

H20N50F

500V N-Channel MOSFET

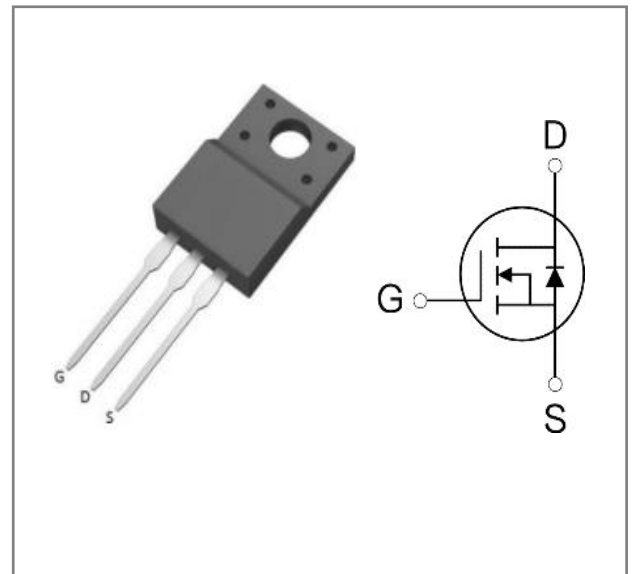
VDSS	R _{DS(ON)} (Typ)	ID
500V	0.23Ω	20A

Features:

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability
- Enhanced Avalanche Ruggedness
- Lead Free

Applications:

- Switch Mode Power Supply(SMPS)
- Adapter & Charger
- AC-DC Switching Power Supply



Ordering Information

Part Number	Package	Marking	Packing	Qty.
H20N50F	TO-220F	H20N50F	Tube	50 PCS

Absolute Maximun Ratings (Tc= 2 5℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
VDS	Drain-to-Source Voltage	500	V
VGS	Gate- to- Source Voltage	±30	V
ID	Continuous Drain Current TC=25℃	20	A
	Continuous Drain Current TC=100℃	12.6	
IDM	Pulsed Drain Current	80	
PD	Power Dissipation	48	W
EAS	Single Pulse Avalanche Enenergy L = 10mH, RG = 25 Ω, TC=25℃	1200	mJ
TJ, TSTG	Operating Junction and Storage Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ	Max	Unit
RθJC	Thermal Resistance Junction-Case	2.6	--	℃/ W
RθJA	Thermal Resistance Junction-Ambient	62.5	--	℃/ W

Electrical Characteristics (TJ= 25℃ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V(BR)DSS	Drain- Source Breakdown Voltage	500	--	--	V	VGS=0V,ID=250μA
IDSS	Zero Gate Voltage Drain Current (25℃)	--	--	10	μA	VDS=500V,VGS=0V
	Zero Gate Voltage Drain Current (100℃)	--	--	100	μA	VDS=500V,VGS=0V
IGSS	Gate to Source Forward Leakage	--	--	100	nA	VGS=30V ,VDS=0V
	Gate to Source Reverse Leakage	--	--	-100		VGS=-30V ,VDS=0V
VGS(TH)	Gate Threshold Voltage	2	3	4	V	VGS=VDS,ID=250μA
RDS(on)	Static Drain- to- Source On-Resistance	--	0.23	0.28	Ω	VGS=10V,ID=10A

Dynamic Electrical Characteristics

Ciss	Input Capacitance	--	1920	--	pF	VGS=0V VDS=25V f=1MHz
Coss	Output Capacitance	--	290	--		
Crss	Reverse Transfer Capacitance	--	18	--		
Qg	Total Gate Charge	--	56	--	nC	VDS=400V ID=20A VGS=10V
Qgs	Gate- to- Source Charge	--	13	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	20	--		

Switching Characteristics

td(ON)	Turn- on Delay Time	--	33	--	nS	VDS=250V ID=20A VGS=10V
trise	Rise Time	--	75	--		
td(OFF)	Turn- OFF Delay Time	--	91	--		
tfall	Fall Time	--	83	--		

Source- Drain Diode Characteristics

VSD	Diode Forward Voltage	--	--	1.2	V	IF=20A,VGS=0V
trr	Reverse Recovery Time	--	536	--	nS	VGS=0V,IF=20A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	5.7	--	uC	

Typical Characteristics

Figure 1a Safe Operating Area (No FullPAK)

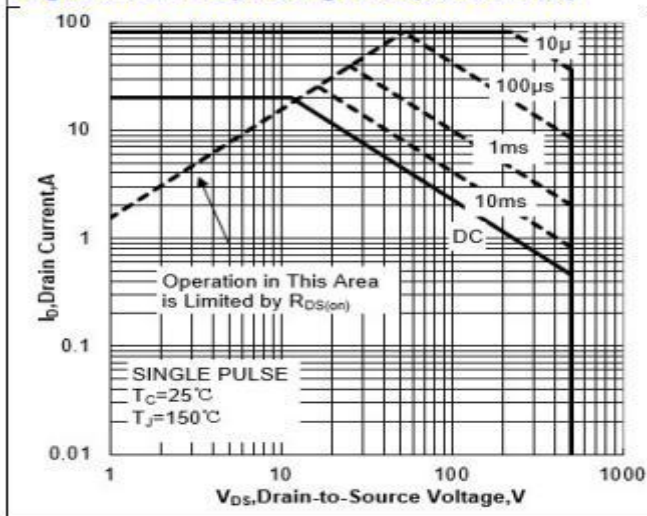


Figure 1b Safe Operating Area (FullPAK)

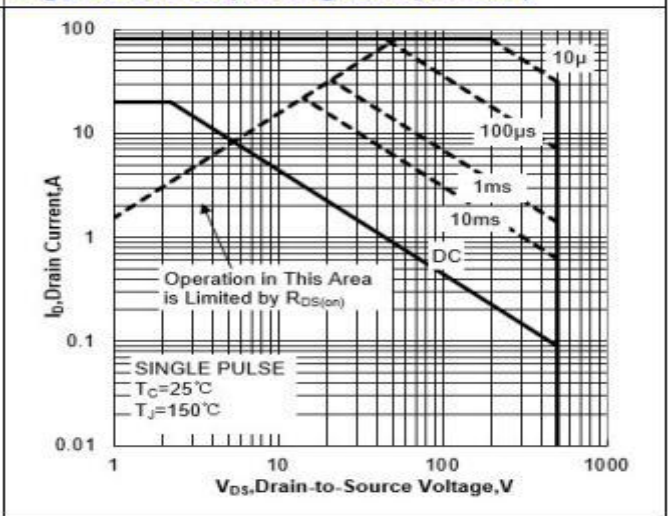


Figure 2a Power Dissipation (No FullPAK)

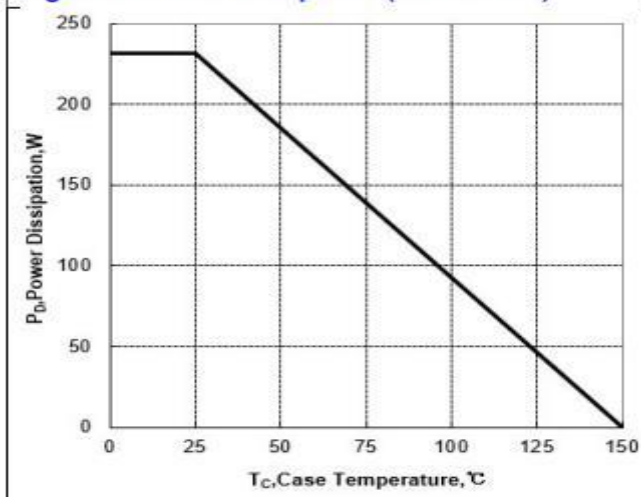


Figure 2b Power Dissipation (FullPAK)

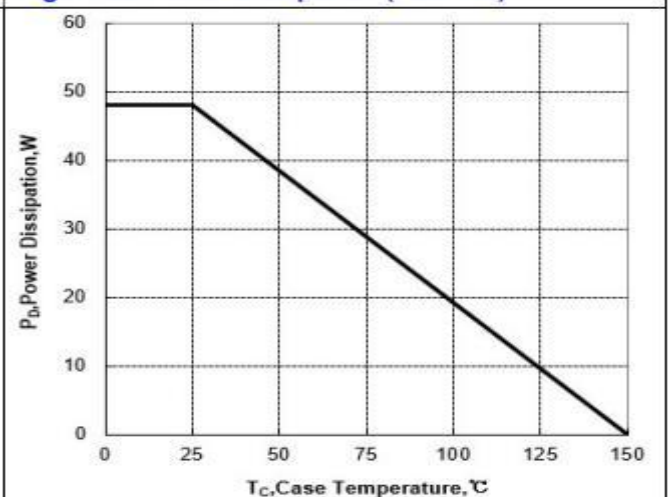


Figure 3a Max Thermal Impedance (No FullPAK)

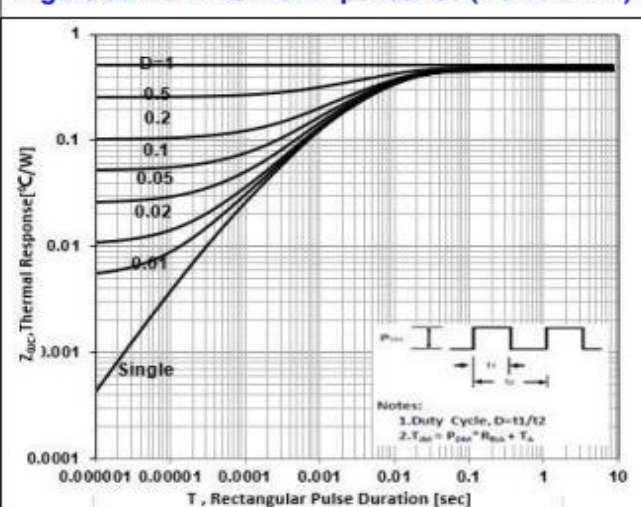


Figure 3b Max Thermal Impedance (FullPAK)

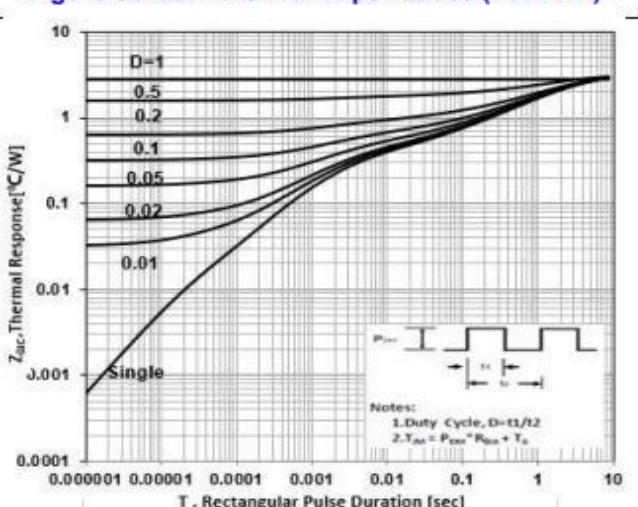


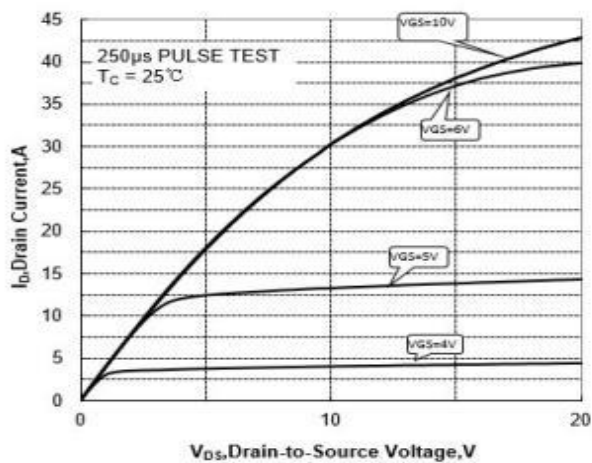
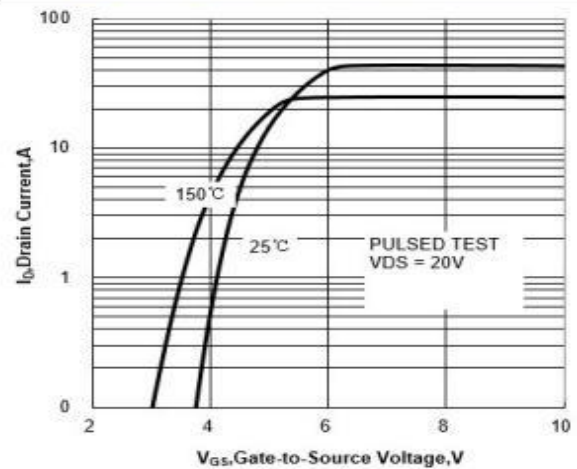
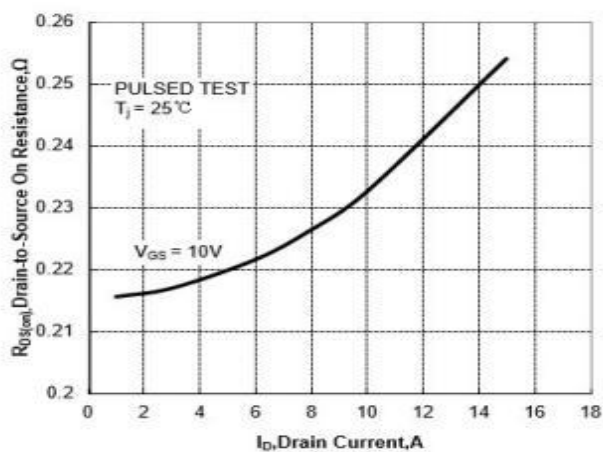
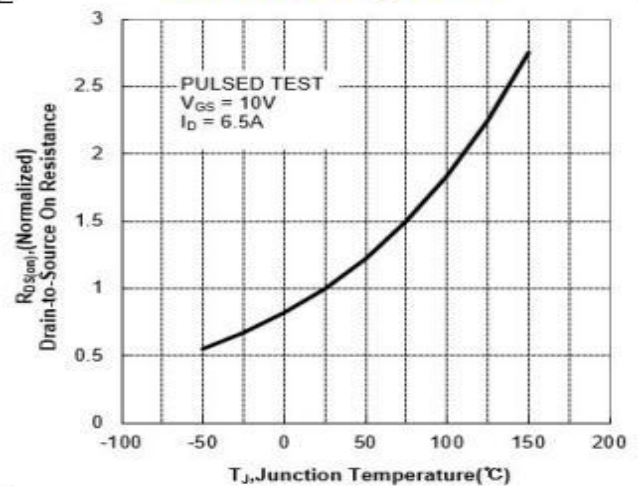
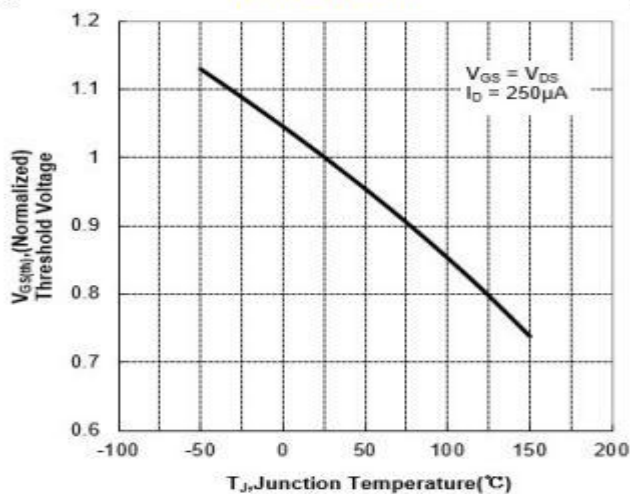
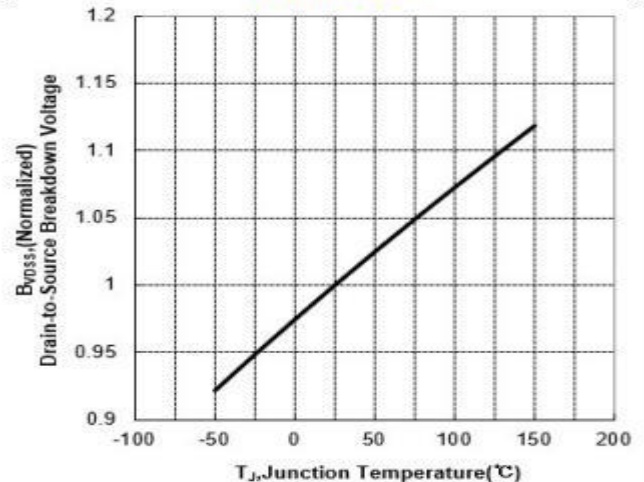
Figure 4 Typical Output Characteristics

Figure 5 Typical Transfer Characteristics

Figure 6 Typical Drain to Source ON Resistance vs Drain Current

Figure 7 Typical Drain to Source on Resistance vs Junction Temperature

Figure 8 Typical Threshold Voltage vs Junction Temperature

Figure 9 Typical Breakdown Voltage vs Junction Temperature


Figure 10 Typical Theshold Voltage vs Junction Temperature

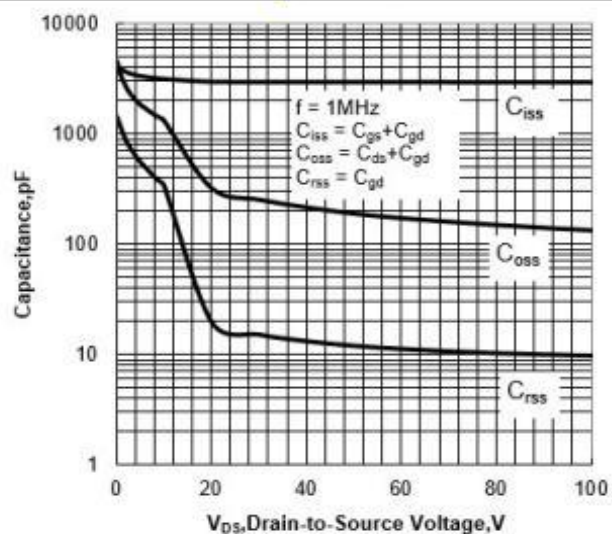
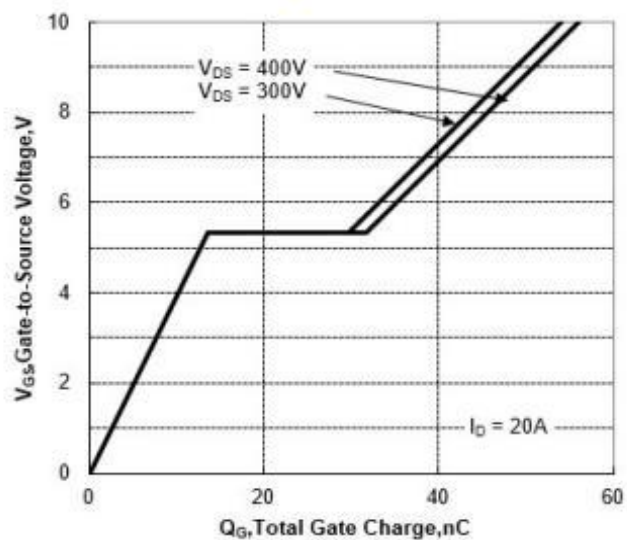


Figure 11 Typical Breakdown Voltage vs Junction Temperature



Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

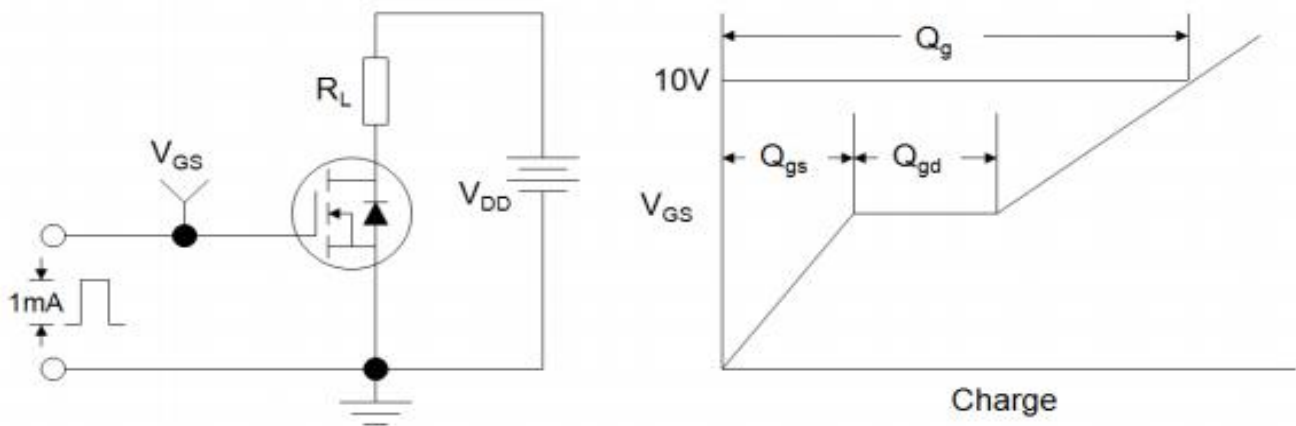


Figure B: Resistive Switching Test Circuit and Waveform

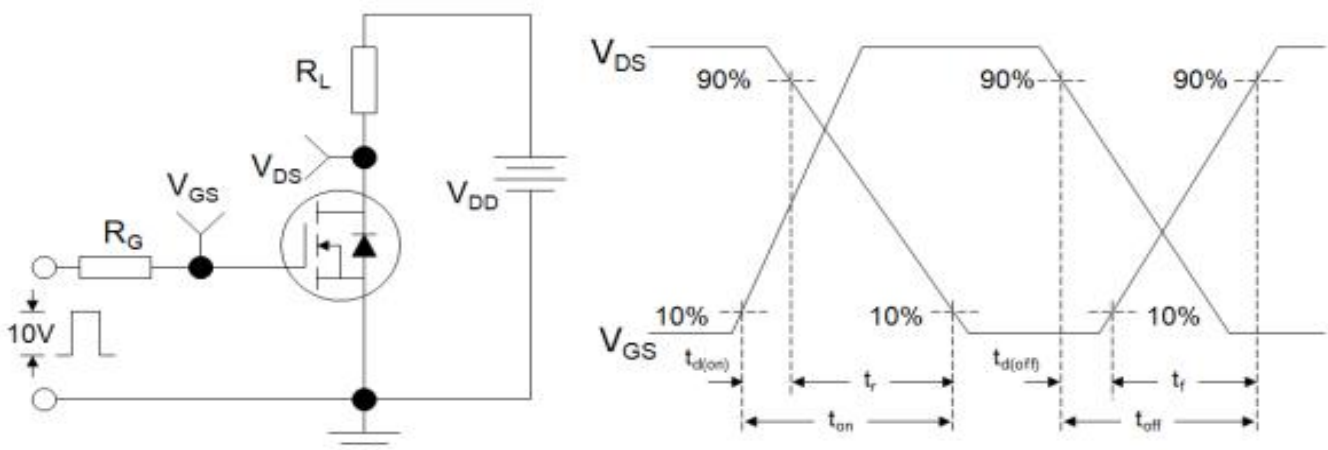
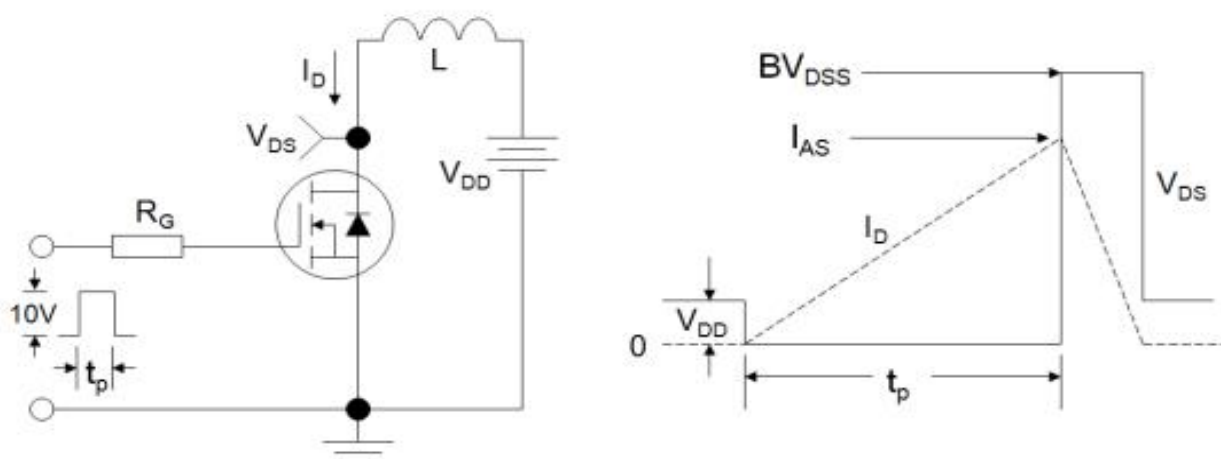
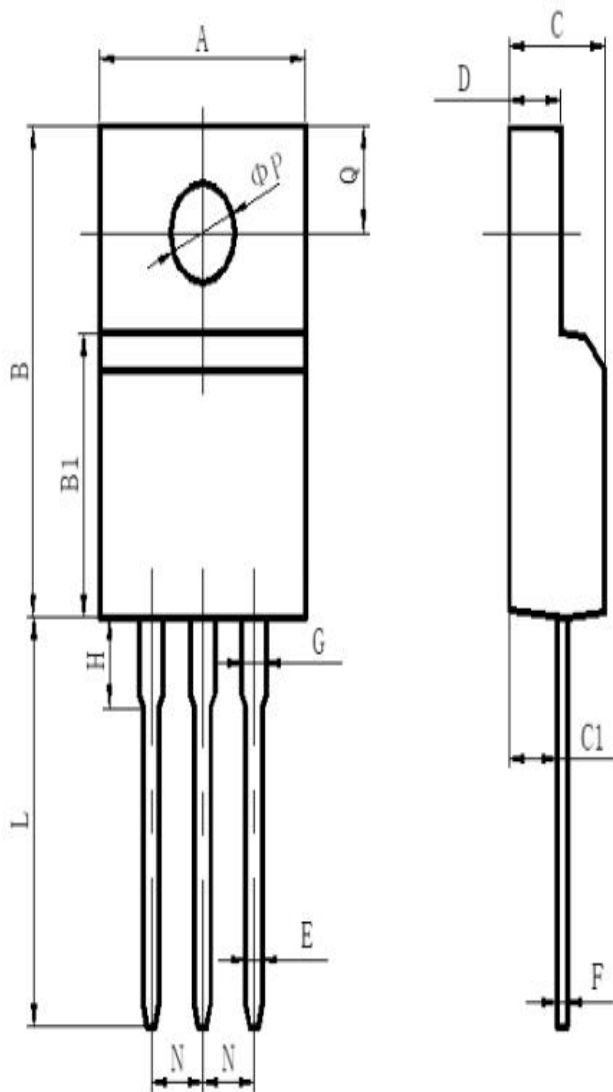


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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



Symbol	unit(mm)	
	MIN	MAX
A	9.7	10.4
B	15.5	16.10
B1	8.95	9.40
C	4.40	4.80
C1	2.15	2.55
D	2.50	2.90
E	0.70	0.90
F	0.40	0.60
G	1.12	1.42
H	3.40	4.00
L	12.6	13.6
N	2.34	2.74
Q	3.15	3.55
ΦP	3.00	3.30