

General Description

The AGM425ME 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

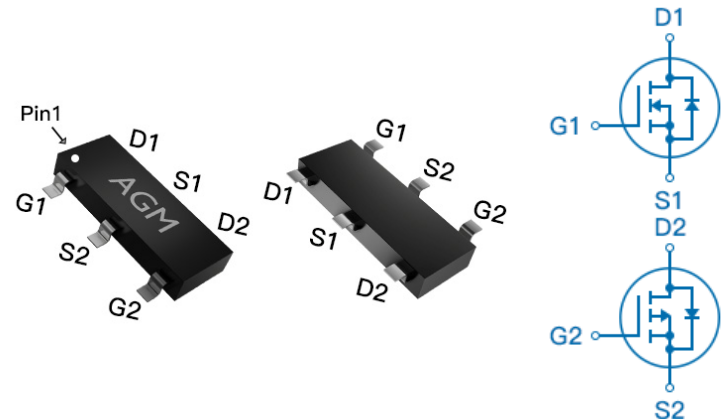
Application

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

Product Summary

BVDSS	RDSON	ID
40V	25mΩ	6.6A
-40V	65.5mΩ	-3.3A

SOT23-6L Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM425ME	AGM425ME	SOT23-6L	178mm	8mm	3000

Table 1. Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	40	-40	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	± 20	V
I_D	Drain Current-Continuous($T_A=25^{\circ}\text{C}$) (Note 1)	6.6	-3.3	A
	Drain Current-Continuous($T_A=100^{\circ}\text{C}$)	5.2	-2.2	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	26.4	-13.2	A
P_D	Total Power Dissipation($T_A=25^{\circ}\text{C}$)	1.25	1.25	W
	Total Power Dissipation($T_A=100^{\circ}\text{C}$)	0.5	0.5	W
EAS	Avalanche energy (Note 3)	13	15	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	-55 To 150	$^{\circ}\text{C}$

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	---	100	$^{\circ}\text{C/W}$

Table 3. N- Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=40V,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=3A	--	8	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=4A	--	25	33	mΩ
		VGS=4.5V, ID=3A	--	34.5	55	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=20V,VGS=0V, F=1MHZ	--	495	--	pF
Coss	Output Capacitance		--	42	--	pF
Crss	Reverse Transfer Capacitance		--	33	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=20V, ID=3.5A,RGEN=3Ω	--	15	--	nS
tr	Turn-on Rise Time		--	49.5	--	nS
td(off)	Turn-Off Delay Time		--	19.2	--	nS
tf	Turn-Off Fall Time		--	11	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=20V, ID=3.5A	--	10	--	nC
Qgs	Gate-Source Charge		--	1.4	--	nC
Qgd	Gate-Drain Charge		--	1.9	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	6.6	A
VSD	Forward on Voltage	VGS=0V,IS=4A	--	--	1.2	V
trr	Reverse Recovery Time	IF=4A , dl/dt=100A/μs , TJ=25℃	--	2.6	--	ns
Qrr	Reverse Recovery Charge		--	19	--	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: T_J=25°C, V_{DD}=25V, V_{gs}=10V, I_D=7.2A, L=0.5mH, R_G=25ohm

Table 3. P-Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-40	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-40V,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=-3A	--	4	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-4A	--	65.5	79	mΩ
		VGS=-4.5V, ID=-3A	--	78	94	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-20V,VGS=0V, F=1MHZ	--	600	--	pF
Coss	Output Capacitance		--	90	--	pF
Crss	Reverse Transfer Capacitance		--	70	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-20V, ID=-3A,RGEN=3Ω	--	9	--	nS
tr	Turn-on Rise Time		--	8	--	nS
td(off)	Turn-Off Delay Time		--	28	--	nS
tf	Turn-Off Fall Time		--	10	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-20V, ID=-3A	--	14	--	nC
Qgs	Gate-Source Charge		--	2.9	--	nC
Qgd	Gate-Drain Charge		--	3.8	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-3.3	A
VSD	Forward on Voltage	VGS=0V,IS=-4A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-4A , dI/dt=100A/μs , TJ=25℃	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

Notes2.Repetitive Rating: Pulse width limited by maximum junction temperature Notes

3.EAS condition: T_J=25°C, V_{DD}=25V, V_{gs}=10V, I_D=7.8A, L=0.5mH, R_G=25ohm

N-Channel Typical Characteristics

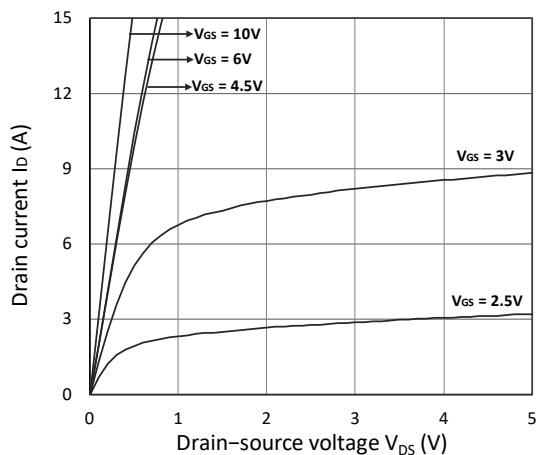


Figure 1. Output Characteristics

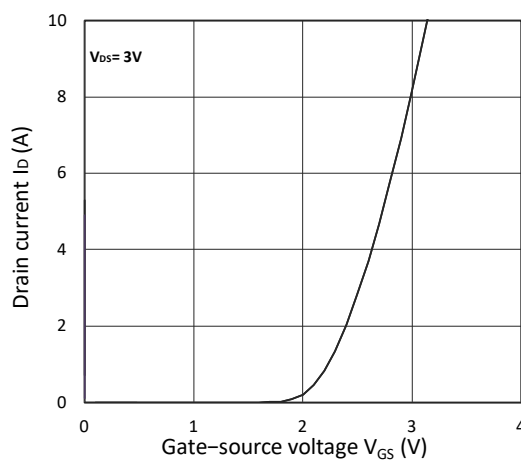


Figure 2. Transfer Characteristics

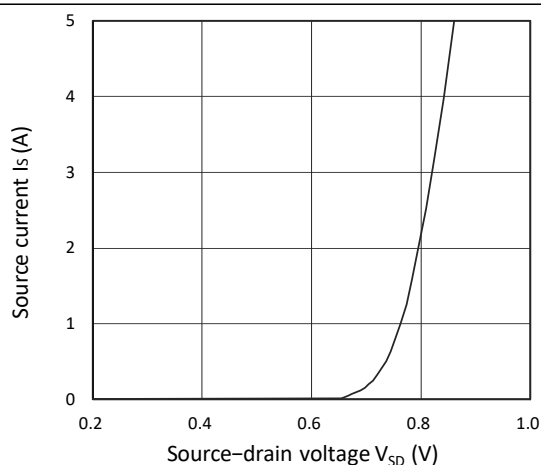


Figure 3. Forward Characteristics of Reverse

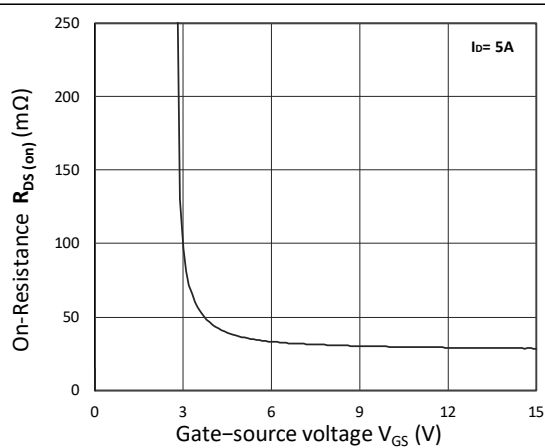


Figure 4. $R_{DS(on)}$ vs. V_{GS}

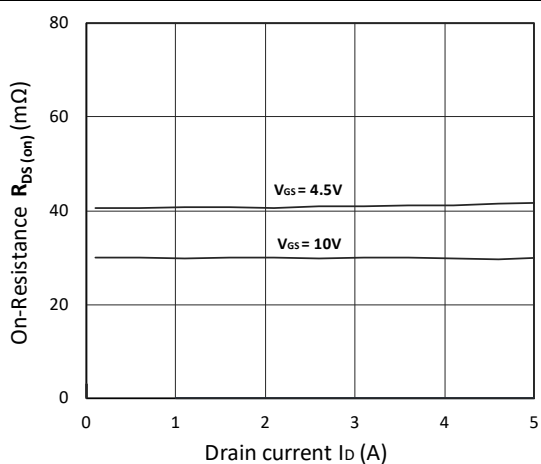


Figure 5. $R_{DS(on)}$ vs. I_D

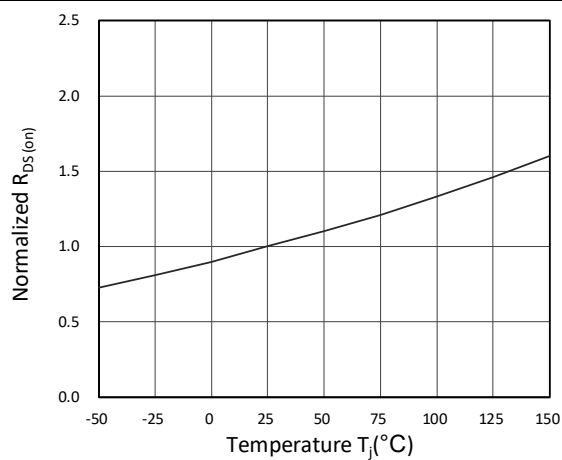


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

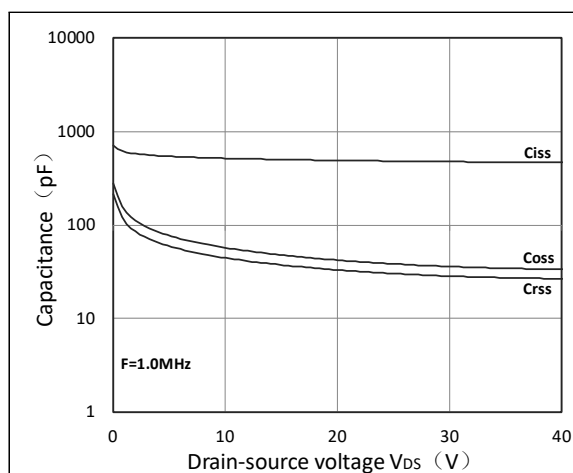


Figure 7. Capacitance Characteristics

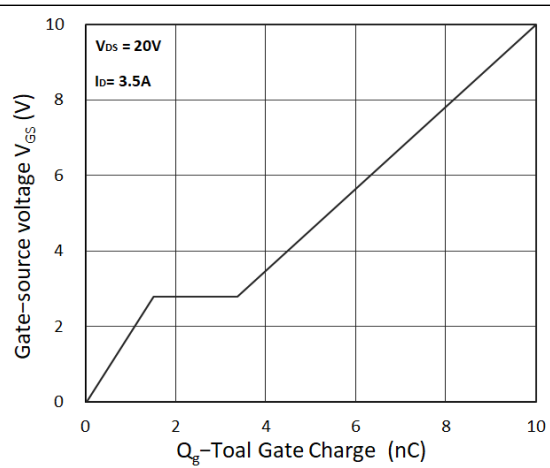


Figure 8. Gate Charge Characteristics

P-Channel Typical Characteristics

Typical Electrical and Thermal Characteristics

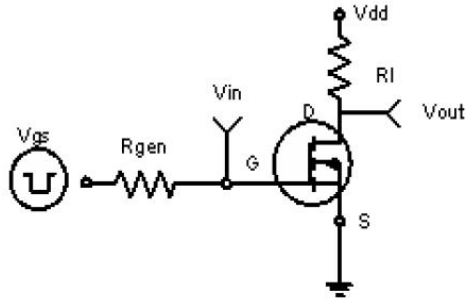


Figure 1: Switching Test Circuit

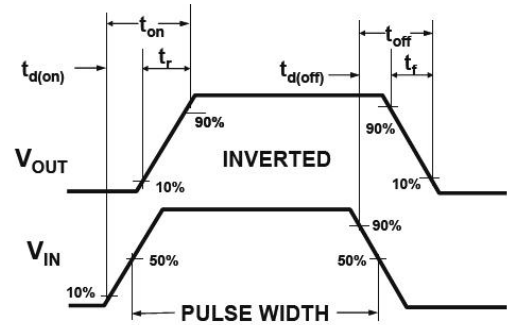


Figure 2: Switching Waveforms

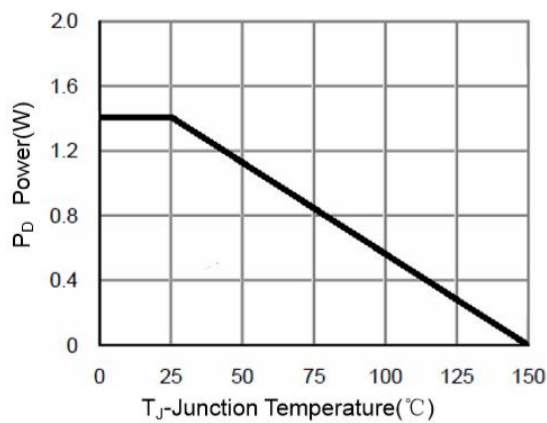


Figure 3 Power Dissipation

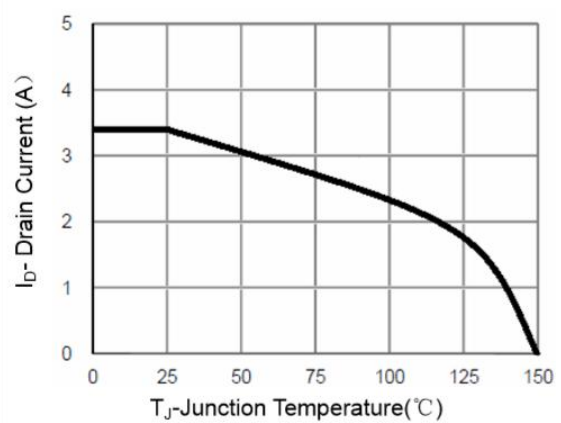


Figure 4 Drain Current

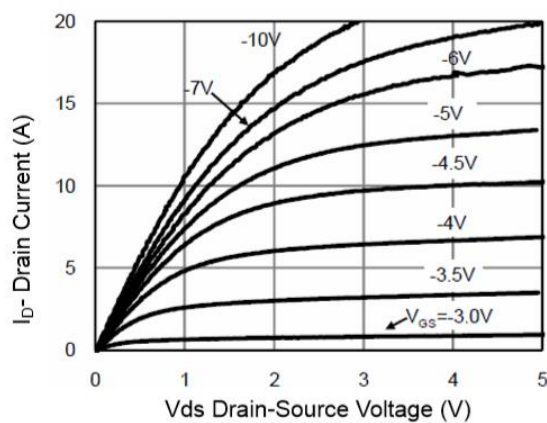


Figure 5 Output Characteristics

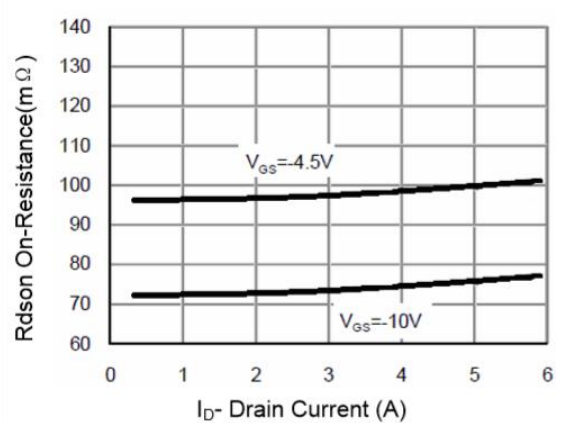


Figure 6 Drain-Source On-Resistance

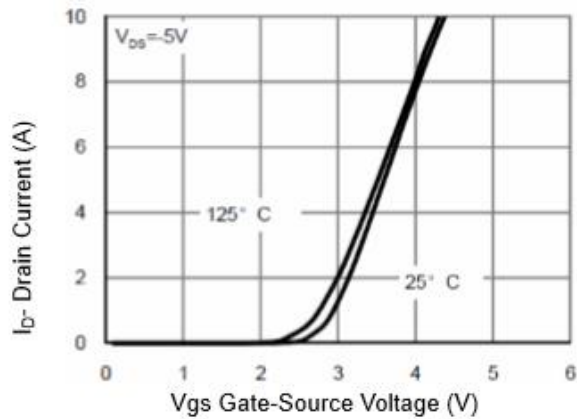


Figure 7 Transfer Characteristics

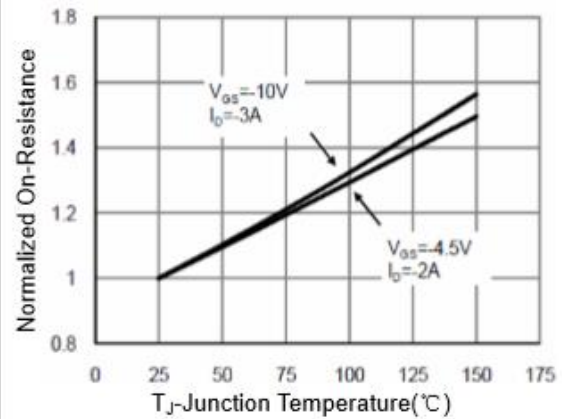


Figure 8 Drain-Source On-Resistance

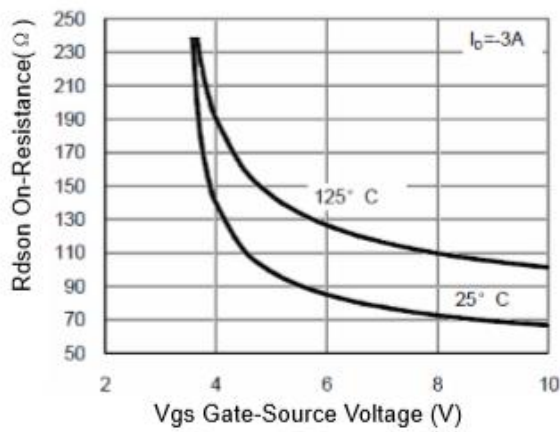


Figure 9 Rdson vs Vgs

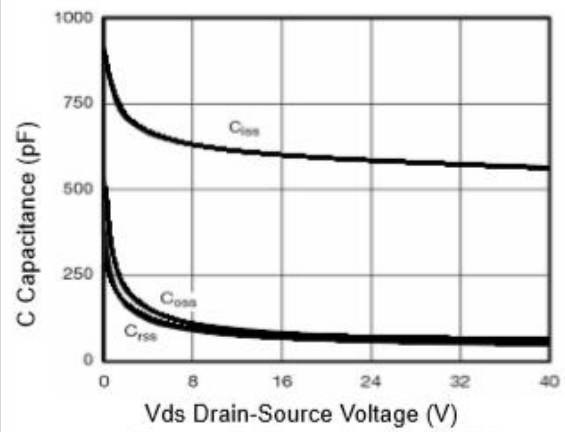


Figure 10 Capacitance vs Vds

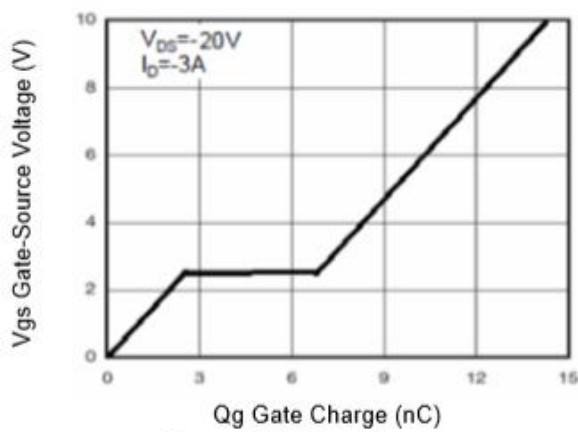


Figure 11 Gate Charge

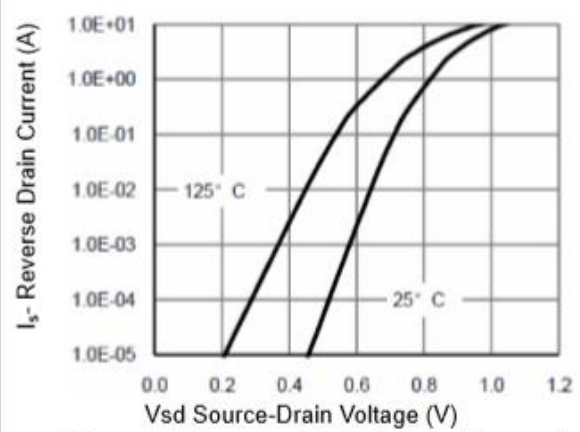


Figure 12 Source- Drain Diode Forward

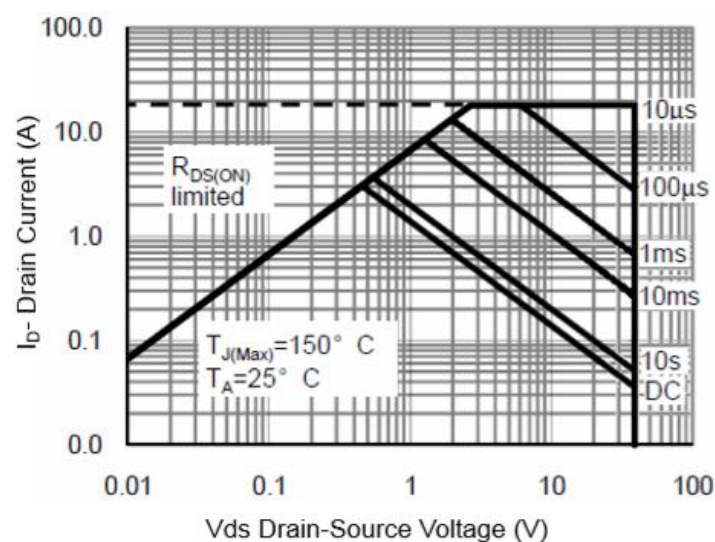


Figure 13 Safe Operation Area

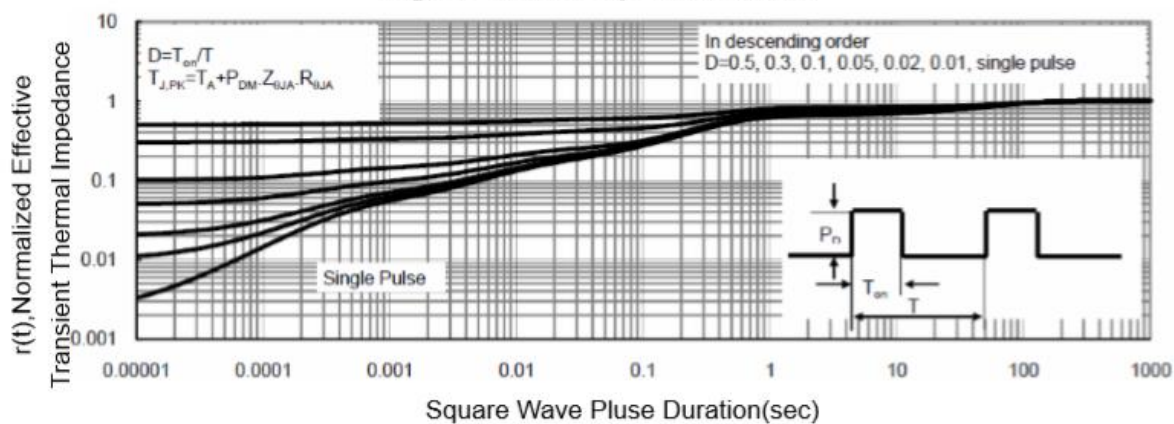
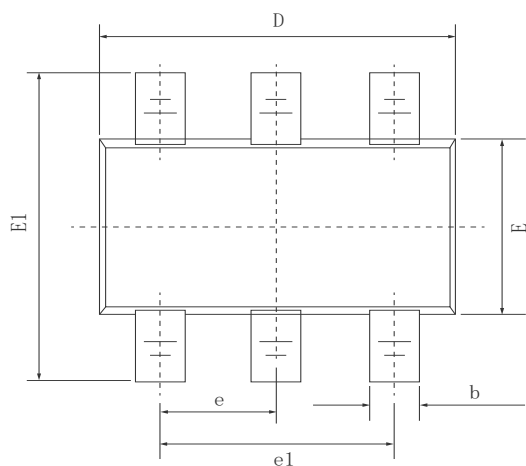
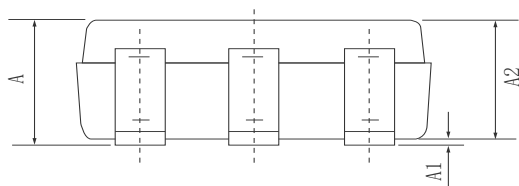


Figure 14 Normalized Maximum Transient Thermal Impedance

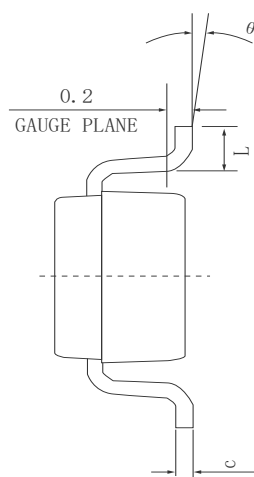
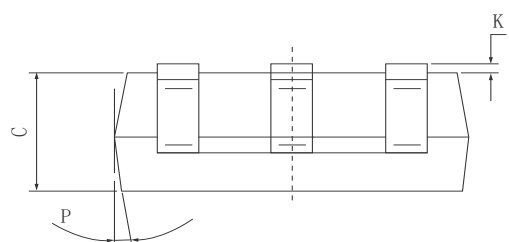
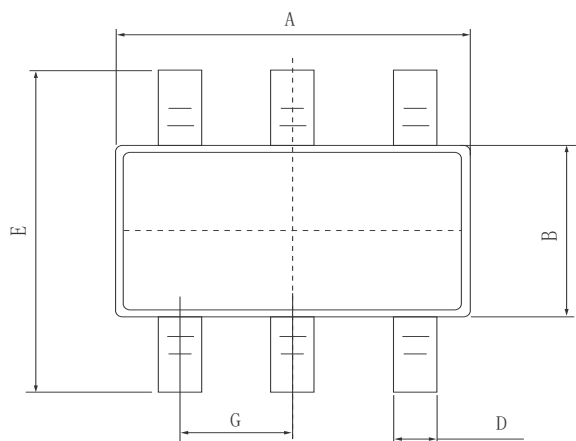
Dimensions (SOT23-6L)



TOP VIEW



SIDE VIEW



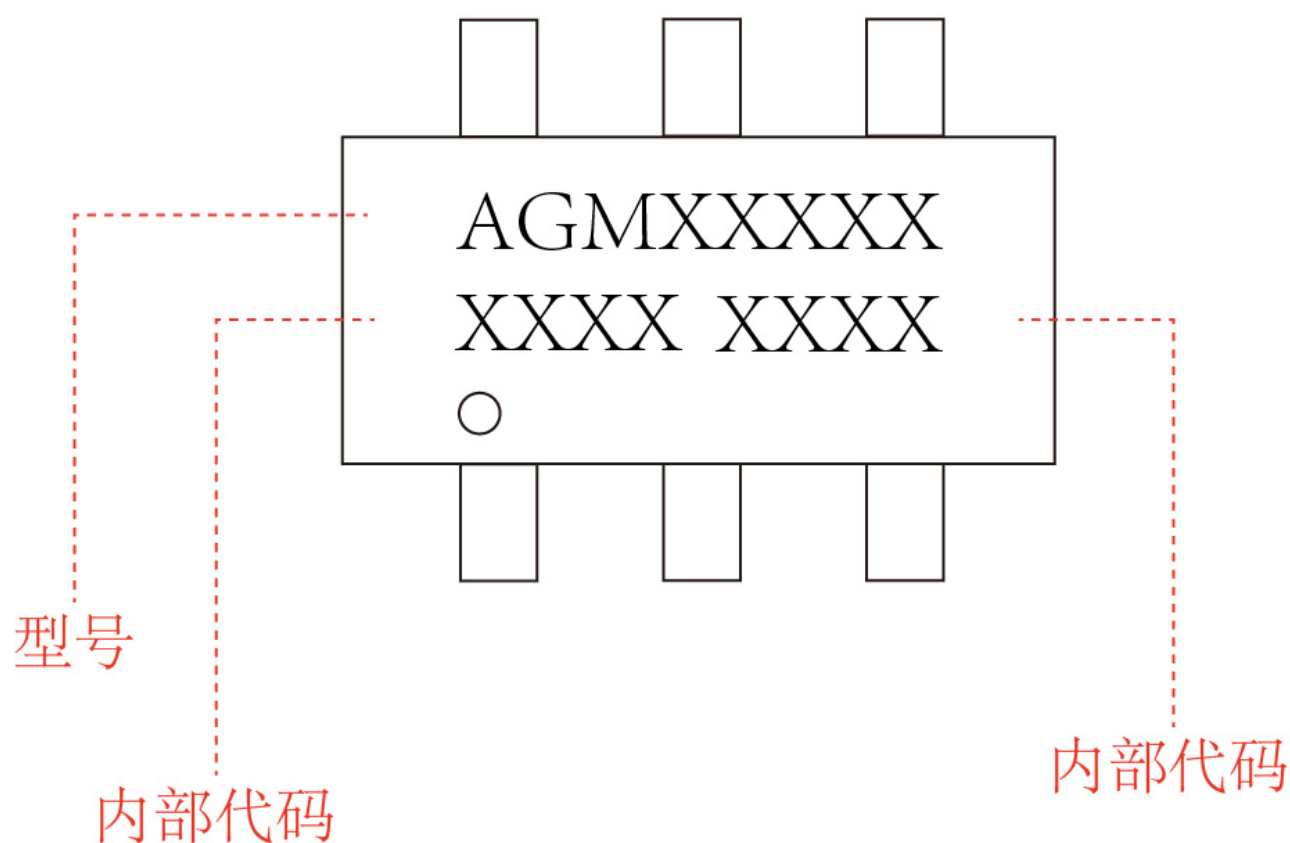
SIDE VIEW

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		

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:



Disclaimer:

The information provided in this document is believed to be accurate and reliable. However, Shenzhen Core Control Source Electronics Technology Co., Ltd. does not assume any responsibility for the following consequences. Do not consider the use of such information or use beyond its scope.

The information mentioned in this document may be changed at any time without notice.

The products and information provided in this document do not infringe patents. Shenzhen Core Control Source Electronics Technology Co., Ltd. assumes no responsibility for any infringement of any other rights of third parties. The result of using such products and information.

This document is the third version issued on March 20th, 2024. This document replaces all previously provided information.

 It is a registered trademark of Shenzhen Core Control Source Electronics Technology Co., Ltd.

Copyright © 2017 Shenzhen Core Control Source Electronics Technology Co., Ltd. all rights reserved.