

General Description

The AGM12N65F 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

- Electronic Ballast
- Electronic Transformer
- Switch Mode Power Supply

Product Summary

BVDSS	RDSON	ID
650V	0.76Ω	12A

TO-220F Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM12N65F	AGM12N65F	TO-220F	----	----	1000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	650	V
VGS	Gate-Source Voltage (VDS=0V)	±30	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	12	A
	Drain Current-Continuous(Tc=100°C)	4.8	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	48	A
PD	Maximum Power Dissipation(Tc=25°C)	65	w
	Maximum Power Dissipation(Tc=100°C)	26	w
EAS	Avalanche energy (Note 3)	352	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	---	62.5	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	1.92	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	650	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=650V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±30V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	3.0	--	4.0	V
gFS	Forward Transconductance	VDS=15V,ID=6.0A	--	--	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=6.0A	--	0.76	0.84	Ω
		VGS=4.5V, ID=6.0A	--	--	--	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V,VGS=0V, F=1MHZ	--	1641	--	pF
Coss	Output Capacitance		--	162	--	pF
Crss	Reverse Transfer Capacitance		--	20	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VDD=325V, ID=12A,RGEN=25Ω	--	47	--	nS
tr	Turn-on Rise Time		--	32	--	nS
td(off)	Turn-Off Delay Time		--	219	--	nS
tf	Turn-Off Fall Time		--	58	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=520V, ID=12A	--	51	--	nC
Qgs	Gate-Source Charge		--	7.1	--	nC
Qgd	Gate-Drain Charge		--	24.5	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	12	A
VSD	Forward on Voltage	VGS=0V,ISD=6A	--	--	1.4	V
trr	Reverse Recovery Time	Vgs=0V,IF=12A ,	--	579	--	ns
Qrr	Reverse Recovery Charge	dI/dt=100A/μs , TJ=25℃	--	2.9	--	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 Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

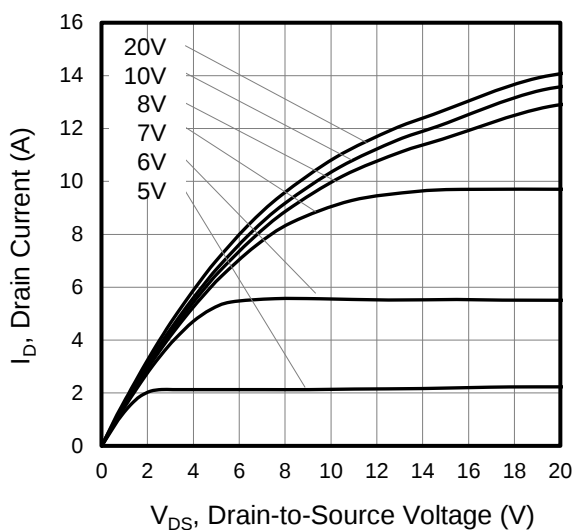


Figure 2. Body Diode Forward Voltage

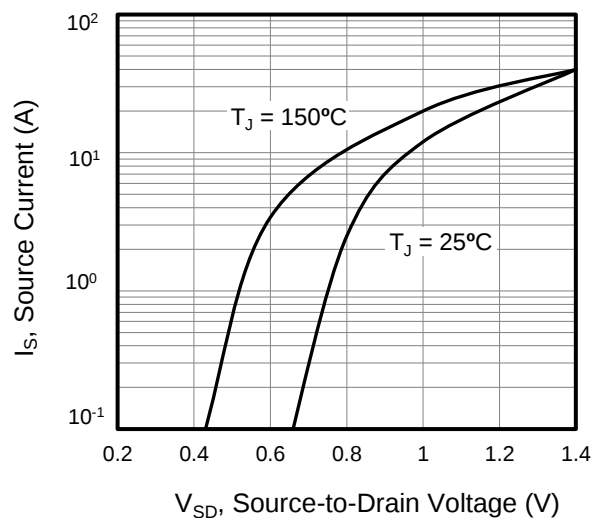


Figure 3. Drain Current vs. Temperature

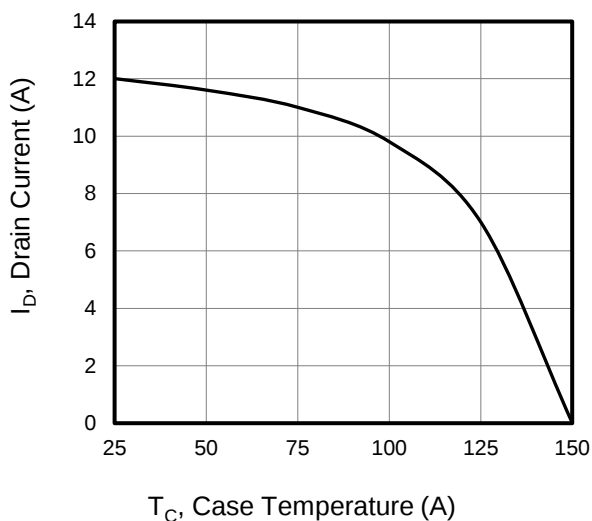


Figure 4. BV_{DSS} Variation vs. Temperature

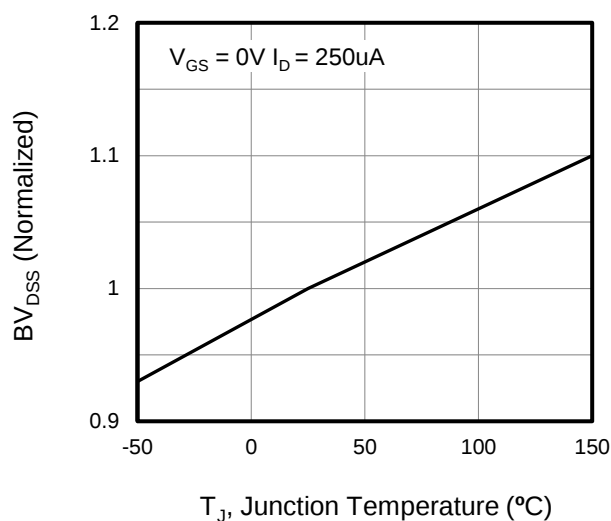


Figure 5. Transfer Characteristics

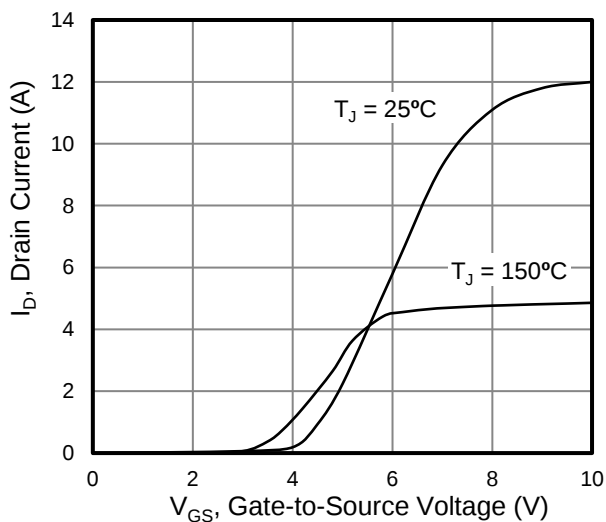
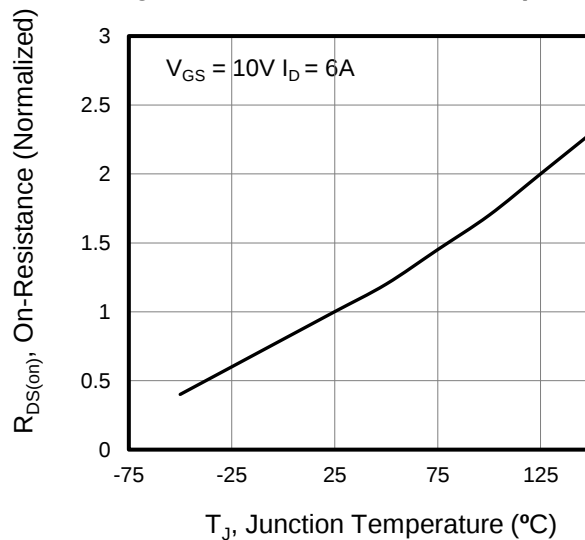


Figure 6. On-Resistance vs. Temperature



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Capacitance

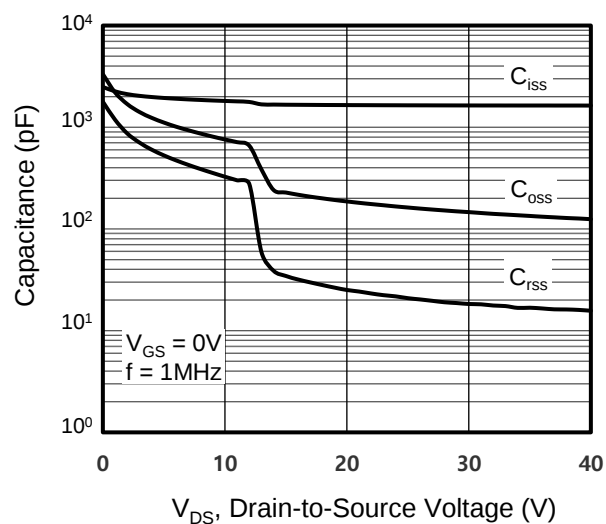


Figure 8. Gate Charge

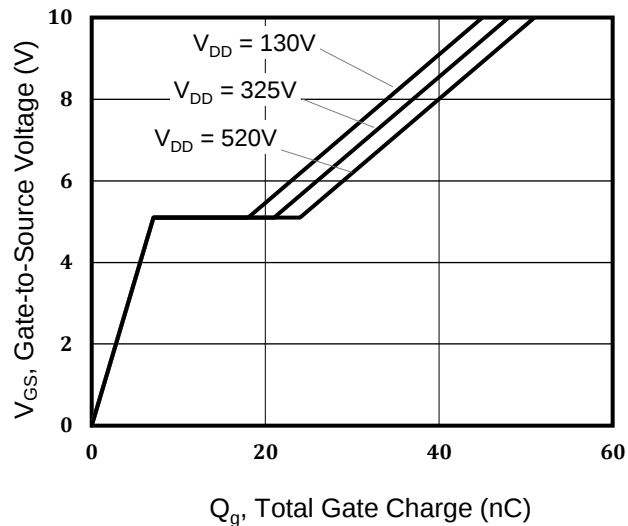


Figure 9. Transient Thermal Impedance

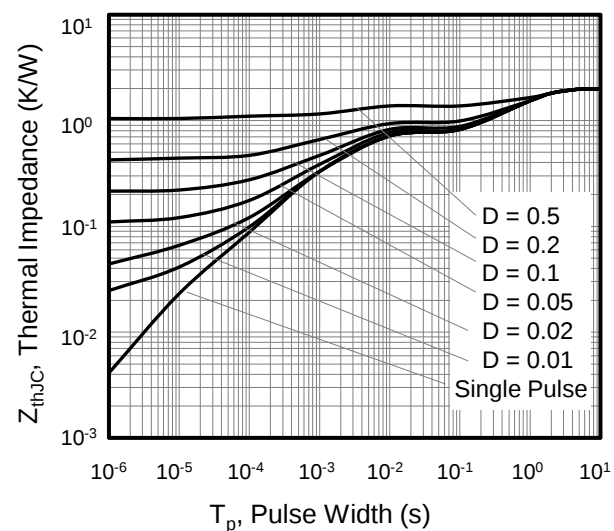


Figure A: Gate Charge Test Circuit and Waveform

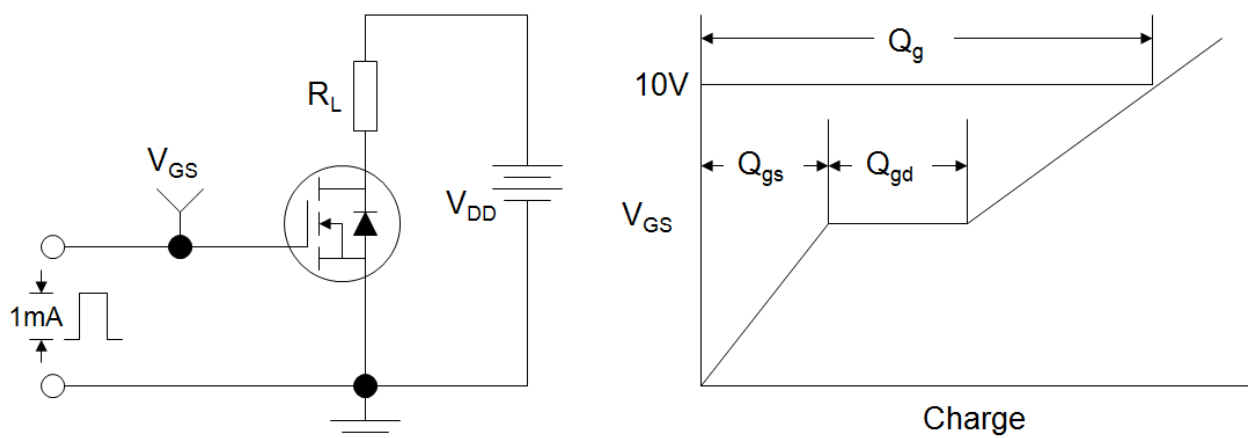


Figure B: Resistive Switching Test Circuit and Waveform

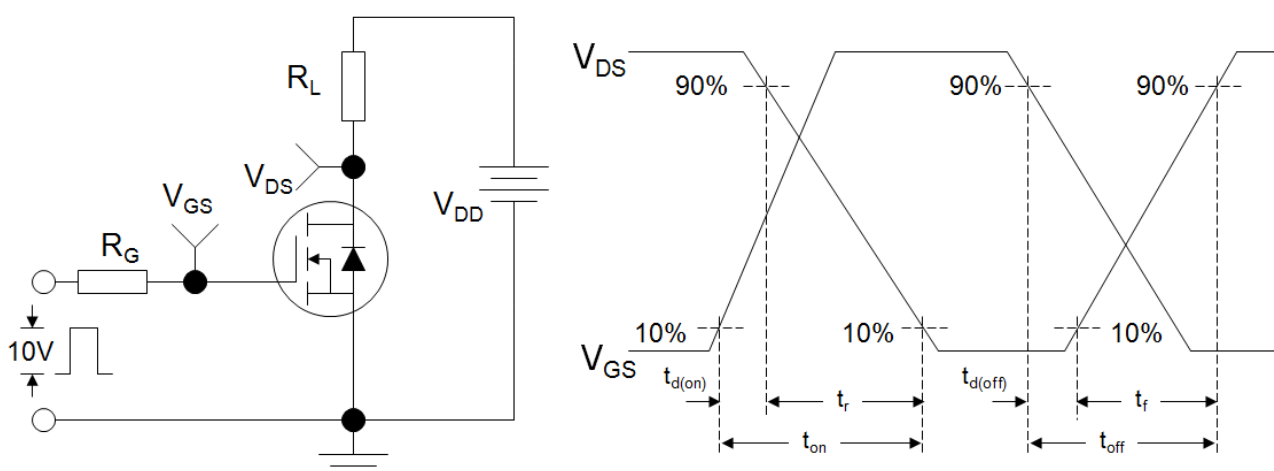
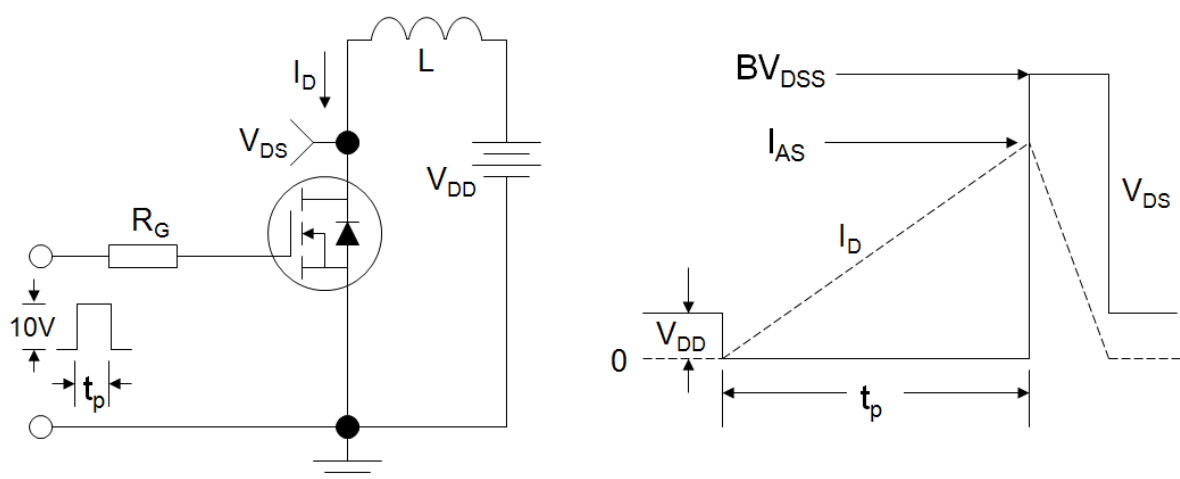
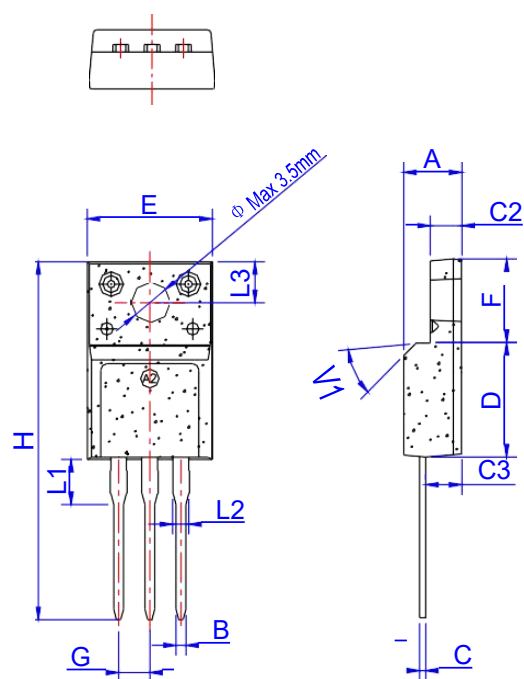


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



TO-220F Package Mechanical Data



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°	

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