

• General Description

The AGM15P13E 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
-15V	14.5mΩ	-8.0A

SOT-23-3 Pin Configuration

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
15P13	AGM15P13E	SOT-23-3	178mm	8mm	3000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	-15	V
VGS	Gate-Source Voltage (VDS=0V)	±10	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	-8.0	A
	Drain Current-Continuous(Tc=100°C)	-5.3	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	-32	A
PD	Maximum Power Dissipation(Tc=25°C)	1.8	w
	Maximum Power Dissipation(Tc=100°C)	0.72	w
EAS	Avalanche energy (Note 3)	84.5	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	---	69	°C/W

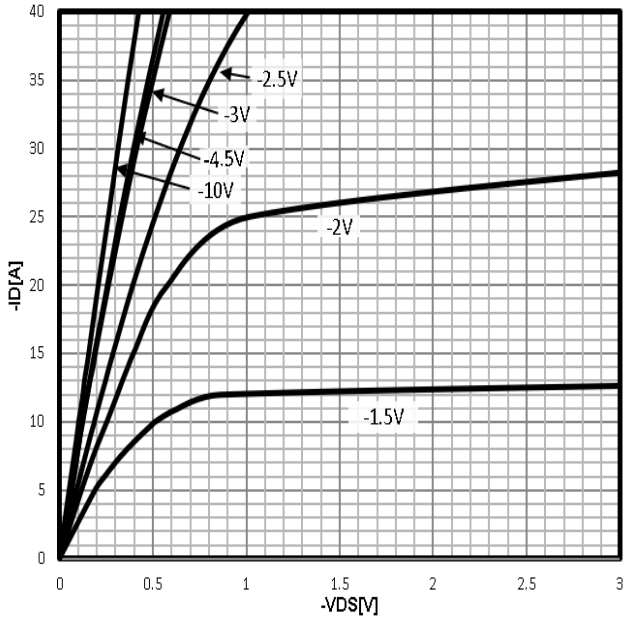
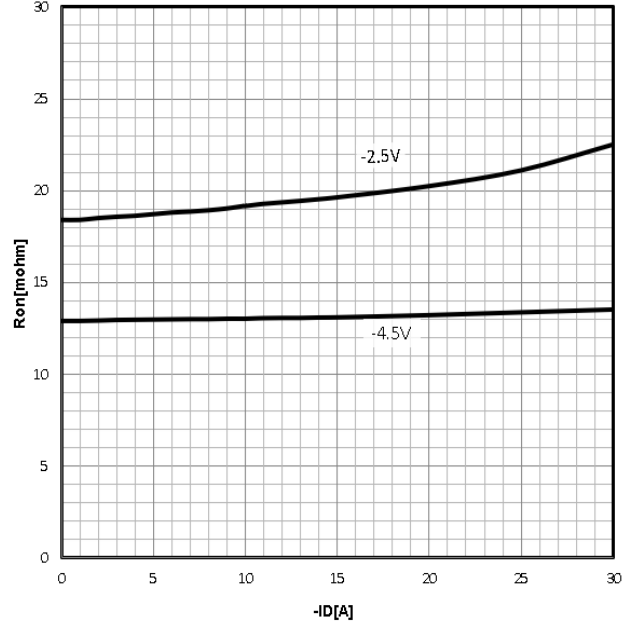
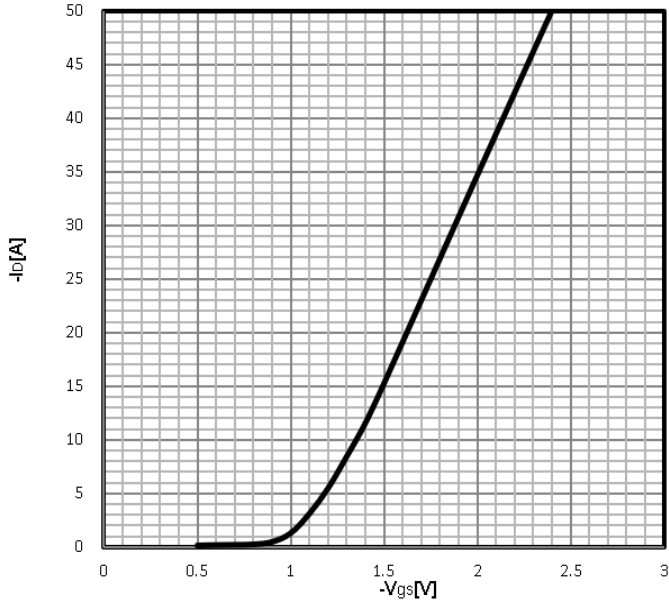
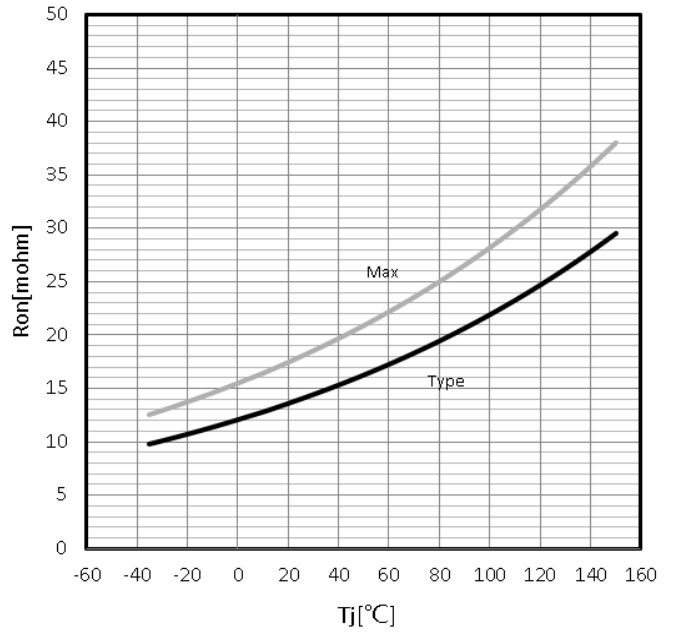
Table 3. Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-15	-18	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-15V,VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±10V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.4	-0.5	-1.0	V
gFS	Forward Transconductance	VDS=-5V,ID=-3A	--	16	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-4.5V, ID=-5A	--	14.5	21	mΩ
		VGS=-2.5V, ID=-3A	--	19	27	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-10V,VGS=0V, F=1MHZ	--	1243	--	pF
Coss	Output Capacitance		--	328	--	pF
Crss	Reverse Transfer Capacitance		--	325	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	8.1	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	ID =-1A VDS = -10V VGS =-4.5V RG = 10Ω	--	12	--	nS
tr	Turn-on Rise Time		--	40	--	nS
td(off)	Turn-Off Delay Time		--	45	--	nS
tf	Turn-Off Fall Time		--	11	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-10V, ID=-5A	--	37.2	--	nC
Qgs	Gate-Source Charge		--	1.4	--	nC
Qgd	Gate-Drain Charge		--	7.0	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-8.0	A
VSD	Forward on Voltage	VGS=0V,IS=-5A	--	--	-1.2	V
trr	Reverse Recovery Time	Isd=-5A , dl/dt=100A/μs , TJ=25°C	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

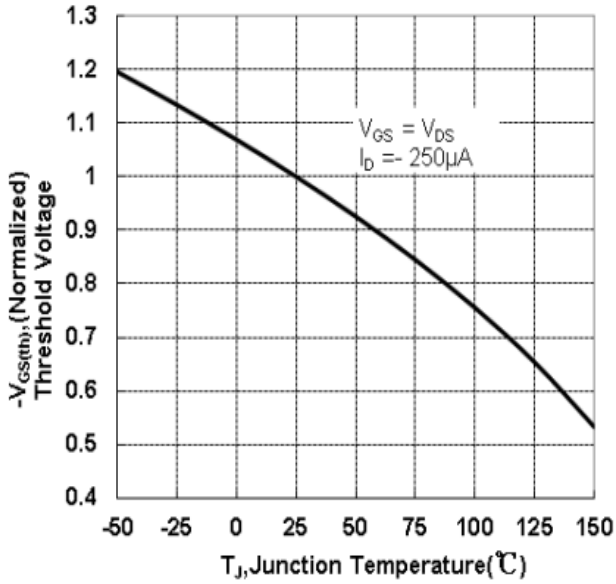
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T_J=25°C,VDD=-10V,Vgs=-10V,ID=-13A,L=0.1mH,RG=25ohm

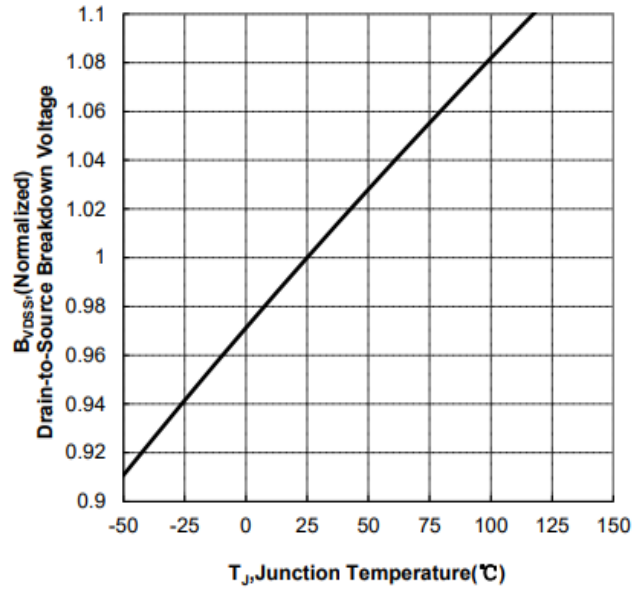
Characteristics Curve:
Typ. output characteristics
 $I_D = f(V_{DS})$

Typ. drain-source on resistance
 $R_{DS(on)} = f(I_D)$

Typ. transfer characteristics
 $I_D = f(V_{GS})$

Drain-source on-state resistance
 $R_{DS(on)} = f(T_j); I_D = -5A;$


Gate Threshold Voltage

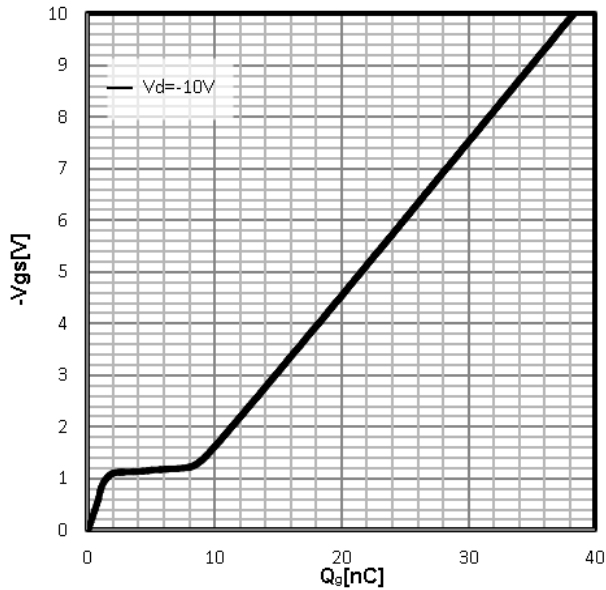
$$-V_{TH} = f(T_j); I_D = -250 \mu A$$


Drain-source breakdown voltage

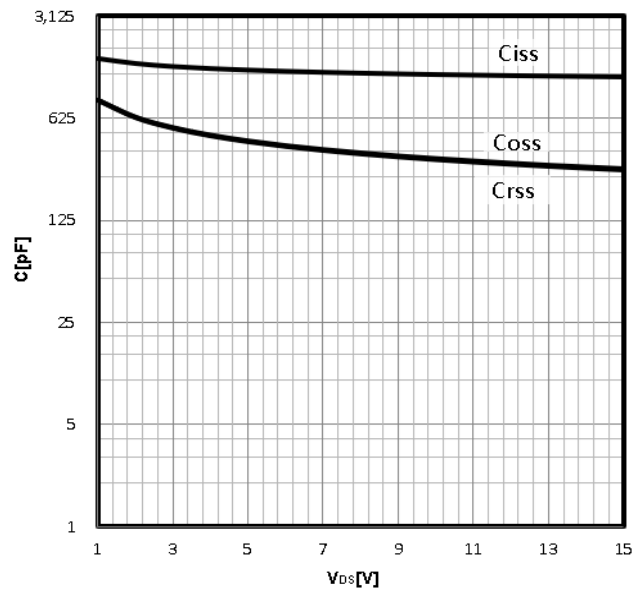
$$V_{BR(DSS)} = f(T_j); I_D = -250 \mu A$$


Typ. gate charge

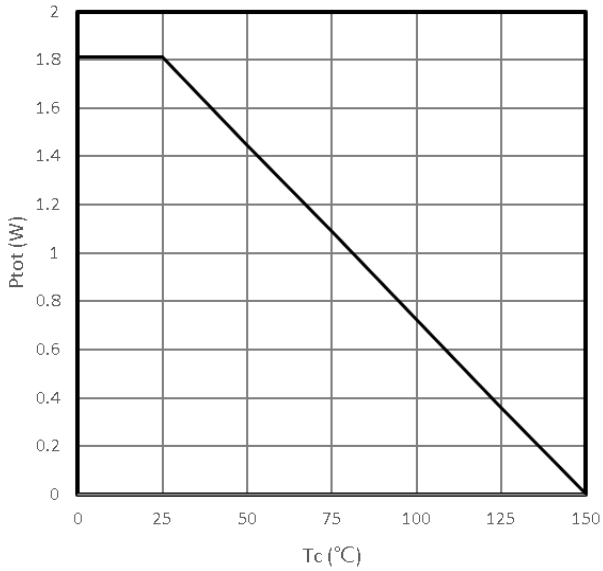
$$V_{GS} = f(Q_g); I_D = -5 A$$


Typ. capacitances

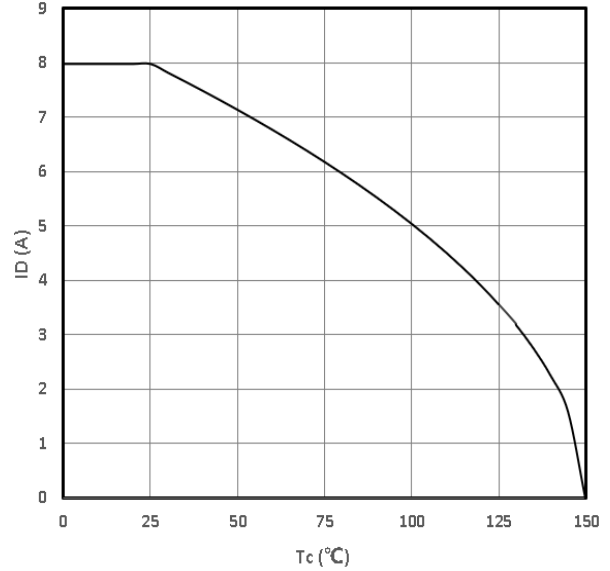
$$C = f(V_{DS}); V_{GS} = 0V; f = 1MHz$$



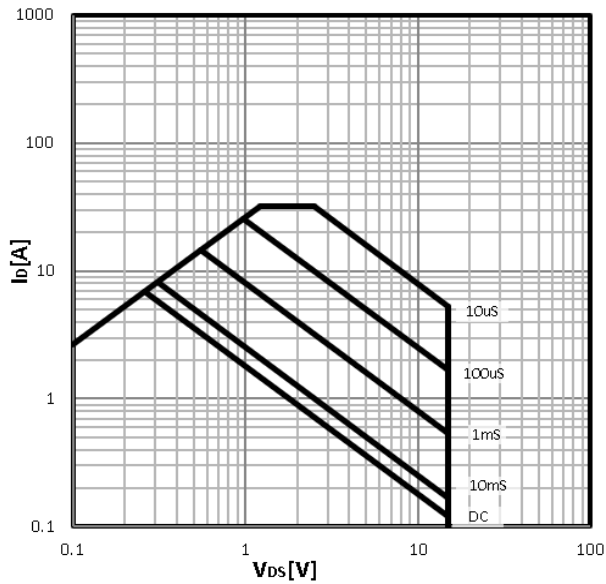
Power Dissipation
 $P_{tot}=f(T_c)$



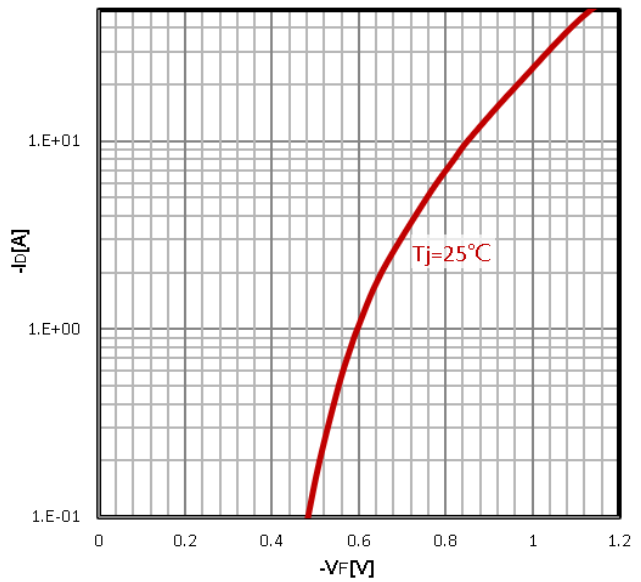
Maximum Drain Current
 $-I_D=f(T_c)$



Safe operating area
 $-I_D=f(-V_{DS})$

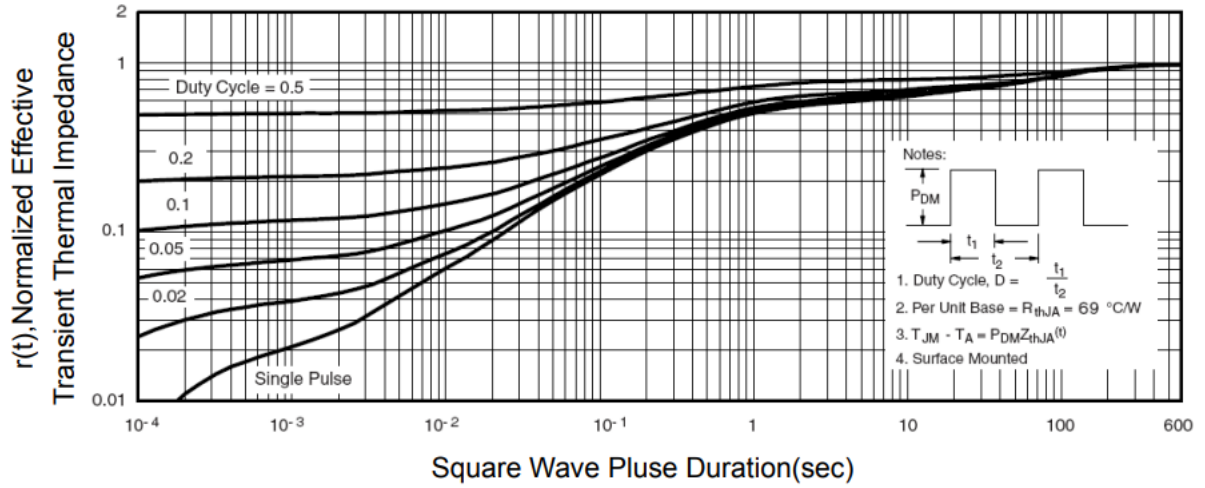


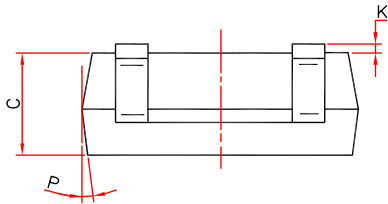
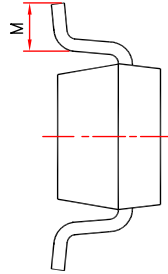
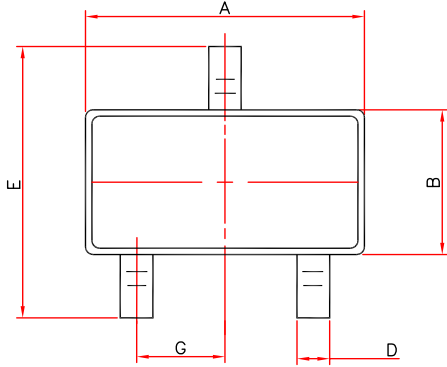
Body Diode Forward Voltage Variation
 $-I_F=f(-V_{GS})$



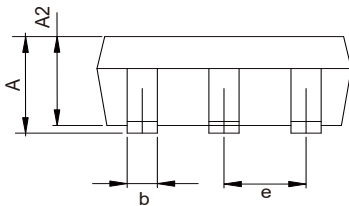
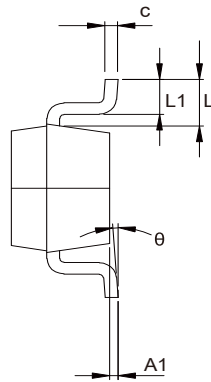
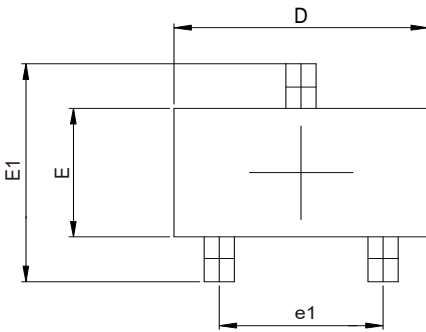
Max. transient thermal impedance

$$Z_{thJC} = f(t_p)$$



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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