

### General Description

The AGM601AD 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

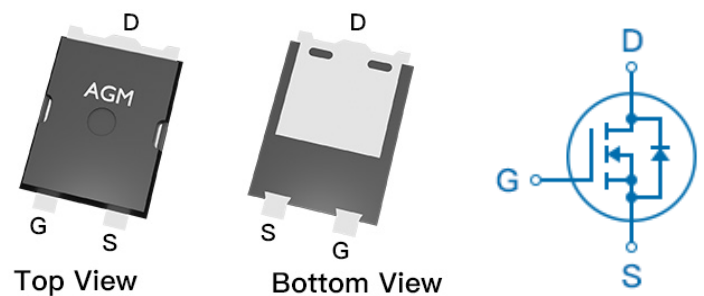
### Application

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

### Product Summary

BVDSS	RDSON	ID
60V	1.3mΩ	223A

### PTO252 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM601AD	AGM601AD	PTO252	330mm	16mm	3000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	60	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>	223	A
	Drain Current-Continuous(Tc=100°C)	141	A
IDM (pulse)	Drain Current-Pulsed <b>(Note 2)</b>	892	A
PD	Maximum Power Dissipation(Tc=25°C)	178	w
	Maximum Power Dissipation(Tc=100°C)	71	w
EAS	Avalanche energy <b>(Note 3)</b>	870	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

**Table 2. Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	55	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	0.7	°C/W

**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V	--	--	1.0	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	--	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=15A	--	60	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	1.3	2.0	mΩ
		VGS=4.5V, ID=15A	--	2.1	3.0	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=30V,VGS=0V, F=1.0MHz	--	5471	--	pF
Coss	Output Capacitance		--	1847	--	pF
Crss	Reverse Transfer Capacitance		--	86	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.6	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V ID=20A,RGEN=3Ω	--	15	--	nS
tr	Turn-on Rise Time		--	12	--	nS
td(off)	Turn-Off Delay Time		--	60	--	nS
tf	Turn-Off Fall Time		--	19	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=30V, ID=20A	--	102	--	nC
Qgs	Gate-Source Charge		--	15.7	--	nC
Qgd	Gate-Drain Charge		--	27.9	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	223	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	Is=20A , dI/dt=100A/μs , TJ=25°C	--	50	--	ns
Qrr	Reverse Recovery Charge		--	72	--	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<sub>J</sub>=25°C

### Typical Characteristics

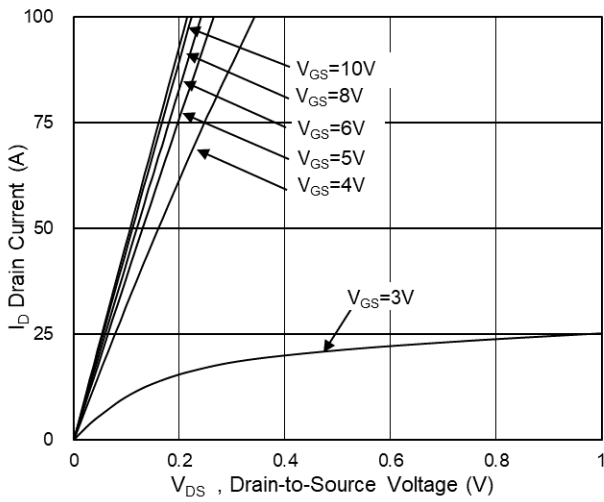


Fig.1 Typical Output Characteristics

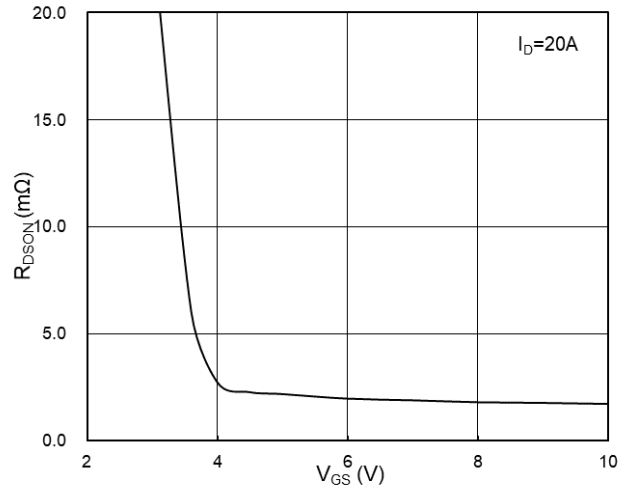


Fig.2 On-Resistance vs G-S Voltage

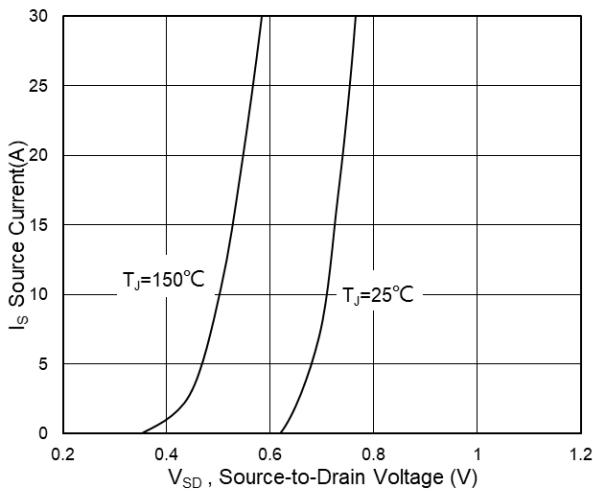


Fig.3 Diode Forward Voltage vs Current

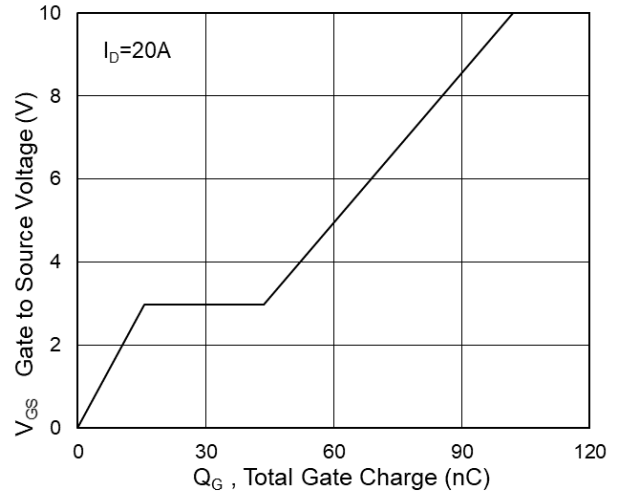


Fig.4 Gate-Charge Characteristics

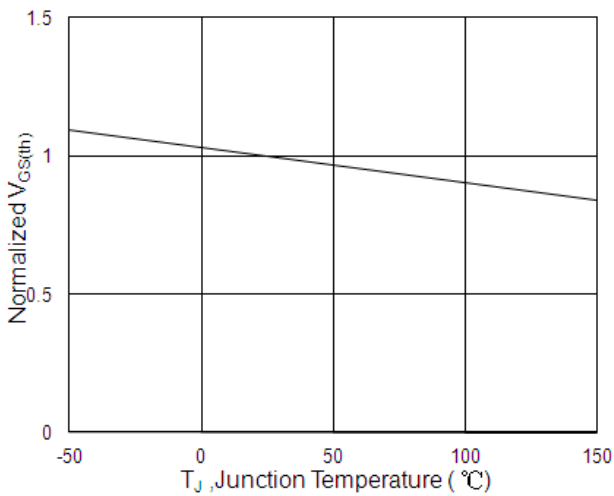


Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$

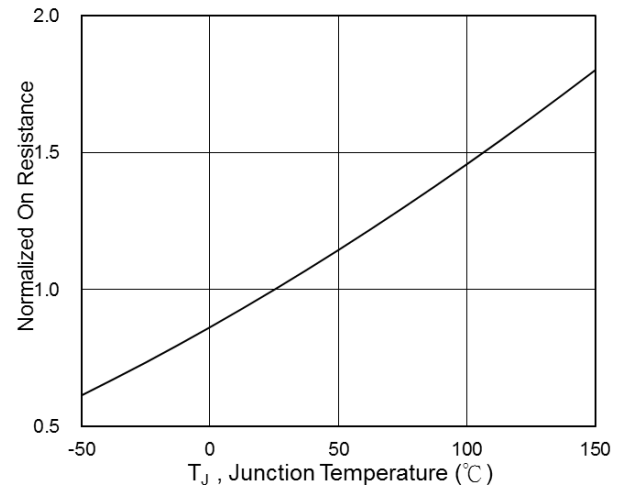


Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$

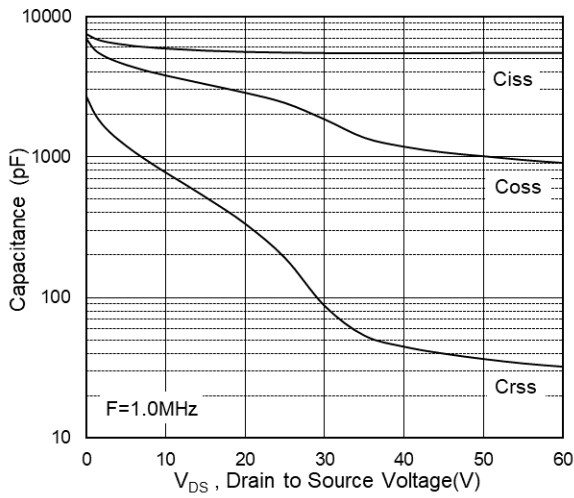


Fig.7 Capacitance

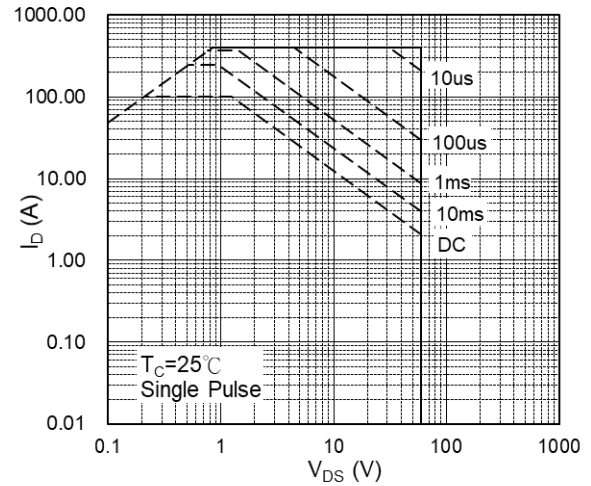


Fig.8 Safe Operating Area

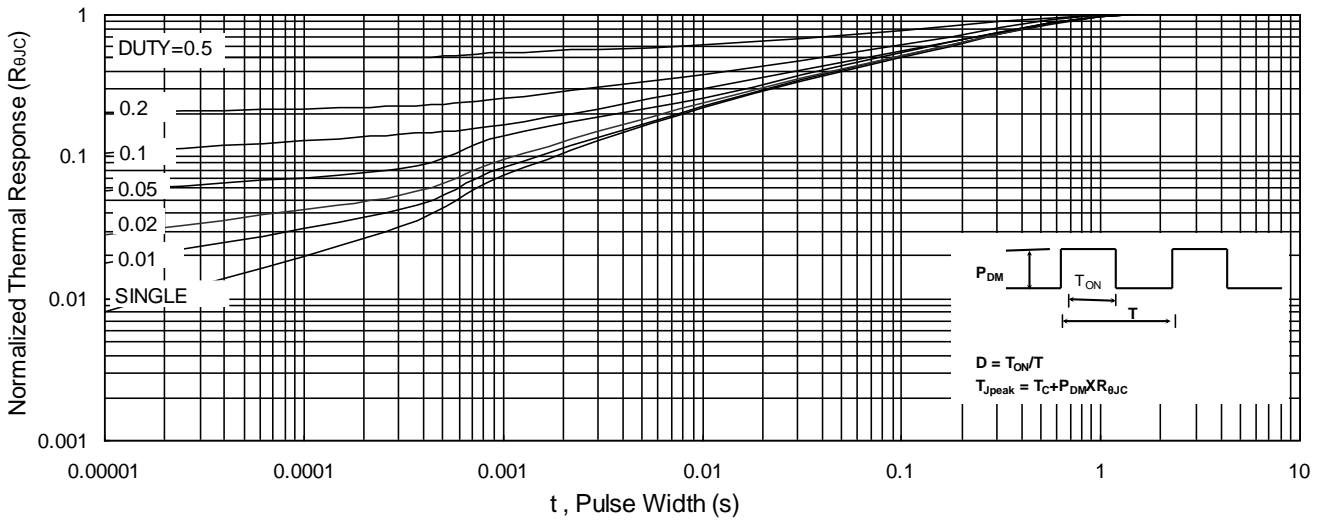


Fig.9 Normalized Maximum Transient Thermal Impedance

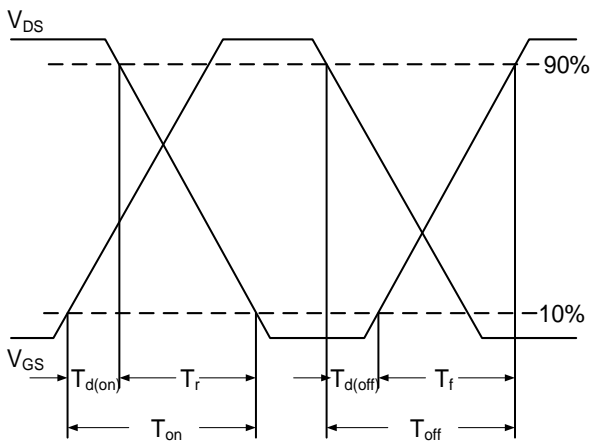


Fig.10 Switching Time Waveform

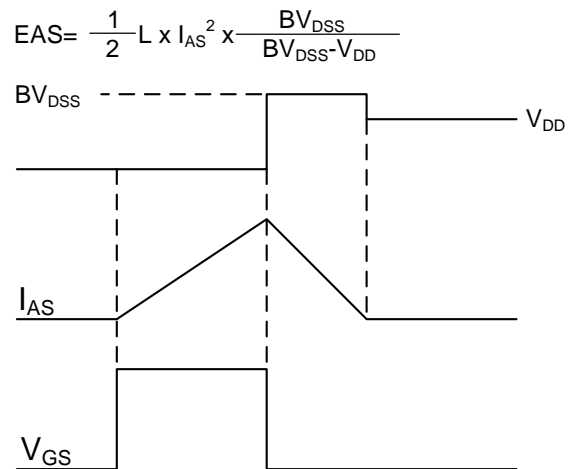
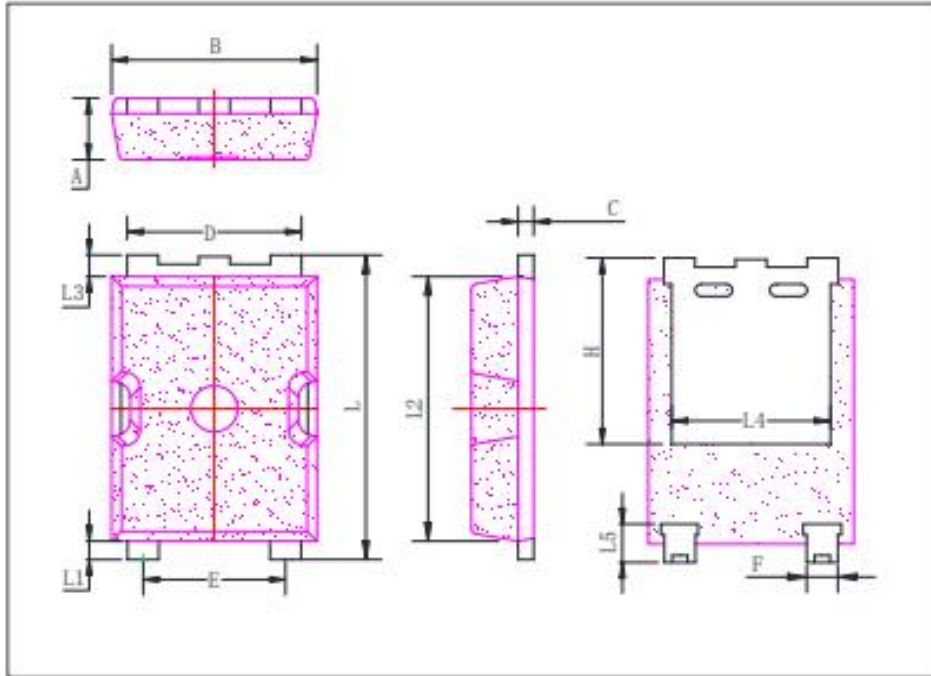


Fig.11 Unclamped Inductive Switching Waveform

## PTO252 Package Outline Data



Symbol	Min	Typ	Max
A	1.90	2.00	2.10
B	6.50	6.60	6.70
C	0.45	0.50	0.60
D	5.50	5.60	5.70
E	4.50	4.60	4.70
F	0.90	1.00	1.05
H	5.90	6.05	6.20
L	9.80	9.90	10.0
L1	0.50	0.60	0.70
L2	8.50	8.60	8.70
L3	0.60	0.70	0.80
L4	4.65	4.80	4.90
L5	1.05	1.20	1.30


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