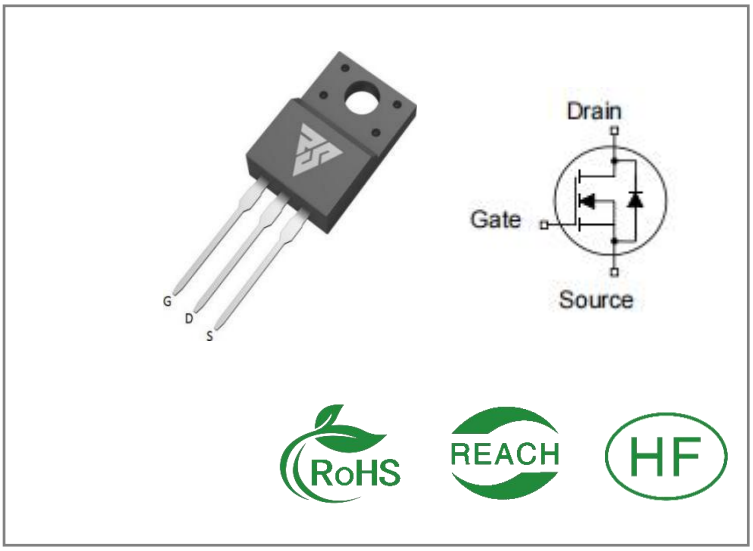
ID	R_{DS}(ON)(Typ)	VDSS
12A	0.64Ω	800V



Applications:
- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

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

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RS12N80F	T0-220F	RS12N80F	Tube	50 PCS

Absolute Maximun Ratings Tc= 2 5℃ unless otherwise specified

Symbol	Parameter	RS12N80F	Units
VDSS	Drain-to-Source Voltage	800	V
ID	Continuous Drain Current TC=25℃ TC=100℃	12 7.6	A
IDM	Pulsed Drain Current (Note*1)	48	
PD	Power Dissipation	96	W
VGS	Gate- to- Source Voltage	±30	V
EAS	Single Pulse Avalanche Engergy L = 19mH, ID = 12A	1368	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	
dv/dt	Peak Diode Recovery dv/dt ISD ≤12A, di/dt≤100A/μs, VDD≤BVDSS	5	V/ns

* 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	RS12N80F	Units	Test Conditions
RθJC	Junction-to-Case	1.3	℃/ W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 ℃
RθJA	Junction-to-Ambient	80		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	800	--	--	V	VGS=0V ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=800V 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(Note*2)	--	0.64	0.8	Ω	VGS=10V ID=6A
VGS (TH)	Gate Threshold Voltage	2	--	4	V	VGS=VDS ID=250μA
RG	Gate Resistance	--	2.5	--	Ω	f = 1.0MHz open drain

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	40	--	nS	VDS=400V ID=12A RG=25Ω
trise	Rise Time	--	30	--		
td(OFF)	Turn- OFF Delay Time	--	200	--		
tfall	Fall Time	--	70	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	2986	--	pF	VGS=0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	205	--		
Crss	Reverse Transfer Capacitance	--	6.5	--		
Qg	Total Gate Charge	--	58.2	--	nC	VDS=640V ID=12A VGS=10V
Qgs	Gate- to- Source Charge	--	14.1	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	17.7	--		
VPlateau	Gate Plateau Voltage	--	4.4	--	V	VDD = 640V ID = 12A VGS = 10V

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	12	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	48	A	
VSD	Diode Forward Voltage	--	--	1.2	V	IS=12A VGS=0V
trr	Reverse Recovery Time	--	635	--	nS	VDD=400V IS=12A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	14	--	μC	

Notes:

* 1. Repetitive rating, pulse width limited by maximum junction temperature.
* 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Feature Curve

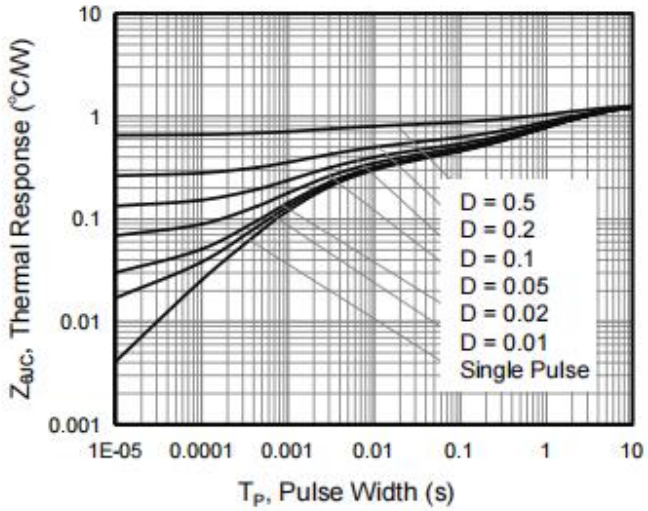


Figure 1. Transient Thermal Impedance For TO-220F

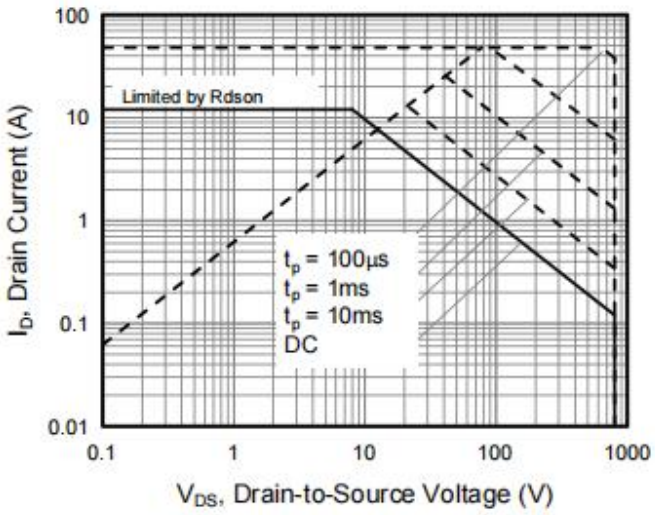


Figure 2. Safe Operation Area For TO-220F

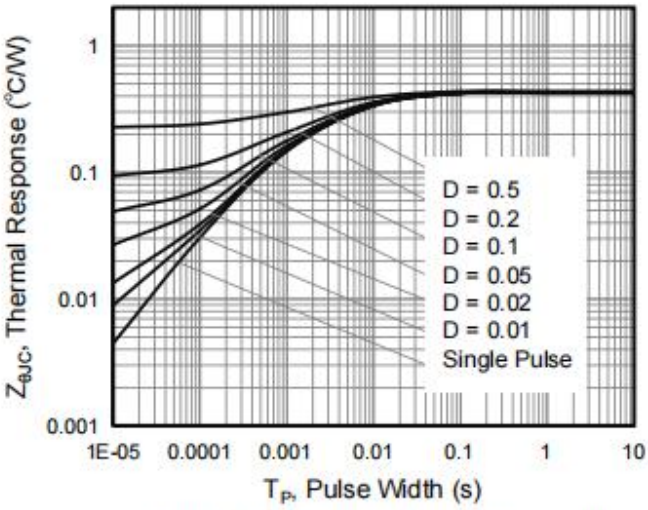


Figure 3. Transient Thermal Impedance For TO-247、TO-3P

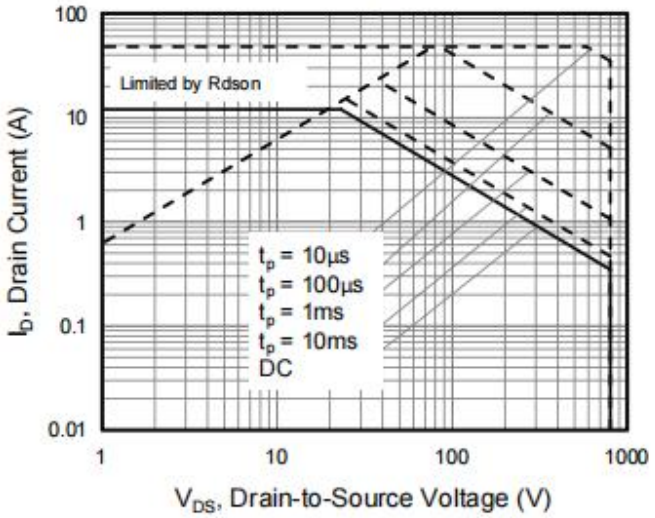


Figure 4. Safe Operation Area For TO-247、TO-3P

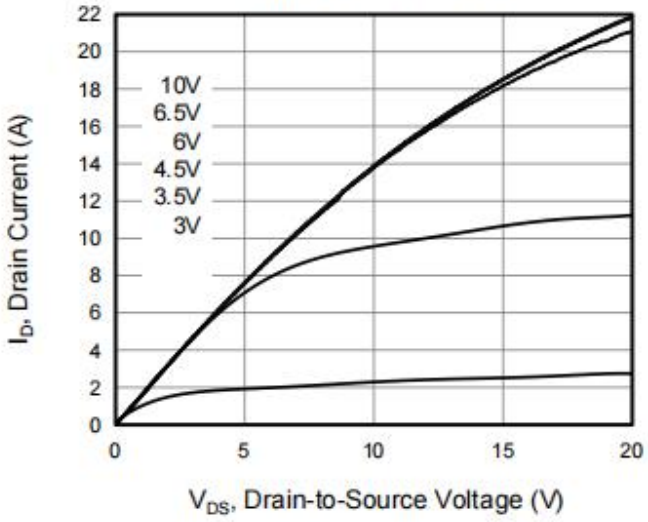


Figure 5. Output Characteristics

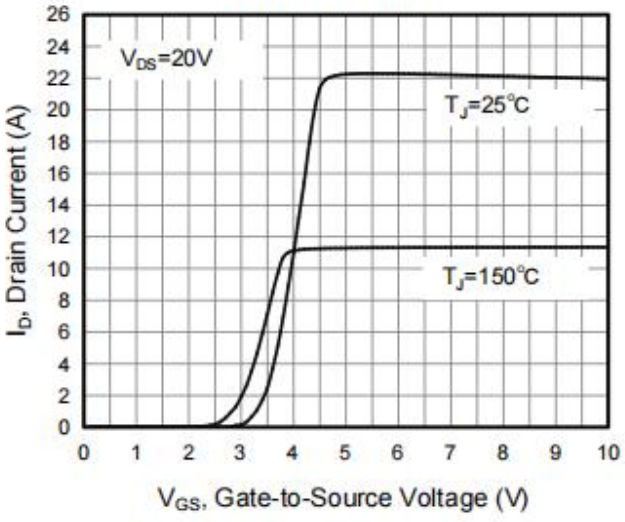


Figure 6. Transfer Characteristics

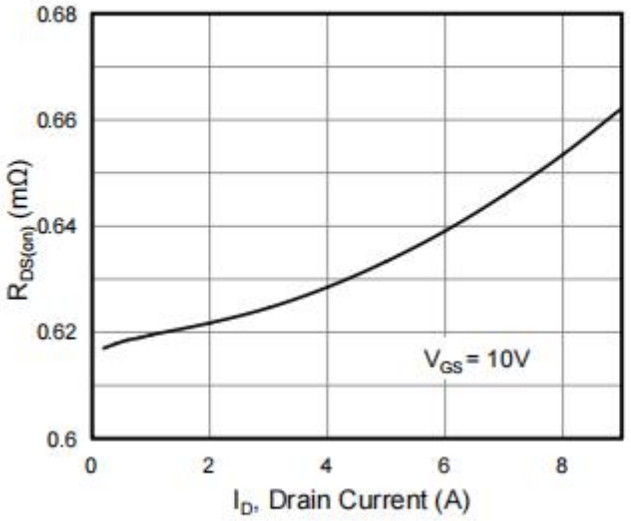


Figure 7. On-Resistance vs Drain Current

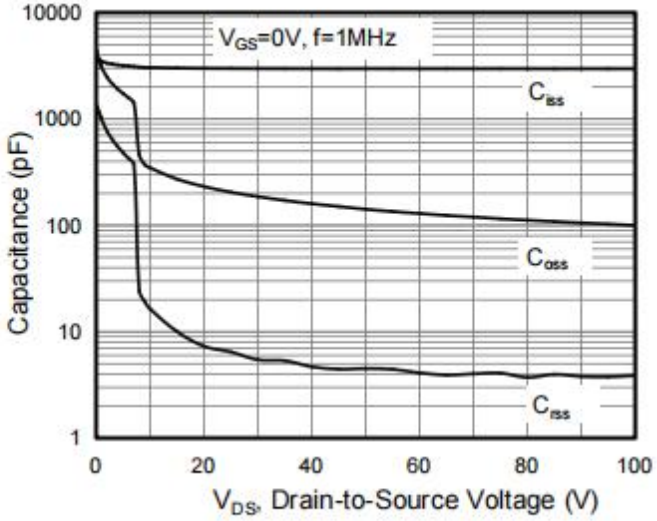


Figure 8. Capacitance

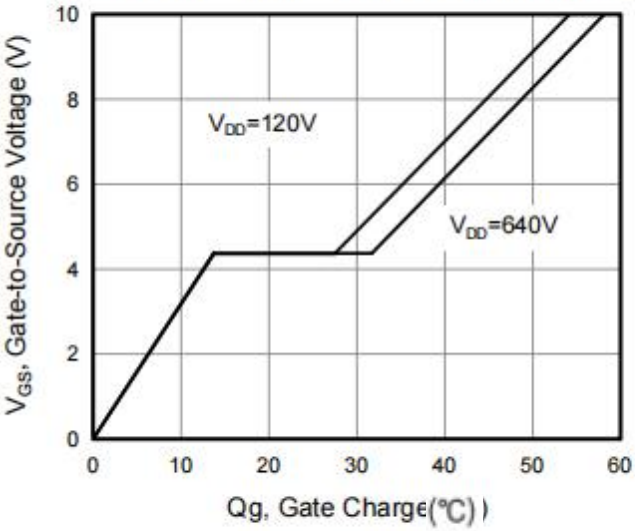


Figure 9. Gate Charge

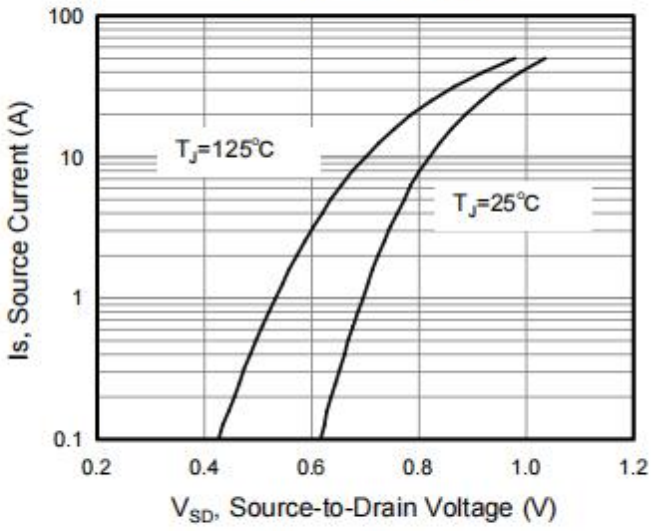


Figure 10. Body Diode Forward Voltage

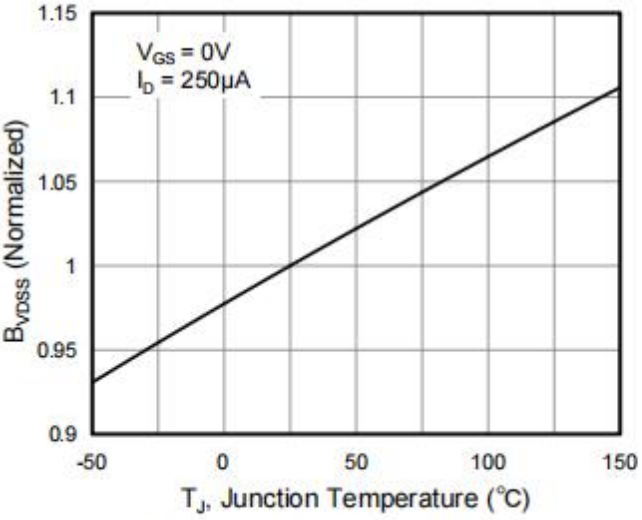


Figure 11. Breakdown Voltage vs Junction Temperature

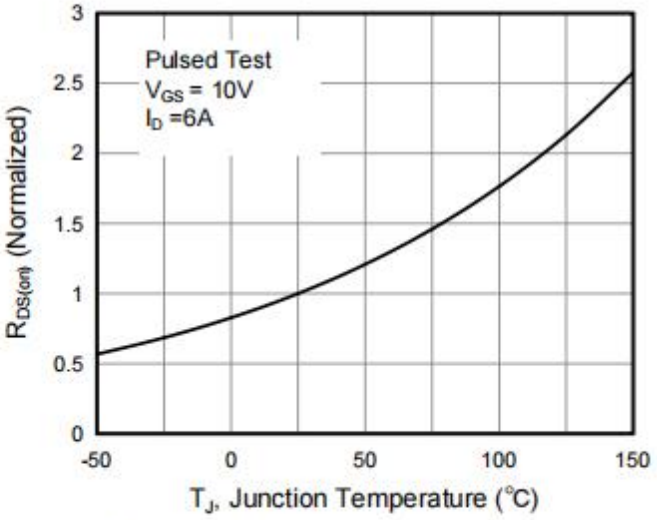


Figure 12. On-Resistance vs Temperature

Test Circuits and Waveforms

Figure A：Gate Charge Test Circuit and Waveform

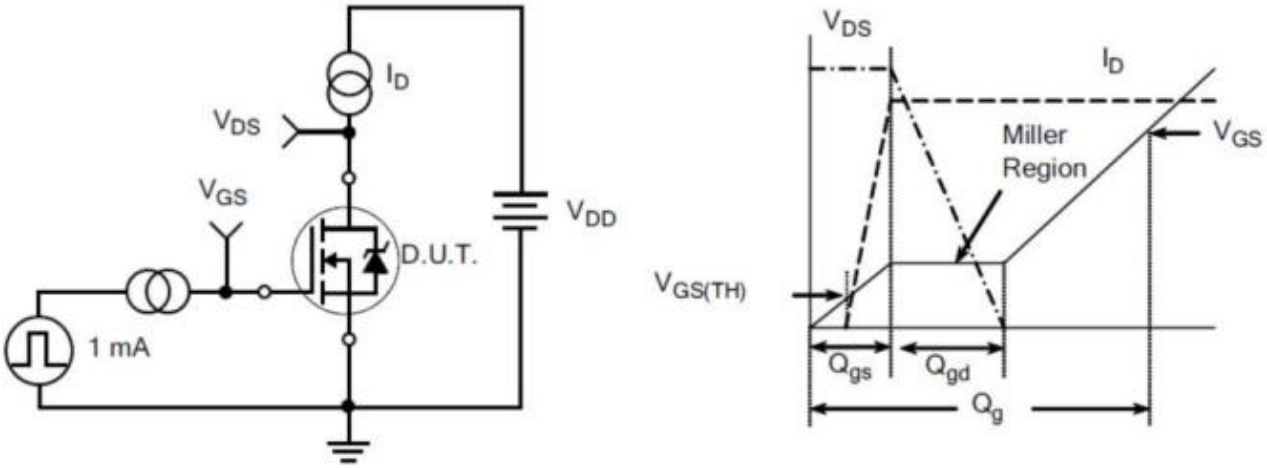


Figure B：Resistive Switching Test Circuit and Waveform

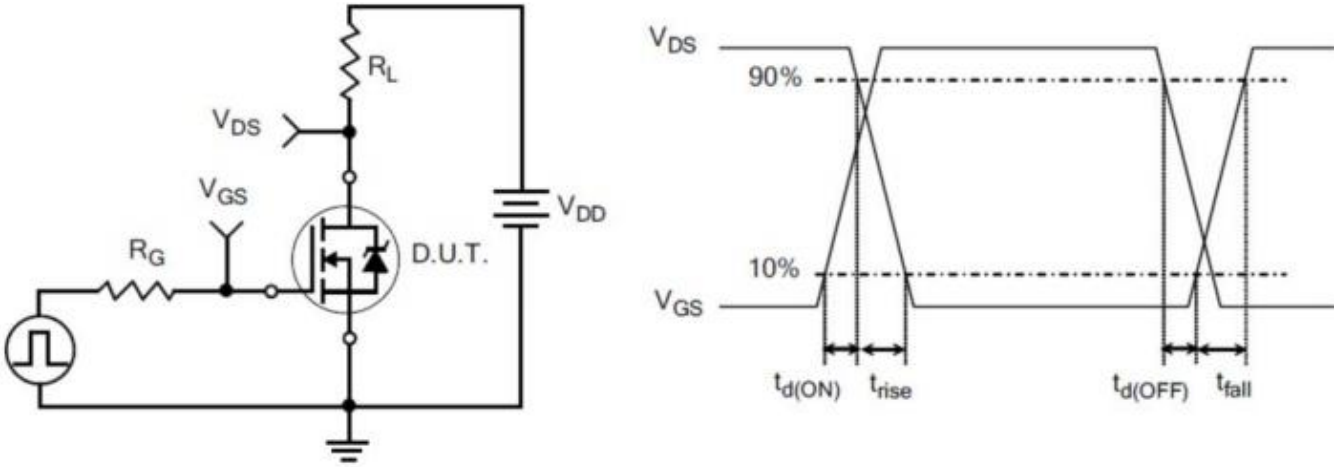
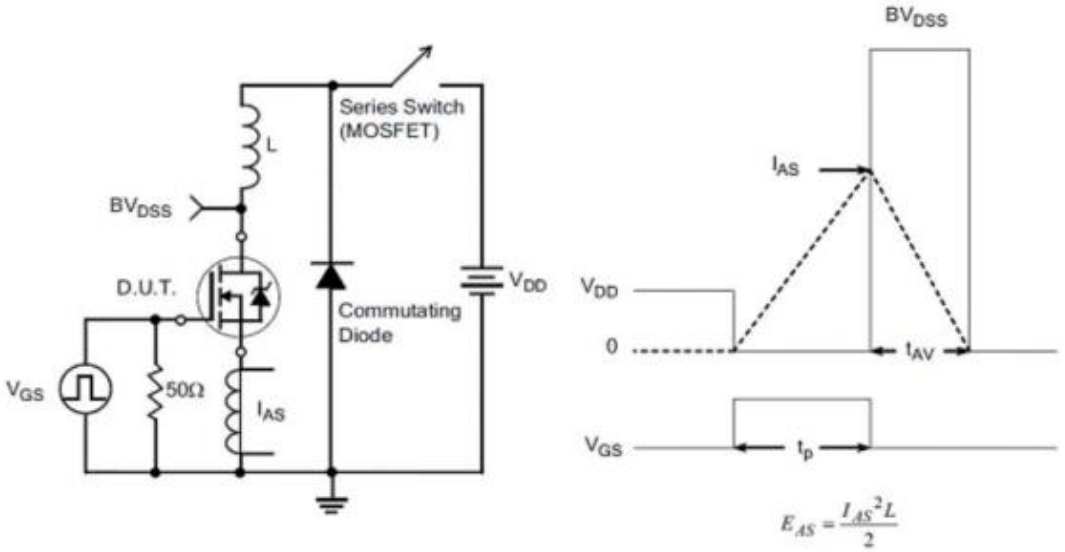
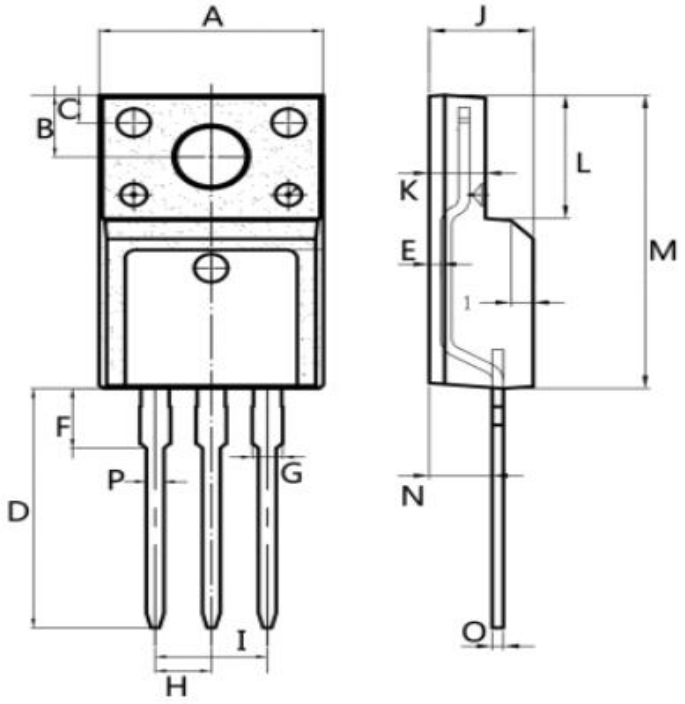


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

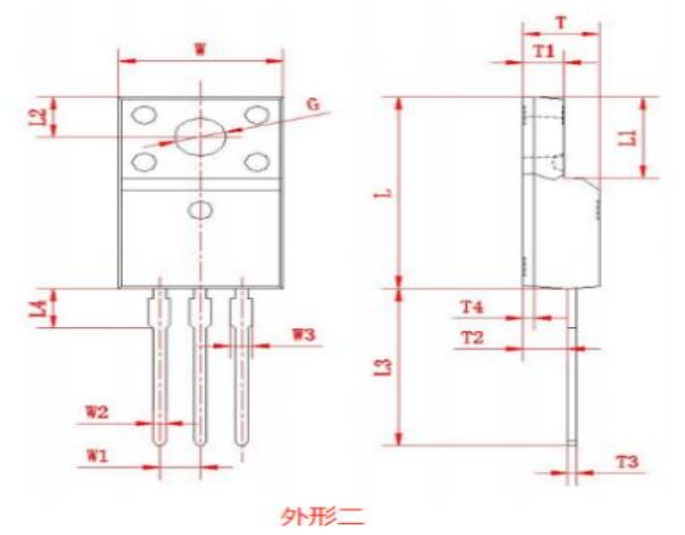
Package outline drawing(TO-220F Unit: mm)



外形一

Dim.	Min.	Max.
A	9.95	10.36
A1	4.5	5.0
B	2.95	3.25
C	1.25	1.45
D	12.60	13.60
E	0.40	0.60
F	2.8	3.5
G	1.30	1.45
H	(2.54)	
I	(5.08)	
J	4.60	4.75
K	2.45	2.65
L	6.5	6.8
M	15.4	16.0
N	2.25	3.05
O	0.45	0.55
P	0.70	0.90

All Dimensions in millimeter



外形二

Dim.	Min.	Max.
W	9.95	10.36
W1	(2.54)	
W2	0.70	0.90
W3	1.25	1.47
L	15.67	16.07
L1	6.48	6.88
L2	3.2	3.4
L3	12.6	13.6
L4	(3.23)	
T	4.50	4.90
T1	2.34	2.74
T2	2.25	2.95
T3	0.45	0.60
T4	(0.70)	
G	3.08	3.28

All Dimensions in millimeter

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