

### ● General Description

The AGM40P13S 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

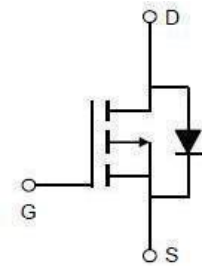
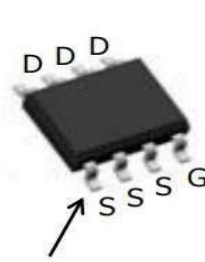
### ● Application

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

### Product Summary

BVDSS	RDS(ON)	ID
-40V	16mΩ	-8A

### SOP8 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM40P13S	AGM40P13S	SOP8	----	----	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) <b>(Note 1)</b>	-8.0	A
	Drain Current-Continuous(Tc=100°C)	-5.0	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	-32	A
PD	Maximum Power Dissipation(Tc=25°C)	3.0	w
	Maximum Power Dissipation(Tc=100°C)	1.2	w
EAS	Avalanche energy <b>(Note 3)</b>	--	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>	---	42	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	--	°C/W

**Table 3. Electrical Characteristics (TA=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	-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	-1.1	-1.7	-2.5	V
gFS	Forward Transconductance	VDS=5V,ID=-12A	--	15	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-8A	--	16	21	mΩ
		VGS=-4.5V, ID=-5A	--	21	34	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=-20V,VGS=0V, F=1MHZ	--	2050	--	pF
Coss	Output Capacitance		--	360	--	pF
Crss	Reverse Transfer Capacitance		--	150	--	pF
Rg	Gate resistance	f=1.0MHz	--	--	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-20V, RL=1.6Ω,RGEN=3Ω	--	10	--	nS
tr	Turn-on Rise Time		--	24	--	nS
td(off)	Turn-Off Delay Time		--	40	--	nS
tf	Turn-Off Fall Time		--	9.0	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-20V, ID=-8A	--	45	--	nC
Qgs	Gate-Source Charge		--	6.0	--	nC
Qgd	Gate-Drain Charge		--	11	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	-8.0	A
VSD	Forward on Voltage	VGS=0V,IS=-8A	--	--	-1.2	V
trr	Reverse Recovery Time	Isd=-8A , di/dt=100A/μs , TJ=25°C	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	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

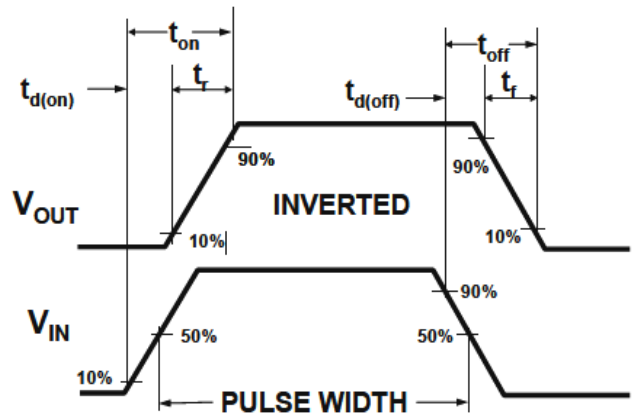
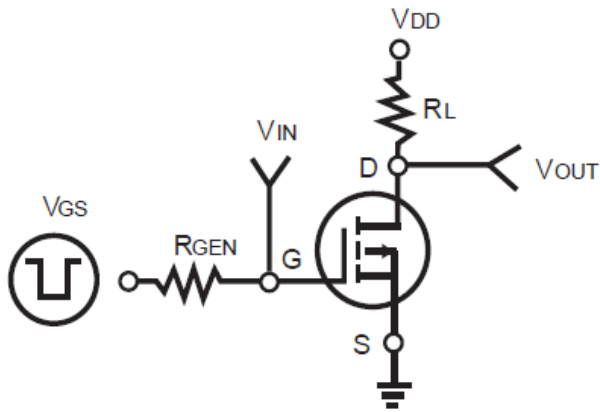
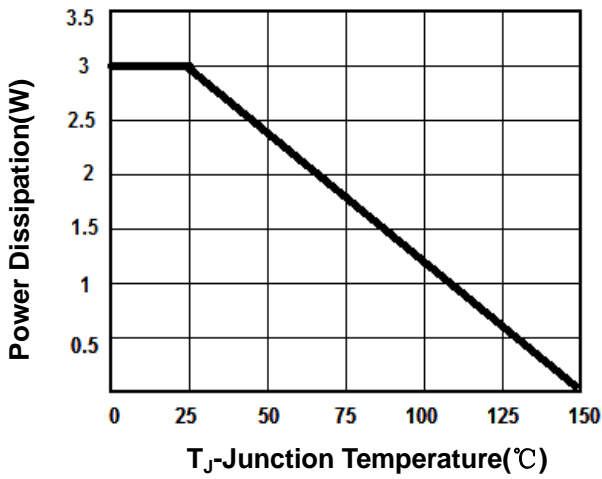
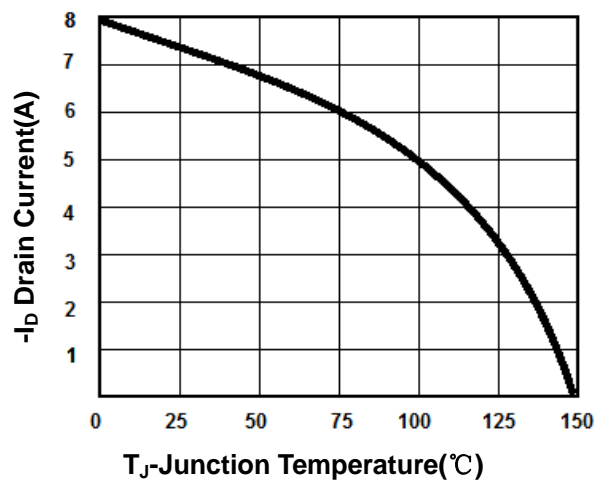
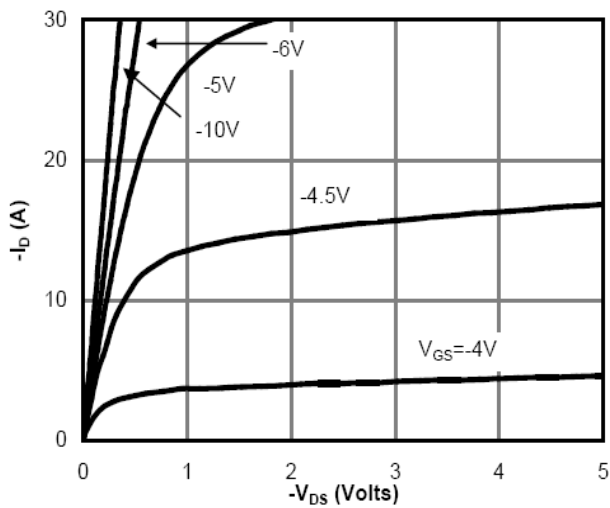
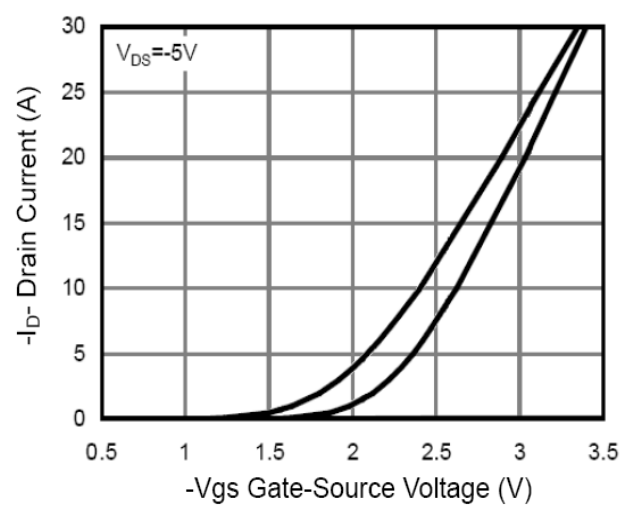
**Switch Time Test Circuit and Switching Waveforms:**

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)**
**Figure1. Power Dissipation**

**Figure2. Drain Current**

**Figure3. Output Characteristics**

**Figure4. Transfer Characteristics**


Figure5. Capacitance

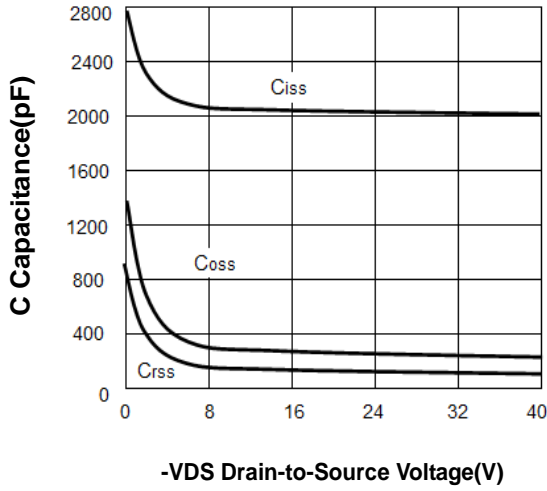
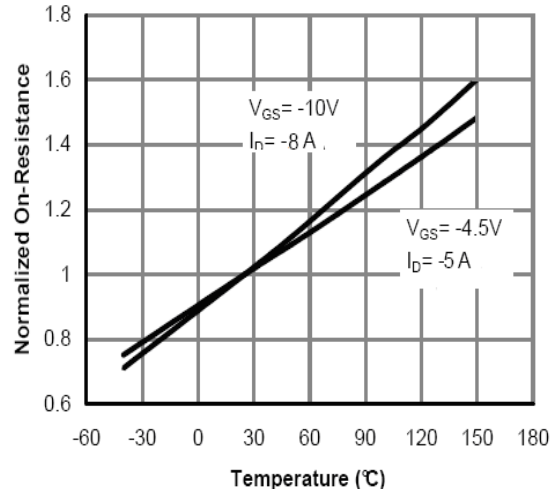
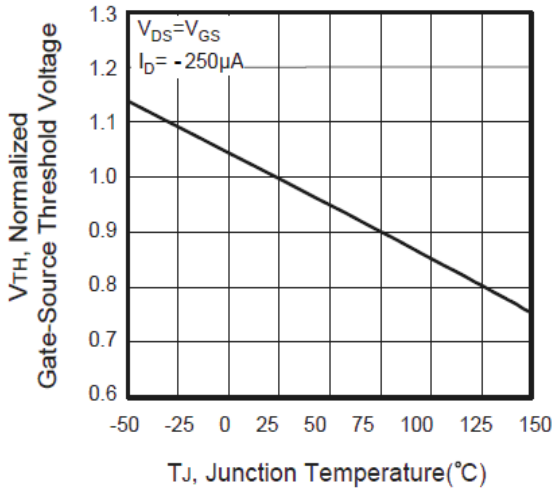

 Figure6.  $R_{DS(ON)}$  vs Junction Temperature

 Figure7.  $V_{GS(th)}$  vs Junction Temperature


Figure8. Gate Charge Waveforms

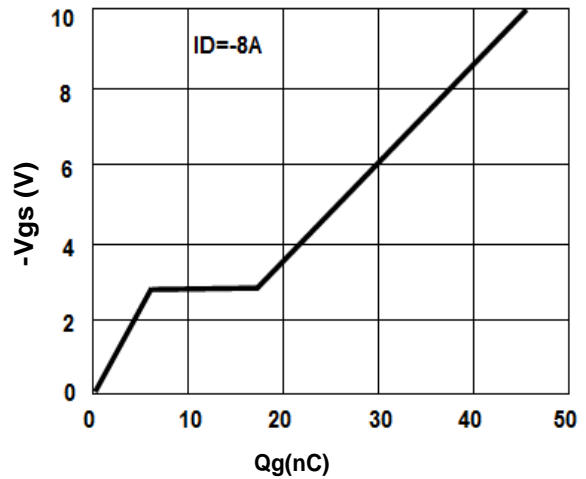
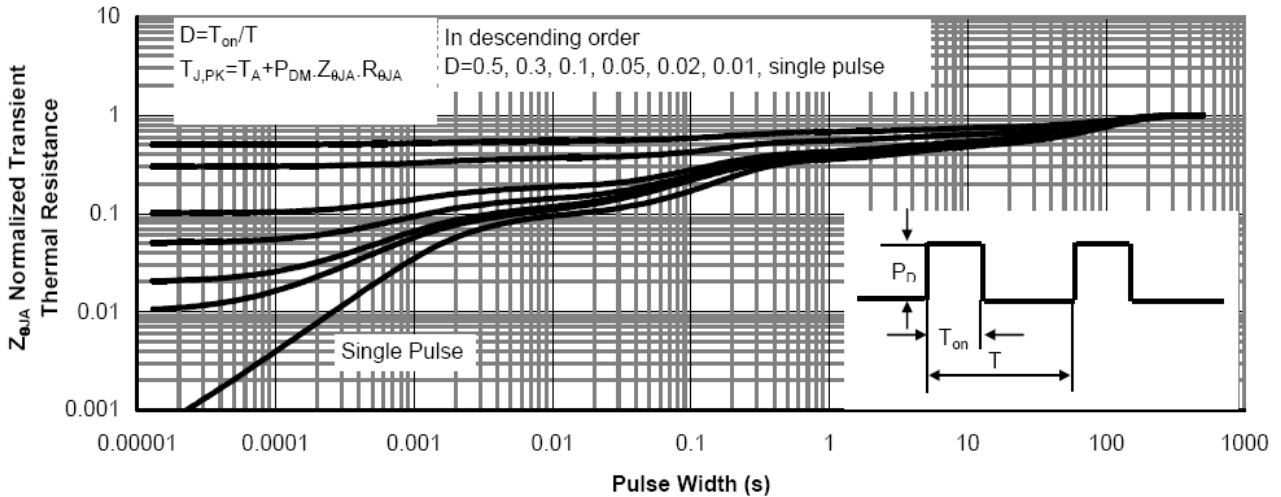
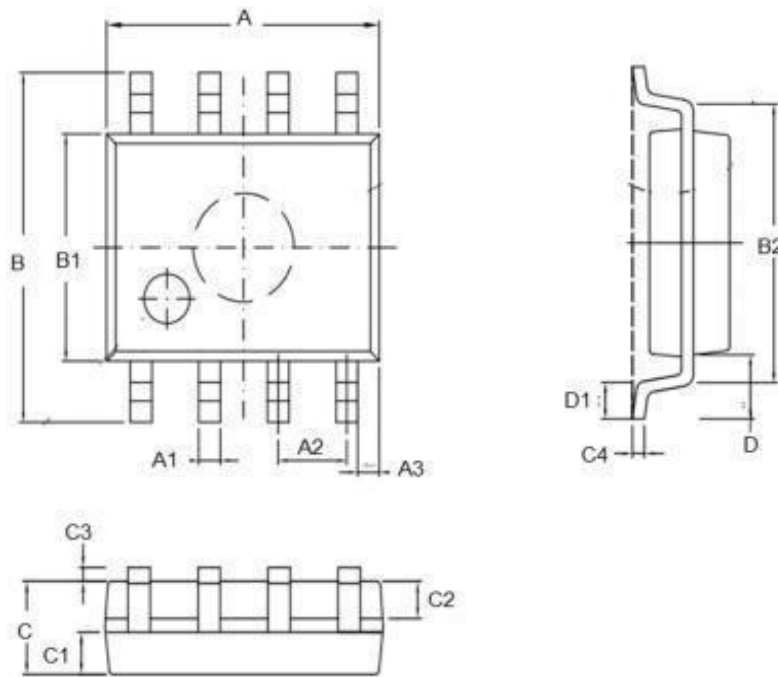


Figure9. Normalized Maximum Transient Thermal Impedance



**•Dimensions(SOP8)**

SYMBOL	min	TYP	max	SYMBOL	min		max
A	4.80		5.00	C	1.30		1.50
A1	0.37		0.47	C1	0.55		0.75
A2		1.27		C2	0.55		0.65
A3		0.41		C3	0.05		0.20
B	5.80		6.20	C4	0.19	0.20	0.23
B1	3.80		4.00	D		1.05	
B2		5.00		D1	0.40		0.62




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