REASUNOS

N Channel MOSFET

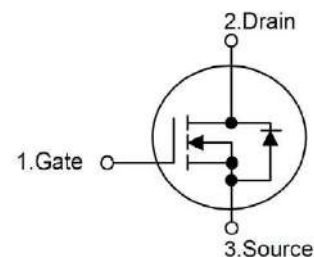Pb Lead Free Package and Finish

Applications：
- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- PFC stages for server & telecom

ID	RDS(ON)(Typ)	VDSS
4A	1.8Ω	600V

Features:
- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability

2.Drain

1.Gate

3.Source

Ordering Information

Not to Scale

Part Number	Package	Marking
RS4N60F	TO-220F	RS4N60F

Absolute Maximun Ratings Tc=25℃ unless otherwise specified

Symbol	Parameter	RS4N60F	Units
VDSS	Drain-to-Source Voltage	600	V
ID	Continuous Drain Current (TC = 25℃)	4	A
	Continuous Drain Current (TC = 100℃)	1.8	
IDM	Pulsed Drain Current (Note*1)	16	
PD	Power Dissipation(Tc=25℃)	20	W
VGS	Gate-to-Source Voltage	±30	V
EAS	Single Pulse Avalanche Engergy (Note*2)	88	mJ
IAR	Avalanche Current (Note*1)	4.2	A
EAR	Repetitive Avalanche Engergy (Note*1)	53	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	℃
	Leads at 0.063in(1.6mm)from Case for 10 seconds		
	Package Body for 10 seconds		
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 150	

*Drain Current Limited by Maximum Junction Temperature

Caution:Stresses greater than those listed in the"Absolute Maximum Ratings"Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RS4N60F	Units	Test Conditions
RθJC	Junction-to-Case	5	℃/W	Drain lead soldered to water cooled heatsink,PD Adjusted for a peak junction temperature of +150℃.
RθJA	Junction-to-Ambient	62.5		1 cubic foot chamber,free air.

OFF Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-to-source Breakdown Voltage	600	--	--	V	VGS = 0V, ID = 250μA, TJ= 25℃
		--	600	--	V	VGS = 0V, ID = 250μA, TJ= 150℃
IDSS	Drain-to-Source Leakage Current	--	--	1.0	μA	VDS=600V,VGS=0V
IGSS	Gate-to-Source Forward Leakage	--	--	100	nA	VGS=+30V VDS=0V
	Gate-to-Source Reverse Leakage	--	--	-100		VGS=-30V VDS=0V

ON Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain-to-Source On-Resistance	--	1.80	2.20	Ω	VGS=10V,ID=2A
VGS(TH)	Gate Threshold Voltage	3.0	--	4.0	V	VGS=VDS,ID=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn-on Delay Time	--	36	--	ns	VDS=250V ID=4A RG=25Ω VGS=10V
trise	Rise Time	--	15	--		
td(OFF)	Turn-OFF Delay Time	--	90			
tfall	Fall Time	--	17			

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	537	--	pF	VGS=0V VDS=100V f=1.0MHz
Coss	Output Capacitance	--	55.0	--		
Crss	Reverse Transfer Capacitance	--	5.0	--		
Qg	Total Gate Charge	--	16.0	--	nC	VDS=480V ID=4A VGS=10V
Qgs	Gate-to-Source Charge	--	3.0	--		
Qgd	Gate-to-Drain("Miller"）Charge	--	8.0	--		

Source-Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	4	A	Integral pn-diode in MOSFET
ISM	Maximum Pulsed Current	--	--	16	A	
VSD	Diode Forward Voltage	--	0.9	1.4	V	IS=4A,VGS=0V Tj=25℃
trr	Reverse Recovery Time	--	320	--	nS	VGS=0V IS=4A,di/dt=100A/µs
Qrr	Reverse Recovery Charge	--	1.1	--	µC	

Notes:

*1.Repetitive rating;pulse width limited by maximum junction temperature.

*2. IAS = 4A, VDD = 50V, RG = 25Ω, Starting TJ = 25°CPulse width tp limited by Tj,max

Typical Feature curve T_J=25℃, unless otherwise noted

Figure 1. Output Characteristics (TJ = 25ºC)
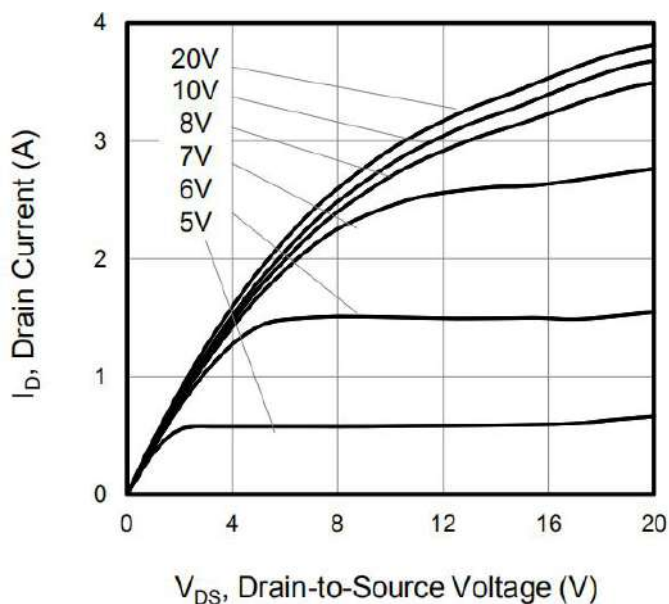
Figure2. Body Diode Forward Voltage
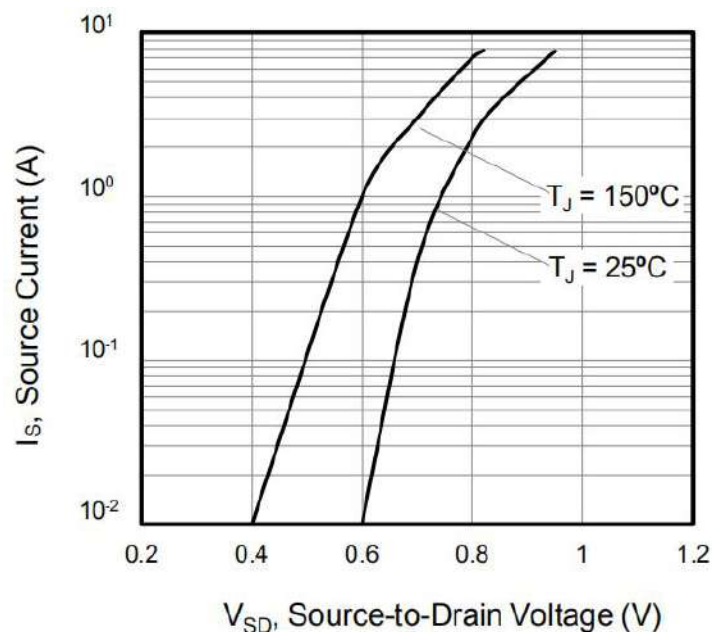
Figure 3. Drain Current vs. Temperature
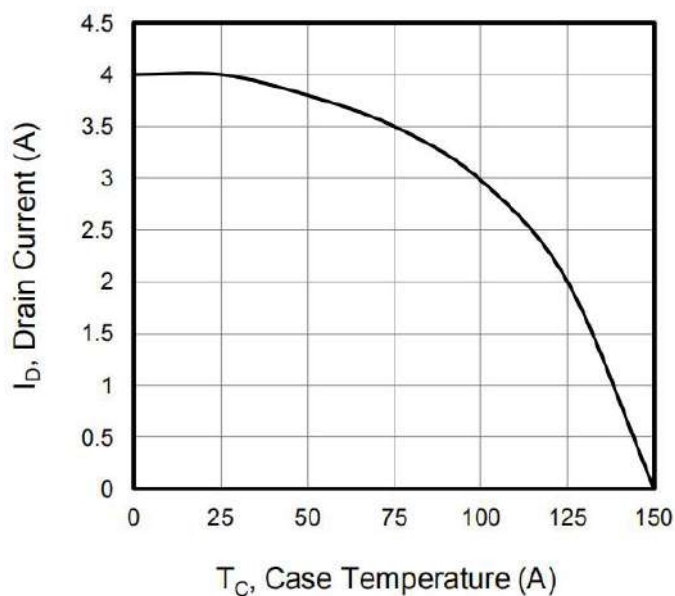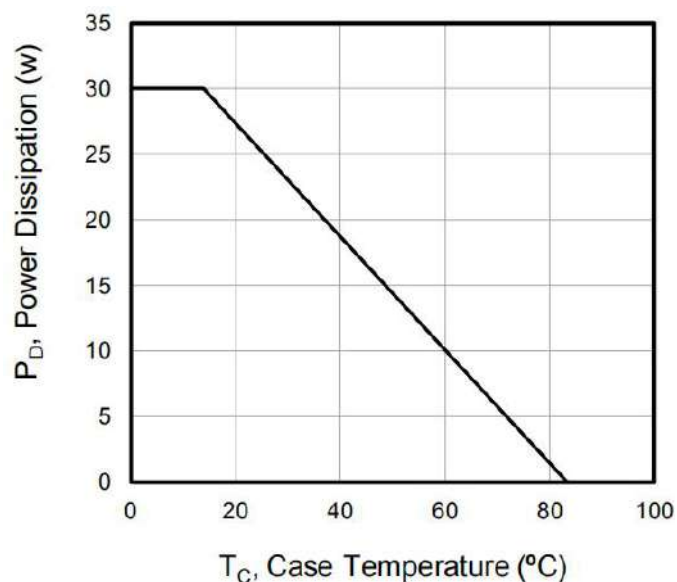

Figure 4. Power Dissipation vs. Temperature
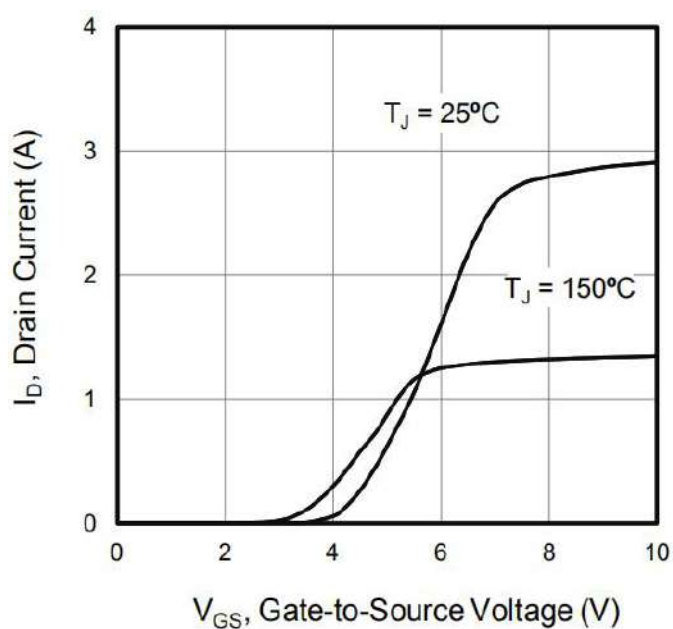

Figure 5. Transfer Characteristics

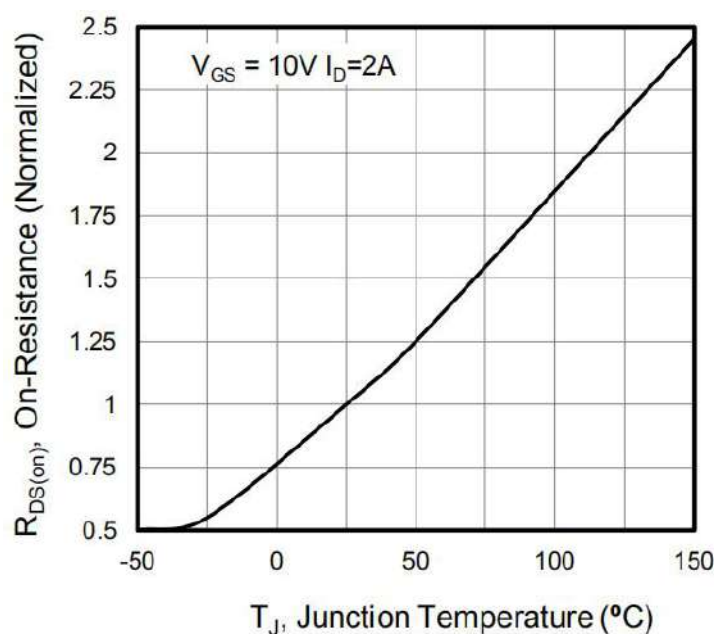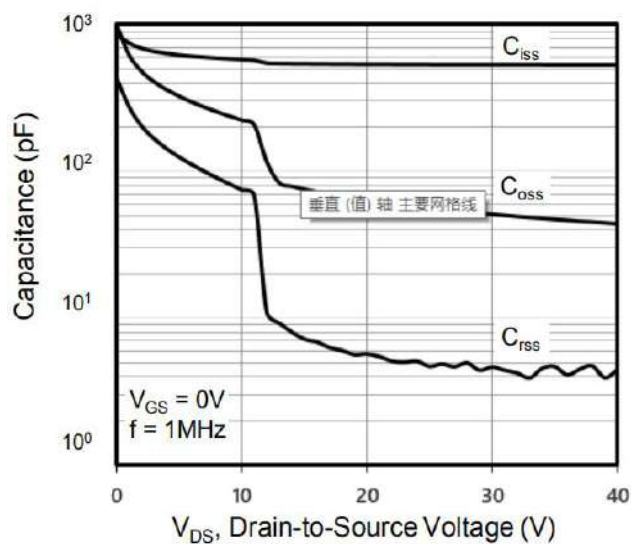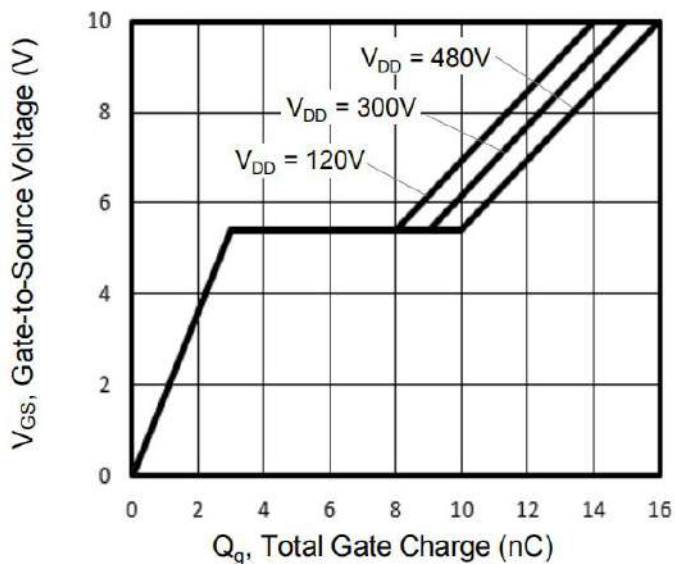## Figure 6. On-Resistance vs. Temperature
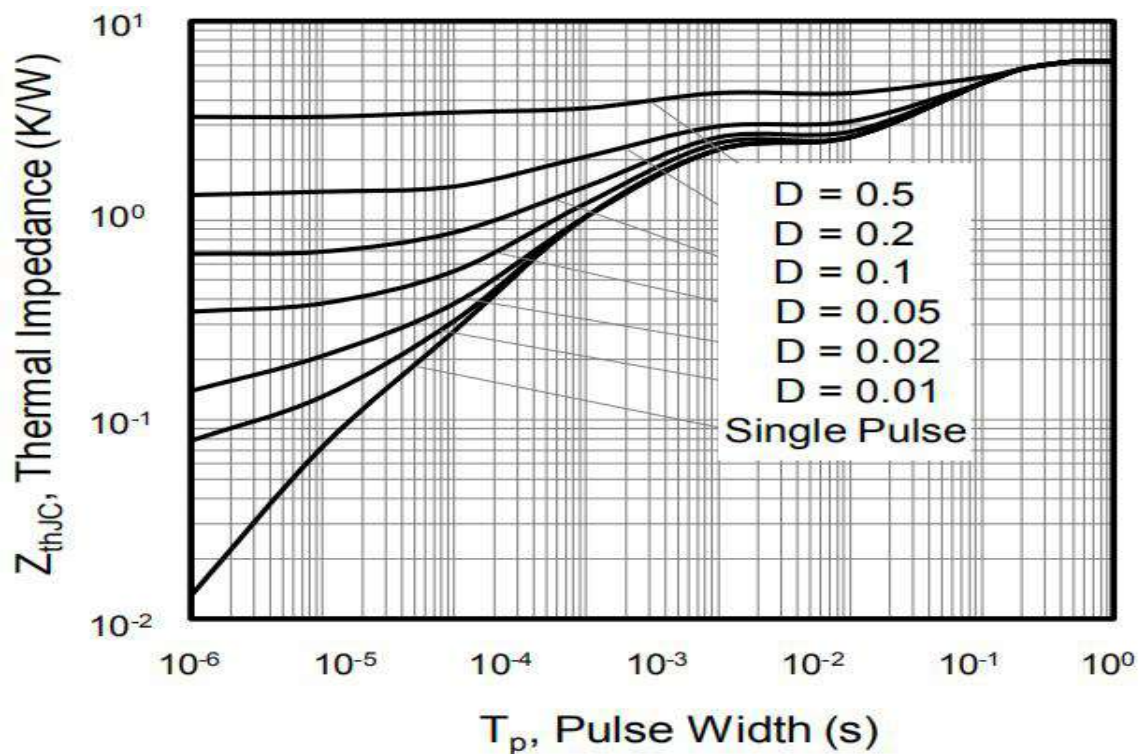
Figure 7. Capacitance

Figure 8. Gate Charge

Figure 9. Transient Thermal Impedance
TO-220F

Test Circuits and Waveforms

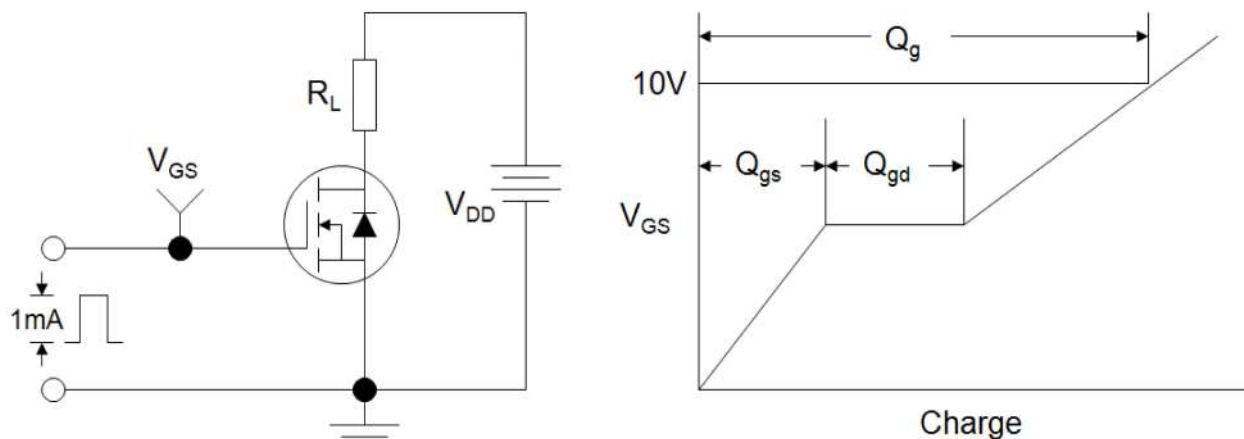### Figure A: Gate Charge Test Circuit and Waveform

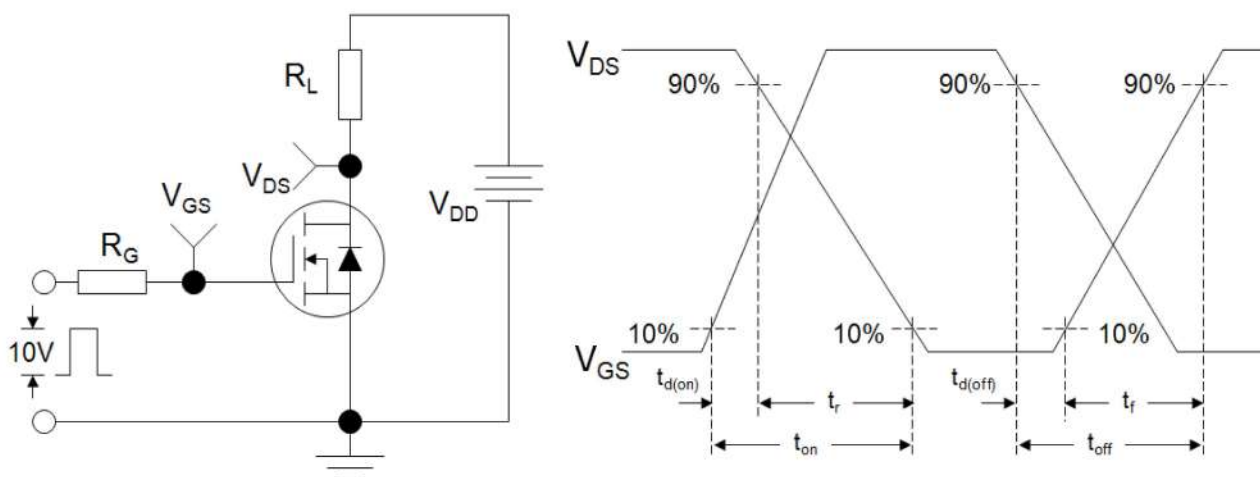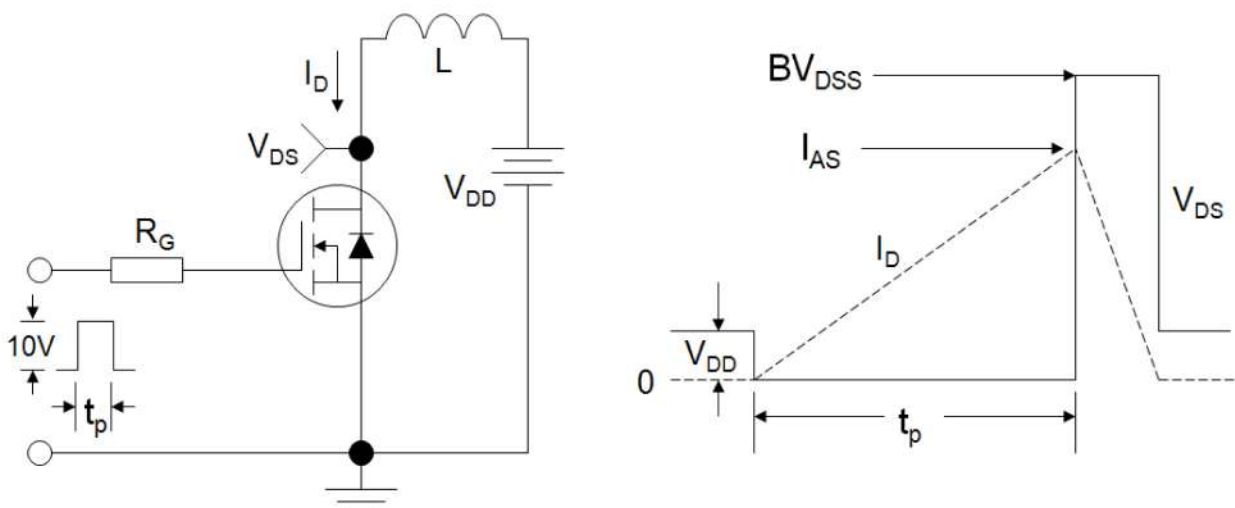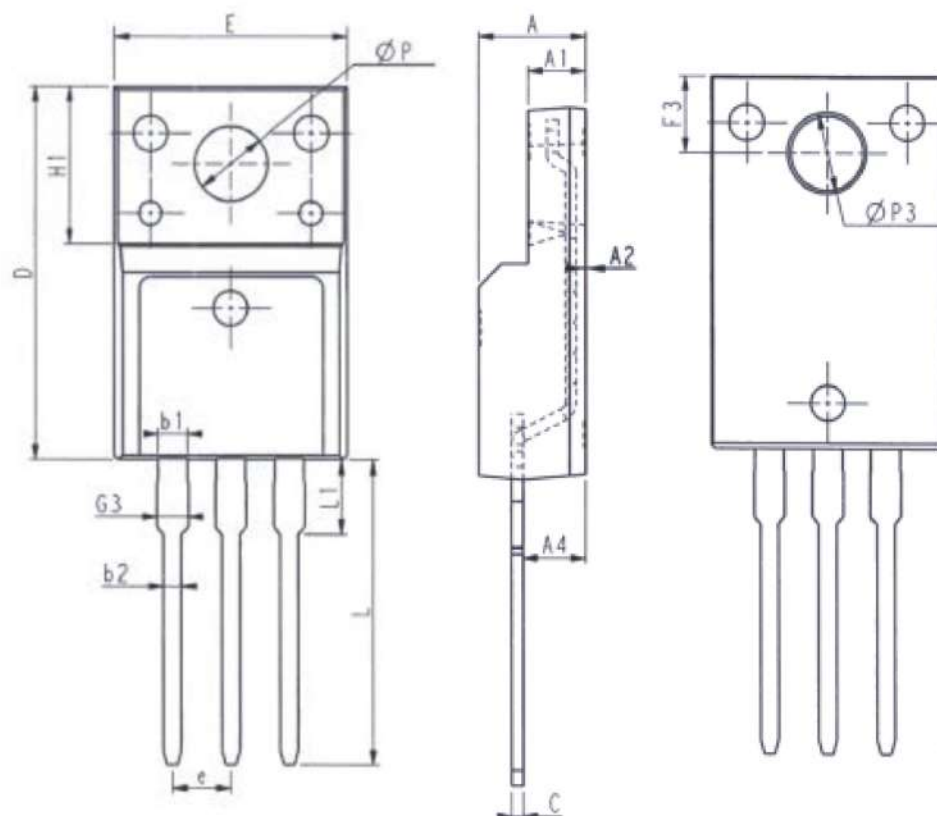### Figure B: Resistive Switching Test Circuit and Waveform

Figure C: Unclamped Inductive Switching Test Circuit and Waveform

Package outline drawing

Unit:mm

TO-220F

Unit: mm		
Symbol	Min.	Max.
E	9.96	10.36
A	4.50	4.90
A1	2.34	2.74
A2	0.30	0.60
A4	2.56	2.96
c	0.40	0.65
D	15.57	16.17
H1	6.70REF	
e	2.54BSC	

Unit: mm		
Symbol	Min.	Max.
L	12.68	13.28
L1	2.93	3.13
P	3.03	3.38
P3	3.15	3.65
F3	3.15	3.45
G3	1.25	1.55
b1	1.18	1.43
b2	0.70	0.95

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