

General Description

The AGM20N65F 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

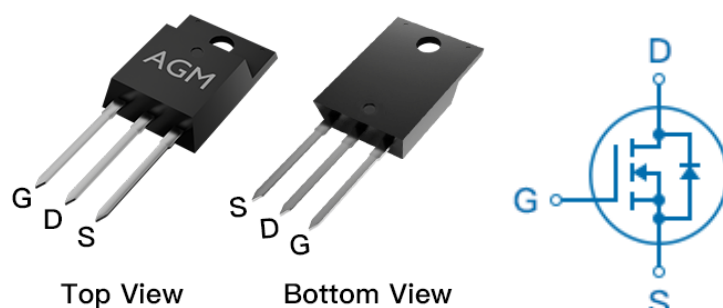
Application

- Electronic Ballast
- Electronic Transformer
- Switch Mode Power Supply

Product Summary

BVDSS	RDSON	ID
650V	0.36Ω	20A

TO-220F Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM20N65F	AGM20N65F	TO-220F	----	----	1000

Table 1. Absolute Maximum Ratings (TA=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)	20	A
	Drain Current-Continuous(Tc=100°C)	11	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	80	A
PD	Maximum Power Dissipation(Tc=25°C)	62	w
	Maximum Power Dissipation(Tc=100°C)	25	w
EAS	Avalanche energy (Note 3)	1125	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	---	39.7	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	2.01	°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	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	2.0	--	4.0	V
gFS	Forward Transconductance	VDS=15V,ID=3.5A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=10A	--	0.36	0.53	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V,VGS=0V, F=1MHZ	--	3565	--	pF
Coss	Output Capacitance		--	250	--	pF
Crss	Reverse Transfer Capacitance		--	6.9	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3.3	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VDD=325V, ID=20A,RGEN=25Ω	--	54	--	nS
tr	Turn-on Rise Time		--	50	--	nS
td(off)	Turn-Off Delay Time		--	400	--	nS
tf	Turn-Off Fall Time		--	120	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=520V, ID=20A	--	136	--	nC
Qgs	Gate-Source Charge		--	11	--	nC
Qgd	Gate-Drain Charge		--	36	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	20	A
VSD	Forward on Voltage	VGS=0V,ISD=10A	--	--	1.4	V
trr	Reverse Recovery Time	VDD=325V,IF=10A , dI/dt=100A/μs , TJ=25℃	--	440	--	ns
Qrr	Reverse Recovery Charge		--	7.9	--	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, VDD=50V, Vgs=10V, ID=15A, L=10mH, RG=25ohm

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

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

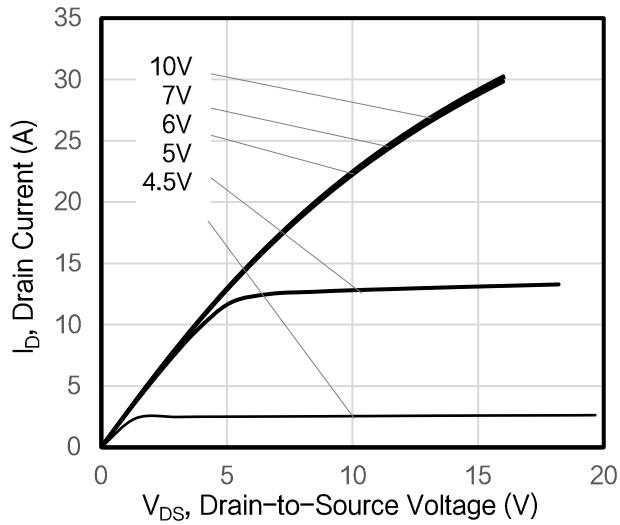


Figure 2. Body Diode Forward Voltage

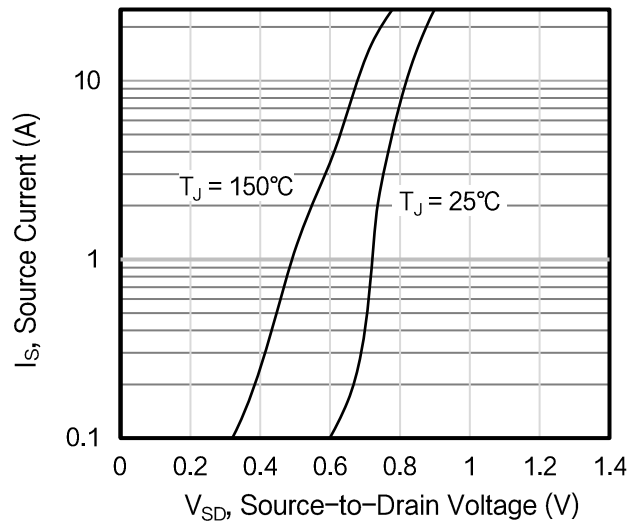


Figure 3. Drain Current vs. Temperature

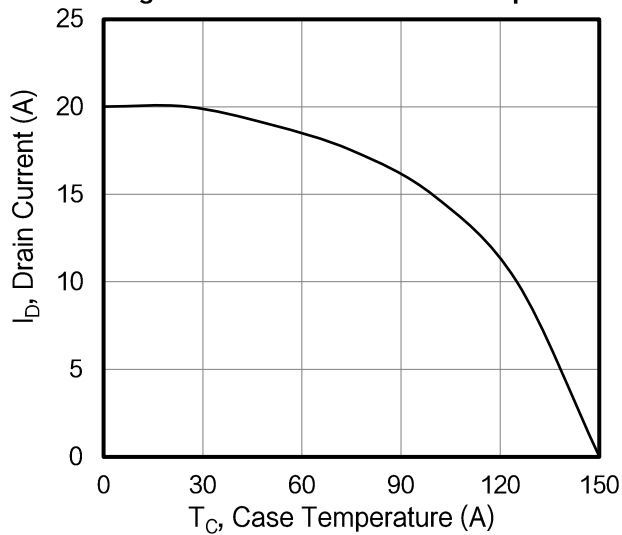


Figure 4. BV_{DSS} Variation vs. Temperature

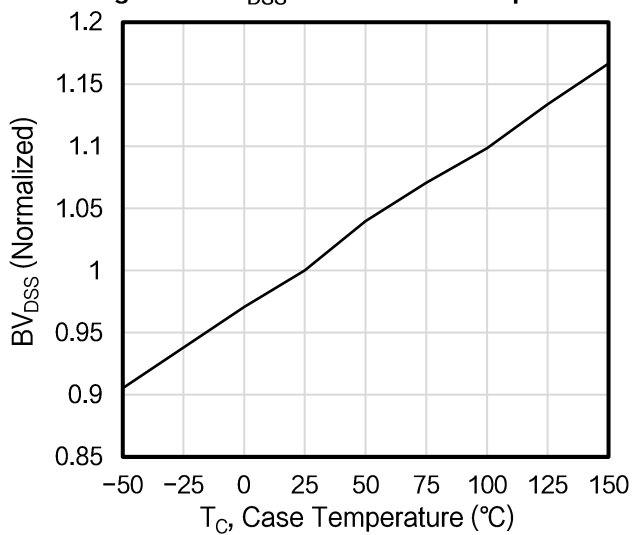


Figure 5. Transfer Characteristics

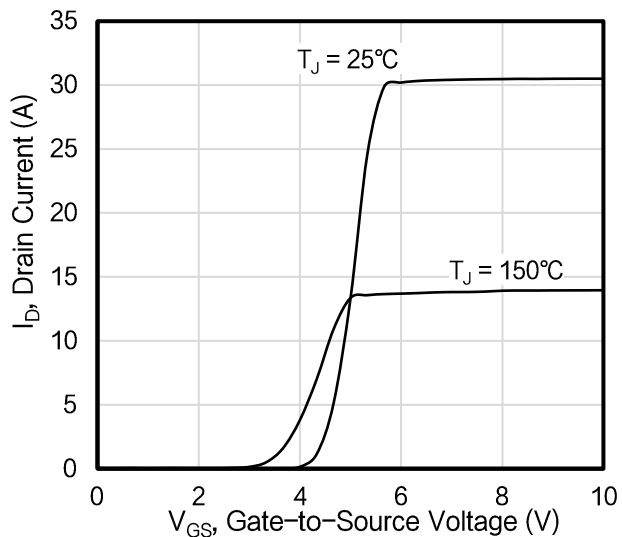
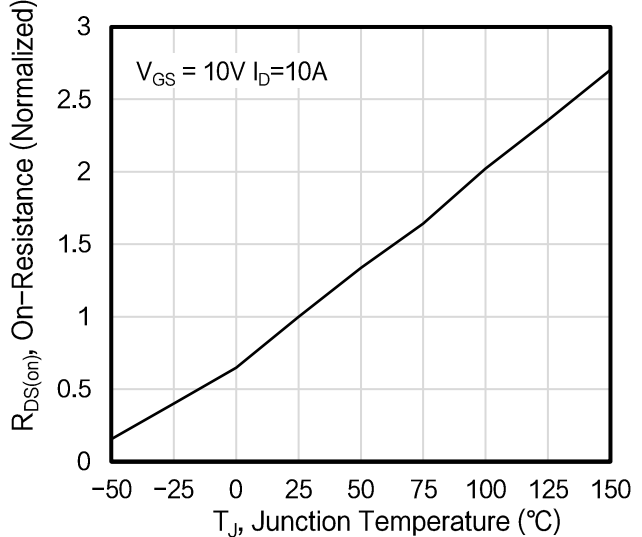


Figure 6. On-Resistance vs. Temperature



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

Figure 7. Capacitance

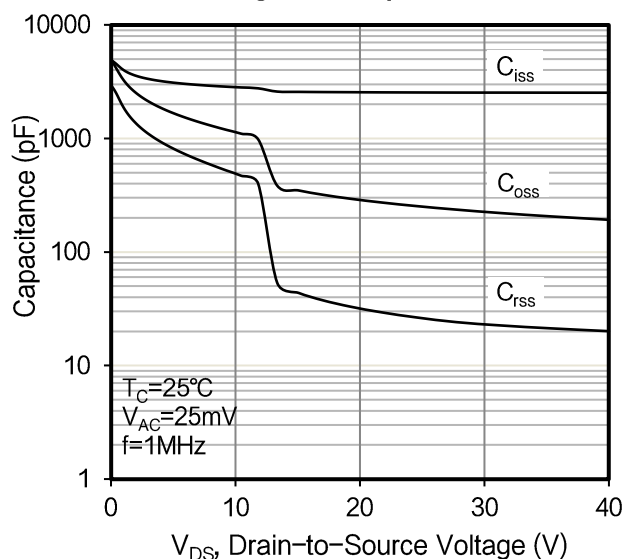


Figure 8. Gate Charge

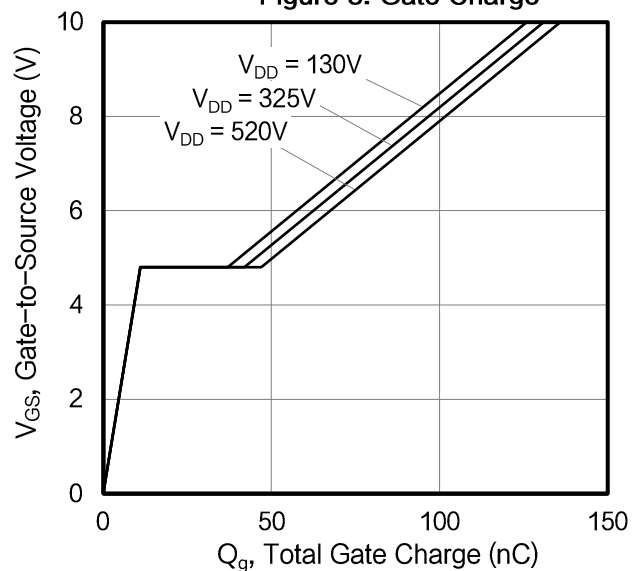


Figure 9. Transient Thermal Impedance

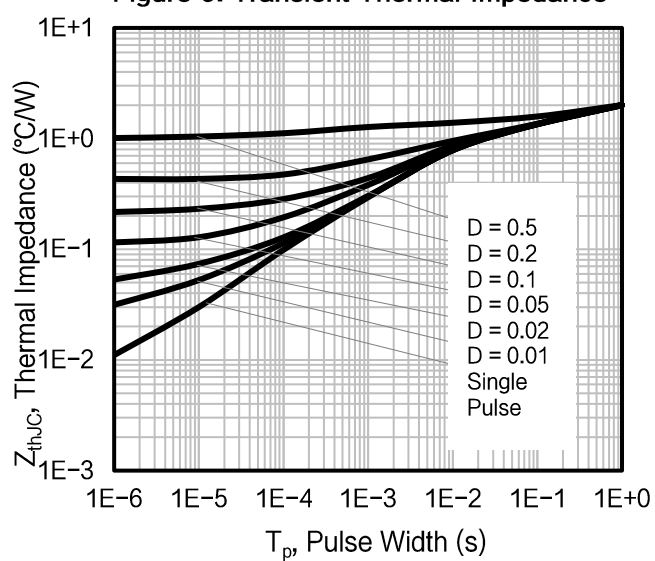


Figure A: Gate Charge Test Circuit and Waveform

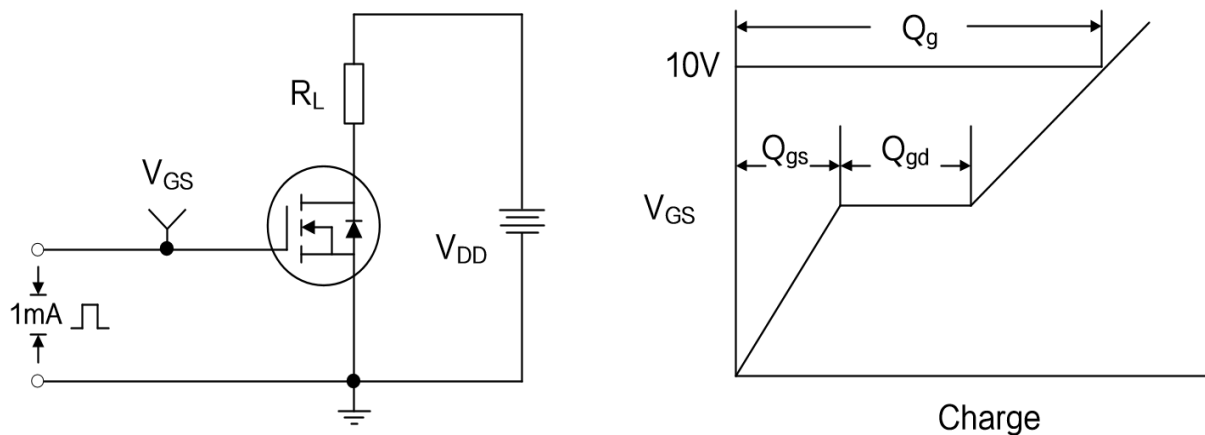


Figure B: Resistive Switching Test Circuit and Waveform

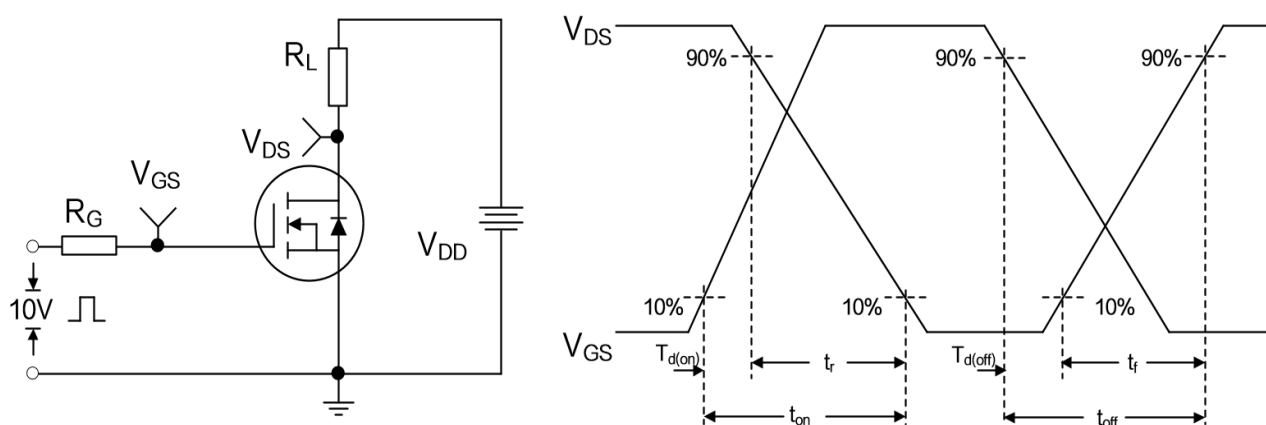
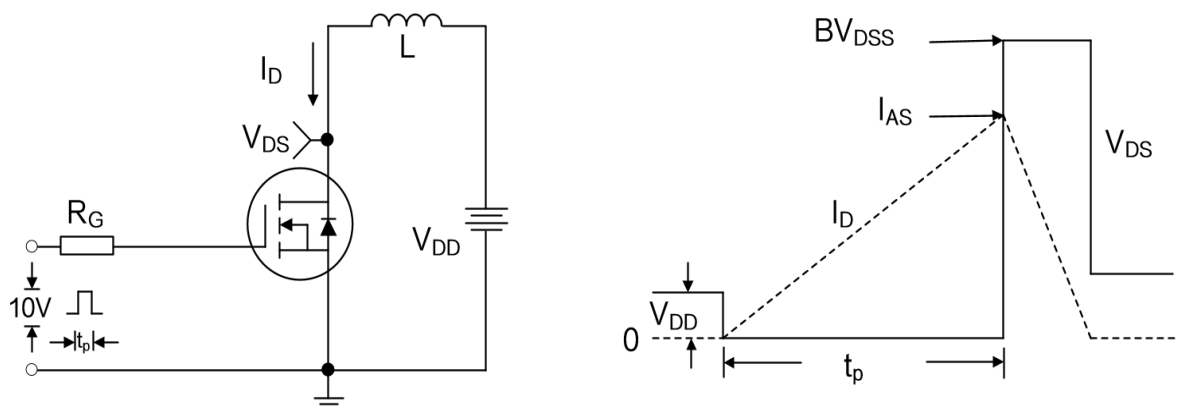
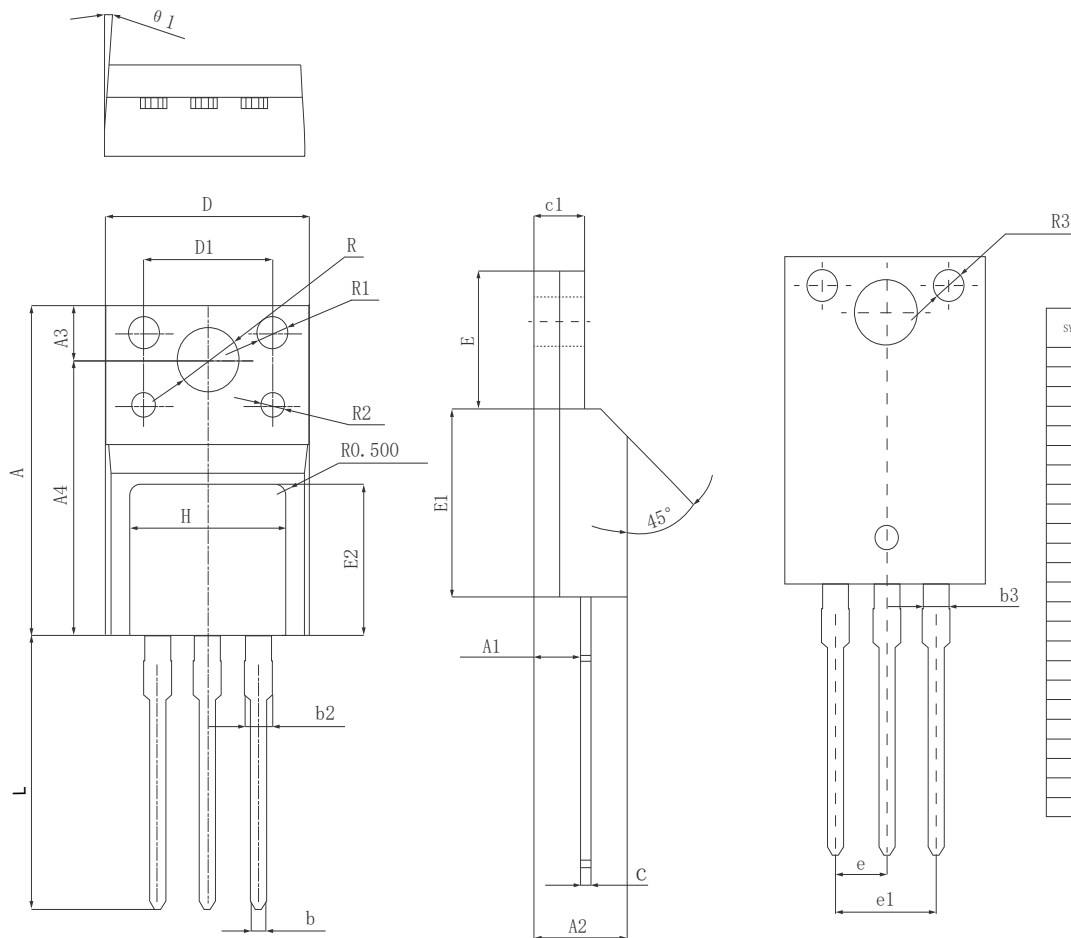


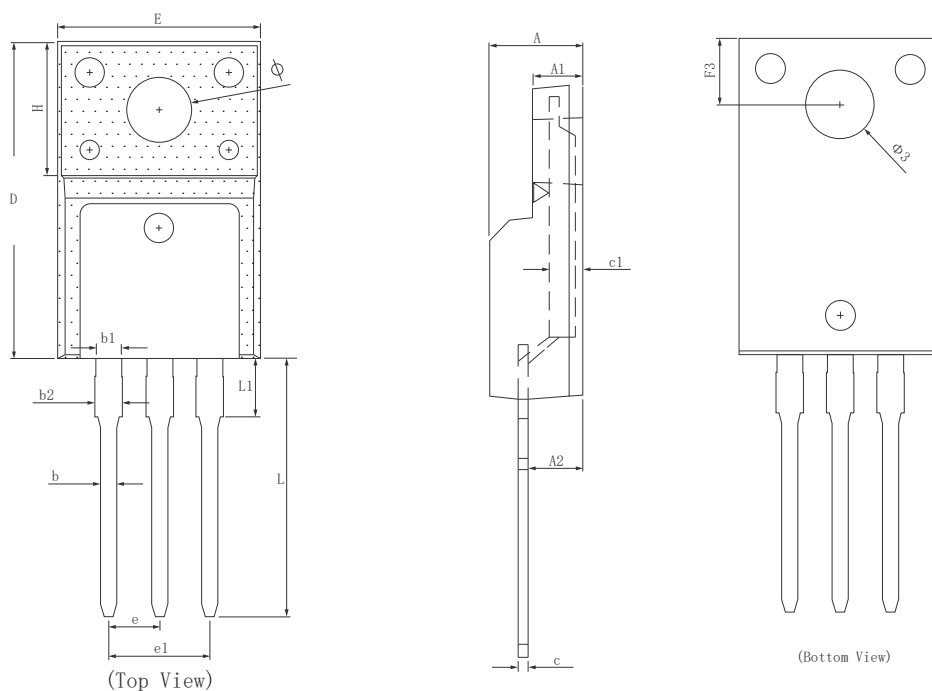
Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Dimensions (TO-220F)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	15.670	15.870	16.070
A1	2.150	2.350	2.550
A2	4.500	4.700	4.900
A3	3.100	3.300	3.500
A4	12.270	12.570	12.870
b	0.770	0.800	0.830
b2	1.200	1.300	1.400
b3	1.200RSC		
c	0.400	0.500	0.600
c1	2.440	2.540	2.640
D	9.860	10.160	10.460
D1	6.900	7.000	7.100
E	6.480	6.680	6.880
E1	8.990	9.190	9.390
E2	7.100	7.300	7.500
e	2.540RSC		
e1	5.080RSC		
L	13.140	13.340	13.540
R	3.100	3.300	3.500
R1	1.500REF.		
R2	1.200REF.		
R3	1.500REF.		
H	7.600	7.800	8.000
θ 1	4°	4.5°	5°

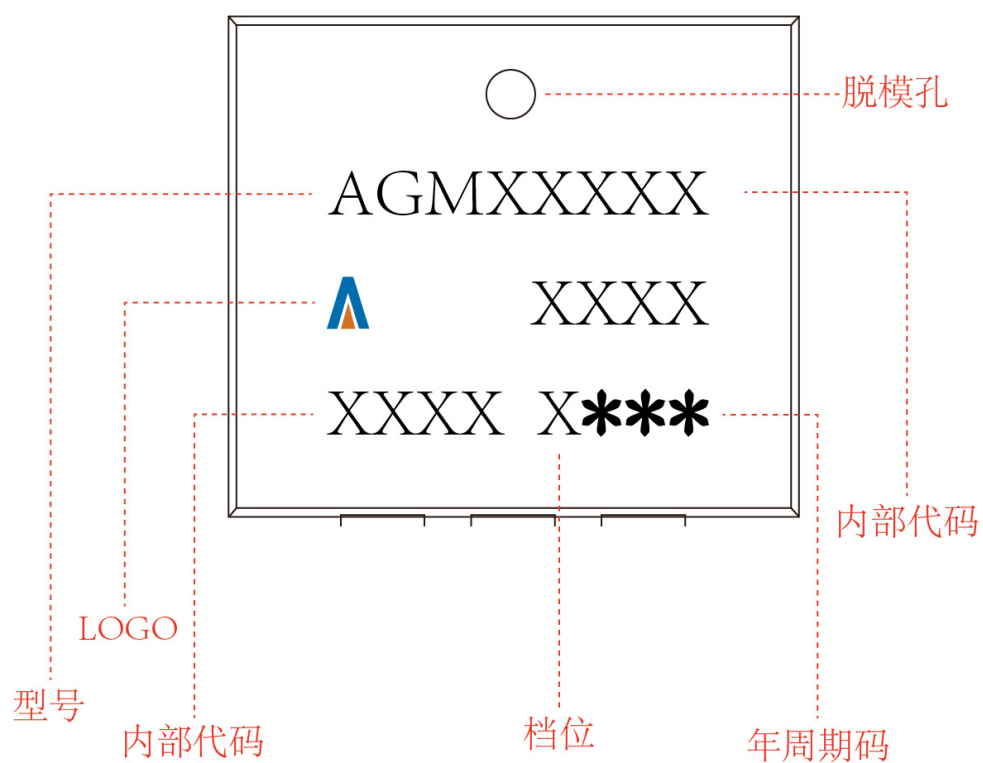


SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.500	4.700	4.900
A1	2.340	2.540	2.740
A2	2.560	2.760	2.960
b	0.700	0.800	0.950
b1	1.180	1.280	1.430
b2	1.250	1.350	1.550
c	0.400	0.500	0.650
c1	1.200	1.300	1.350
D	15.570	15.870	16.170
H	6.700 REF		
E	9.960	10.160	10.360
e	2.540 BSC		
e1	5.080 BSC		
L	12.680	12.980	13.280
L1	2.780	2.930	3.080
F3	3.150	3.300	3.450
Φ	3.030	3.180	3.450
Φ3	3.150	3.450	3.650

(注：全尺寸测量时c1不测)

TO-220F

Marking Instructions:



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