

### ● General Description

The AGM40P65E 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

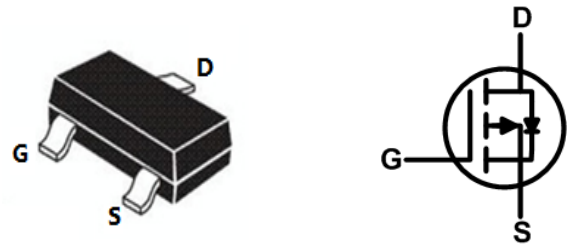
### ● Application

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

### Product Summary

BVDSS	RDSON	ID
-40V	70mΩ	-5A

### SOT-23-3 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
40P65E	AGM40P65E	SOT-23-3	178mm	8mm	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(TA=25°C) (Note 1)	-3.3	A
	Drain Current-Continuous(TA=70°C)	-2.0	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	-13	A
PD	Maximum Power Dissipation(TA=25°C)	1.4	W
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>	---	89	°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	-1.6	-2.3	V
gFS	Forward Transconductance	VDS=-5V, ID=-3.1A	--	-5	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-3A	--	70	85	mΩ
		VGS=-4.5V, ID=-2A	--	95	120	mΩ
<b>Dynamic Characteristics</b>						
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
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=-10V, VDS=-20V, RGEN=3Ω, ID=-3A	--	9	--	nS
tr	Turn-on Rise Time		--	8	--	nS
td(off)	Turn-Off Delay Time		--	25	--	nS
tf	Turn-Off Fall Time		--	9	--	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
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	-5.0	A
VSD	Forward on Voltage	VGS=0V, IS=-3A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-3A , dI/dt=100A/μs ,	--	--	--	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

Typical Electrical and Thermal Characteristics

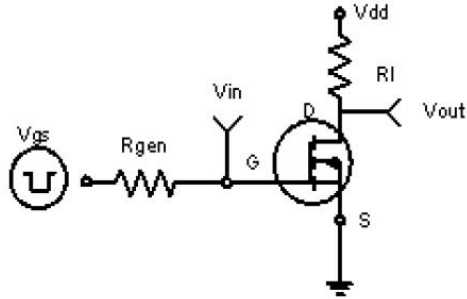


Figure 1: Switching Test Circuit

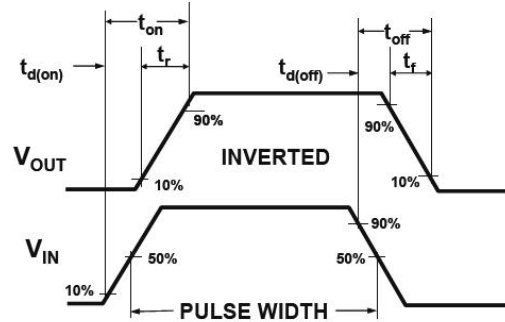


Figure 2: Switching Waveforms

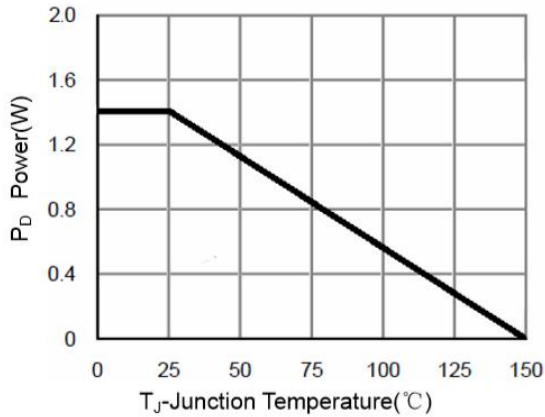


Figure 3 Power Dissipation

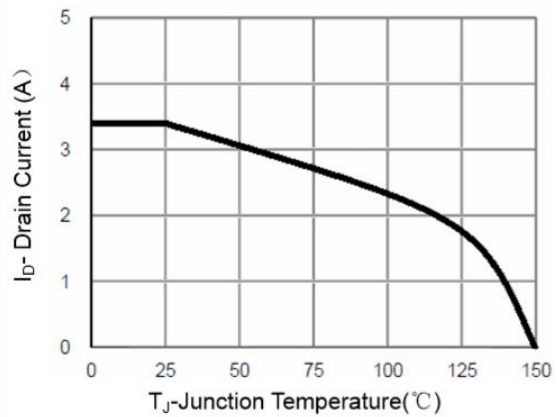


Figure 4 Drain Current

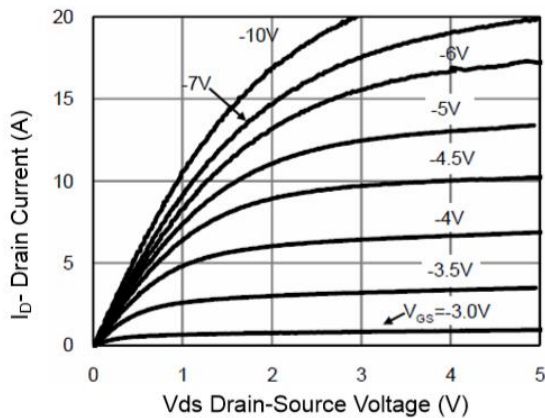


Figure 5 Output Characteristics

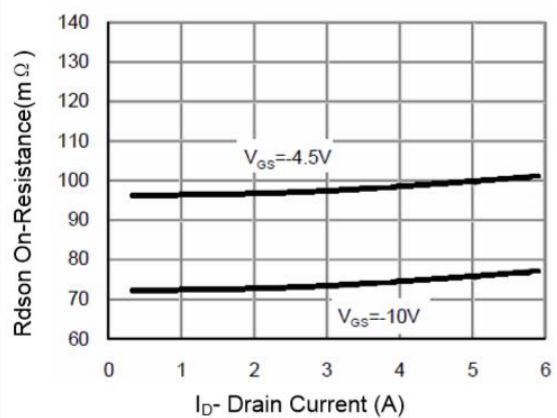
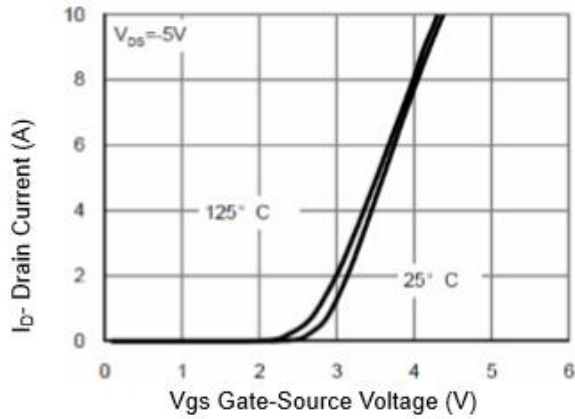
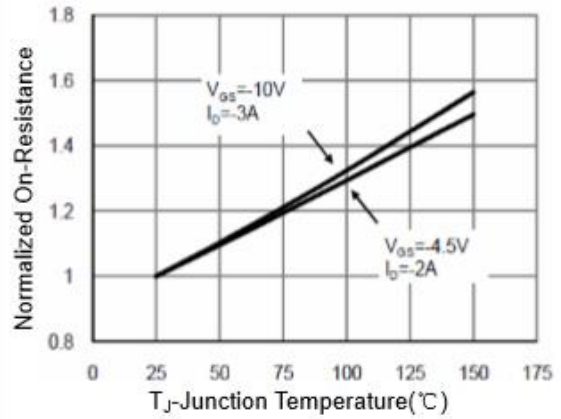
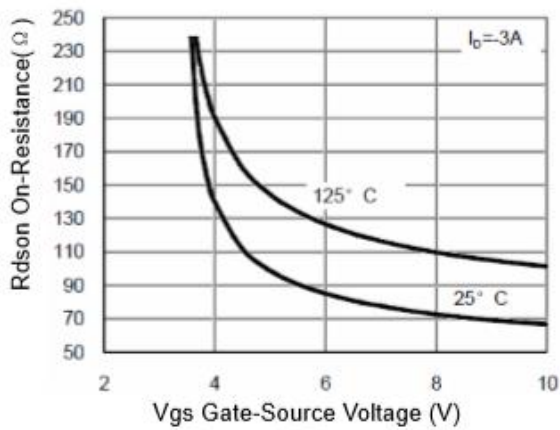
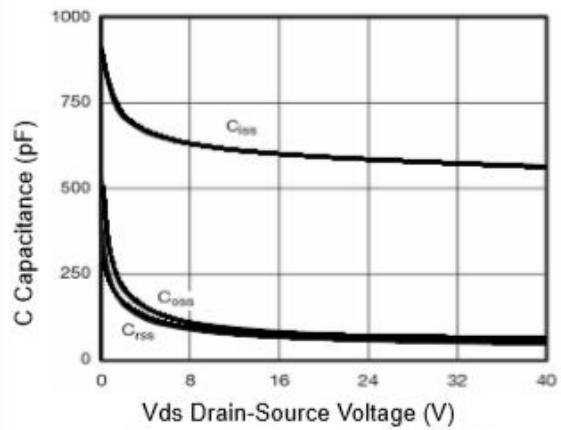
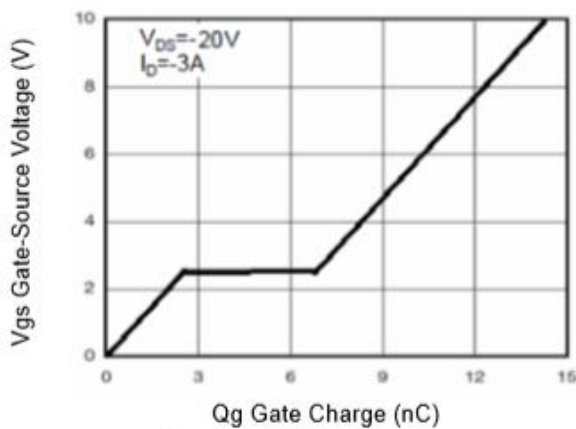
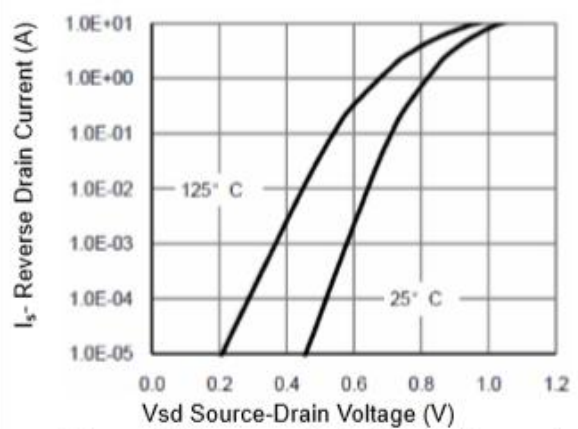


Figure 6 Drain-Source On-Resistance


**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**

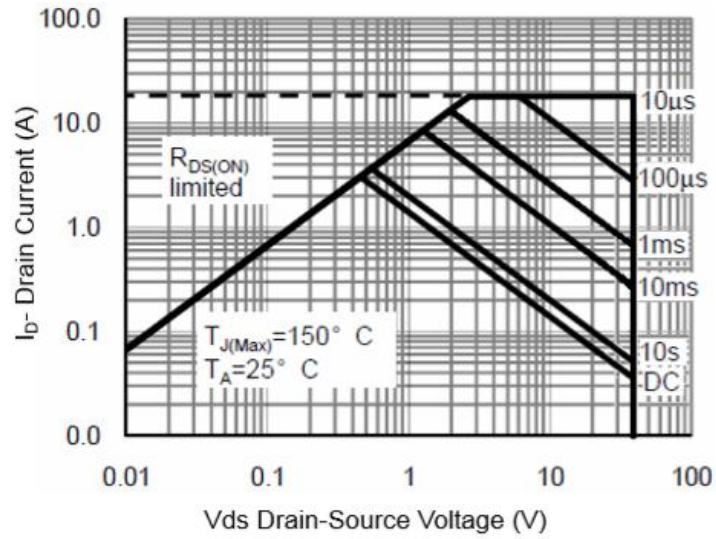


Figure 13 Safe Operation Area

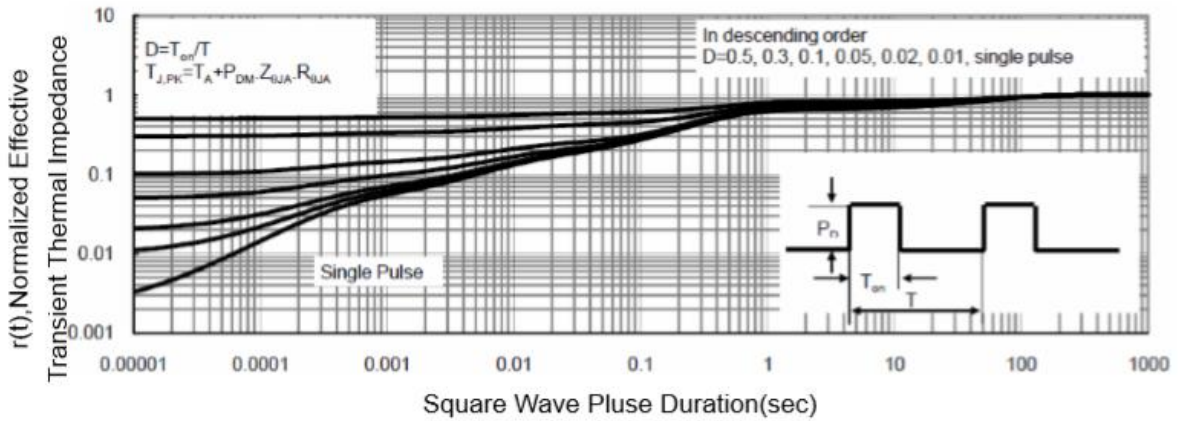
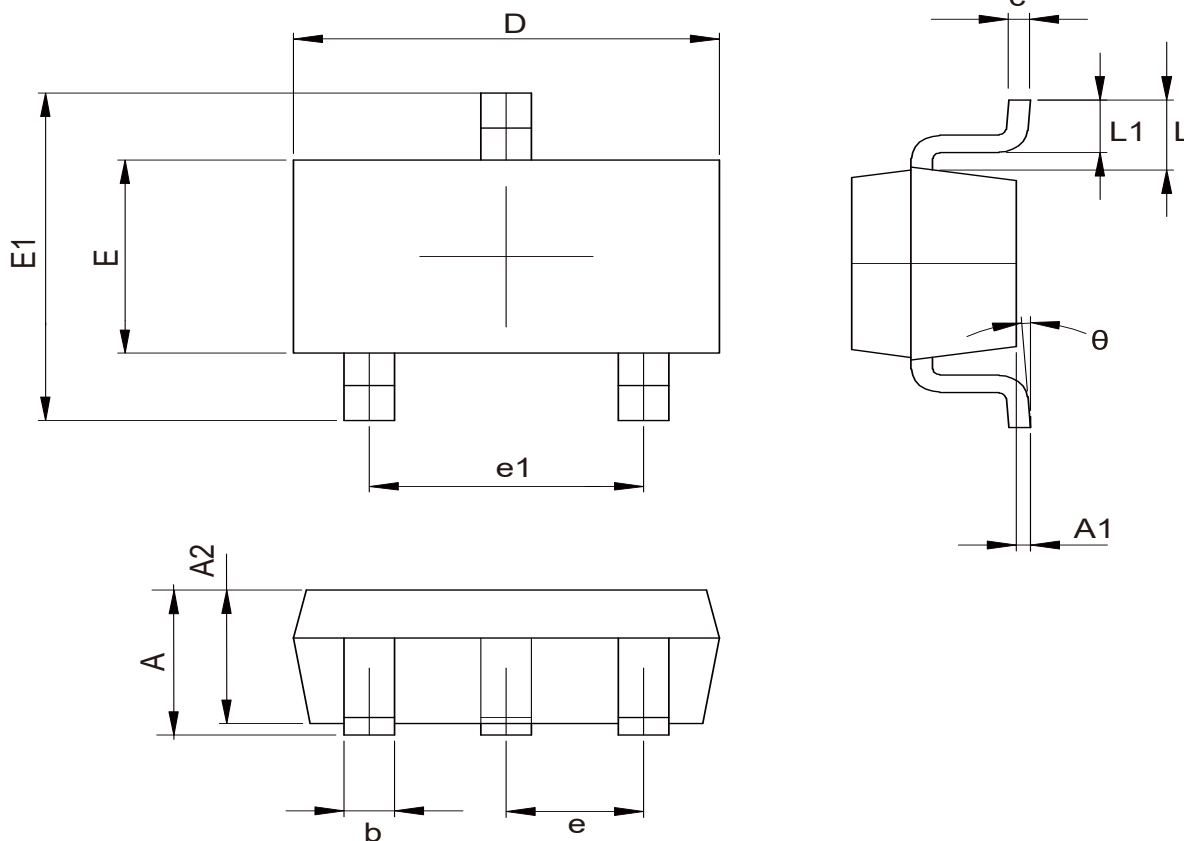


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23-3L  
PACKAGE OUTLINE DIMENSIONS



COMMON DIMENSIONS			
CUNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	1.050	---	1.300
A1	0.000	---	0.200
A2	1.050	---	1.200
b	0.300	0.400	0.500
c	0.100	---	0.200
D	2.820	2.900	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
e	0.950TYP		
e1	1.800	1.900	2.000
L	0.6REF		
L1	0.300	0.450	0.600
$\theta$	0°	--	8°

Unit:mm


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