

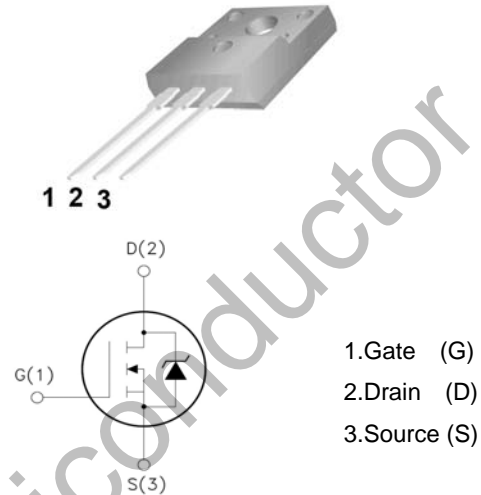


WGF10N80S

Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg=65nC(Typ.).
- BV_{DSS}=800V, I_D=10A
- R_{DS(on)} : 0.68 Ω (Typ.)
- 100% Avalanche Tested

TO-220F



1. Gate (G)
2. Drain (D)
3. Source (S)

Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	800	V
I _D	Drain Current	T _j =25°C	10
		T _j =100°C	6.5
V _{GS(TH)}	Gate Threshold Voltage	±30	V
E _{AS}	Single Pulse Avalanche Energy	997	mJ
I _{DM}	Pulsed Drain Current (Tc= 25°C) (Note1)	40	A
P _D	Power Dissipation (Tc= 25°C)	60	W
T _j	Junction Temperature(Max)	150	°C
T _{stg}	Storage Temperature	-55~+150	°C
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	°C
E _{AR}	Avalanche Energy, Repetitive (Note1)	40	mJ
I _{AR}	Avalanche Current (Note1)	2.8	A
dv/dt	Peak Diode Recovery dv/dt (Note2)	5.0	V/ns

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance, Junction to Case	-	2.08	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	-	100	°C/W

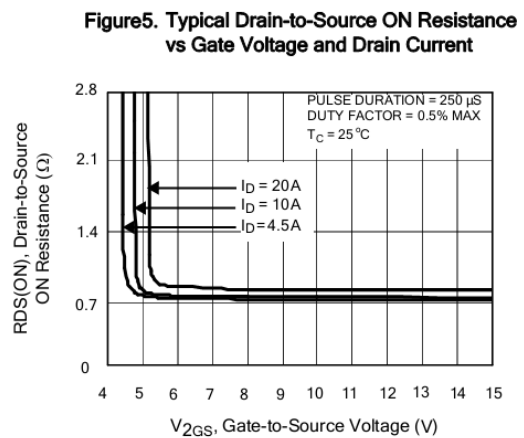
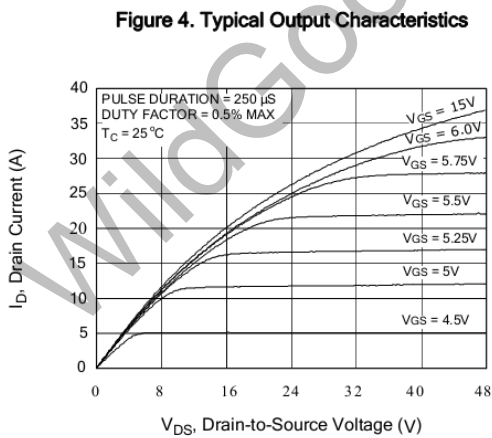
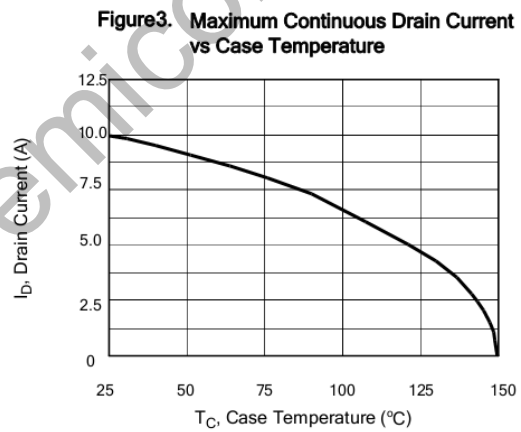
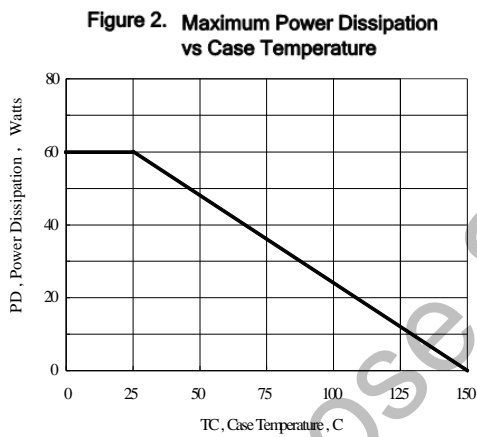
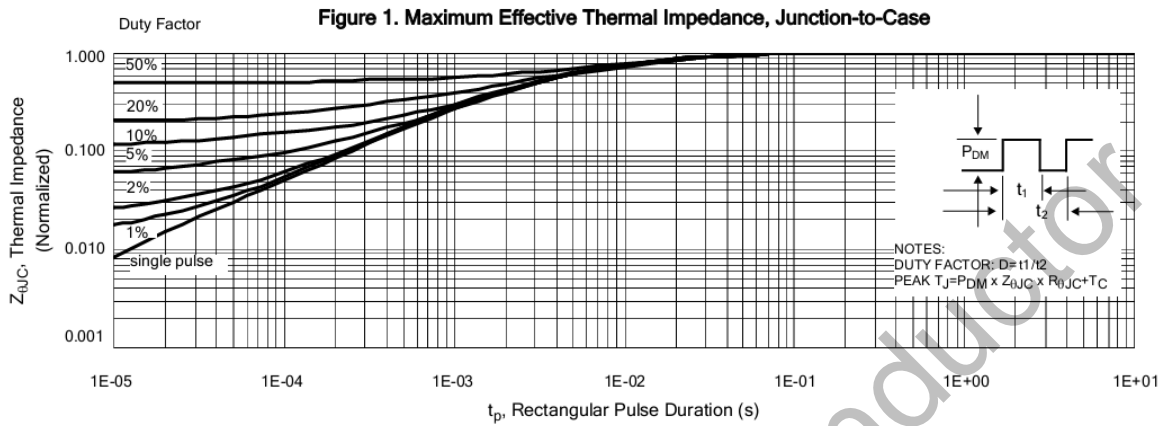
Electrical Characteristics (Ta=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0	800	870	-	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, Reference to 25°C	-	0.5	-	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =800V, V _{GS} =0V	-	-	25	μA
		V _{DS} =640V, T _j =125°C	-	-	250	
I _{GSSF}	Gate-body leakage Current, Forward	V _{GS} =+20V, V _{DS} =0V	-	-	10	nA
I _{GSSR}	Gate-body leakage Current, Reverse	V _{GS} =-20V, V _{DS} =0V	-	-	-10	
On Characteristics						
V _{GS(TH)}	Date Threshold Voltage	I _D =250μA, V _{DS} =V _{GS}	2	-	4	V
R _{DS(ON)}	Static Drain-Source On-Resistance	I _D =5A, V _{GS} =10V	-	0.68	0.75	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0, f=1.0MHz	-	2900	-	pF
C _{oss}	Output Capacitance		-	200	-	
C _{rss}	Reverse Transfer Capacitance		-	25	-	
g _{fs}	Forward Trans conductance	V _{DS} =15V, I _D =10A	-	20	-	S
Switching Characteristics						
T _{d(on)}	Turn-On Delay Time	V _{DD} =400V, I _D =10A R _G =4.7Ω	-	19	-	nS
T _r	Turn-On Rise Time		-	10	-	
T _{d(off)}	Turn-Off Delay Time		-	68	-	
T _f	Turn-Off Rise Time		-	23	-	
Q _g	Total Gate Charge	V _{DS} =640V, V _{GS} =10V, I _D =10A	-	65	-	nC
Q _{gs}	Gate-Source Charge		-	13	-	
Q _{gd}	Gate-Drain Charge		-	25	-	
Drain-Source Diode Characteristics and Maximum Ratings						
I _s	Max. Diode Forward Current	T _C = 25°C	-	-	10	A
I _{SM}	Max. Pulsed Forward Current	T _C = 25°C	-	-	40	
V _{SD}	Diode Forward Voltage	I _s =10A	-	-	1.5	V
T _{rr}	Reverse Recovery Time	I _s =10A, V _{GS} =0V diF/dt=100A/μs	-	200	-	nS
Q _{rr}	Reverse Recovery Charge		-	2.2	-	μC

Notes : 1, Repetitive Rating : Pulse width limited by maximum junction temperature

2, I_{SD}=10A, dv/dt ≤ 100A/us, V_{DD} ≤ BV_{DS}, T_j= 25°C

Typical Characteristics



Typical Characteristics (Continued)

Figure 6. Maximum Peak Current Capability

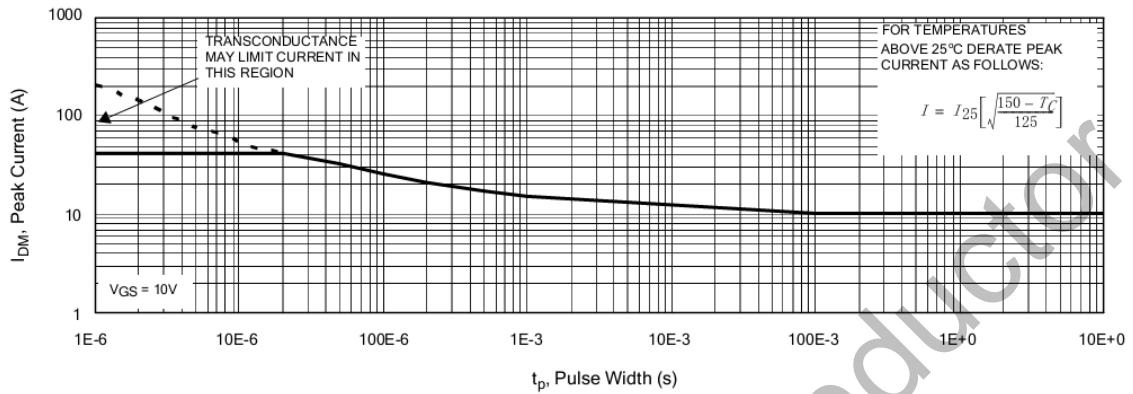


Figure 7. Typical Transfer Characteristics

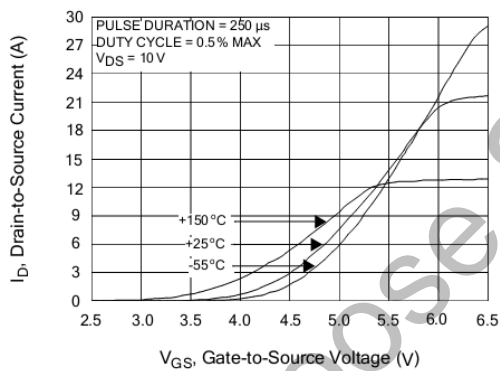


Figure 8. Unclamped Inductive Switching Capability

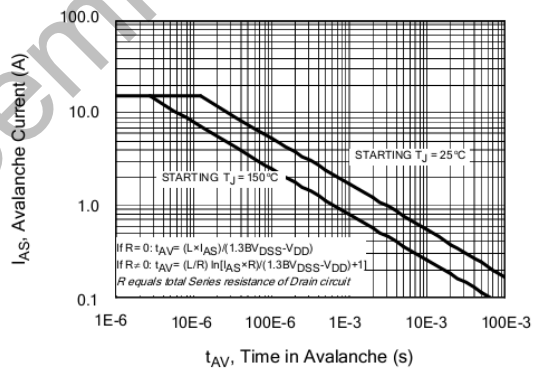


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

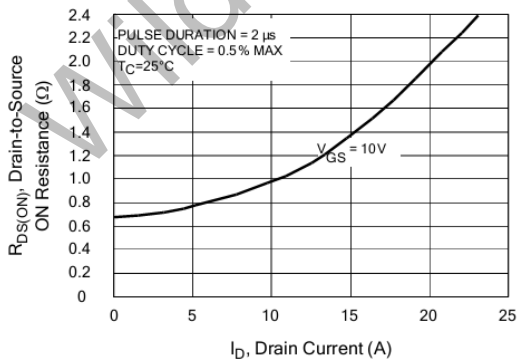


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

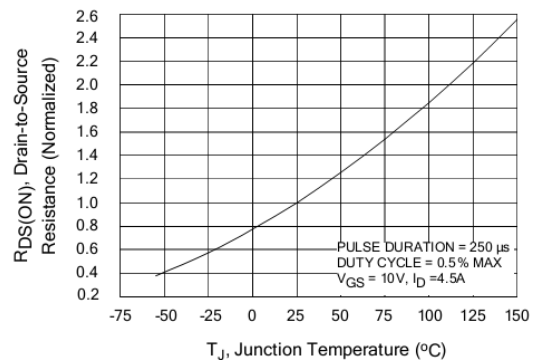


Figure 11. Typical Breakdown Voltage vs Junction Temperature

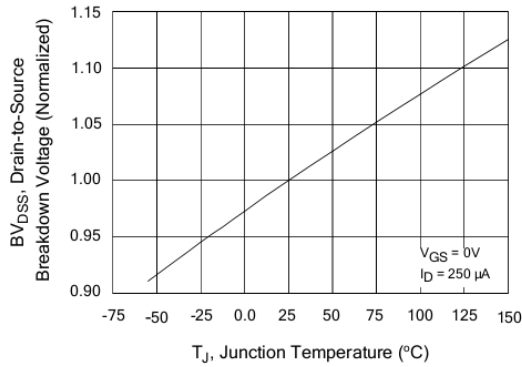


Figure 12. Typical Threshold Voltage vs Junction Temperature

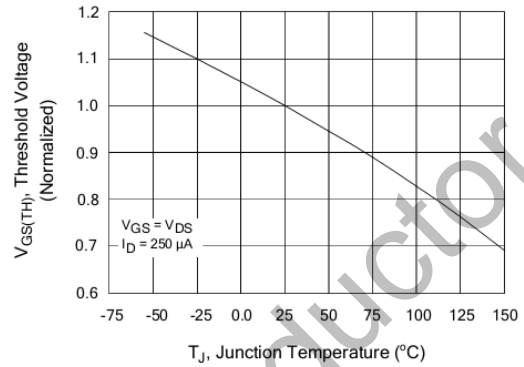


Figure 13. Maximum Forward Bias Safe Operating Area

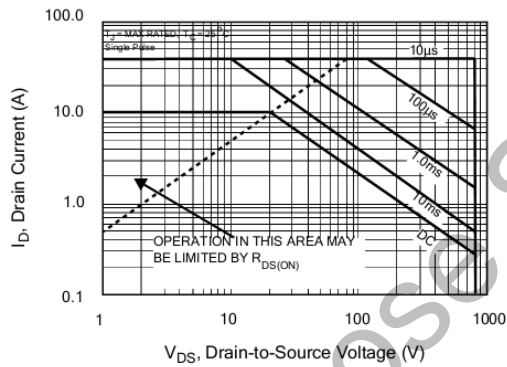


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

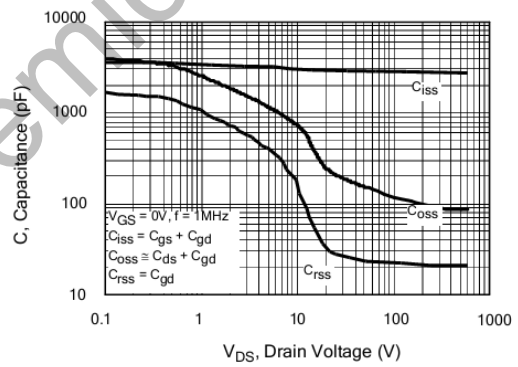


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

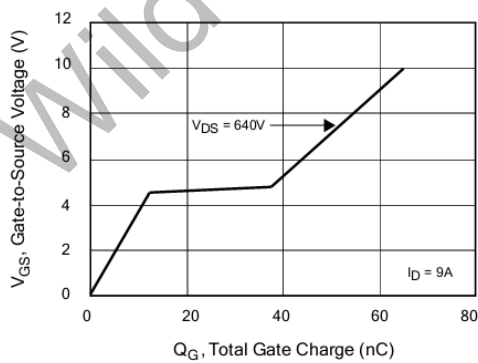
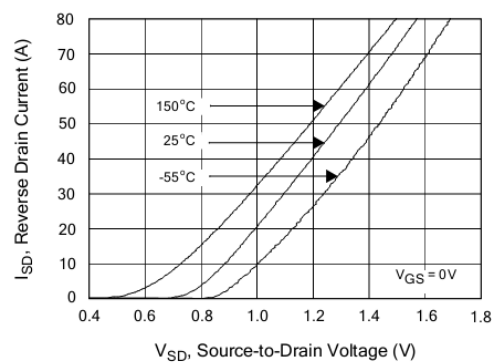


Figure 16. Typical Body Diode Transfer Characteristics



Test Circuit and Waveform

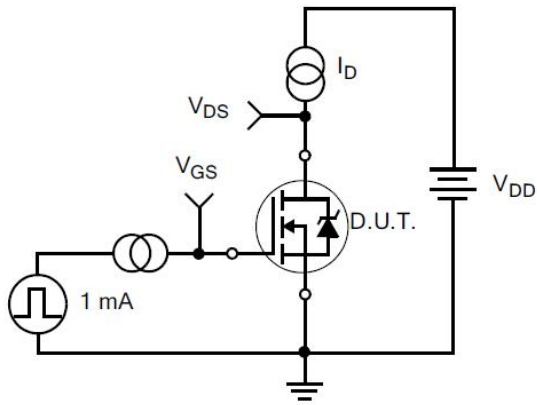


Figure 17. Gate Charge Test Circuit

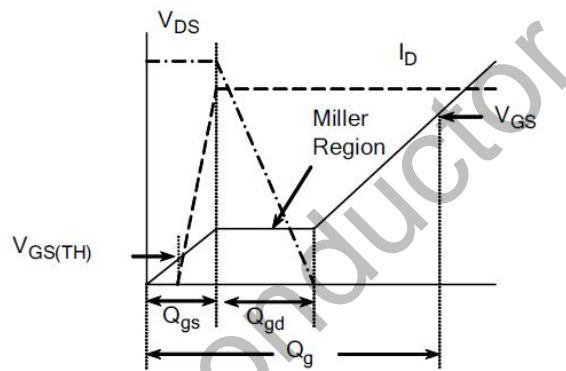


Figure 18. Gate Charge Waveform

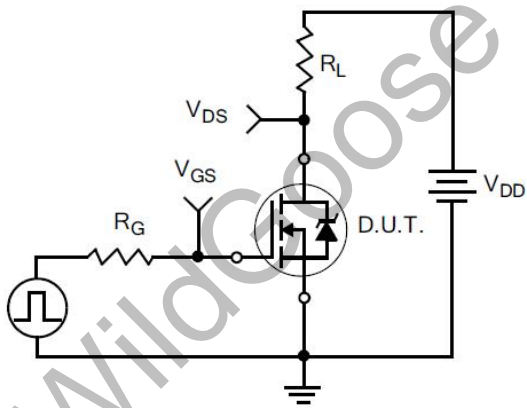


Figure 19. Resistive Switching Test Circuit

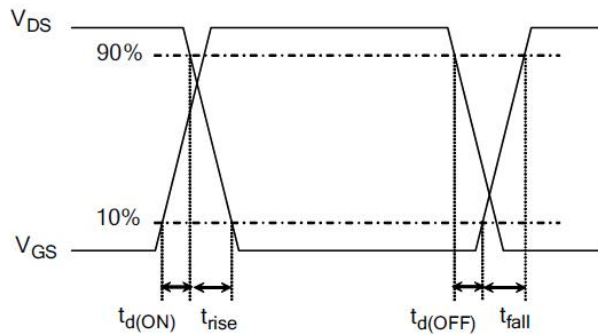


Figure 20. Resistive Switching Waveforms

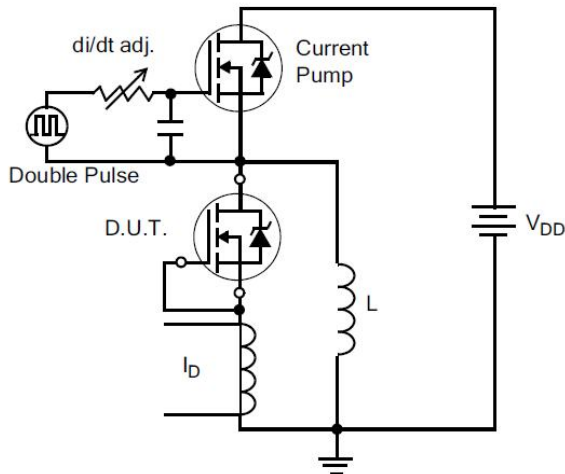


Figure 21. Diode Reverse Recovery Test Circuit

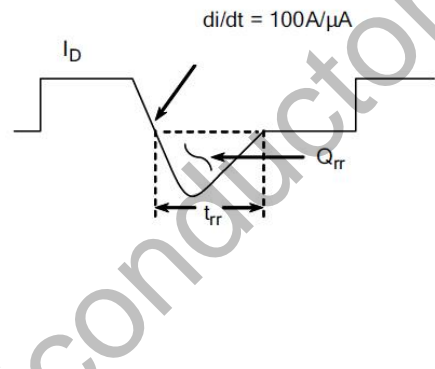


Figure 22. Diode Reverse Recovery Waveform

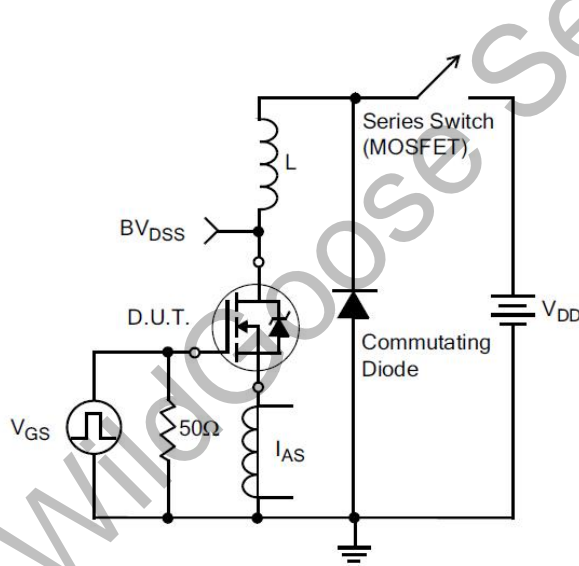


Figure 23. Unclamped Inductive Switching Test Circuit

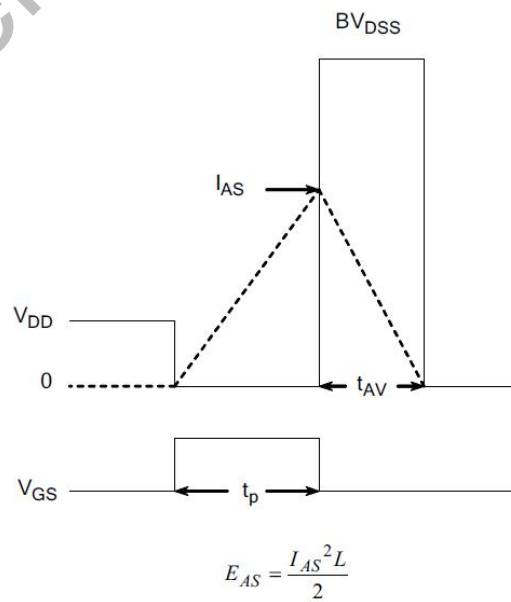
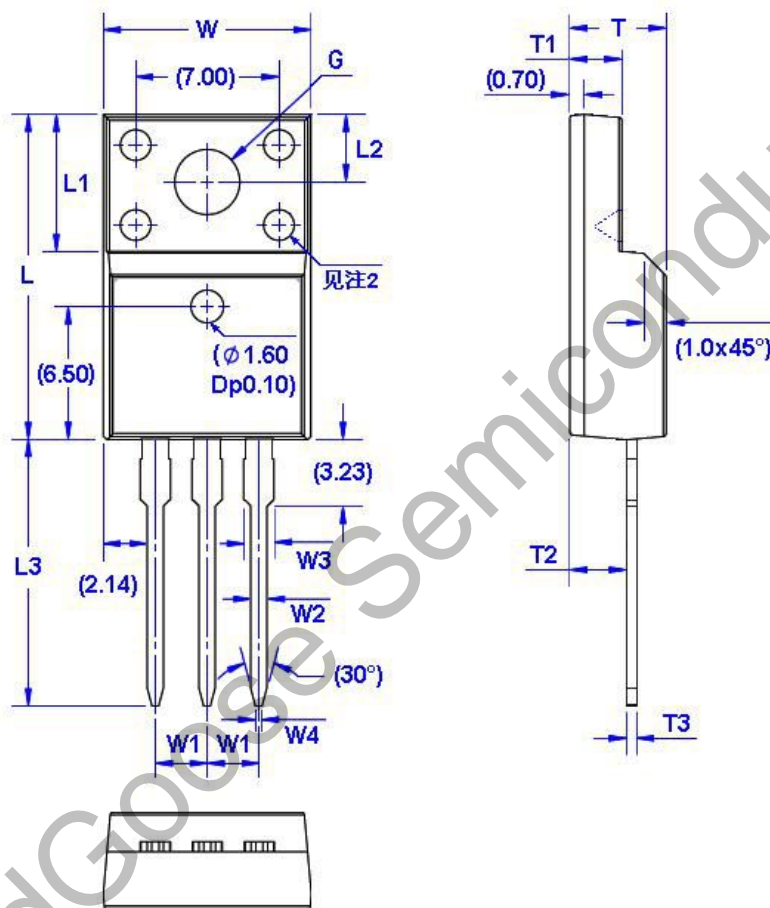


Figure 24. Unclamped Inductive Switching Waveforms

Package Dimension

TO-220F

Unit: mm



Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.96	10.36	W4	0.25	0.45	L3	12.78	13.18	T3	0.45	0.60
W1	2.54 (TYP)		L	15.67	16.07	T	4.50	4.90	G(Φ)	3.08	3.28
W2	0.70	0.90	L1	6.48	6.88	T1	2.34	2.74			
W3	1.24	1.47	L2	3.20	3.40	T2	2.56	2.96			