

● General Description

The AGM406MNQ 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

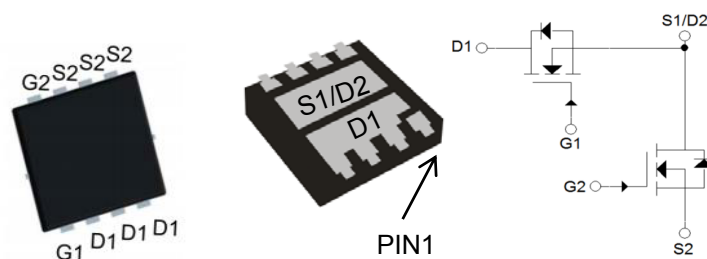
● Application

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

Product Summary

BVDSS	RDSON	ID
40V	6.5mΩ	53A

WQFN5*6 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM406MNQ	AGM406MNQ	WQFN5*6	----	----	3000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	40	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	53	A
	Drain Current-Continuous(Tc=100°C)	32	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	59	A
PD	Maximum Power Dissipation(Tc=25°C)	27	w
	Maximum Power Dissipation(Tc=100°C)	11	w
EAS	Avalanche energy (Note 3)	50	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) ¹	---	--	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	4.5	°C/W

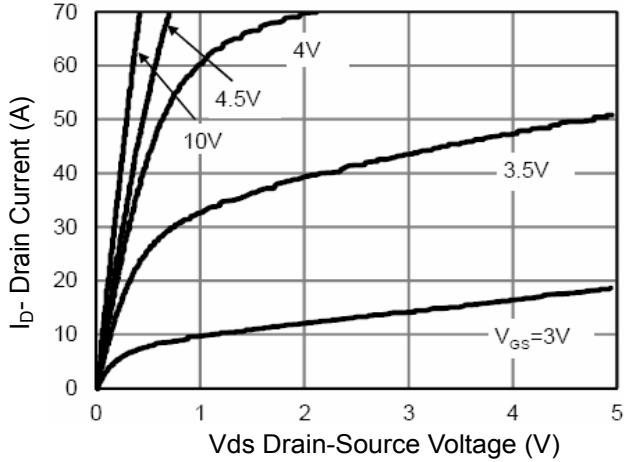
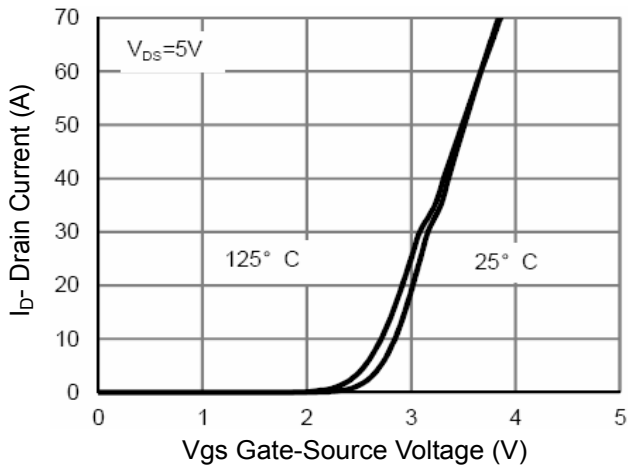
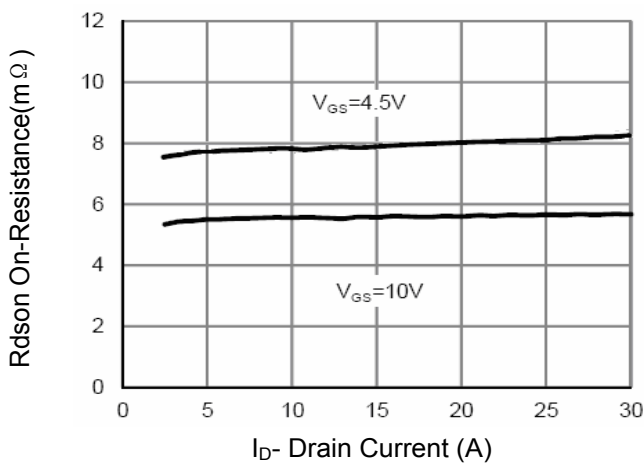
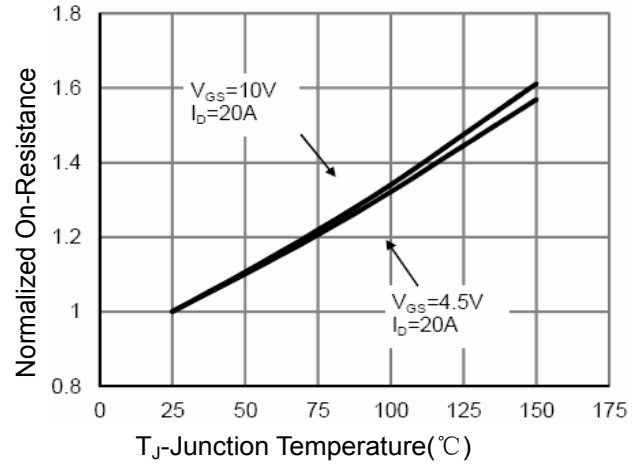
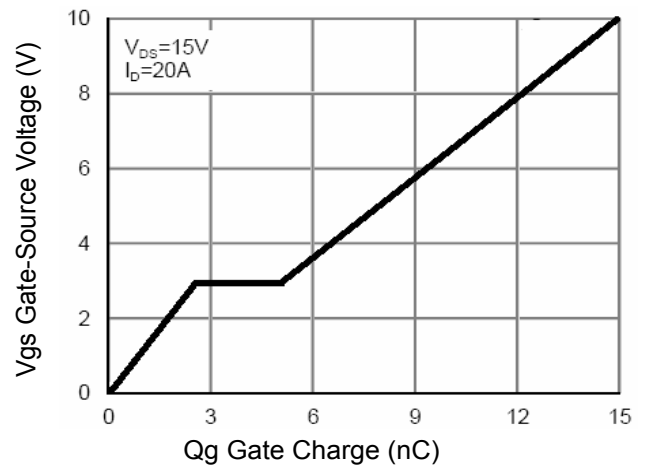
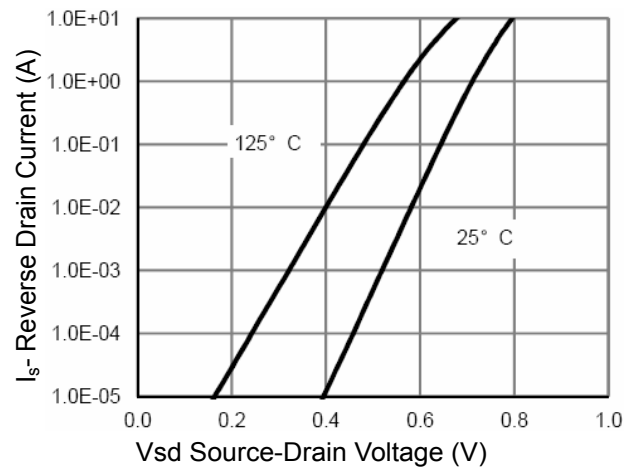
Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)

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=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	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=20A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	6.5	9.0	mΩ
		VGS=4.5V, ID=15A	--	12	18	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=1MHZ	--	630	--	pF
Coss	Output Capacitance		--	160	--	pF
Crss	Reverse Transfer Capacitance		--	32	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=15V, RI=0.75Ω, RGEN=3.3Ω	--	6.5	--	nS
tr	Turn-on Rise Time		--	2.5	--	nS
td(off)	Turn-Off Delay Time		--	17	--	nS
tf	Turn-Off Fall Time		--	2.5	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=25V, ID=12A	--	15	--	nC
Qgs	Gate-Source Charge		--	2.5	--	nC
Qgd	Gate-Drain Charge		--	2.4	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	53	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.0	V
trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs ,	--	--	--	ns
Qrr	Reverse Recovery Charge	TJ=25°C	--	--	--	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°C

Typical Electrical and Thermal Characteristics

Figure 1 Output Characteristics

Figure 2 Transfer Characteristics

Figure 3 Rdson- Drain Current

Figure 4 Rdson-Junction Temperature

Figure 5 Gate Charge

Figure 6 Source- Drain Diode Forward

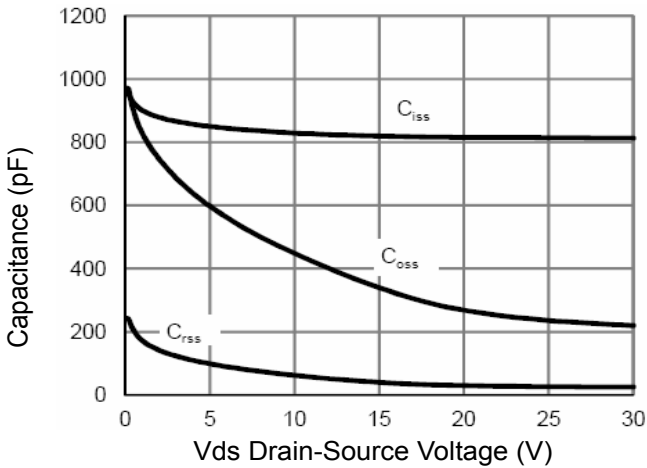


Figure 7 Capacitance vs Vds

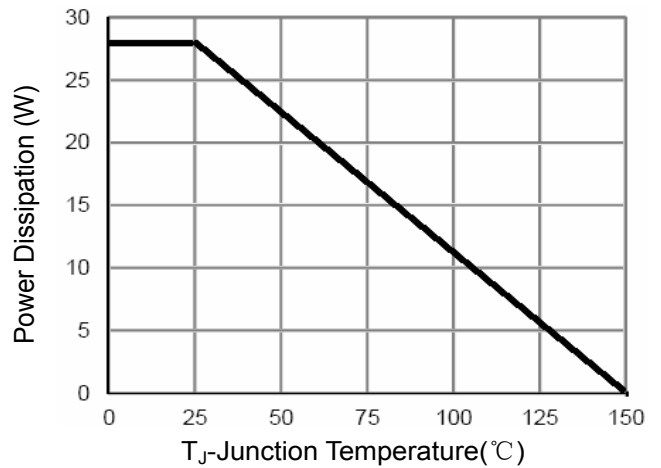


Figure 9 Power De-rating

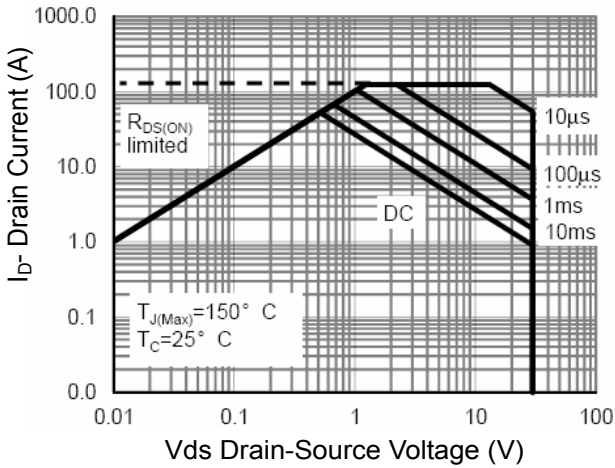


Figure 8 Safe Operation Area

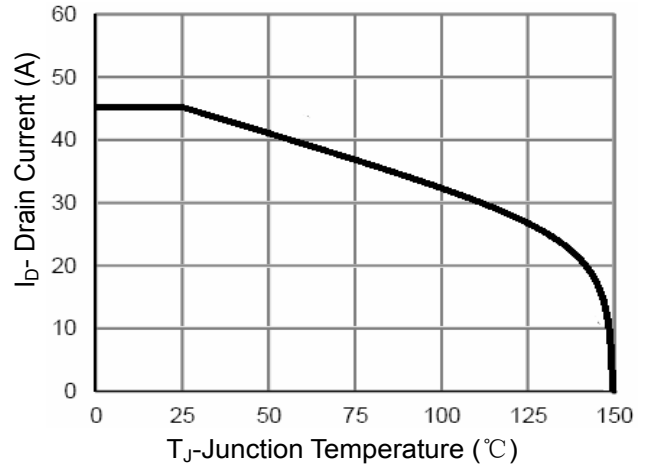


Figure 10 Current De-rating

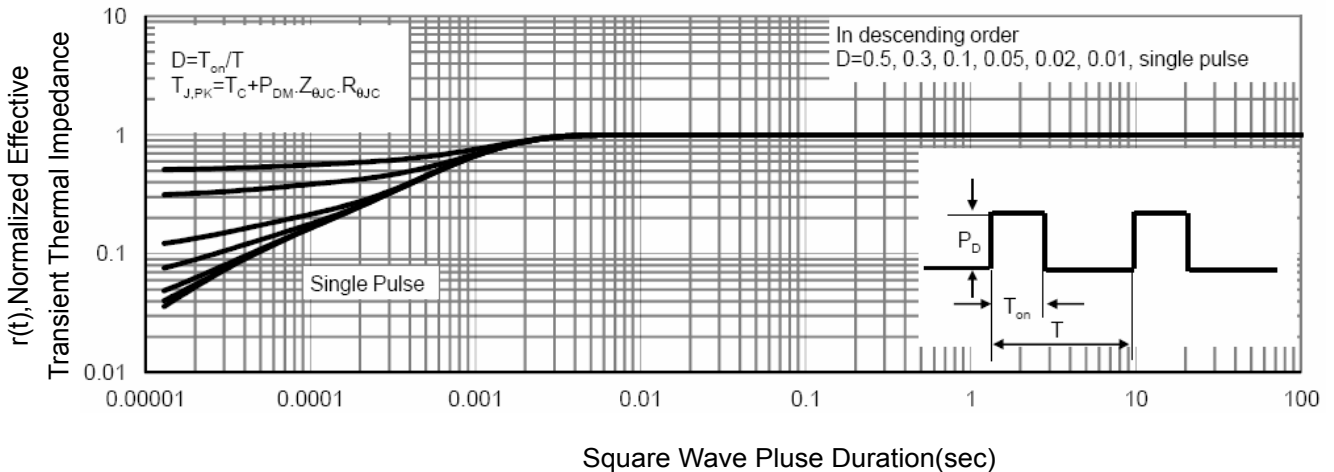
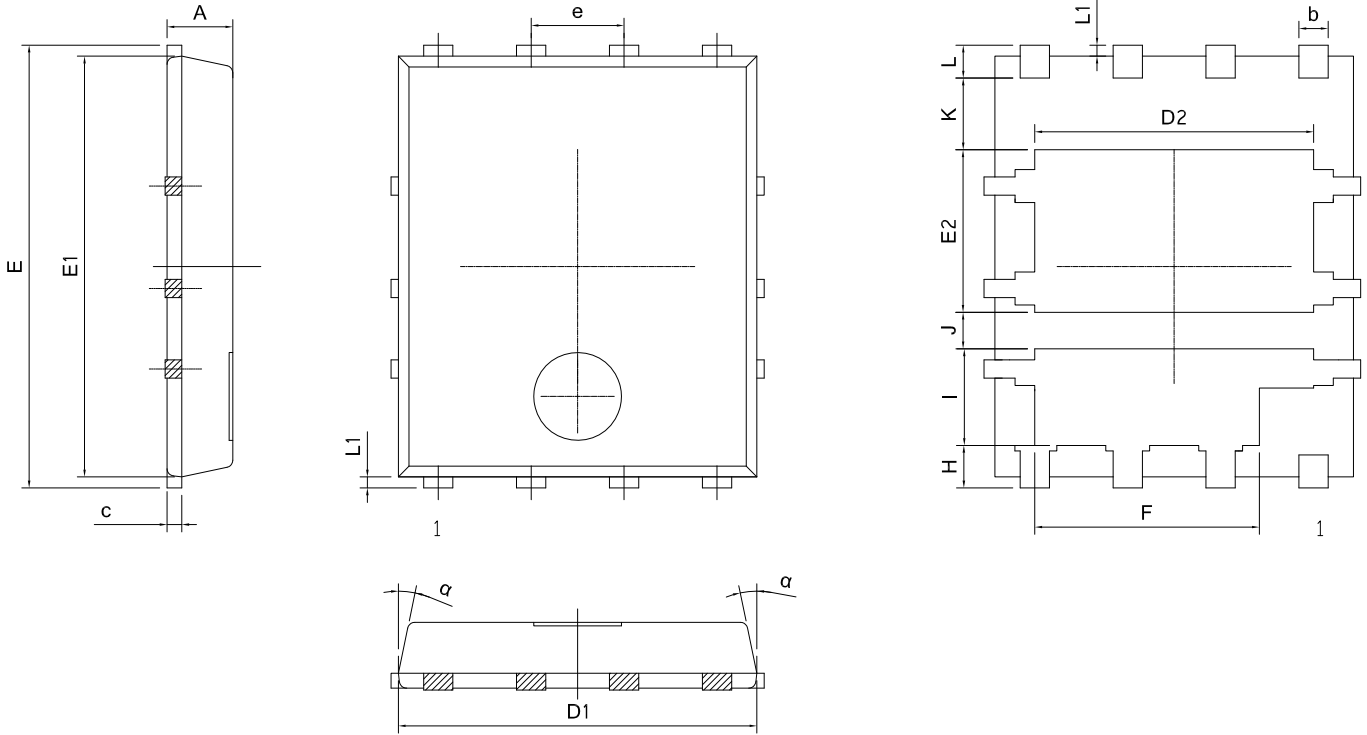


Figure 11 Normalized Maximum Transient Thermal Impedance

WQFN5x6 Package Outline Data

R



DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.85	0.90	1.00
b	0.35	0.40	0.48
c	0.15	0.20	0.28
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.05	6.20
E1	5.65	5.75	5.85
E2	2.02	2.22	2.32
e	1.27 BSC		
F	2.87	3.07	3.22
H	0.43	0.53	0.68
I	1.22	1.32	1.42
J	0.30	0.50	0.60
K	0.50	/	/
L	0.35	0.45	0.55
L1	0.06	0.15	0.25
α	0	12°	14°


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