General Description

The AGM12T05F 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
120V	5.5mΩ	100A

TO-220F Pin Configuration

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM12T05F	AGM12T05F	TO-220F	----	----	1000

Table 1. Absolute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	120	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	100	A
	Drain Current-Continuous(Tc=100℃)	63	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	400	A
PD	Maximum Power Dissipation(Tc=25℃)	125	w
	Maximum Power Dissipation(Tc=100℃)	50	w
EAS	Avalanche energy **(Note 3)**	240	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	---	63	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	1	℃/W

Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	120	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.6	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=20A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	5.5	7.0	mΩ
		VGS=4.5V, ID=15A	--	7.5	10	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=60V,VGS=0V, F=1MHZ	--	3200	--	pF
Coss	Output Capacitance		--	840	--	pF
Crss	Reverse Transfer Capacitance		--	31	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.7	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V, ID=1A,RGEN=3.3Ω	--	20	--	nS
tr	Turn-on Rise Time		--	13	--	nS
td(off)	Turn-Off Delay Time		--	36	--	nS
tf	Turn-Off Fall Time		--	18	--	nS
Qg	Total Gate Charge	VGS=60V, VDS=10V, ID=20A	--	88	--	nC
Qgs	Gate-Source Charge		--	10	--	nC
Qgd	Gate-Drain Charge		--	24	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	100	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.0	V
trr	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , TJ=25℃	--	--	43	ns
Qrr	Reverse Recovery Charge		--	--	88	nc

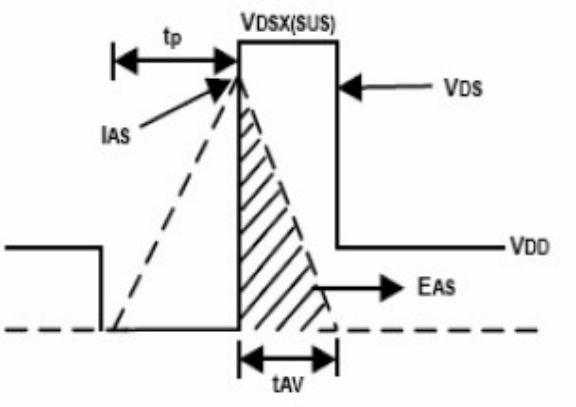
Notes 1.The maximum current rating is package limited.

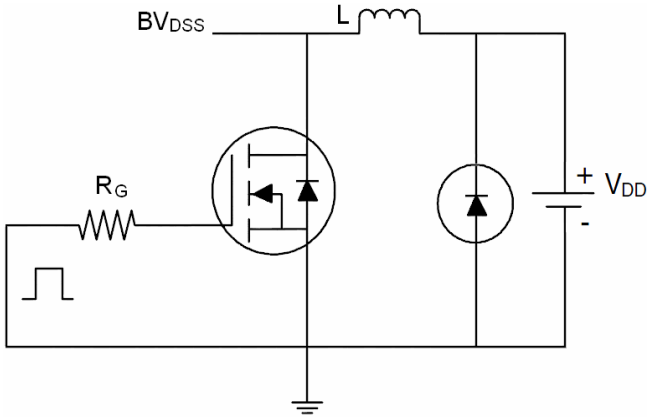
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃

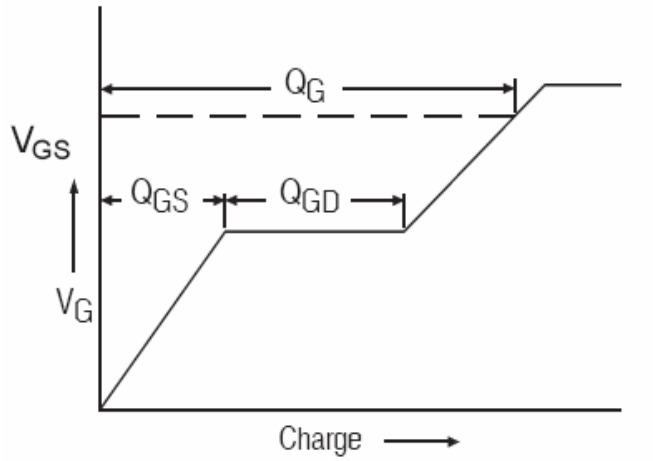
Test Circuit

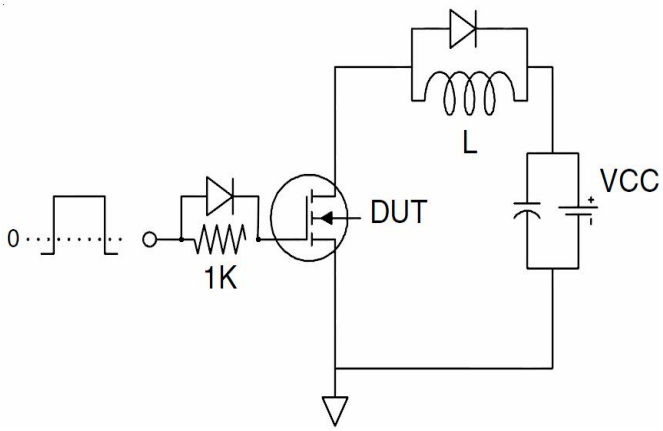
1) E_{AS} Test Circuits



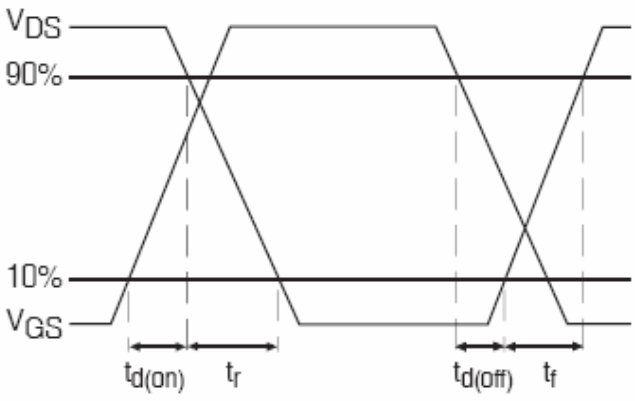


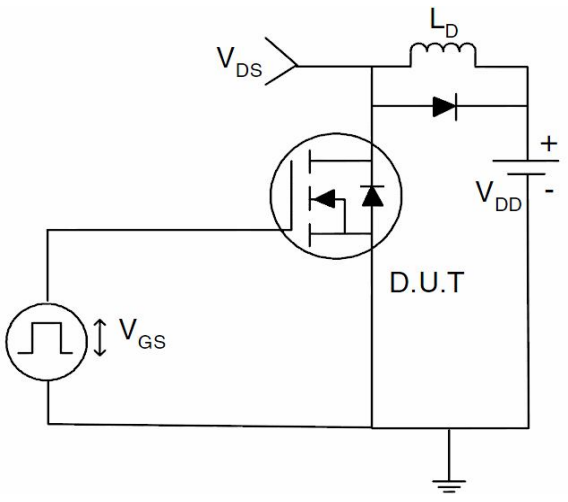
2) **Gate Charge Test Circuit:**





3) **Switch Time Test Circuit:**





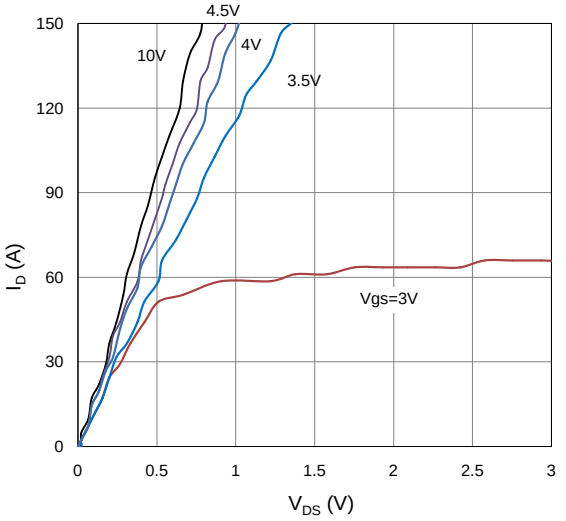


Fig.1 Typical Output Characteristics

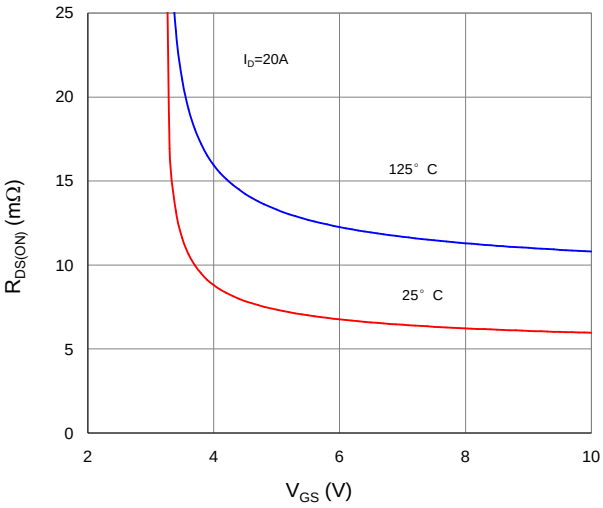


Fig.2 On-Resistance vs. Gate-Source Voltage

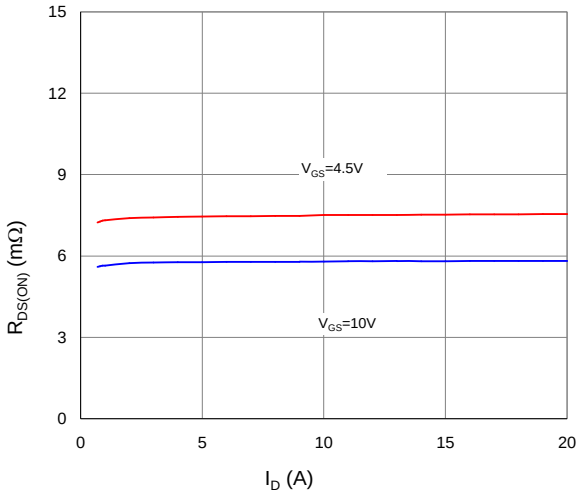


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

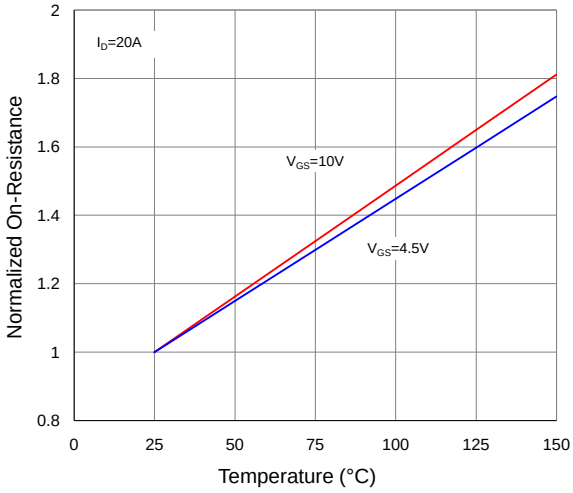


Fig.4 Normalized On-Resistance vs. Junction Temperature

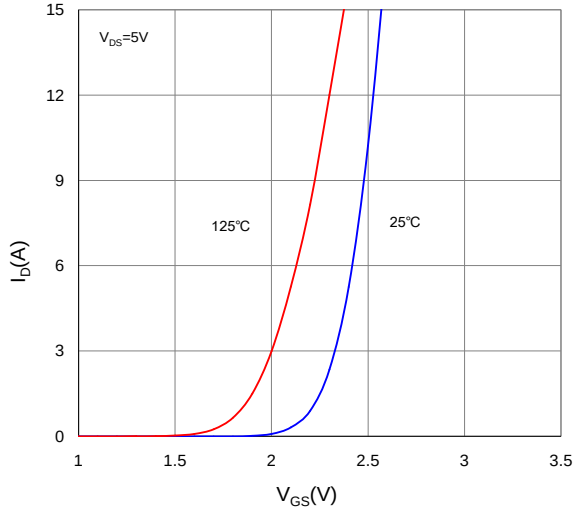


Fig.5 Typical Transfer Characteristics

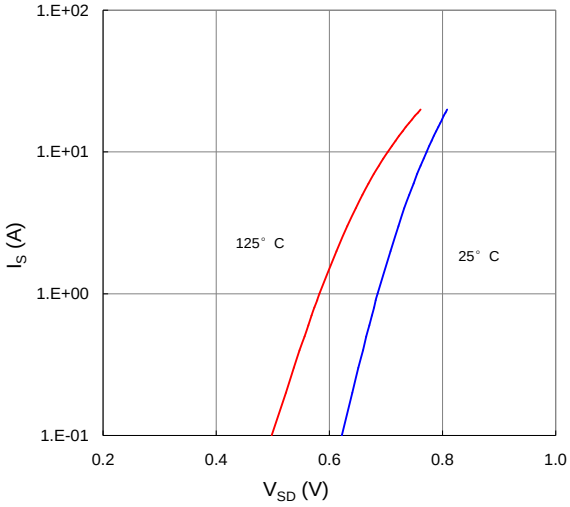


Fig.6 Typical Source-Drain Diode Forward Voltage

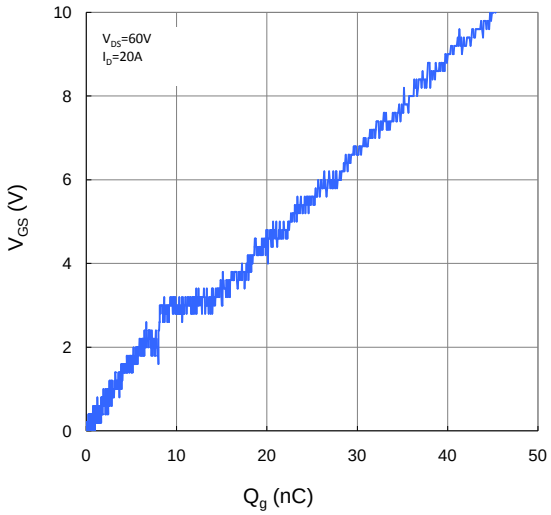


Fig.7 Typical Gate-Charge vs. Gate-to-Source Voltage

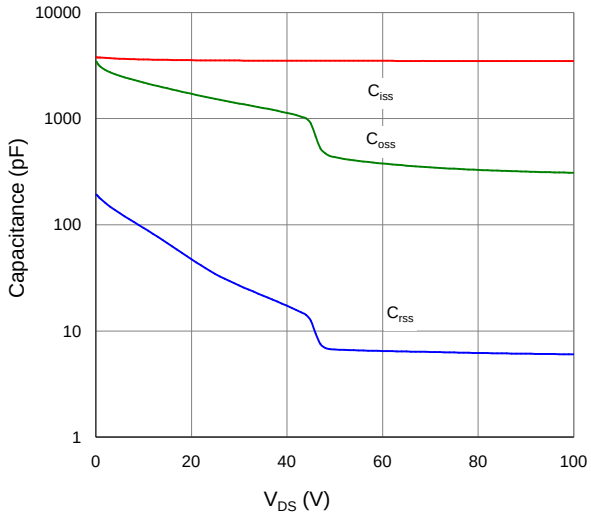


Fig.8 Typical Capacitance vs. Drain-to-Source Voltage

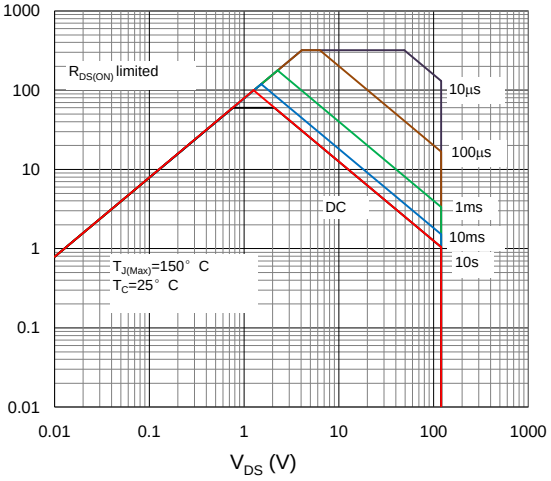


Fig.9 Maximum Safe Operating Area

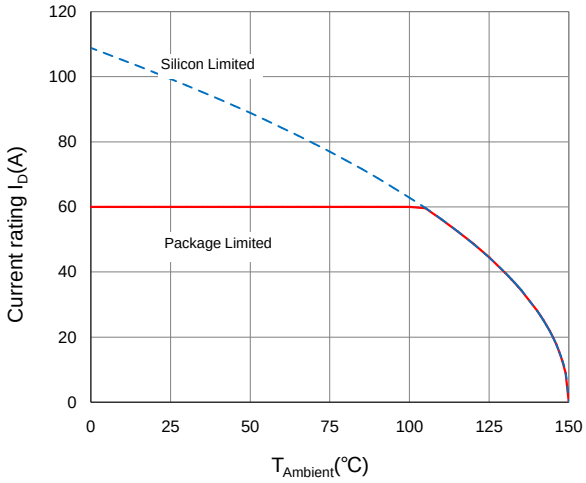


Fig.10 Maximun Drain Current vs. Case Temperature

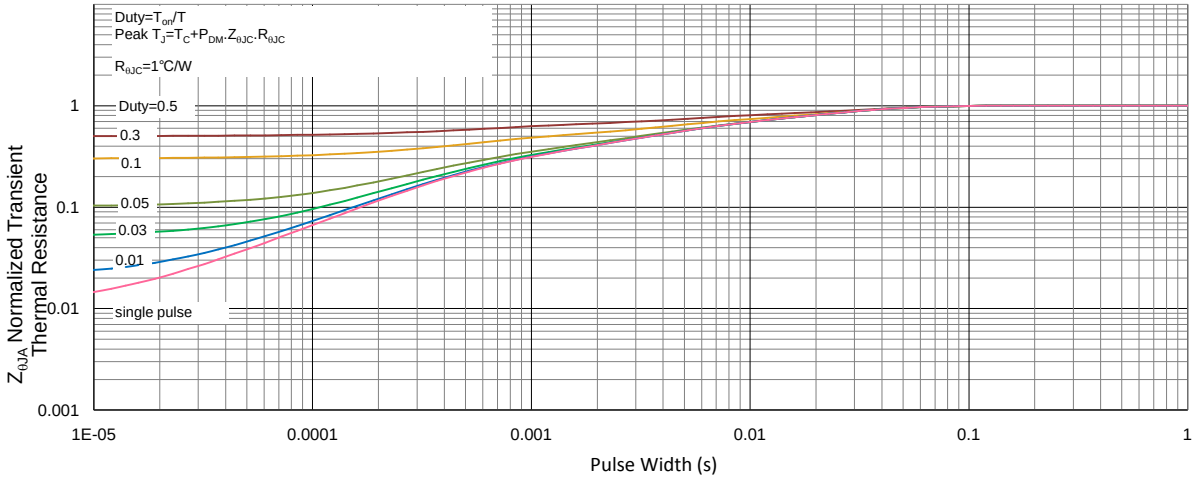
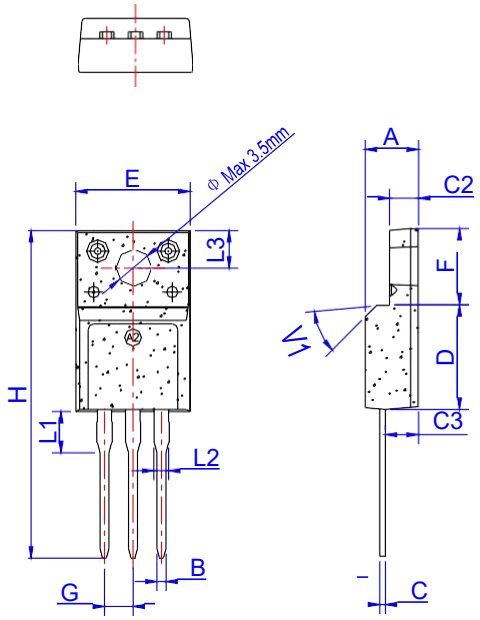


Fig.11 Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

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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