● General Description

The AGM4N65F 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 test
- 100% DVDS tested

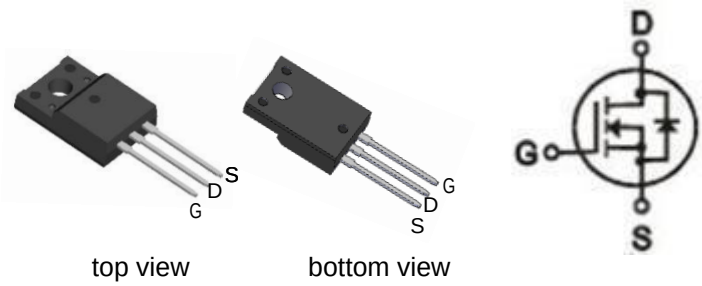
• Application

- Electronic Ballast
- Electronic Transformer
- Switch Mode Power Supply

Product Summary

BVDSS	RDSON	ID
650V	2Ω	4A

TO-220F Pin Configuration



top view bottom view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM4N65F	AGM4N65F	TO-220F	----	----	1000

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

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℃) **(Note 1)**	4	A
	Drain Current-Continuous(Tc=100℃)	2.6	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	16	A
PD	Maximum Power Dissipation(Tc=25℃)	72	w
EAS	Avalanche energy **(Note 3)**	120	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]	62.5	60	℃/W
RθJC	Thermal Resistance Junction-Case[1]	4.0	1.74	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	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
$V_{GS(th)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	2.0	--	4.0	V
gFS	Forward Transconductance	VDS=15V,ID=1A	--	--	--	S
$R_{DS(on)}$	Drain-Source On-State Resistance	VGS=10V, ID=2A	--	2.0	2.4	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V,VGS=0V, F=1.0MHZ	--	512	--	pF
Coss	Output Capacitance		--	61	--	pF
Crss	Reverse Transfer Capacitance		--	10	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VDD=325V, ID=4A,RGEN=25Ω	--	11	--	nS
tr	Turn-on Rise Time		--	24	--	nS
td(off)	Turn-Off Delay Time		--	45	--	nS
tf	Turn-Off Fall Time		--	50	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=520V, ID=4A	--	13.5	--	nC
Qgs	Gate-Source Charge		--	2	--	nC
Qgd	Gate-Drain Charge		--	6	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	4	A
VSD	Forward on Voltage	VGS=0V,ISD=4A	--	--	1.4	V
trr	Reverse Recovery Time	VGS=0V,IF=4A , dI/dt=100A/μs , TJ=25℃	--	220	--	ns
Qrr	Reverse Recovery Charge		--	3.1	--	μC

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℃

Typical Performance Characteristics

Figure1: Output Characteristics

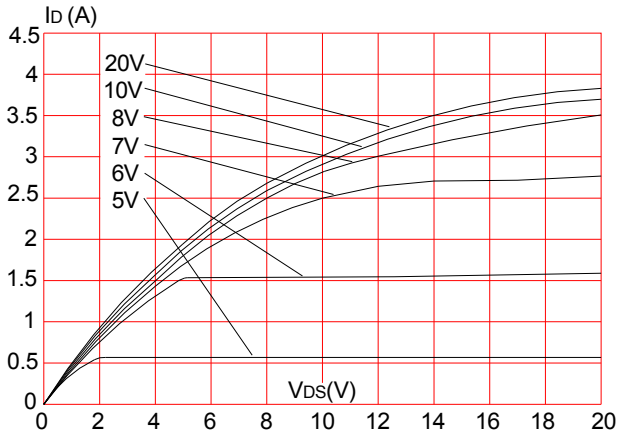


Figure 2: Typical Transfer Characteristics

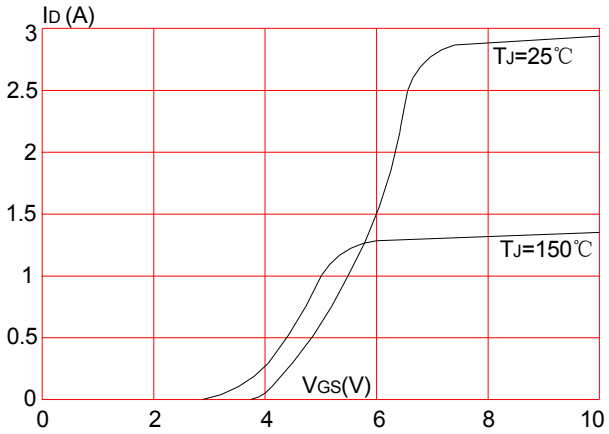


Figure 3: On-resistance vs. Drain Current

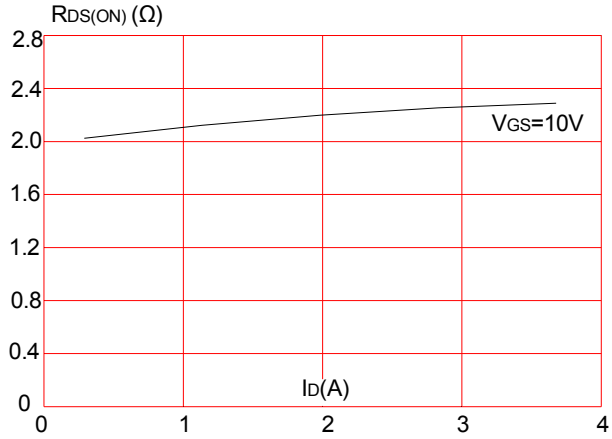


Figure 4: Body Diode Characteristics

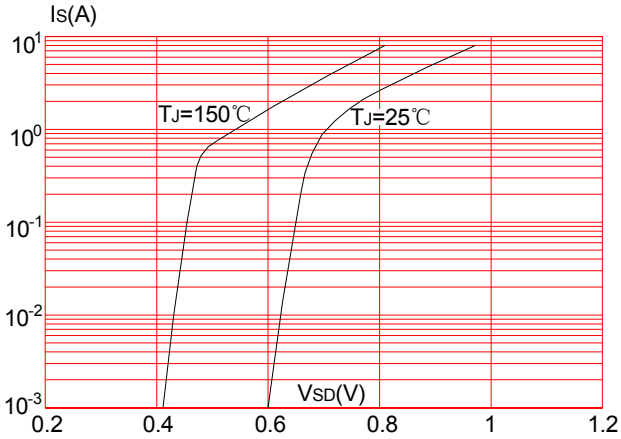


Figure 5: Gate Charge Characteristics

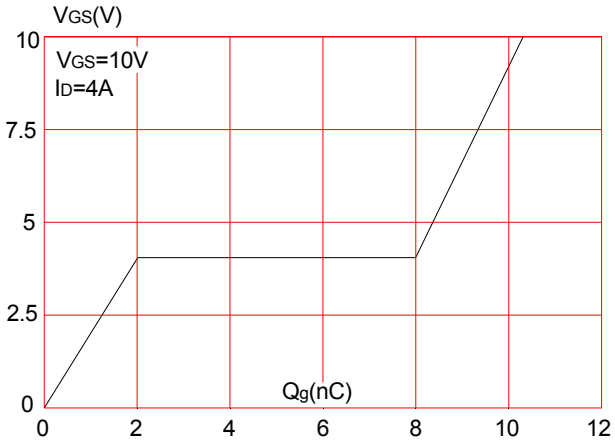


Figure 6: Capacitance Characteristics

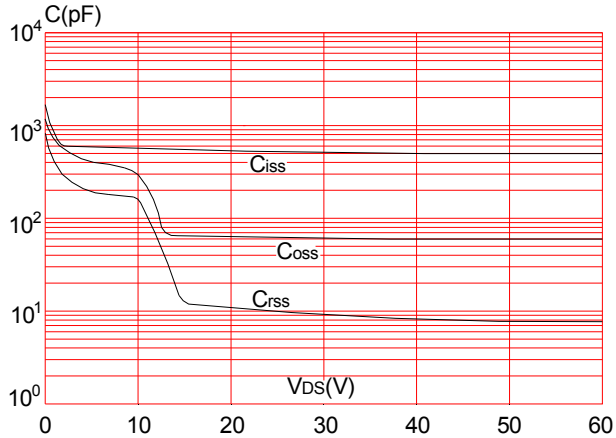


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

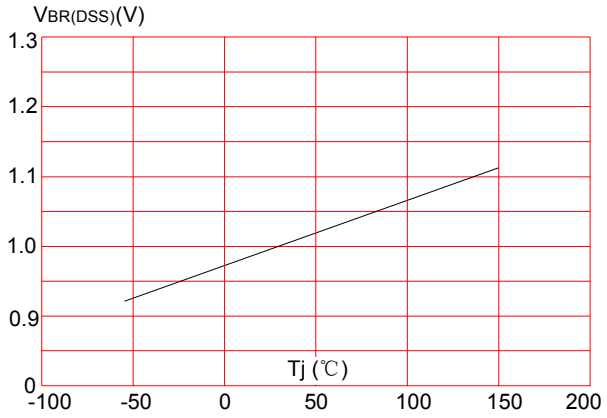


Figure 8: Normalized on Resistance vs. Junction Temperature

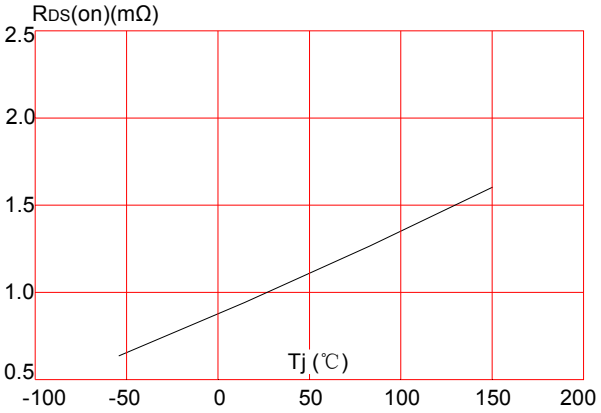


Figure 9: Maximum Safe Operating Area

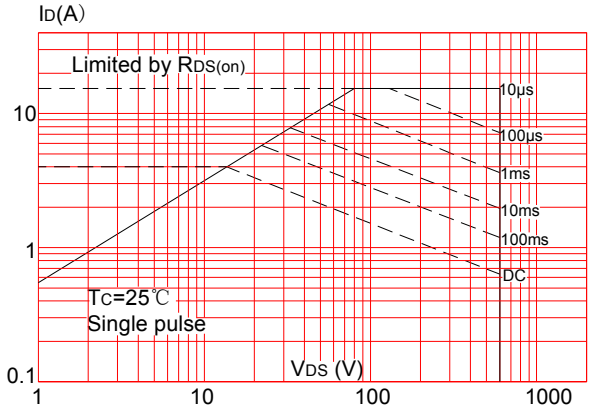


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

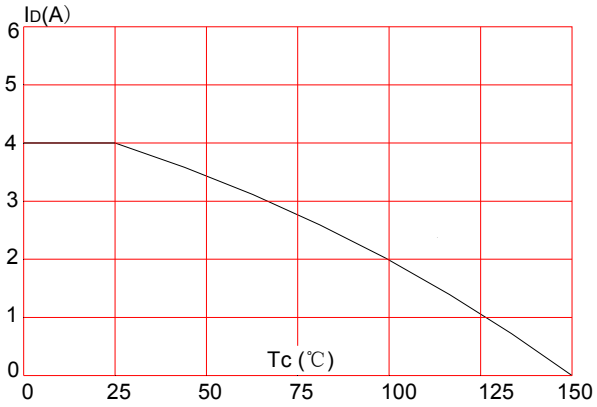


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-220F)

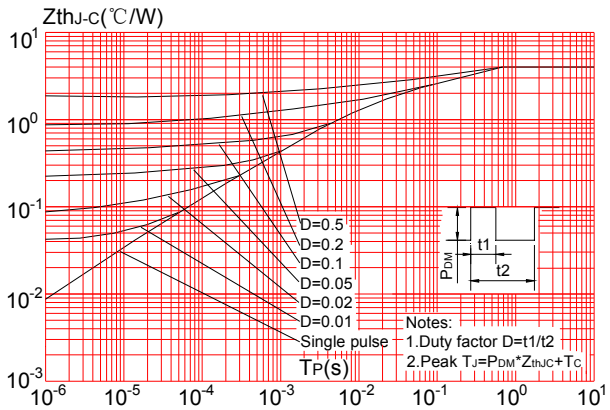
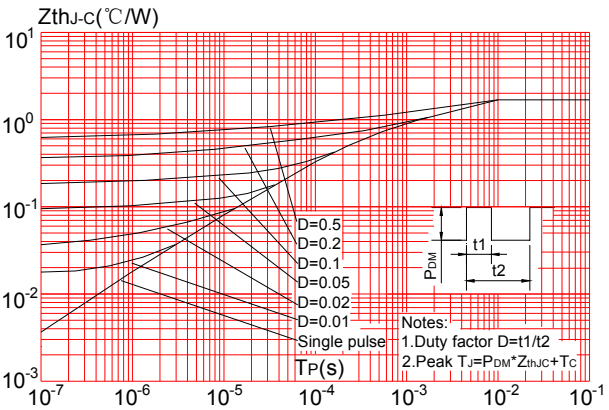


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-220C,TO-251,TO-252)



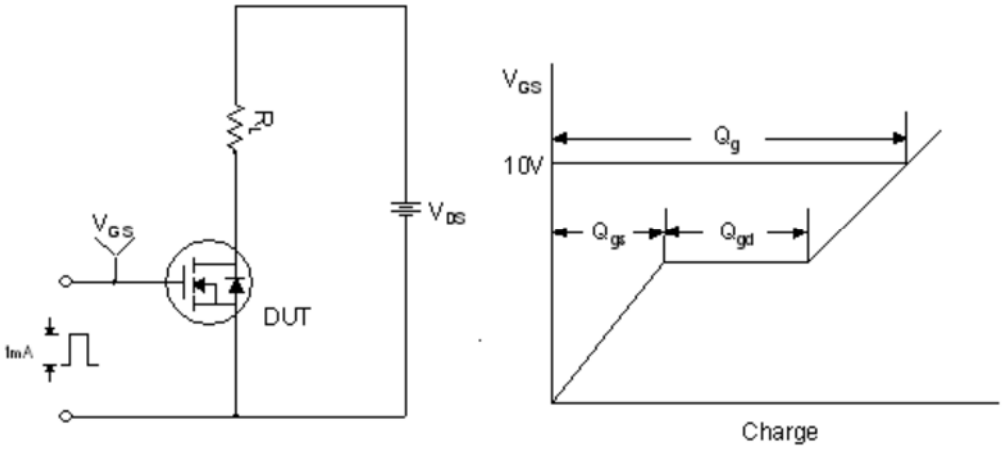


Figure 1. Gate Charge Test Circuit & Waveform

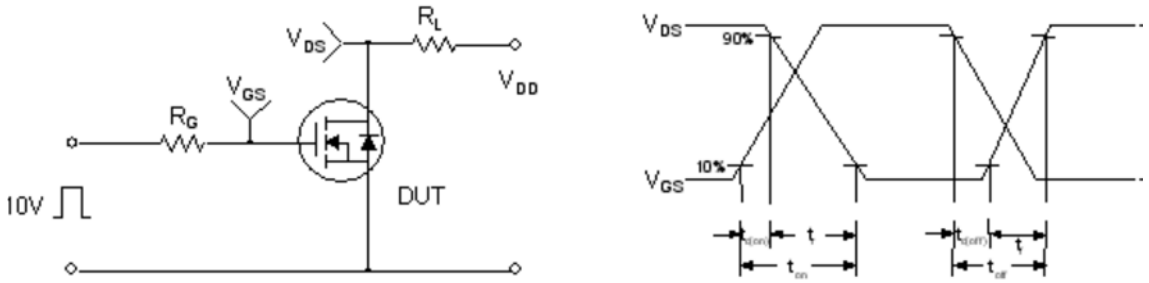


Figure 2. Resistive Switching Test Circuit & Waveforms

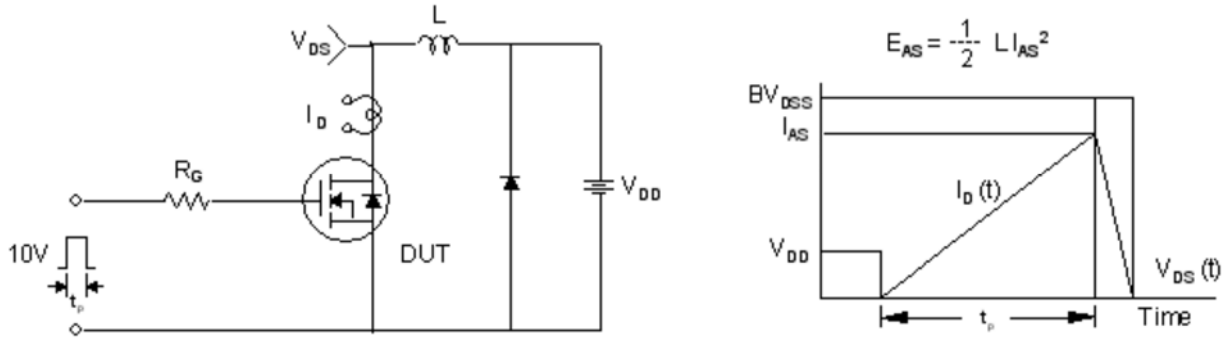


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

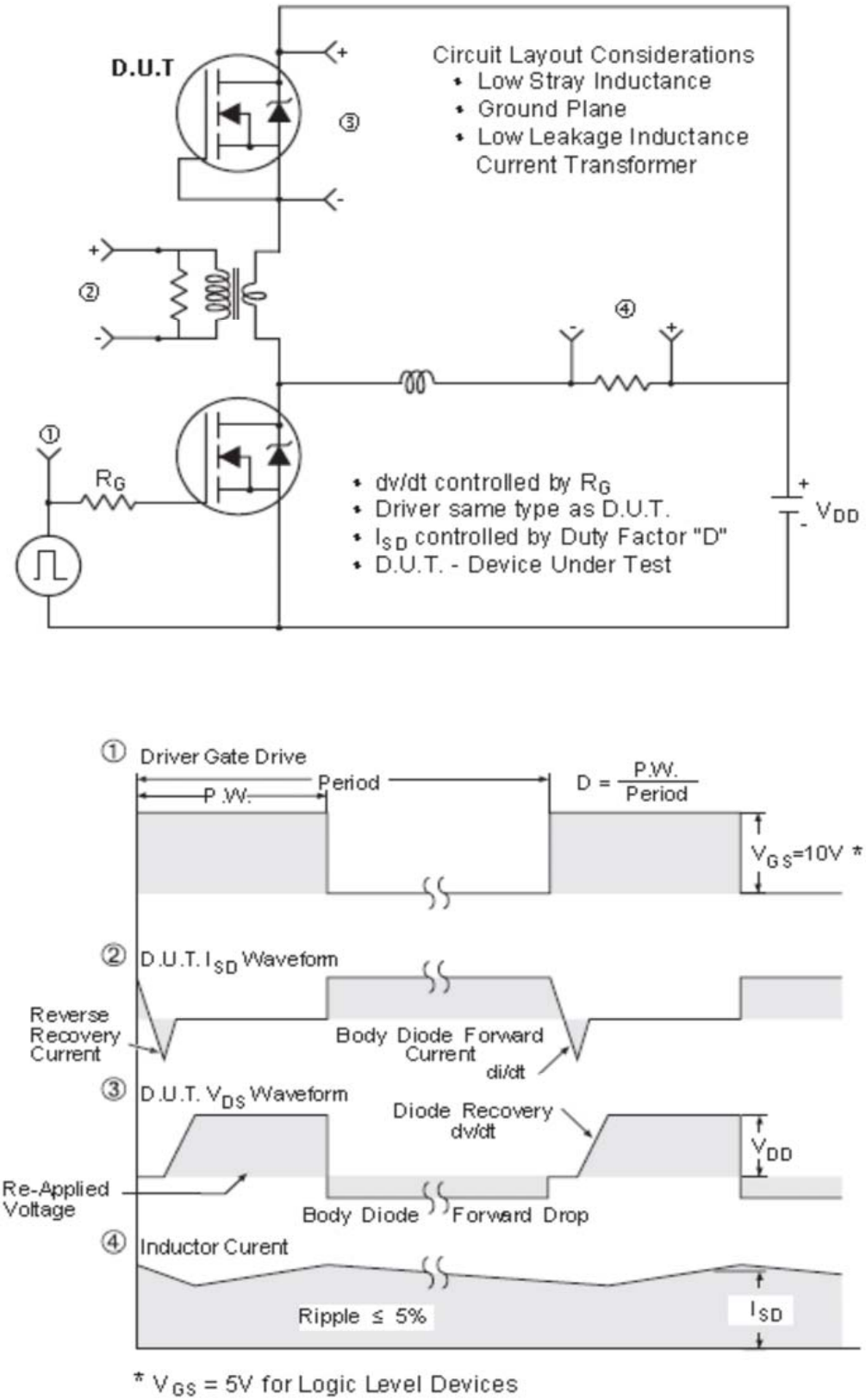
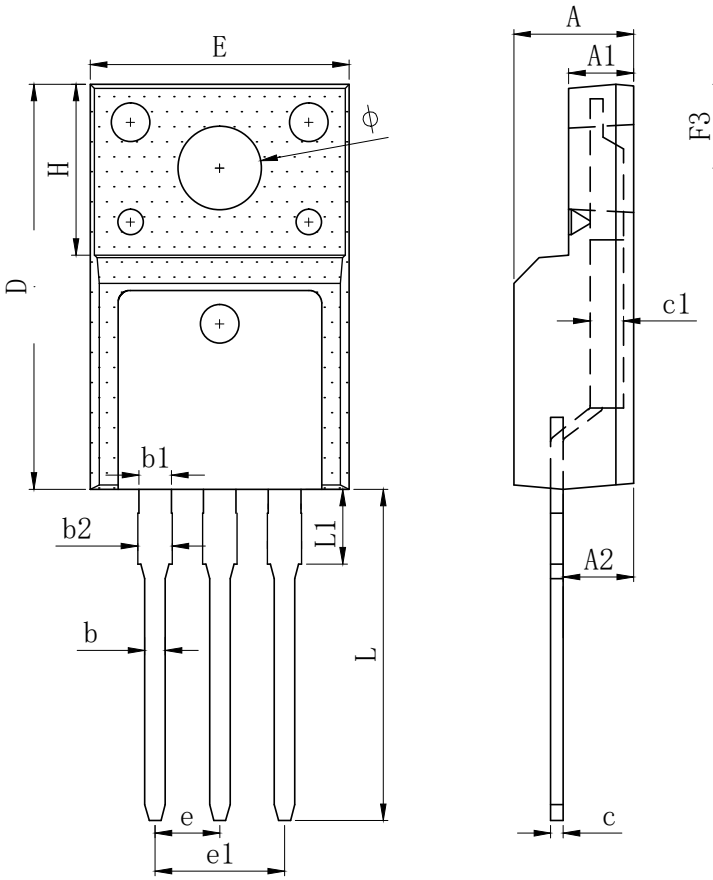


Figure 4. Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

TO-220F Package

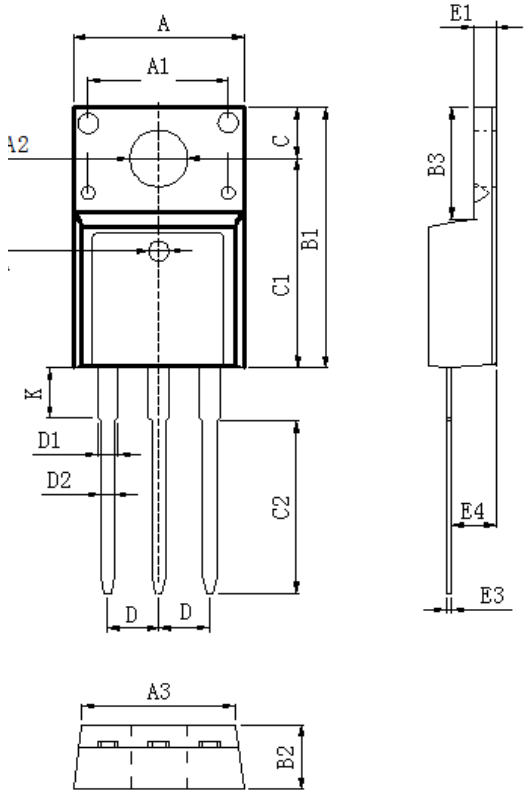
Mechanical Data



(Top View)

(Bottom View)

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



DIM	MILLIMETERS
A	10.16±0.3
A1	7.00±0.1
A2	3.3±0.2
A3	9.5±0.2
B1	15.87±0.3
B2	4.7±0.2
B3	6.68±0.4
C	3.3±0.2
C1	12.57±0.3
C2	10.02±0.5
D	2.54±0.05
D1	1.28±0.2
D2	0.8±0.1
K	3.1±0.3
E1	2.54±0.1
E3	0.5±0.1
E4	2.76±0.2
DIA	⊙1.5(deep 0.2)

Unit :mm

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