

General Description

The AGM609F 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

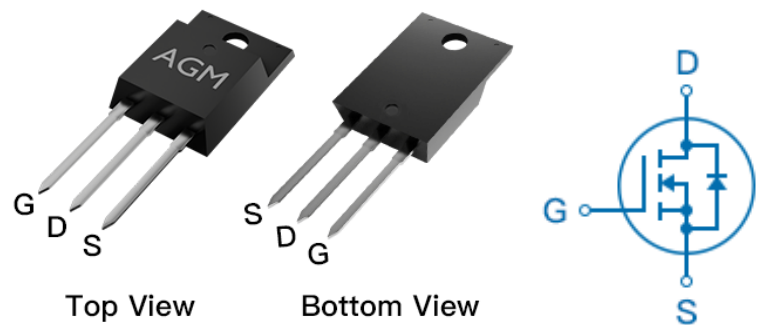
Application

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

Product Summary

BVDSS	RDSON	ID
60V	6.3mΩ	80A

TO-220F Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM609F	AGM609F	TO-220F	----	---	1000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	60	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	80	A
	Drain Current-Continuous(Tc=100°C)	48	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	320	A
PD	Maximum Power Dissipation(Tc=25°C)	62.5	w
	Maximum Power Dissipation(Tc=100°C)	25	w
EAS	Avalanche energy (Note 3)	110	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	---	60	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	2.0	°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	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,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	1.7	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=15A	--	23	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	6.3	8.5	mΩ
		VGS=4.5V, ID=15A	--	8.0	12.5	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=30V,VGS=0V, F=100MHZ	--	1481	--	pF
Coss	Output Capacitance		--	442	--	pF
Crss	Reverse Transfer Capacitance		--	18	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.2	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V, RL=1.5Ω,RGEN=3Ω	--	7.5	--	nS
tr	Turn-on Rise Time		--	5.5	--	nS
td(off)	Turn-Off Delay Time		--	29.3	--	nS
tf	Turn-Off Fall Time		--	5.9	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=30V, ID=30A	--	52.1	--	nC
Qgs	Gate-Source Charge		--	7.0	--	nC
Qgd	Gate-Drain Charge		--	15.3	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	80	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	IS=20A , dI/dt=100A/μs , TJ=25℃	--	26	--	ns
Qrr	Reverse Recovery Charge		--	38	--	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,VDD=30V,Vgs=10V,ID=21A, L=0.5mH, RG=25ohm

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

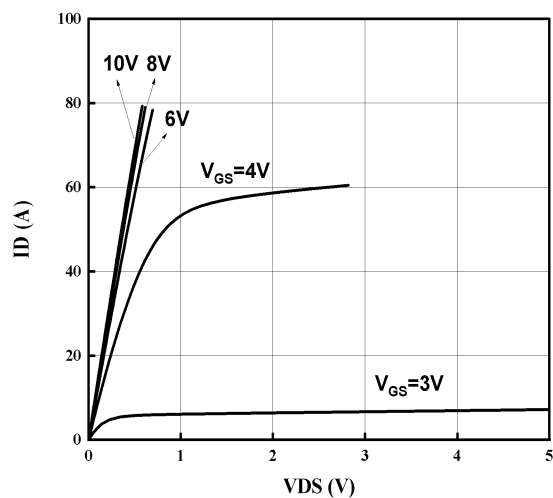


Fig1. Typical Output Characteristics

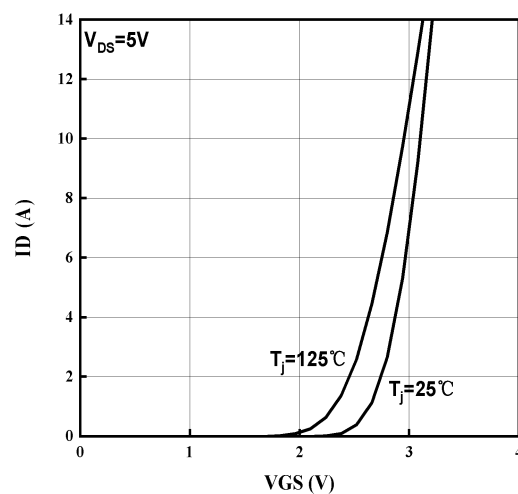


Fig2. Typical Transfer Characteristics

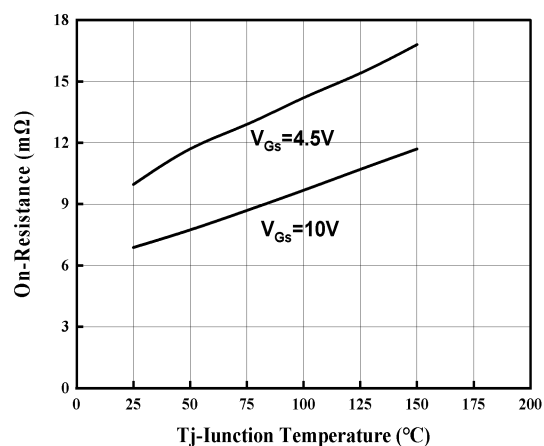


Fig3. Normalized On-Resistance Vs. Temperature

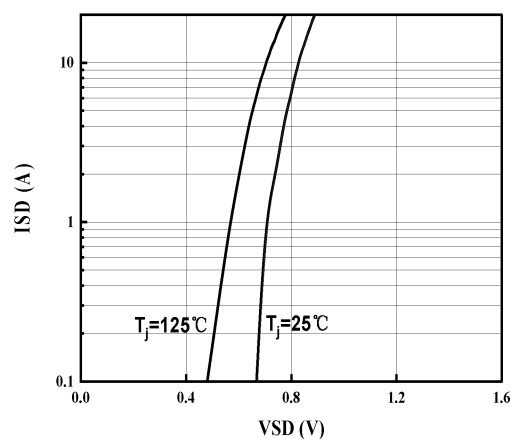


Fig4. Typical Source-Drain Diode Forward Voltage

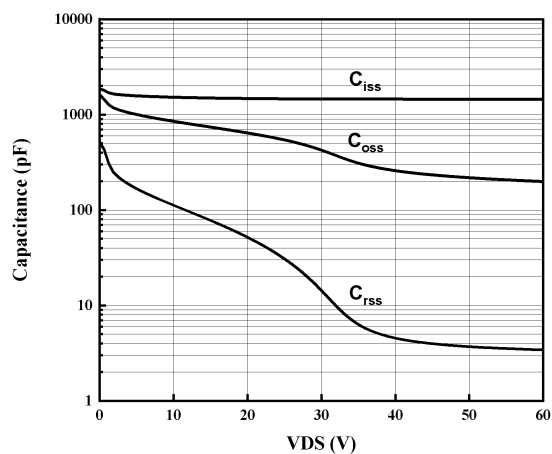


Fig5. Typical Capacitance

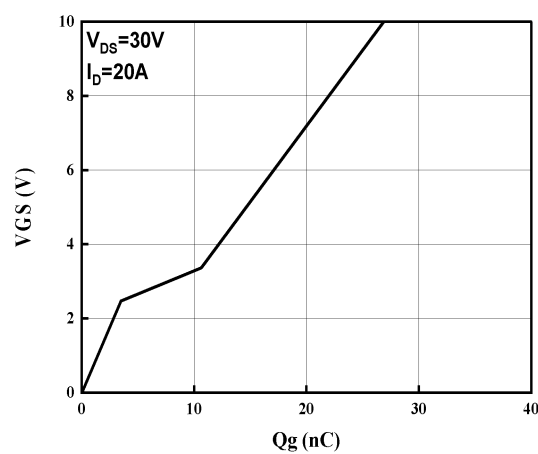


Fig6. Typical Gate Charge

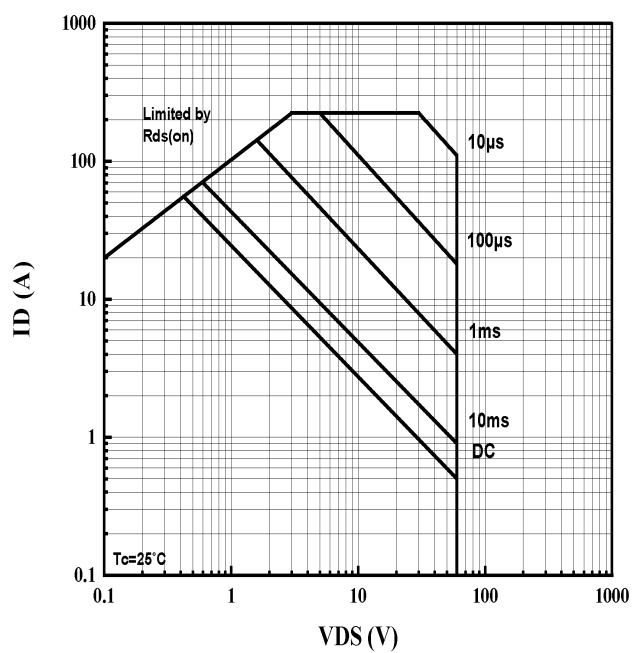


Fig7. Safe Operating Area

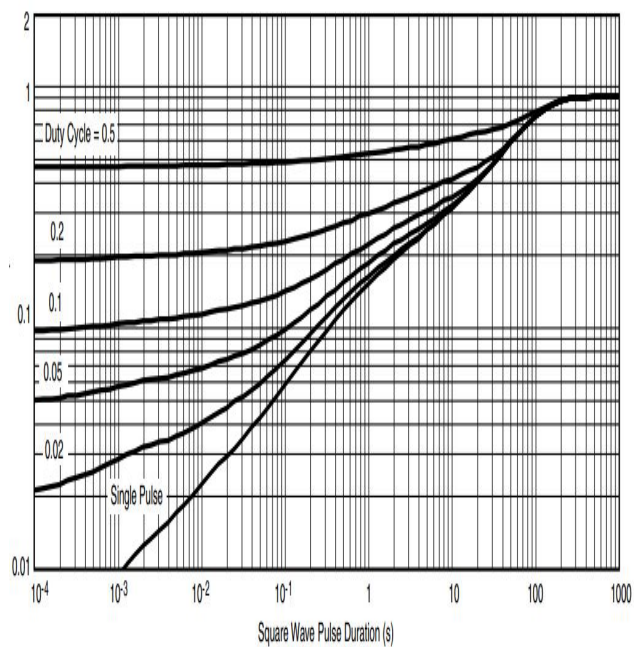


Fig8. Max. transient thermal impedance

Test Circuit

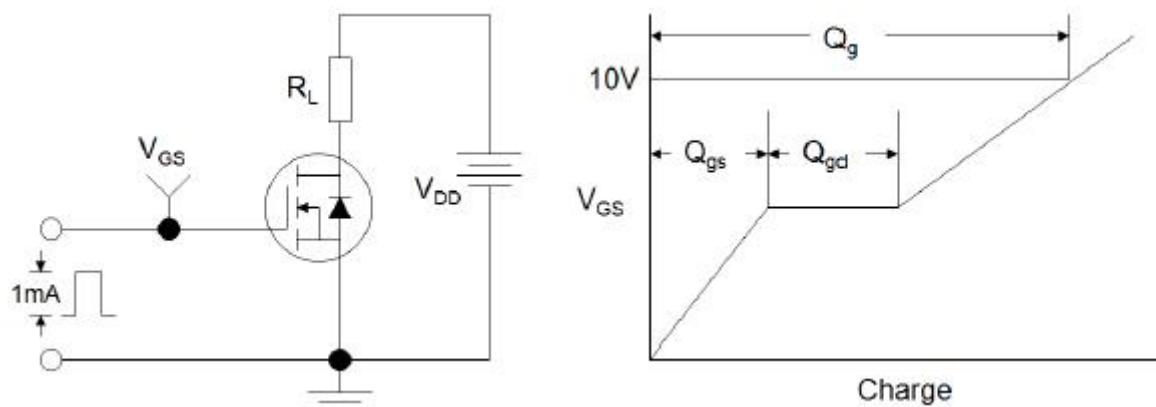


Figure1:Gate Charge Test Circuit & Waveform

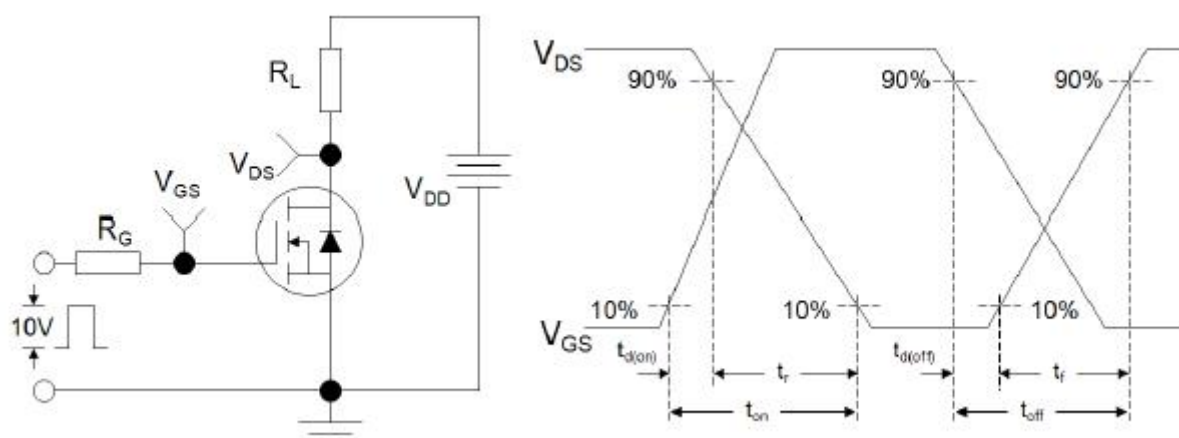


Figure 2: Resistive Switching Test Circuit & Waveforms

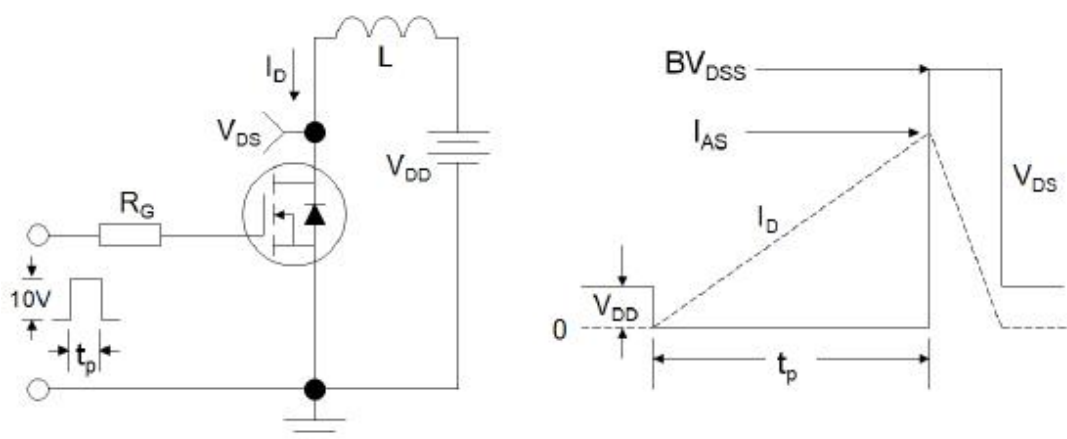
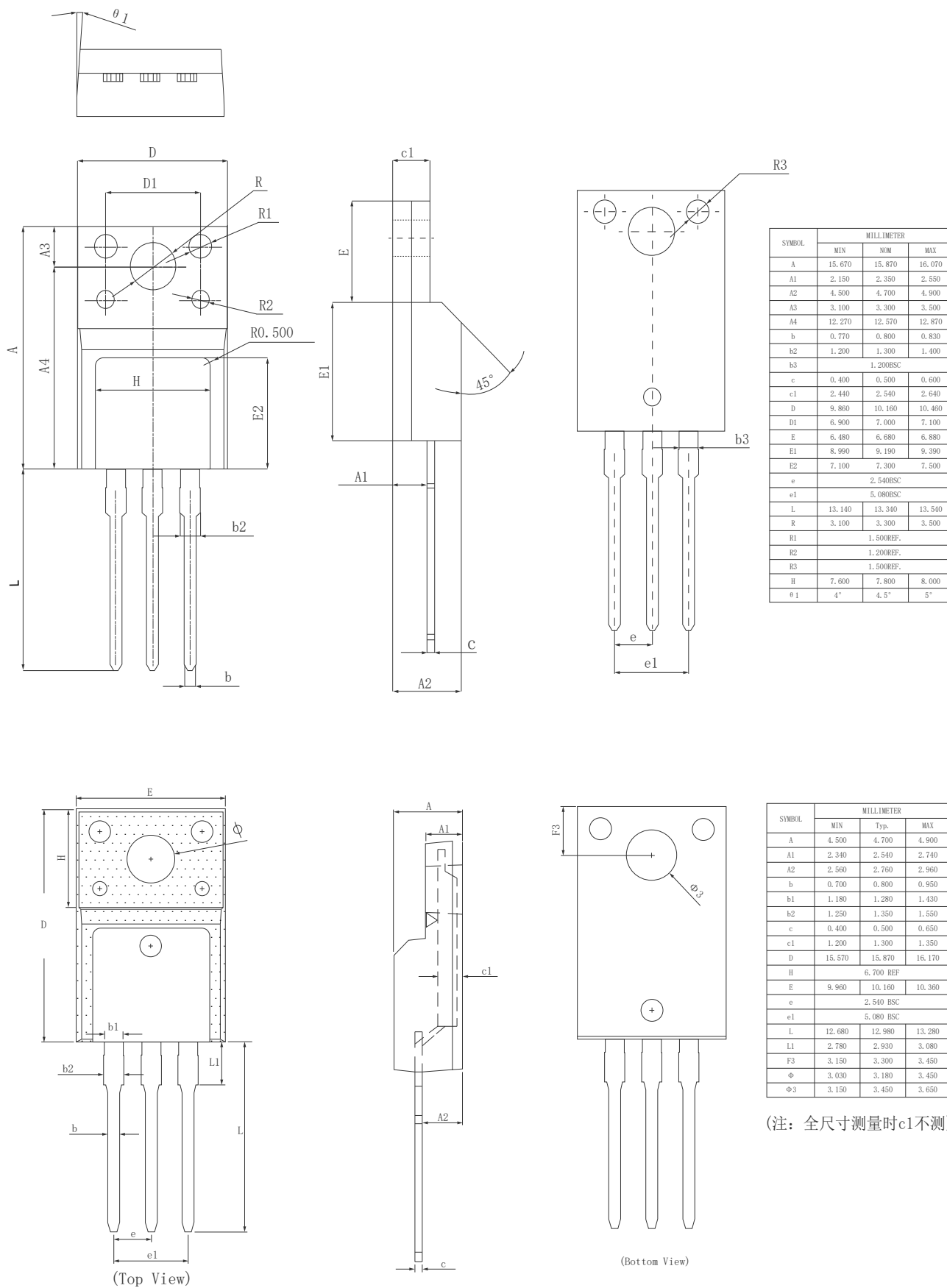


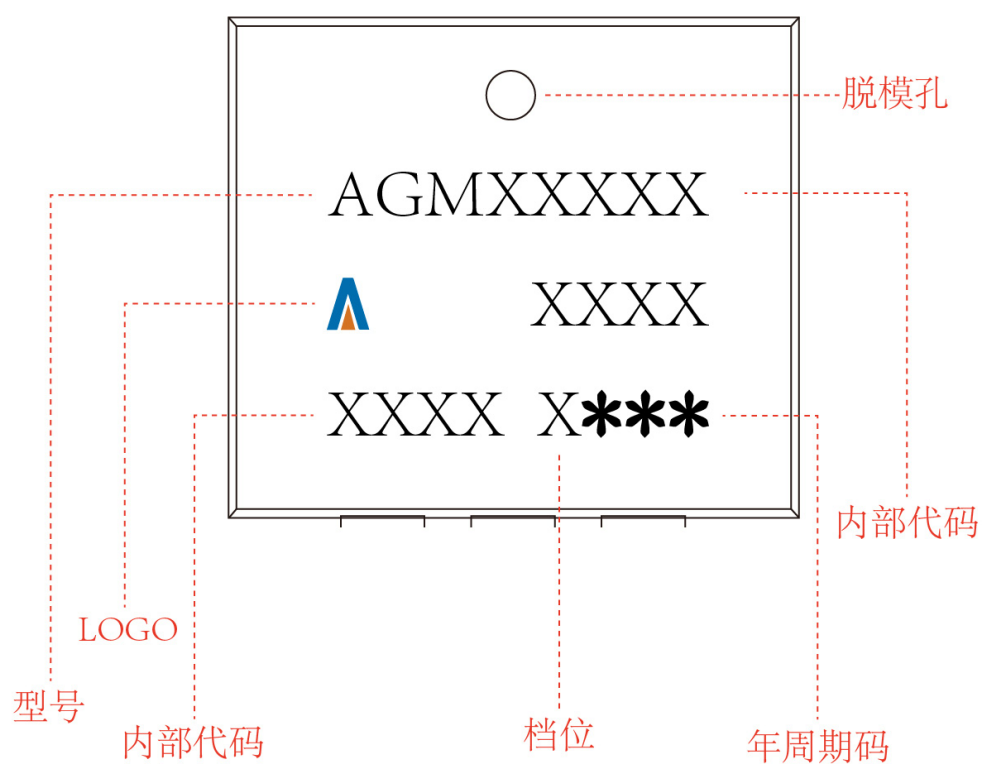
Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Dimensions (TO-220F)



TO-220F

Marking Instructions:



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