

General Description

The AGM20P25E 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

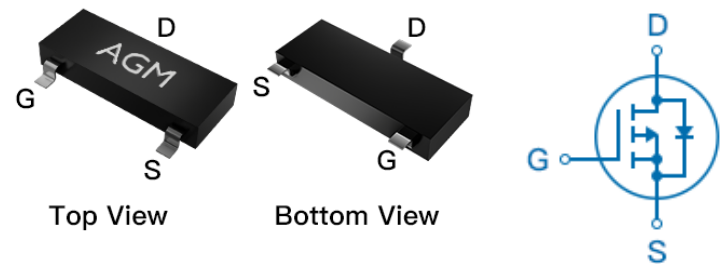
Application

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

Product Summary

BVDSS	RDS(ON)	ID
-20V	22mΩ	-6A

SOT-23-3 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
20P25	AGM20P25E	SOT-23-3	178mm	8mm	3000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	-20	V
VGS	Gate-Source Voltage (VDS=0V)	±12	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	-6.0	A
	Drain Current-Continuous(Tc=100°C)	-4.0	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	-20	A
PD	Maximum Power Dissipation(Tc=25°C)	1.25	w
	Maximum Power Dissipation(Tc=100°C)	0.5	w
EAS	Avalanche energy (Note 3)	---	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	---	100	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-20V,VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.4	-0.6	-1.0	V
gFS	Forward Transconductance	VDS=-5V,ID=-3A	--	3	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-4.5V, ID=-4A	--	22	35	mΩ
		VGS=-2.5V, ID=-3A	--	25	40	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-10V,VGS=0V, F=1MHZ	--	427	--	pF
Coss	Output Capacitance		--	120	--	pF
Crss	Reverse Transfer Capacitance		--	67	--	pF
Rg	Gate resistance	f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	ID =-1A VDS = -10V VGS =-4.5V RG = 6 Ω	--	22	--	nS
tr	Turn-on Rise Time		--	45	--	nS
td(off)	Turn-Off Delay Time		--	21	--	nS
tf	Turn-Off Fall Time		--	11	--	nS
Qg	Total Gate Charge	VGS=-4.5V, VDS=-10V, ID=-2A	--	6.4	--	nC
Qgs	Gate-Source Charge		--	1.0	--	nC
Qgd	Gate-Drain Charge		--	1.5	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-6.0	A
VSD	Forward on Voltage	VGS=0V,IS=-4A	--	--	-1.2	V
trr	Reverse Recovery Time	Isd=-4A , dI/dt=100A/μs , TJ=25℃	--	23	--	ns
Qrr	Reverse Recovery Charge		--	245	--	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:

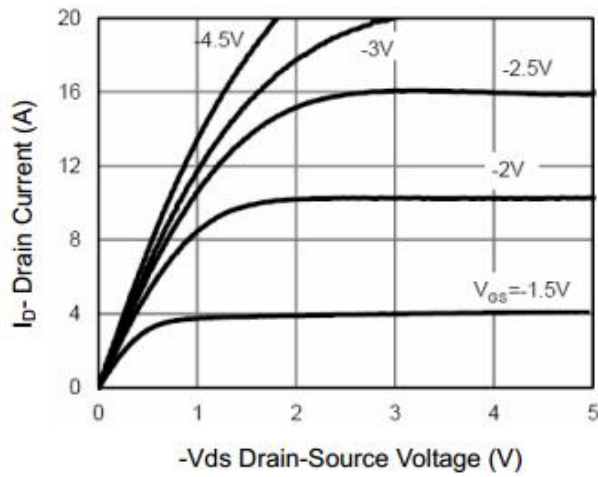


Figure 1: Typical Output Characteristics

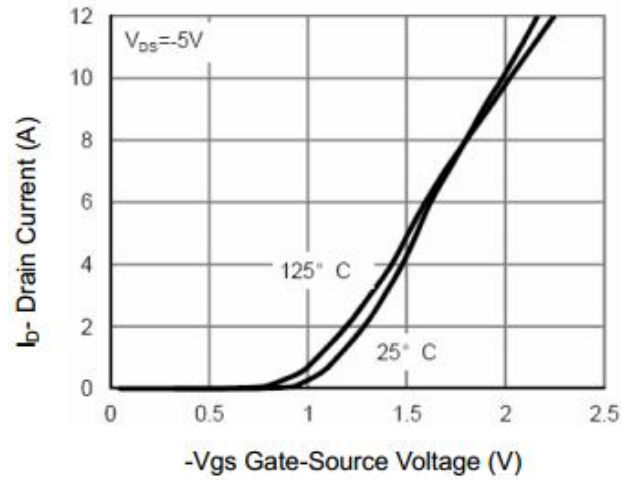


Figure 2: Typical Transfer Characteristics

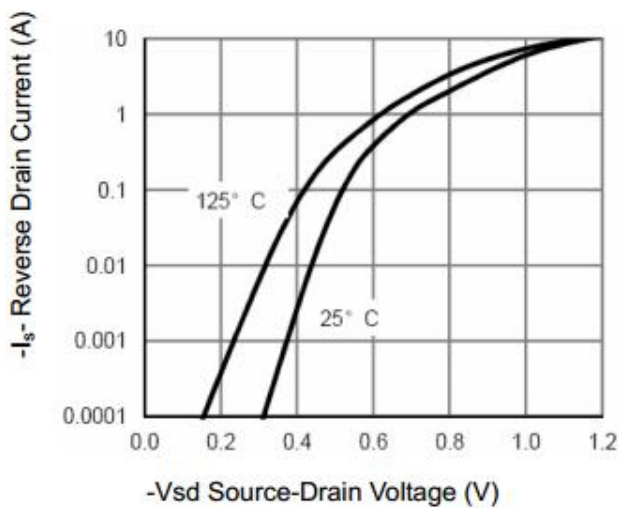


Figure 3: Body-Diode Characteristics

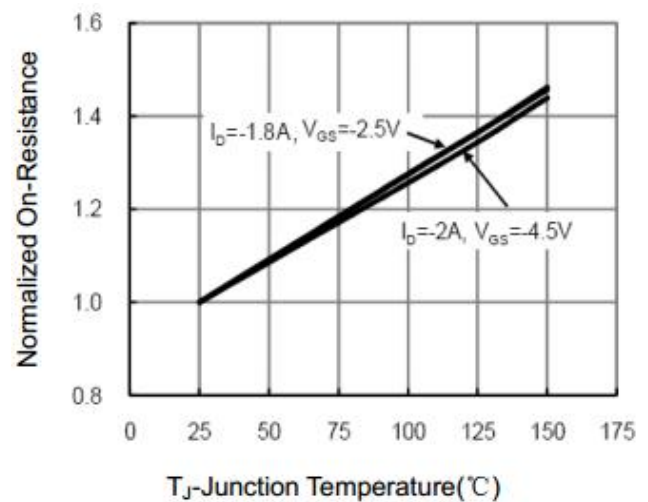


Figure 4: On-Resistance vs. Junction Temperature

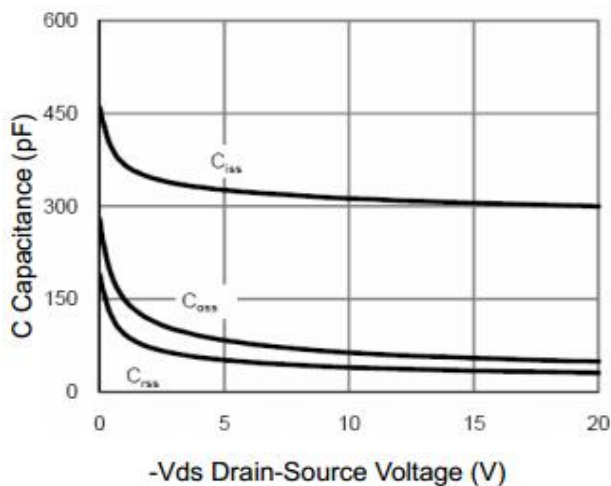


Figure 5: Capacitance Characteristics

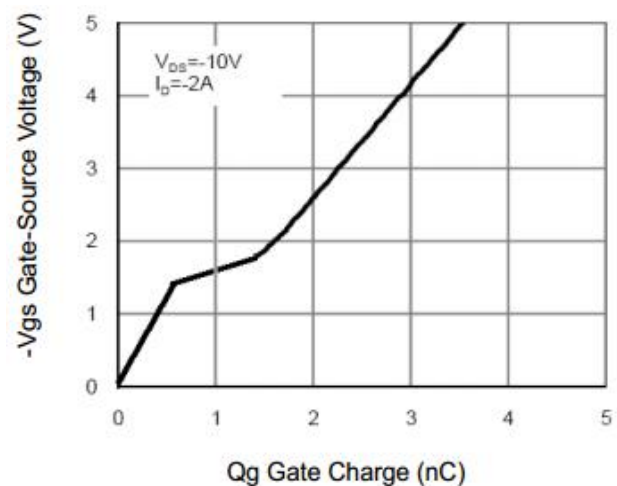


Figure 6: Gate-Charge Characteristics

Typical electrical and thermal characteristics:

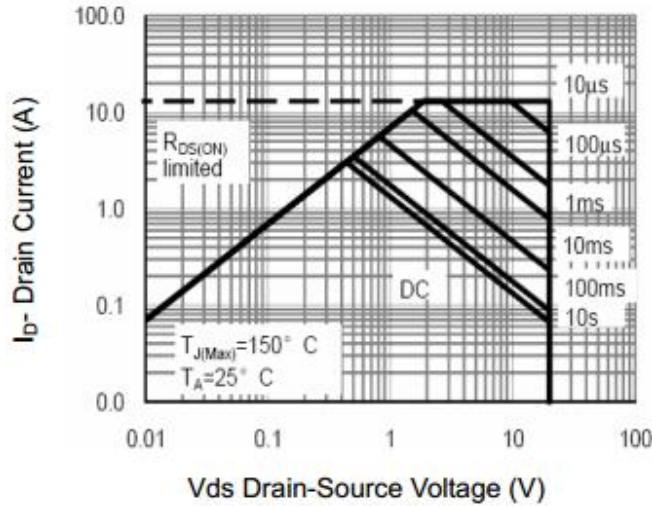


Figure 7: Maximum Forward Biased Safe Operating Area

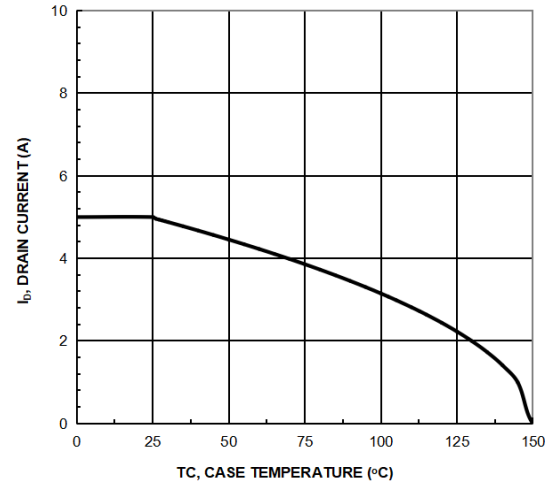
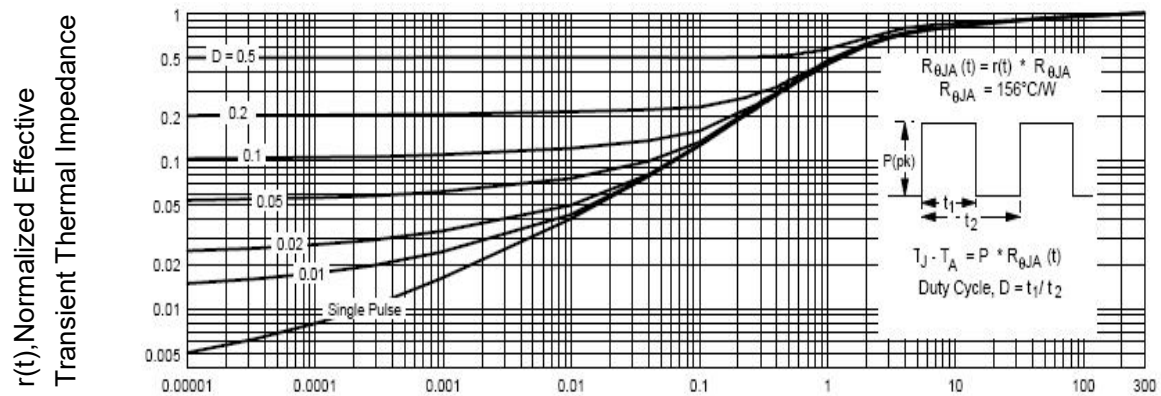


Figure 8: Current De-rating

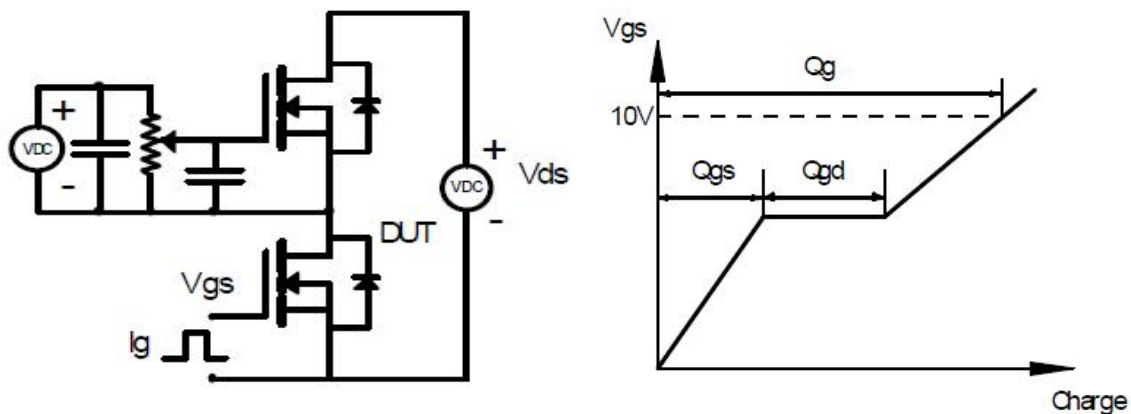


Square Wave Pluse

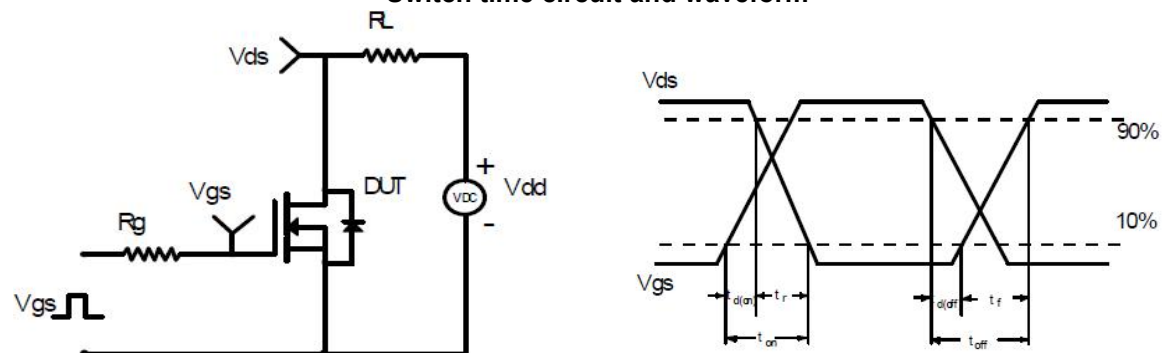
Figure 9: Normalized Maximum Transient Thermal Impedance

Test circuits and Waveforms:

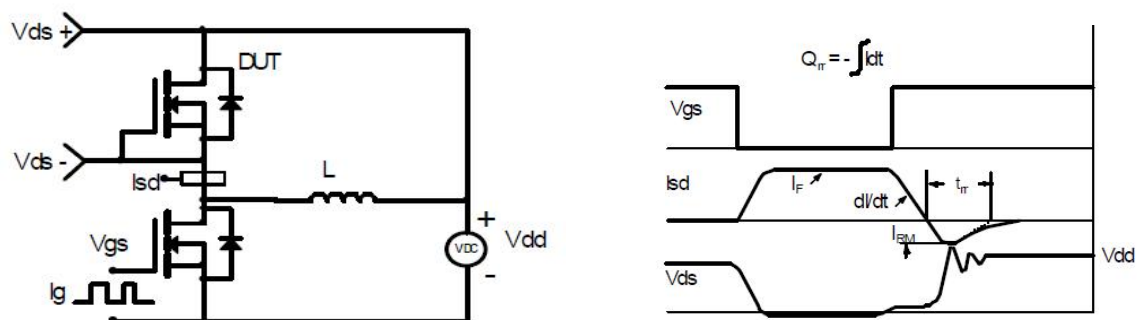
Gate charge circuit and waveform



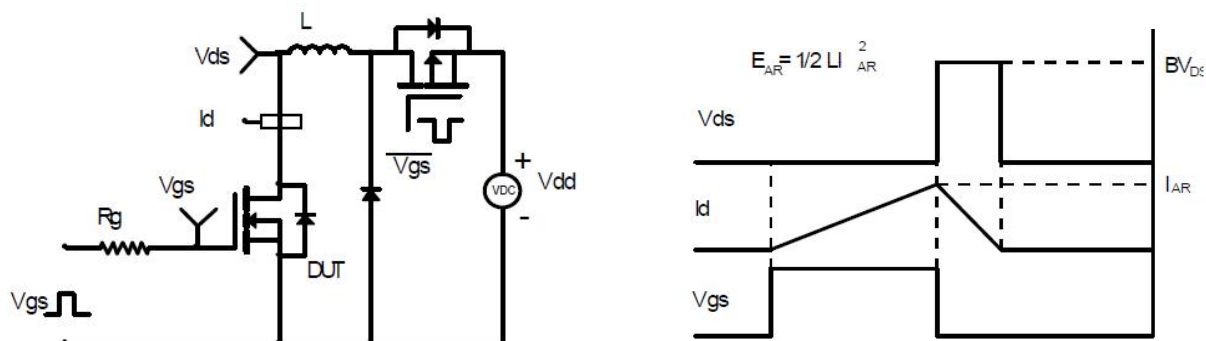
Switch time circuit and waveform



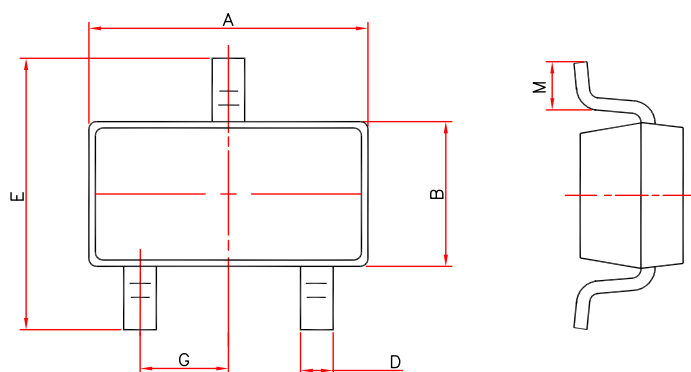
Reverse recovery test circuit and waveform



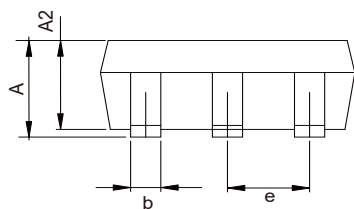
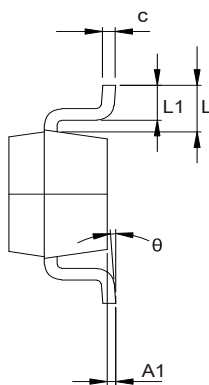
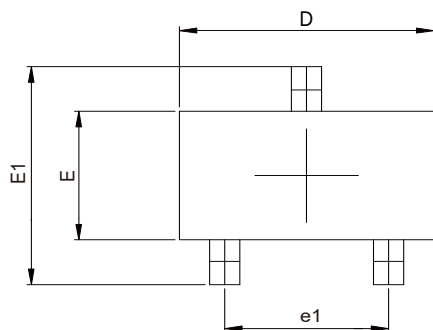
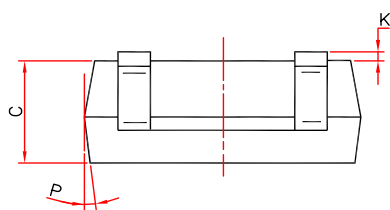
EAS test circuit and waveform



Package Outline Data SOT-23-3



DIM	MILLIMETERS
A	2.82~3.02
B	1.60 ± 0.10
C	1.10 ± 0.05
D	0.40 ± 0.10
E	2.65~2.95
G	0.95typ
K	0.00~0.10
M	0.20MIN
P	9 ± 2°



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER			
SYMBOL			
A	1.050	---	1.300
A1	0.000	---	0.200
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
θ	0°	--	8°

Unit:mm

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