

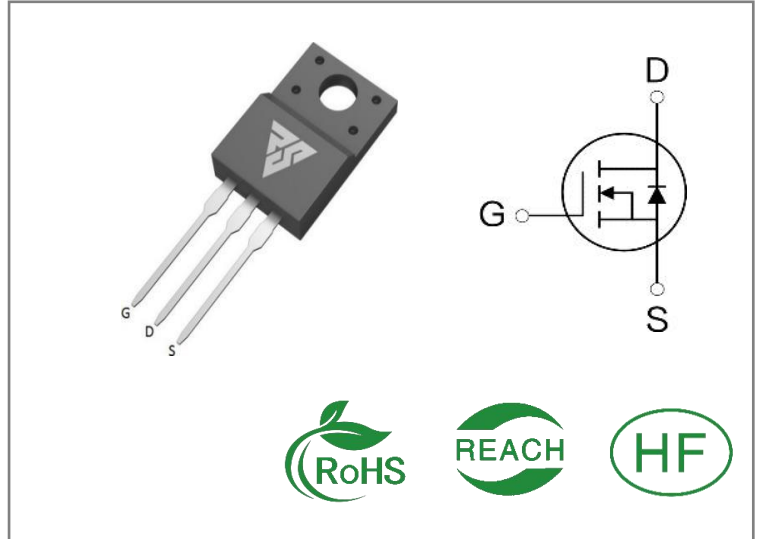
ID	R _{DS(ON)} (Typ)	VDSS
3A	5.4Ω	1500V

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.
RS3N150F	T0-220F	RS3N150F	Tube	50 PCS

Absolute Maximum Ratings Tc= 25°C unless otherwise specified

Symbol	Parameter	RS3N150F	Units
VDSS	Drain-to-Source Voltage	1500	V
ID	Continuous Drain Current TC=25°C	3	A
IDM	Pulsed Drain Current (Note*1)	12	
PD	Power Dissipation	35	W
VGS	Gate- to- Source Voltage	±30	V
EAS	Single Pulse Avalanche Energy L = 30mH, VDD = 50V, RG = 25 Ω	500	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	°C
	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	RS3N150F	Units	Test Conditions
R θ JC	Junction-to-Case	3.57	°C / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 °C
R θ JA	Junction-to-Ambient	100		1 cubic foot chamber, free air.

OFF Characteristics T_J= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	1500	--	--	V	VGS=0V, ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	VDS=1500V, 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 T_J=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance(Note*2)	--	5.4	6.4	Ω	VGS=10V, ID=2A
VGS(TH)	Gate Threshold Voltage	2.5	--	4.5	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	--	25	--	nS	VDS=750V ID=3A RG=25Ω
trise	Rise Time	--	48	--		
td(OFF)	Turn- OFF Delay Time	--	57	--		
tfall	Fall Time	--	52	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1600	--	pF	VGS=0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	100	--		
Crss	Reverse Transfer Capacitance	--	33	--		
Qg	Total Gate Charge	--	36	--	nC	VDS=750V ID=3A VGS=10V
Qgs	Gate- to- Source Charge	--	9.5	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	12	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	3	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	12	A	
VSD	Diode Forward Voltage	--	--	1.5	V	IS=3A,VGS=0V
trr	Reverse Recovery Time	--	255	--	nS	VGS=0V IS=3A,di/dt=100A /μs
Qrr	Reverse Recovery Charge	--	1.1	--	μC	

Notes:

- * 1. Repetitive rating, pulse width limited by maximum junction temperature.
- * 2. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$

Typical Feature Curve

Figure 1. Maximum Transient Thermal Impedance

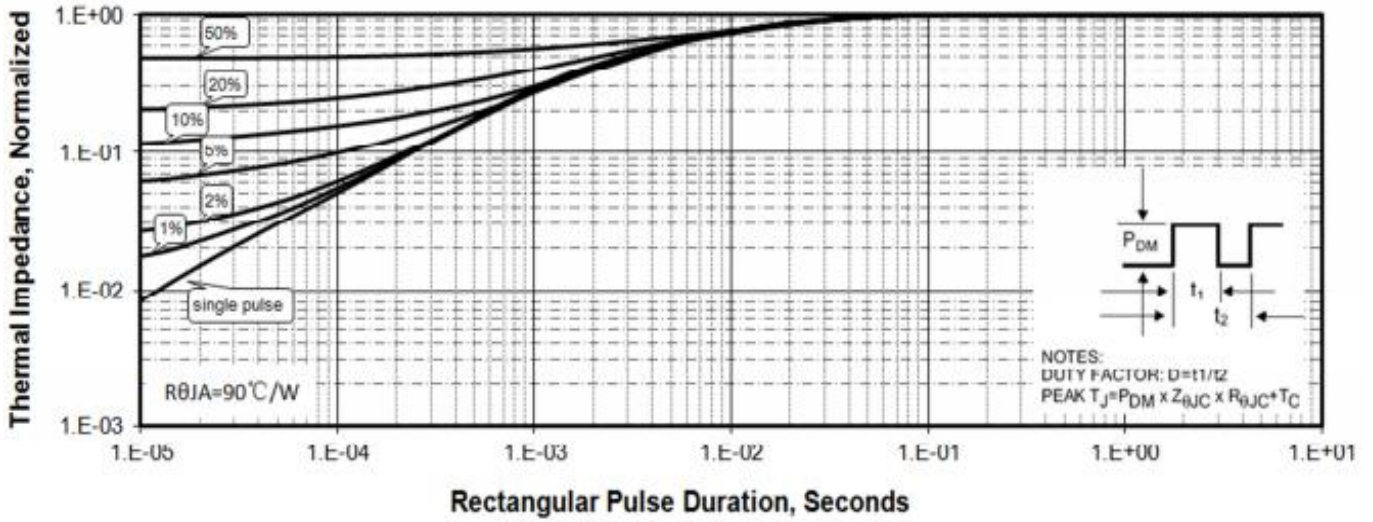


Figure 2 . Max. Power Dissipation vs Case Temperature

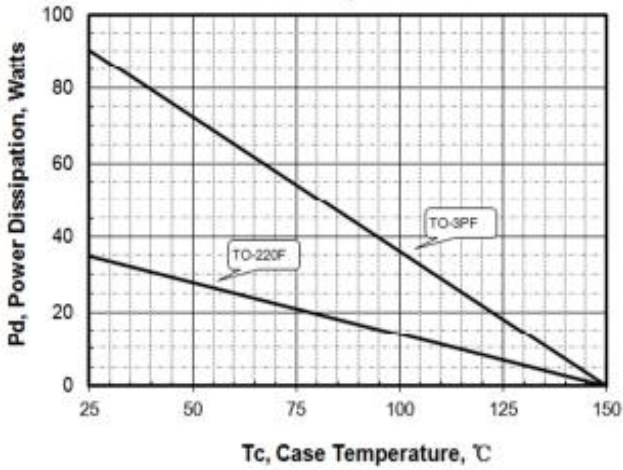


Figure 3 .Maximum Continuous Drain Current vs Tc

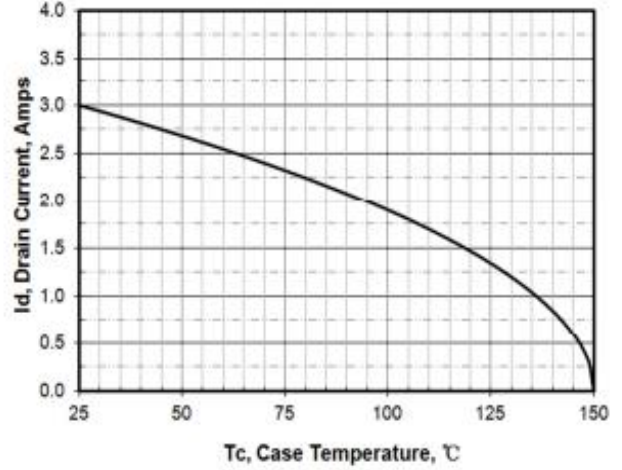


Figure 4. Output Characteristics

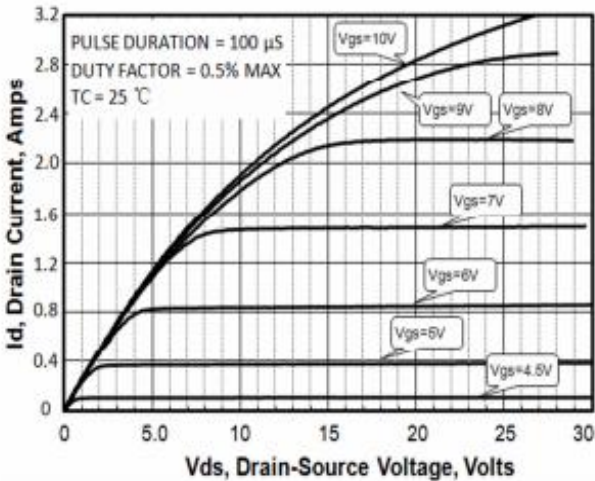


Figure 5. Rds(on) vs Gate Voltage

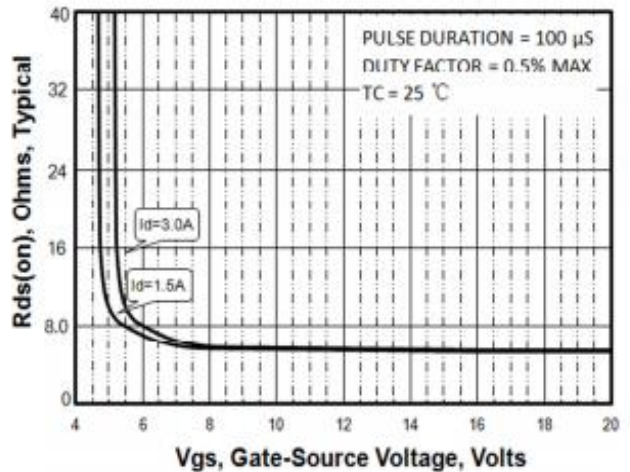


Figure 6. Peak Current Capability

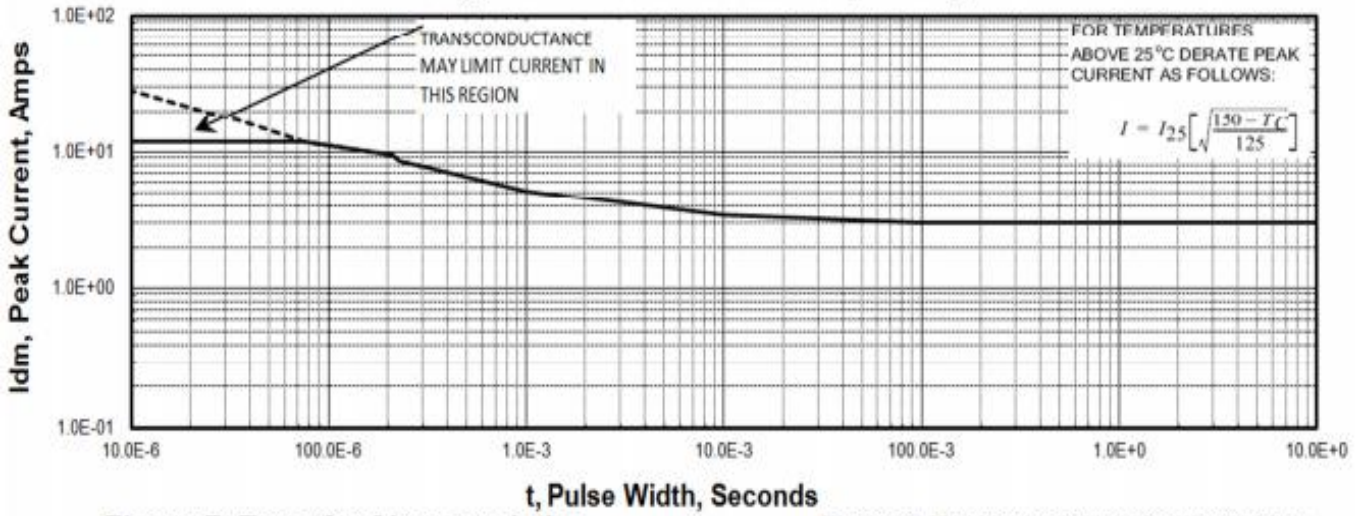


Figure 7. Transfer Characteristics

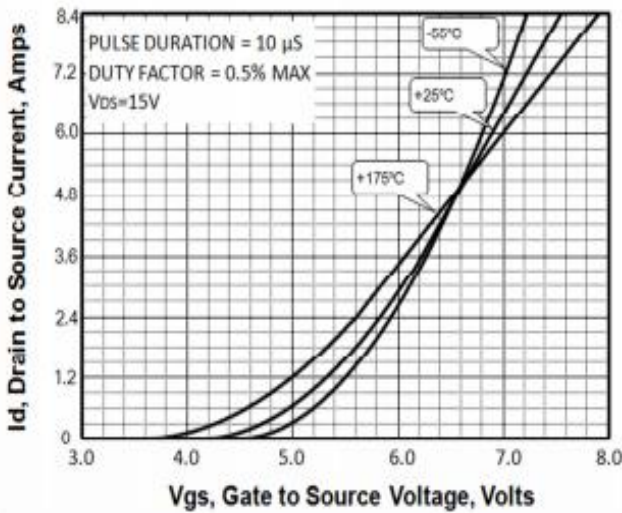


Figure 9. Drain to Source ON Resistance vs Drain Current

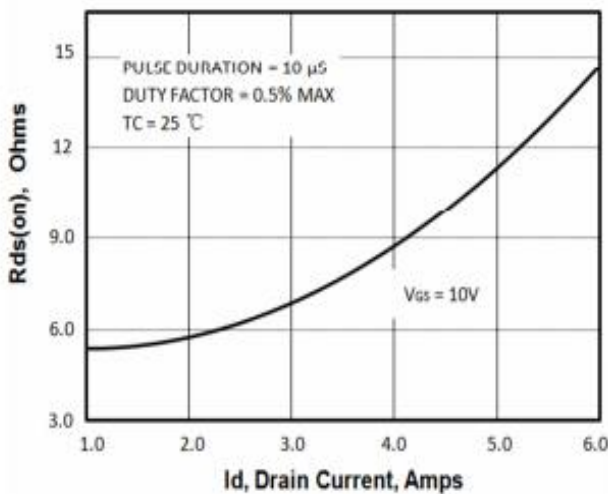


Figure 8. Unclamped Inductive Switching Capability

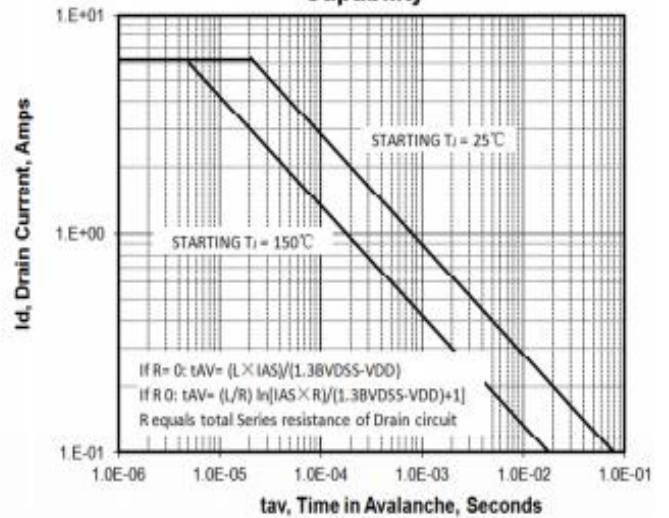


Figure 10. Rds(on) vs Junction Temperature

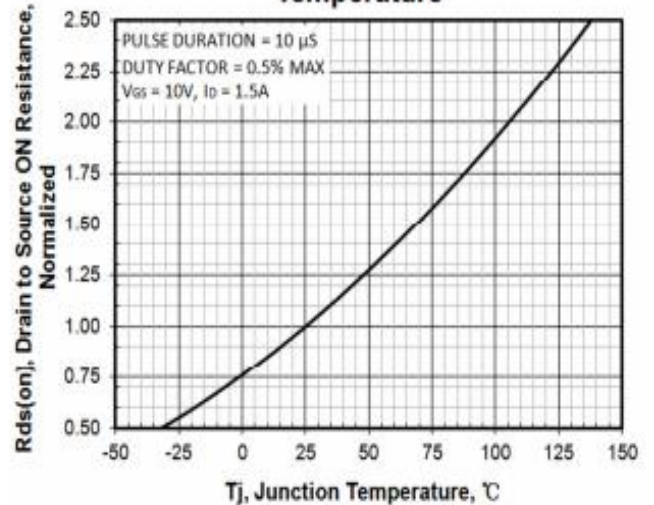


Figure 11. Breakdown Voltage vs Temperature

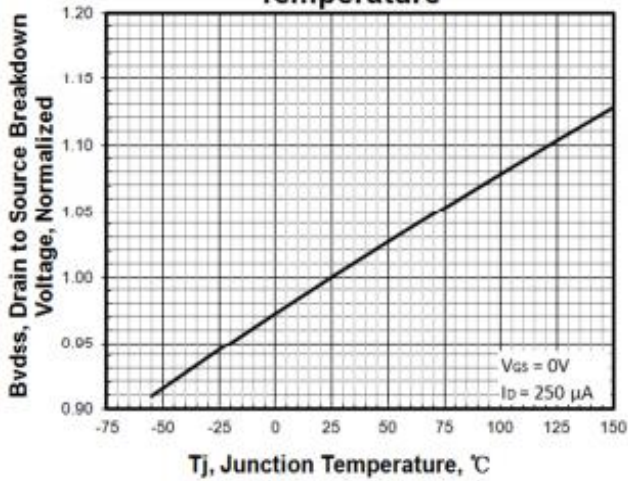


Figure 12. Threshold Voltage vs Temperature

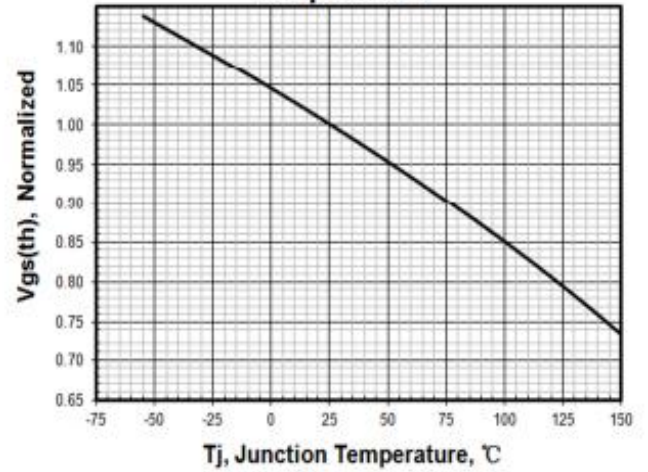


Figure 13 . Maximum Safe Operating Area(TO-3PF)

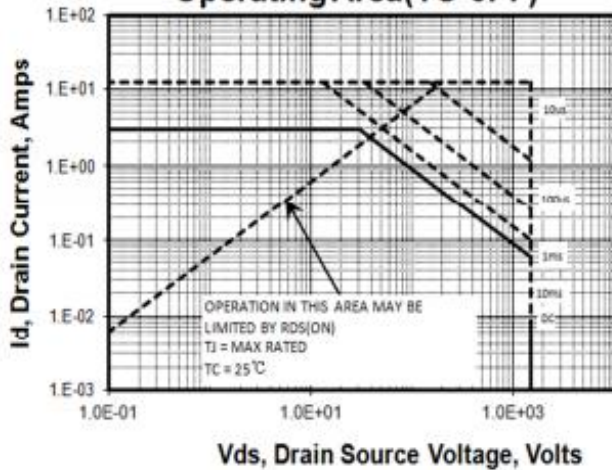


Figure 14 . Maximum Safe Operating Area(TO-220F)

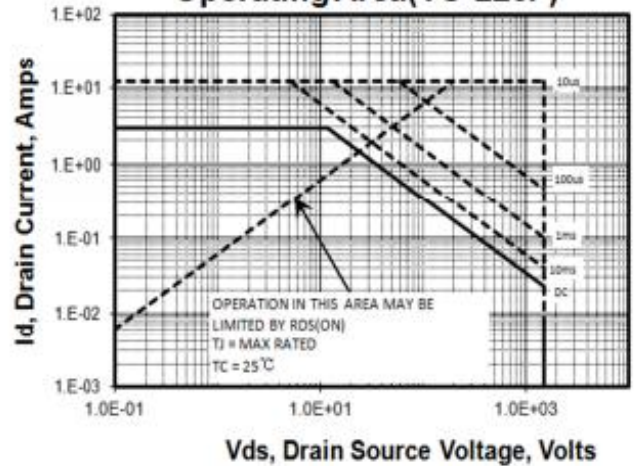


Figure 15. Capacitance vs Vds

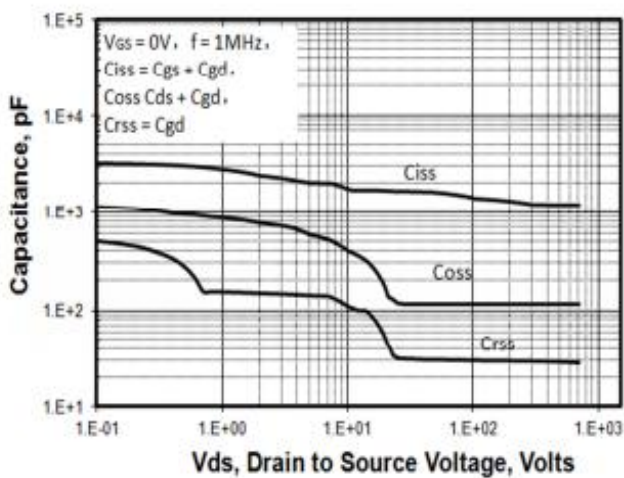
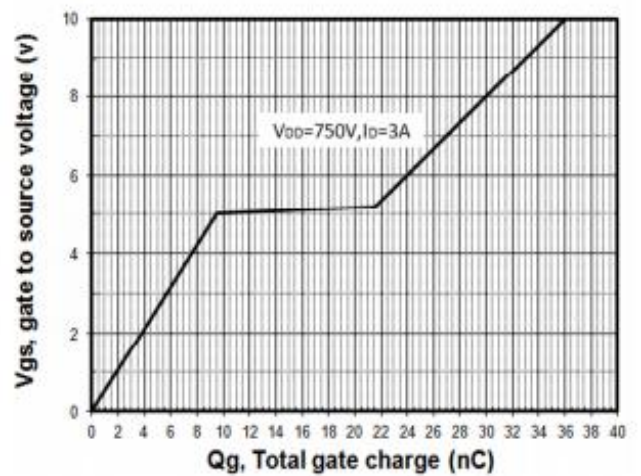


Figure 16 . Typical Gate Charge



Test Circuits and Waveforms

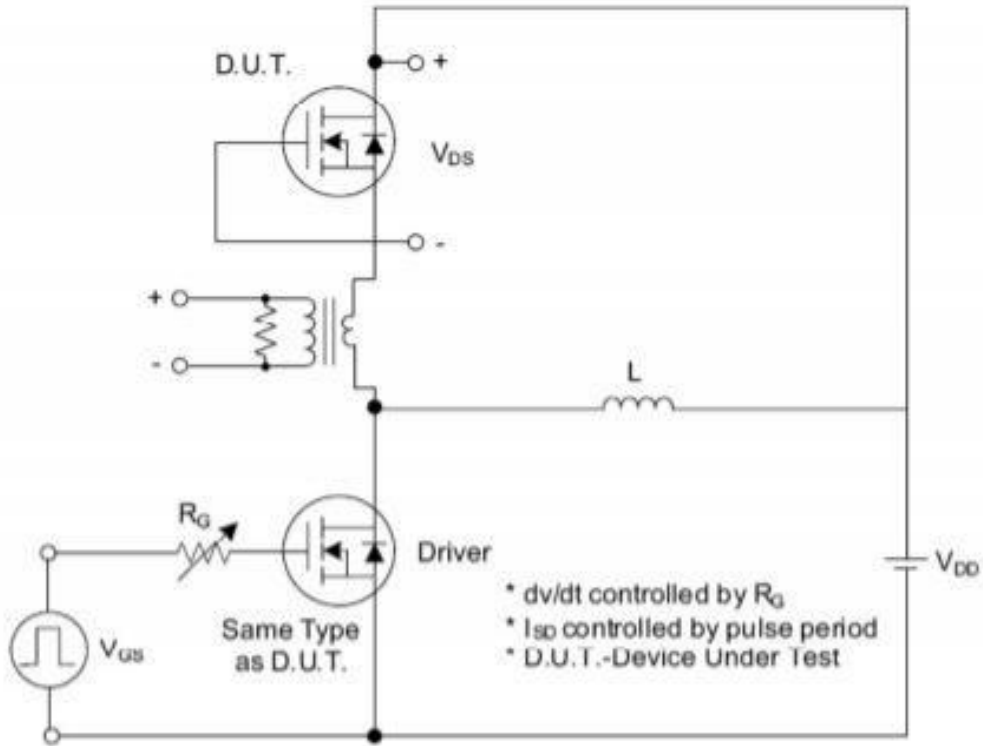


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

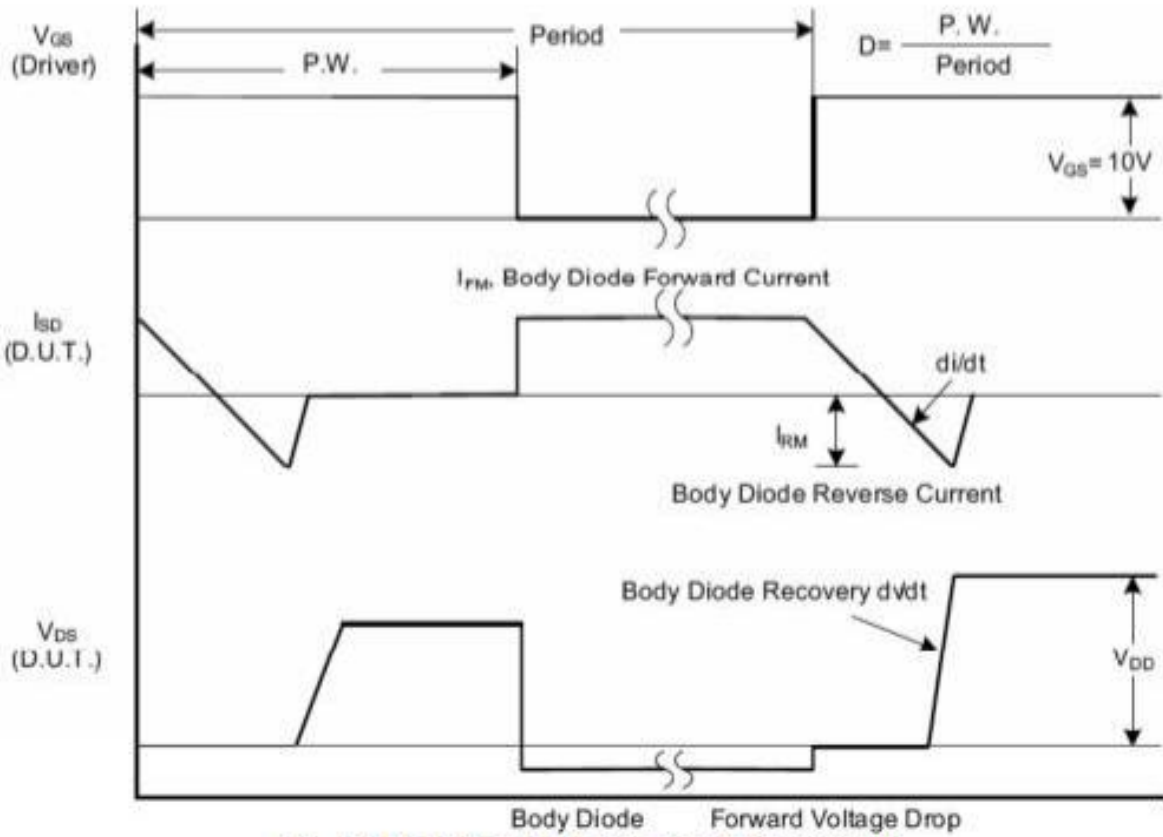


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

Test Circuits and Waveforms

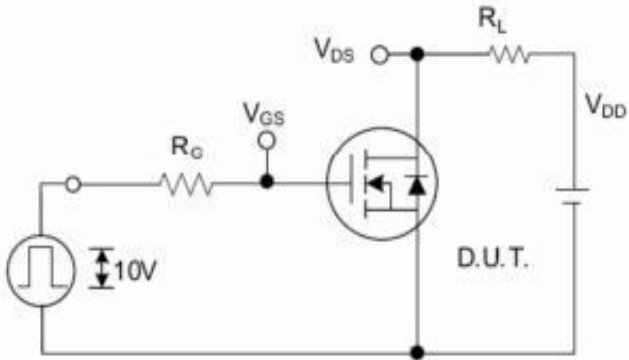


Fig. 2.1 Switching Test Circuit

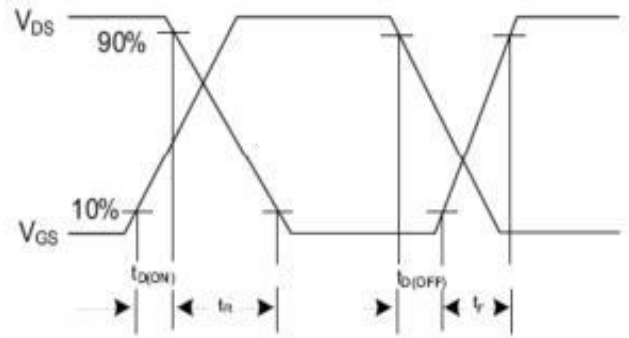


Fig. 2.2 Switching Waveforms

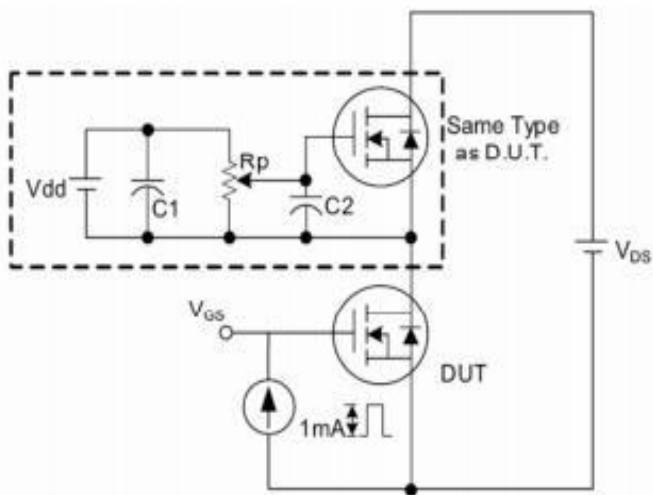


Fig. 3.1 Gate Charge Test Circuit

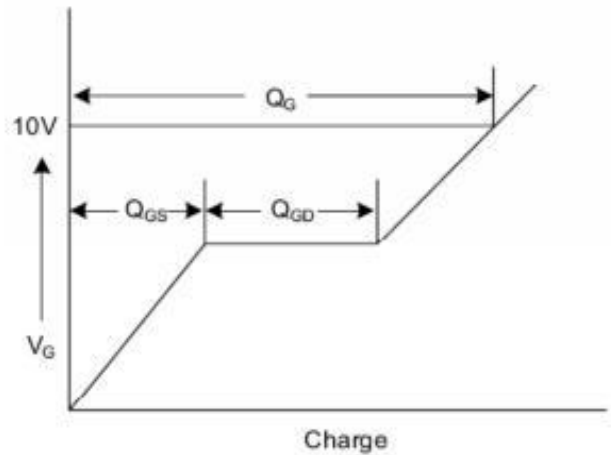


Fig. 3.2 Gate Charge Waveform

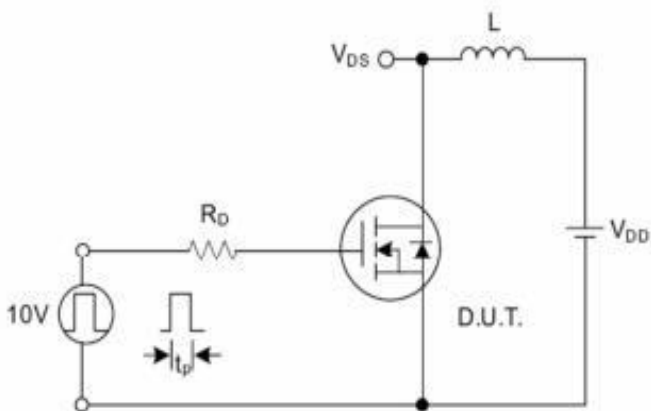


Fig. 4.1 Unclamped Inductive Switching Test Circuit

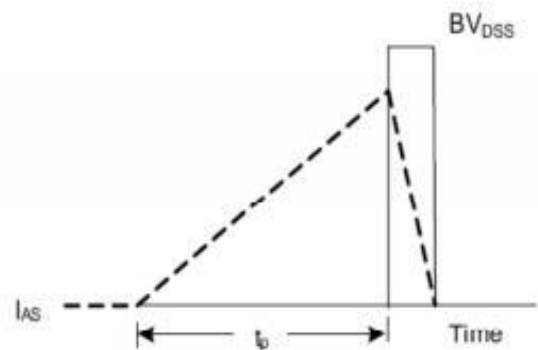
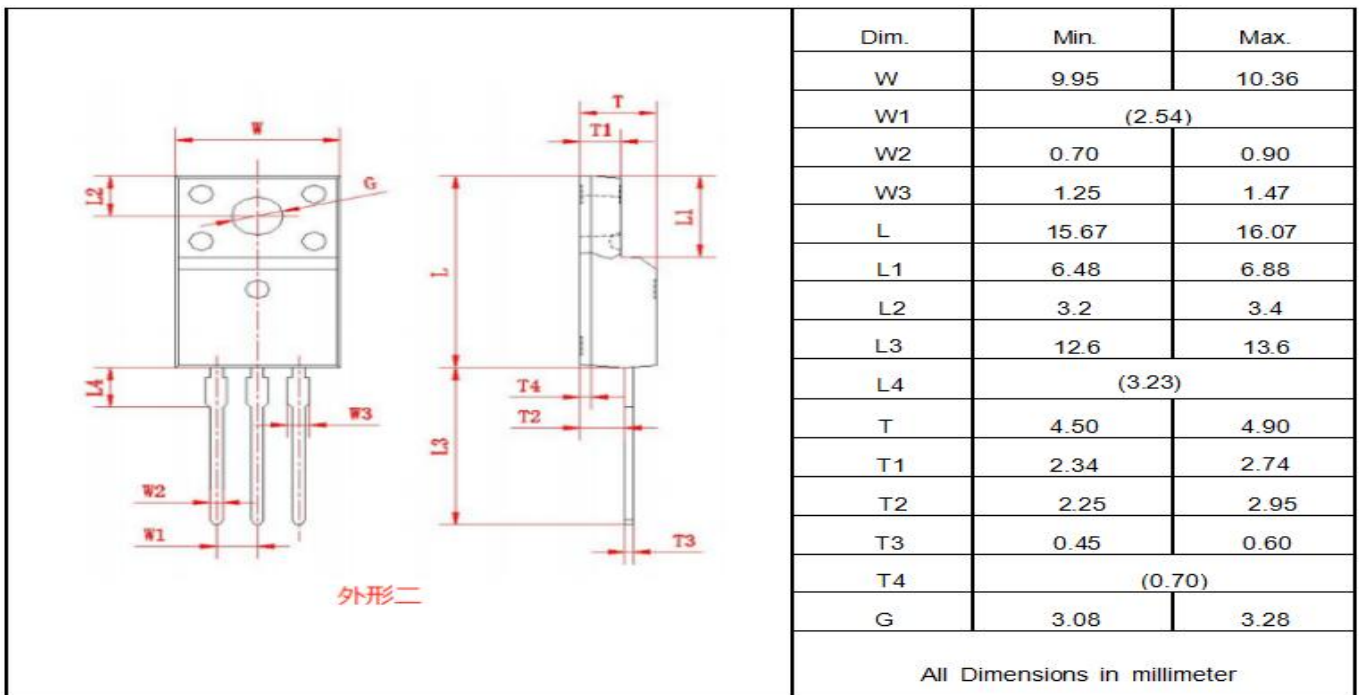
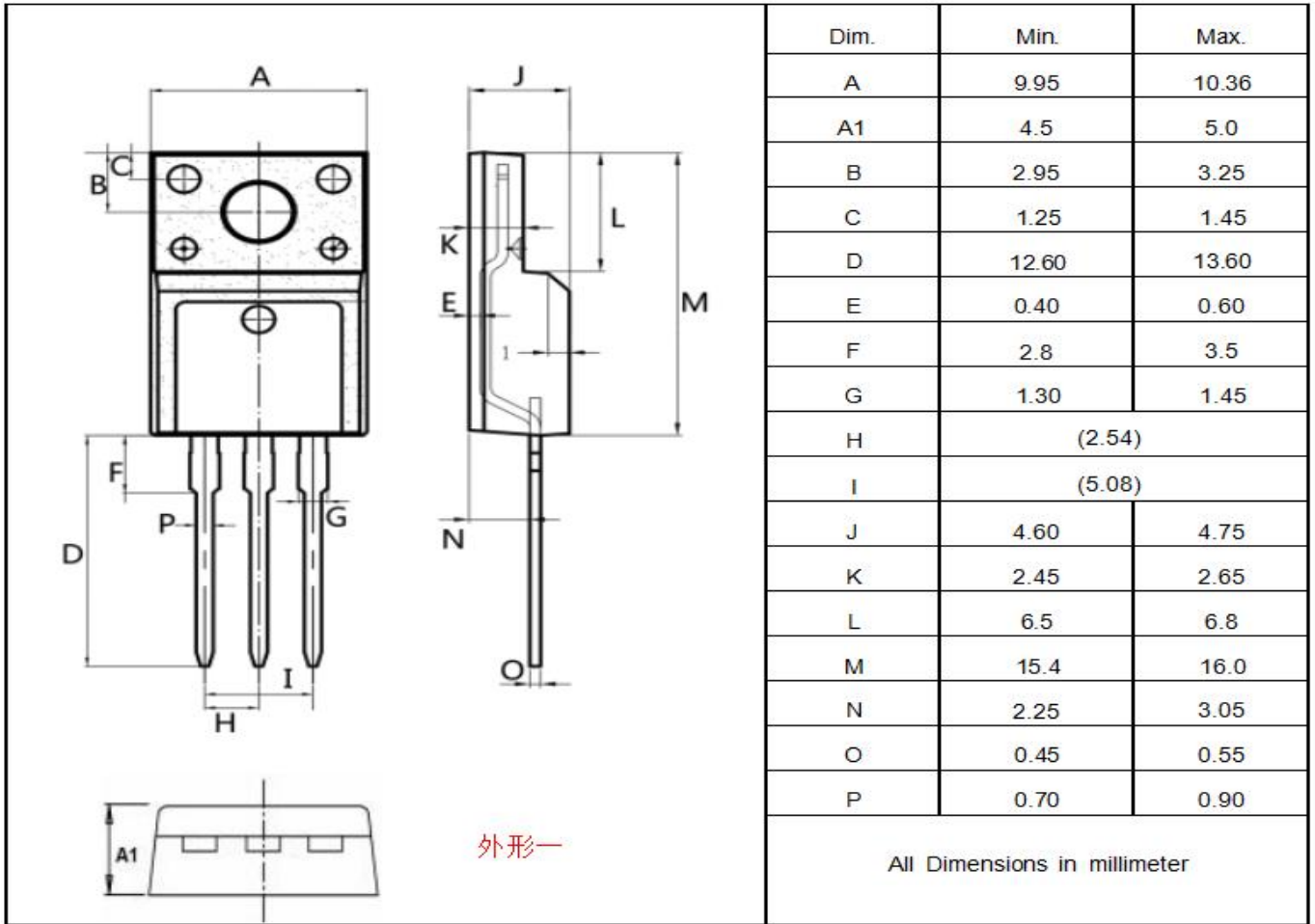


Fig. 4.2 Unclamped Inductive Switching Waveforms

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



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