

● General Description

The AGM15T13F 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
150V	9.5mΩ	78A

TO-220F Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM15T13F	AGM15T13F	TO-220F	----	----	1000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	150	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	78	A
	Drain Current-Continuous(Tc=100°C)	58	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	232	A
PD	Maximum Power Dissipation(Tc=25°C)	112	w
	Maximum Power Dissipation(Tc=100°C)	45	w
EAS	Avalanche energy (Note 3)	156	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	---	1.12	°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	150	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=150V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	2.0	--	4.0	V
gFS	Forward Transconductance	VDS=10V,ID=15A	--	20	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=40A	--	9.5	13	mΩ
		VGS=4.5V, ID=40A	--	--	--	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V,VGS=0V, F=1MHZ	--	4066	--	pF
Coss	Output Capacitance		--	730	--	pF
Crss	Reverse Transfer Capacitance		--	41	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V ID=40A,REGEN=2.5Ω RL=15Ω	--	15	--	nS
tr	Turn-on Rise Time		--	32.3	--	nS
td(off)	Turn-Off Delay Time		--	24	--	nS
tf	Turn-Off Fall Time		--	15	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=75V, ID=70A	--	57	--	nC
Qgs	Gate-Source Charge		--	18	--	nC
Qgd	Gate-Drain Charge		--	11	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	78	A
VSD	Forward on Voltage	VGS=0V,IS=40A	--	0.9	0.99	V
trr	Reverse Recovery Time	IS=30A , di/dt=100A/μs , TJ=25°C	--	45	--	ns
Qrr	Reverse Recovery Charge		--	80	--	nc

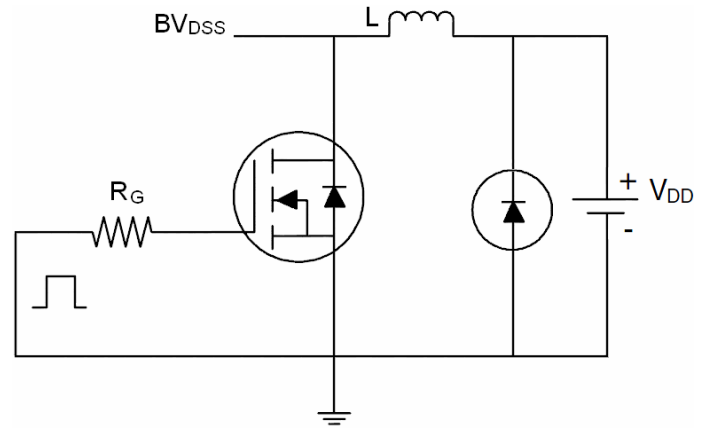
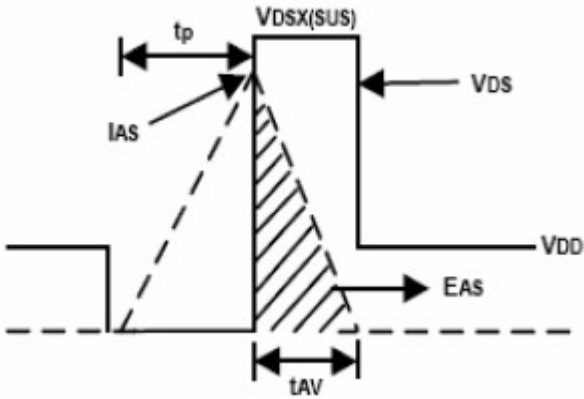
Notes 1.The maximum current rating is package limited.

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

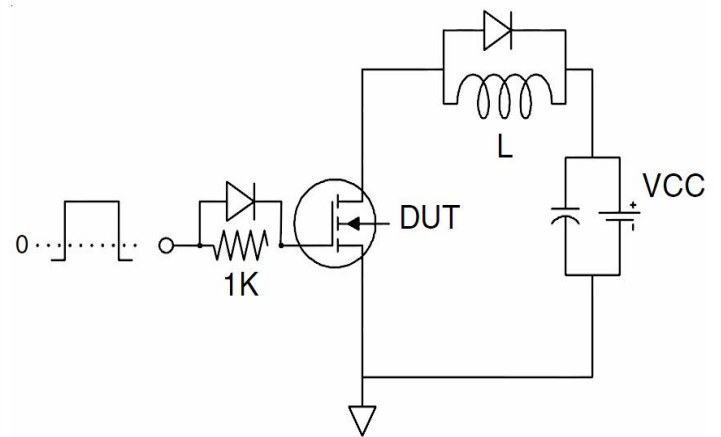
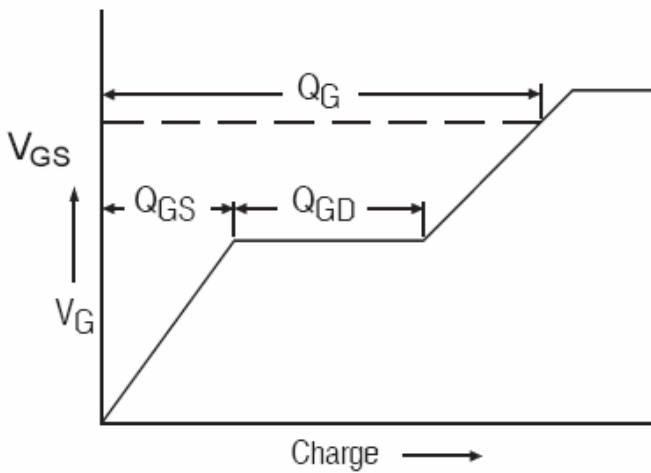
Notes 3.EAS condition: TJ=25°C

Test Circuit

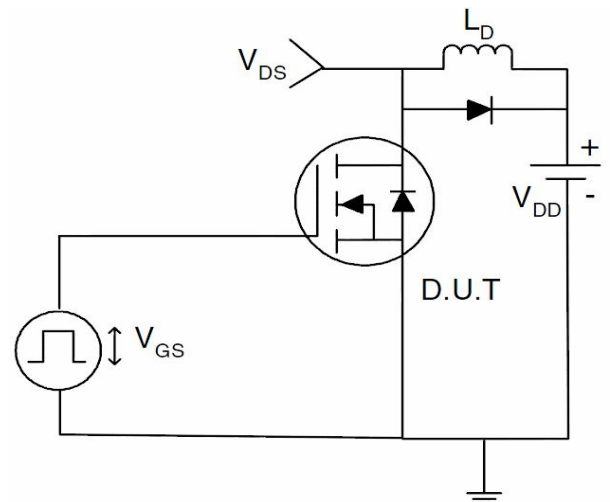
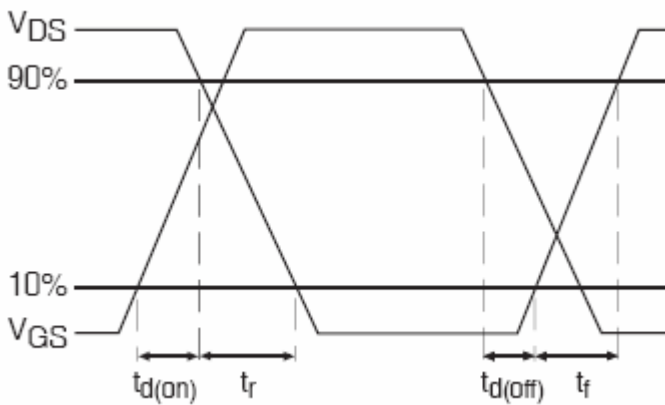
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



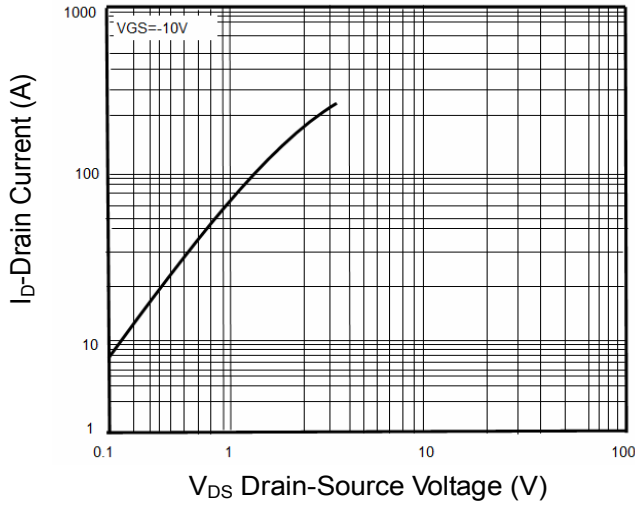
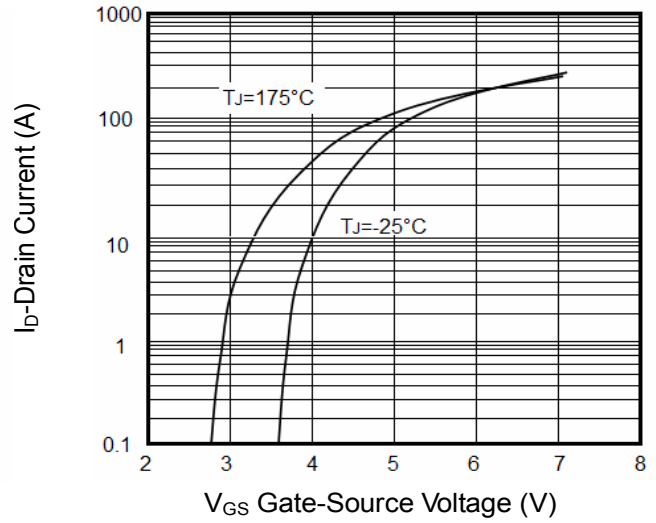
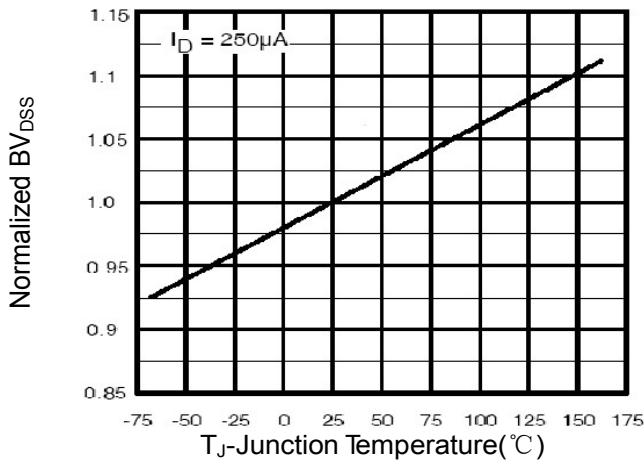
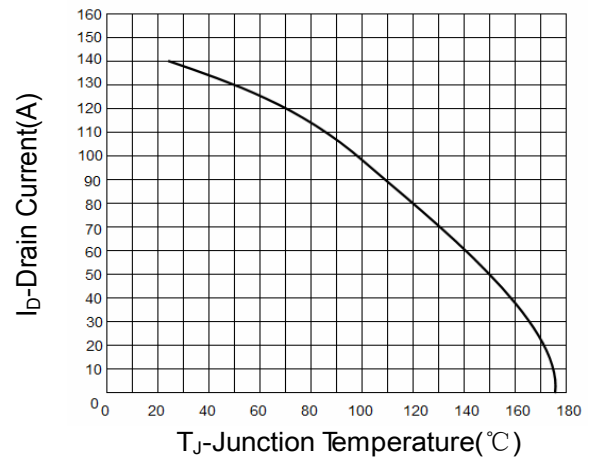
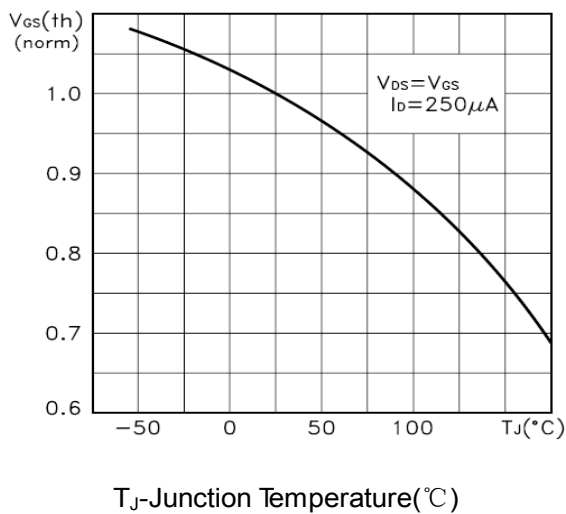
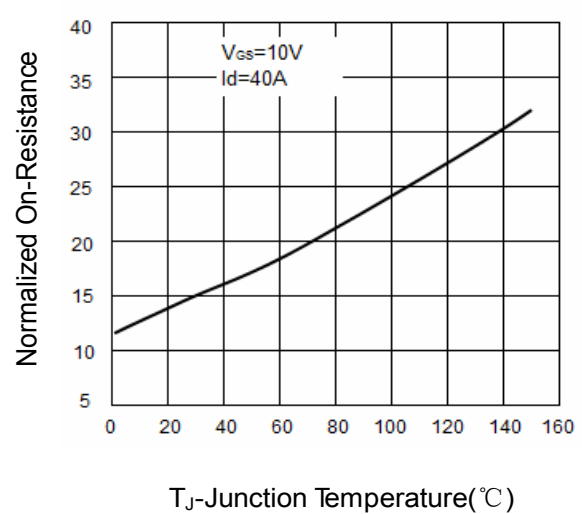
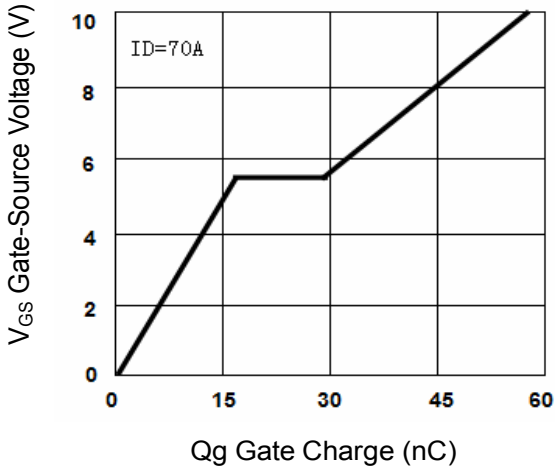
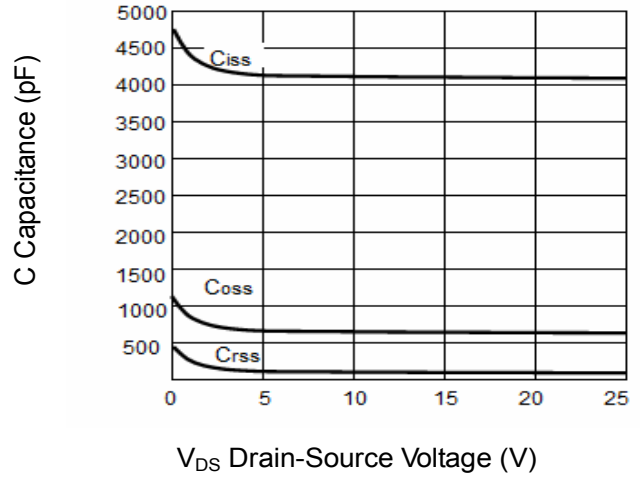
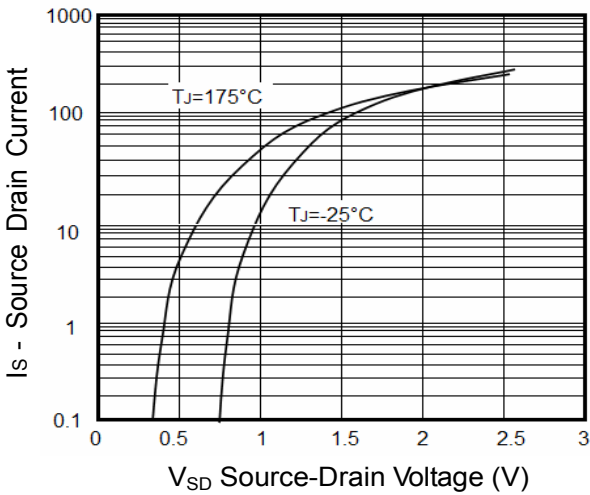
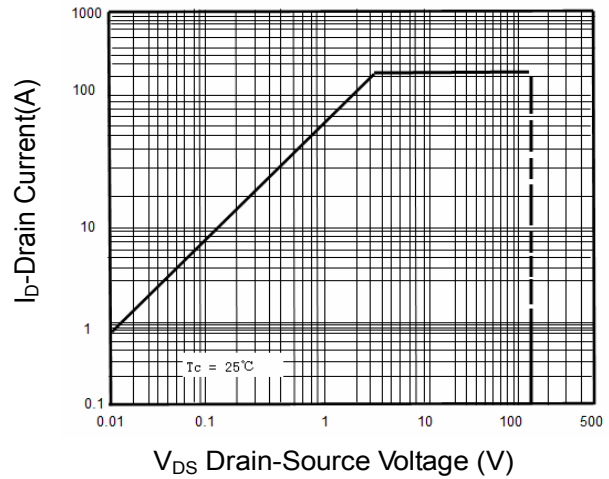
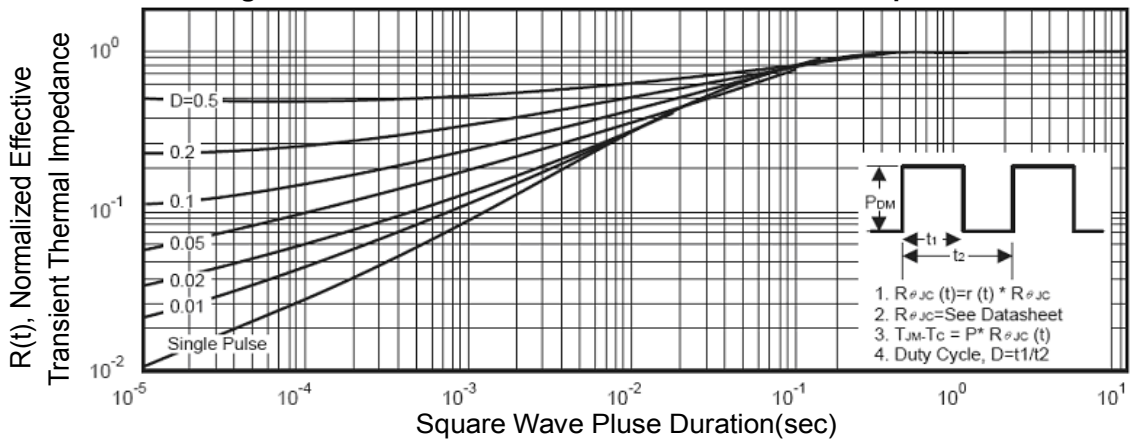
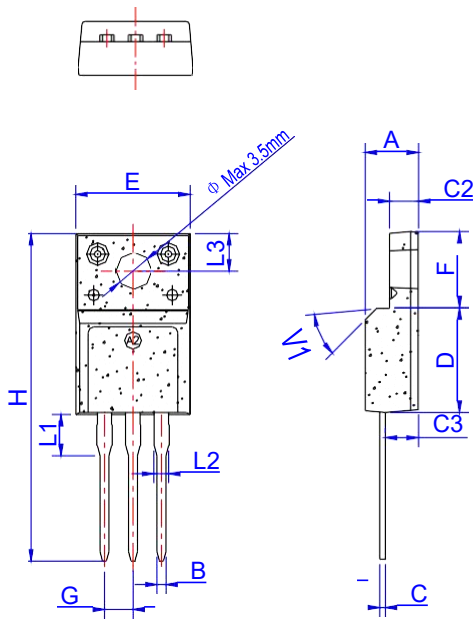
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)
Figure1. Output Characteristics

Figure2. Transfer Characteristics

Figure3. BVDSS vs Junction Temperature

Figure4. ID vs Junction Temperature

Figure5. VGS(th) vs Junction Temperature

Figure6. Rds(on) Vs Junction Temperature


Figure7. Gate Charge

Figure8. Capacitance vs Vds

Figure9. Source- Drain Diode Forward

Figure10. Safe Operation Area

Figure11. Normalized Maximum Transient Thermal Impedance


Package Mechanical Data



TO-220F

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	

Package Information -TO-220F

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	50	1,000	5,000


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