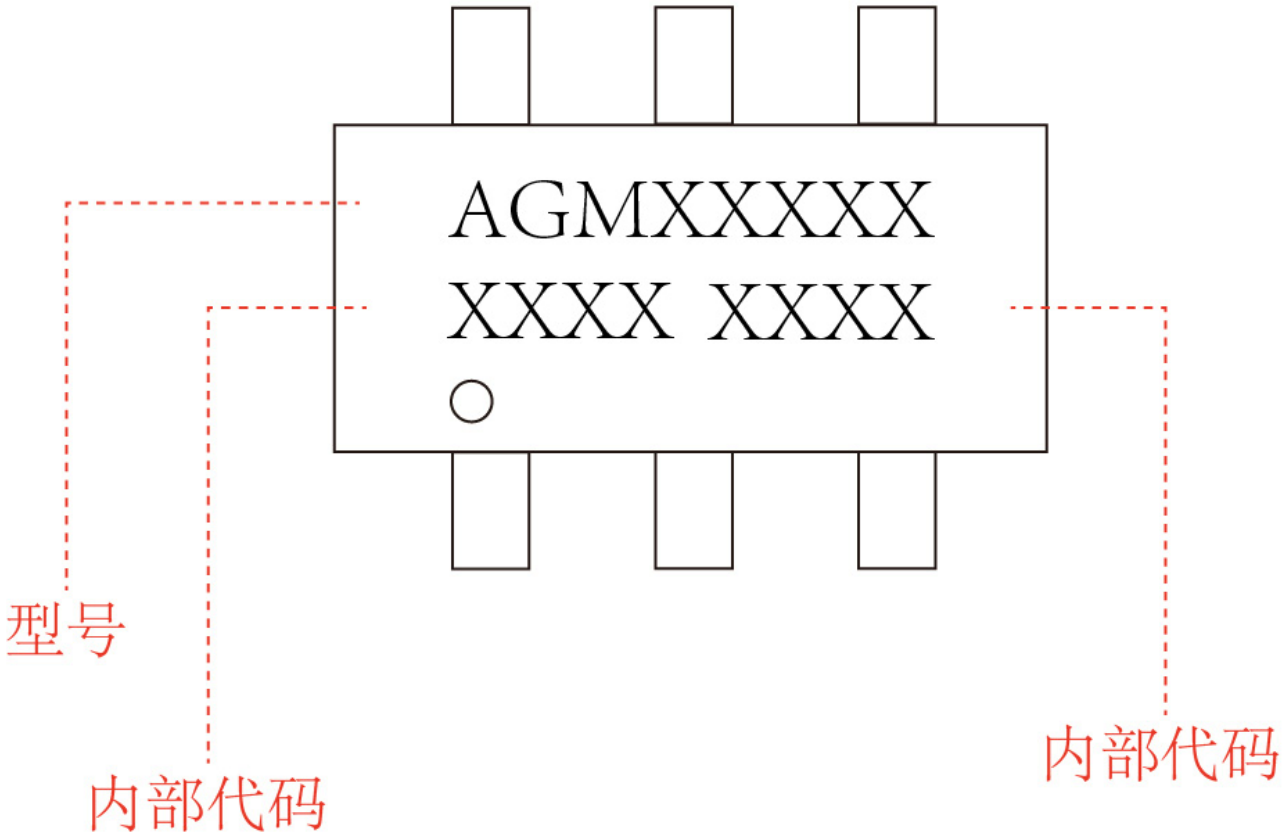






DIM	MILLIMETERS
A	2.82~3.02
B	1.60±0.10
C	1.10±0.05
D	0.40±0.10
E	2.65~2.95
G	0.95typ
K	0.00~0.10
M	0.20MIN
P	9±2°

SOT23-6L
Marking Instructions:



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