General Description

The AGM609C 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

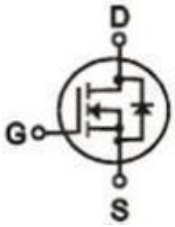
Application

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

Product Summary

BVDSS	RDSON	ID
60V	6.3mΩ	80A

TO-220 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM609C	AGM609C	TO-220	----	---	1000

Table 1. Absolute Maximum Ratings (TC=25℃)

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℃) **(Note 1)**	80	A
	Drain Current-Continuous(Tc=100℃)	48	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	320	A
PD	Maximum Power Dissipation(Tc=25℃)	62.5	w
	Maximum Power Dissipation(Tc=100℃)	25	w
EAS	Avalanche energy **(Note 3)**	52	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	---	60	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	2.0	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.05	1.7	2.1	V
gFS	Forward Transconductance	VDS=5V,ID=15A	--	60	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	6.3	8.5	mΩ
		VGS=4.5V, ID=15A	--	8.0	12.5	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=30V,VGS=0V, F=100MHZ	--	2100	--	pF
Coss	Output Capacitance		--	182	--	pF
Crss	Reverse Transfer Capacitance		--	129	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3.3	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V, RL=1.5Ω,RGEN=3Ω	--	7.5	--	nS
tr	Turn-on Rise Time		--	5.5	--	nS
td(off)	Turn-Off Delay Time		--	29.3	--	nS
tf	Turn-Off Fall Time		--	5.9	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=30V, ID=30A	--	52.1	--	nC
Qgs	Gate-Source Charge		--	7.0	--	nC
Qgd	Gate-Drain Charge		--	15.3	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	80	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	IS=20A , dI/dt=100A/μs , TJ=25℃	--	26	--	ns
Qrr	Reverse Recovery Charge		--	38	--	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℃

Fig.1 Gate-Charge Characteristics

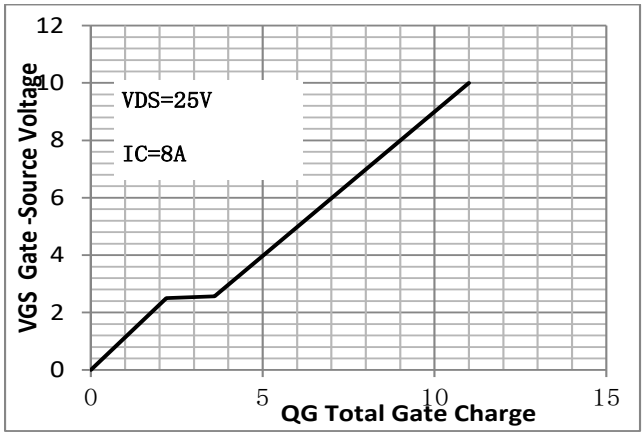


Fig.2 Capacitance Characteristics

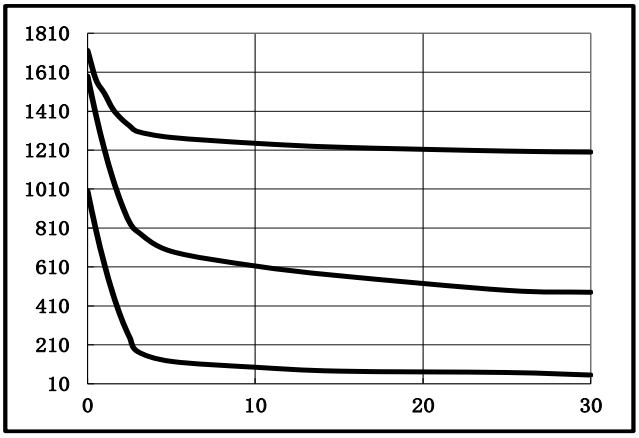


Fig.3 Power Dissipation

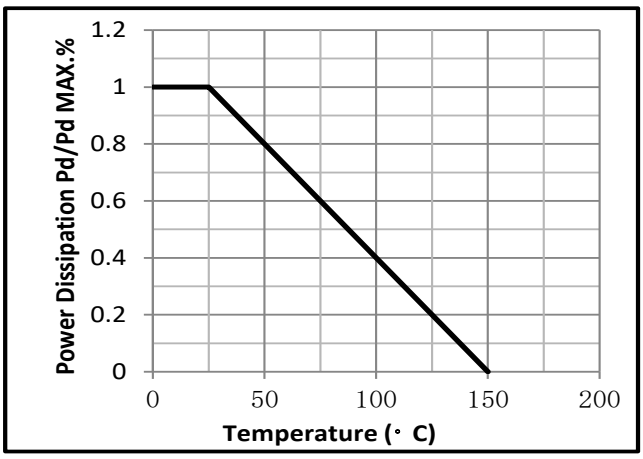


Fig.4 Typical output Characteristics

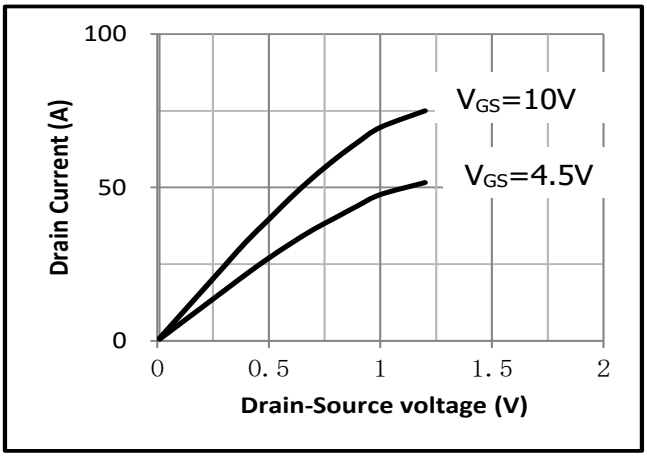


Fig.5 Threshold Voltage V.S Junction Temperature

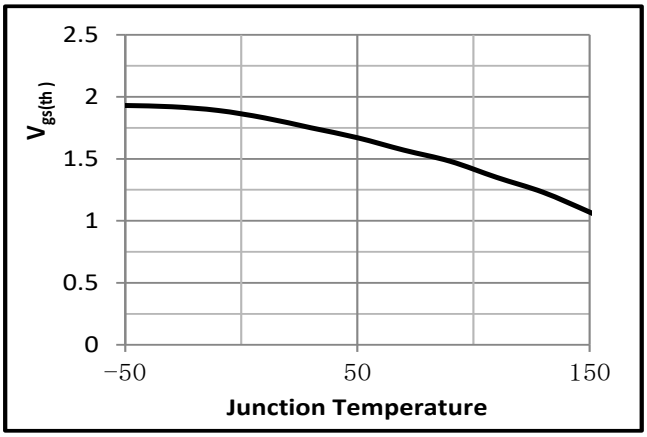


Fig.6 Resistance V.S Drain Current

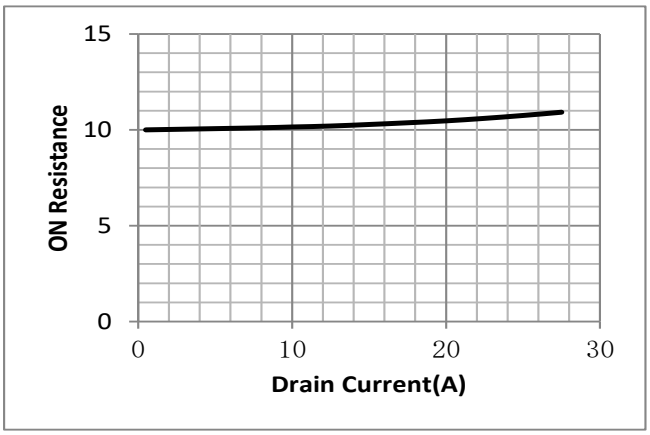


Fig.7 On-Resistance VS Gate Source Voltage

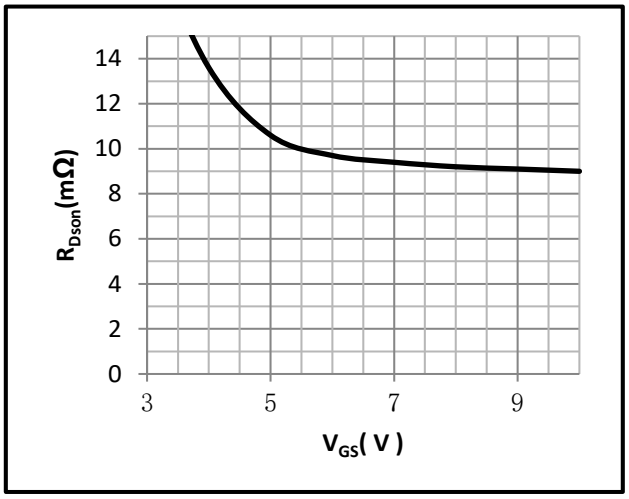


Fig.8 On-Resistance V.S Junction Temperature

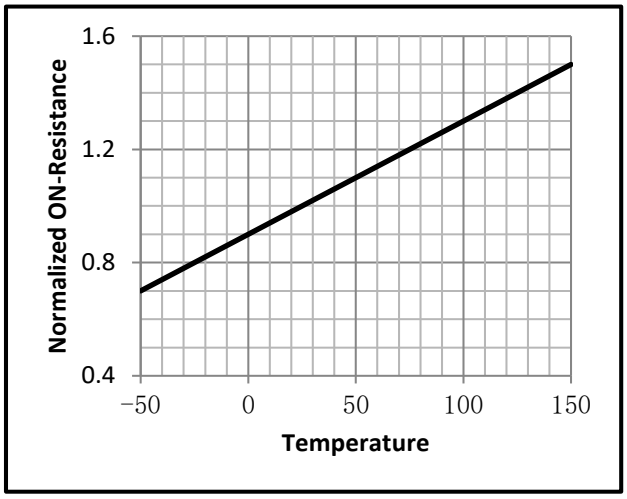


Fig.9 Switching Time Measurement Circuit

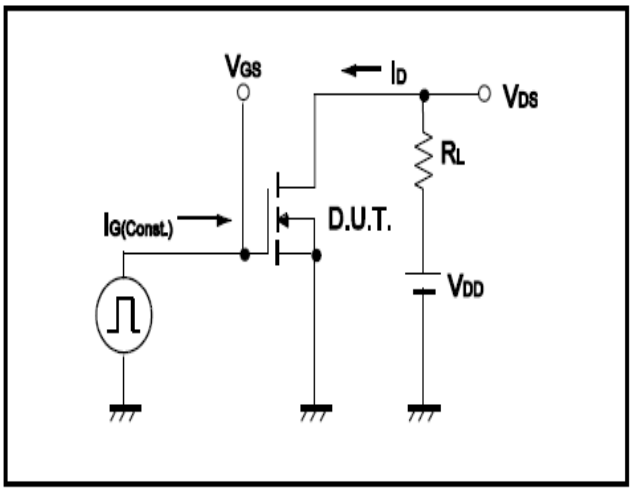


Fig.10 Gate Charge Waveform

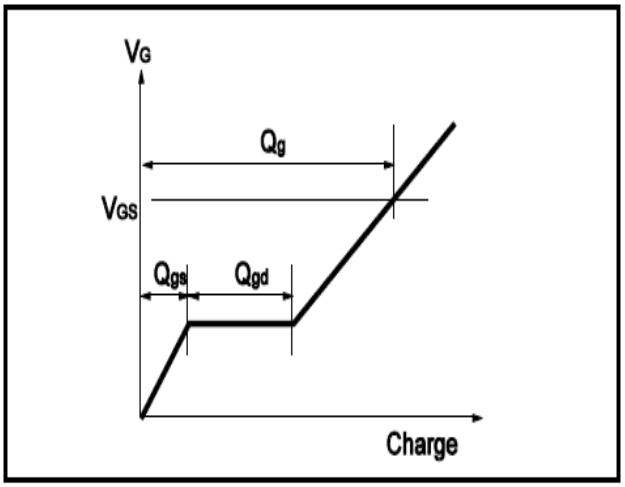


Fig.11 Switching Time Measurement Circuit

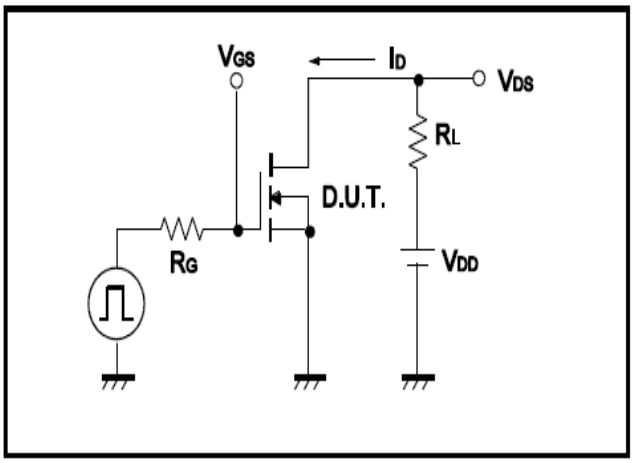
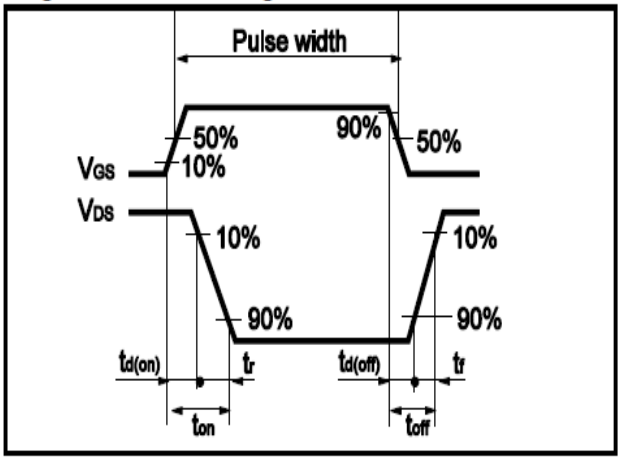


Fig.12 Gate Charge Waveform



Test Circuit

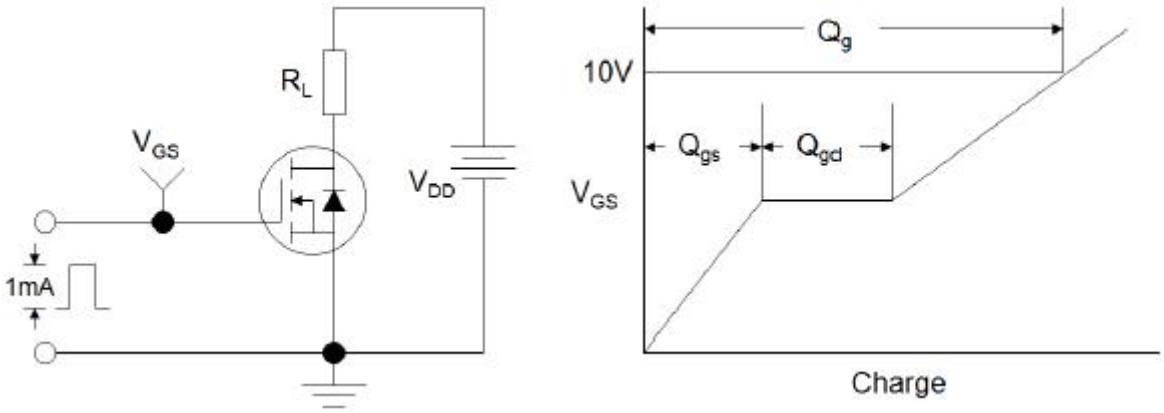


Figure1:Gate Charge Test Circuit & Waveform

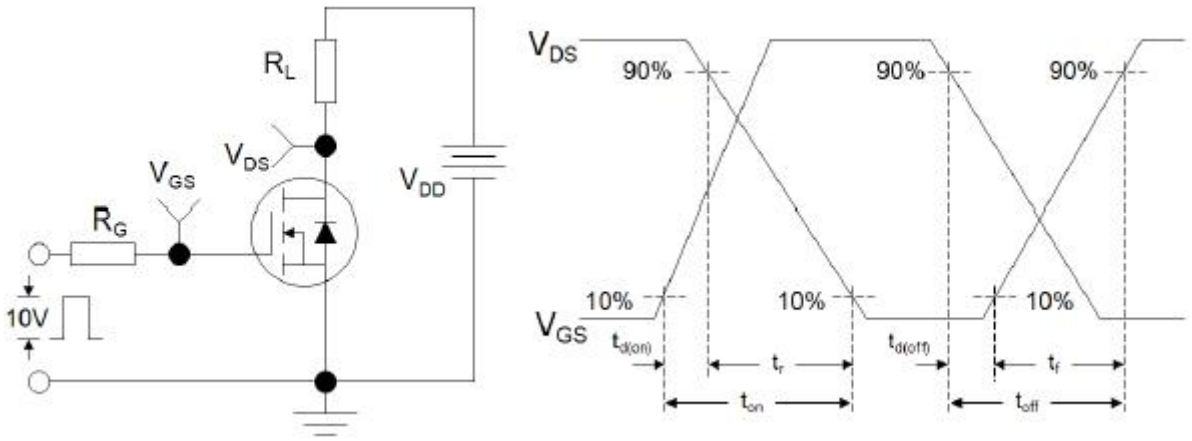


Figure 2: Resistive Switching Test Circuit & Waveforms

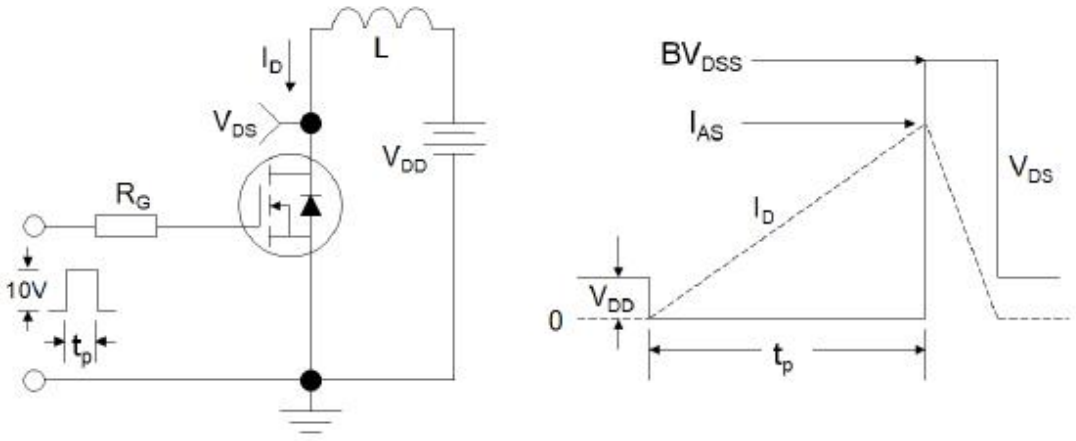
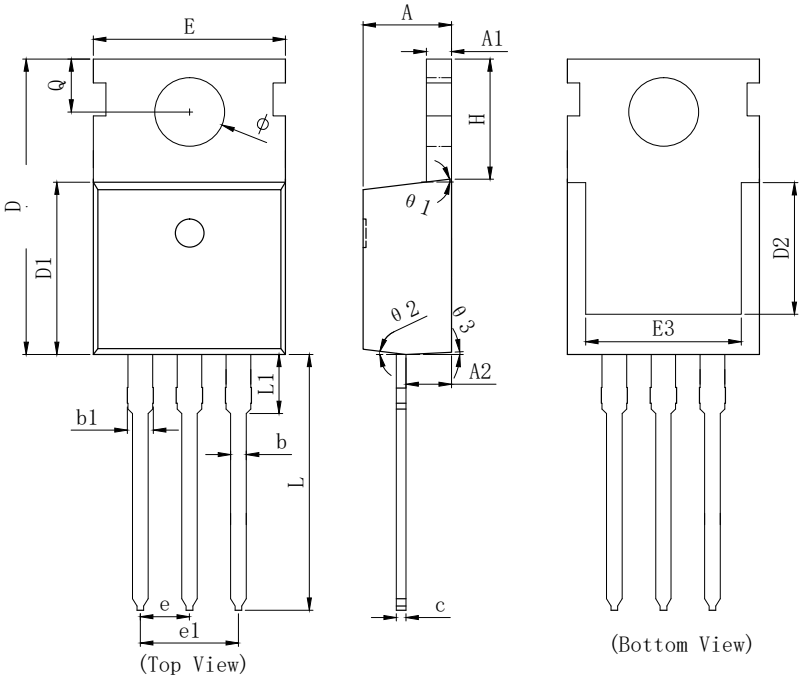


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

TO-220 PACKAGE INFORMATION



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.370	4.570	4.700
A1	1.250	1.300	1.400
A2	2.150	2.350	2.550
b	0.700	0.800	0.950
b1	1.170	1.270	1.470
c	0.450	0.500	0.600
D	15.100	15.600	16.100
D1	8.800	9.100	9.400
D2	5.500	6.300 REF	
E	9.700	10.000	10.300
E3	7.000	7.600 REF	
e	2.540 BSC		
e1	5.080 BSC		
L	13.200	13.500	13.800
L1		3.100	3.400
H	6.250	6.500	6.750
Φ	3.400	3.600	3.800
Q	2.600	2.800	3.000
θ1	7° TYP		
θ2	7° TYP		
θ3	3° TYP		

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