WildGoose

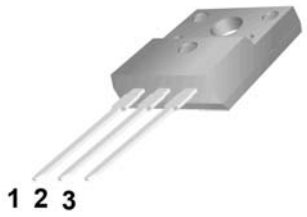
WGF9N90S

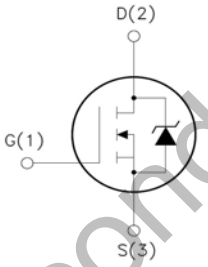
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge: Qg= 60nC (Typ.).
- ☐ VDSS=900V, I_D=9A
- ☐ R_{DS}(on) : 1.0Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

RoHS COMPLIANT

TO-220F





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

Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-Source Voltage		900	V
I_D	Drain Current	T_C=25℃	9	A
		T_C=100℃	5.45	
V_{GSS}	Gate - Source voltage		±30	V
E_{AS}	Single Pulse Avalanche Energy (note1)		410	mJ
I_{AR}	Avalanche Current (note2)		9	A
P_D	Power Dissipation (Tj=25℃)		50	W
T_j	Junction Temperature(MAX)		150	℃
T_{stg}	Storage Temperature		-55~+150	℃
TL	Maximum lead temperature for soldering purpose,1/8” from case for 5 seconds		300	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	2.5	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	-	65	℃/W

Electrical Characteristics (Ta=25℃ 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	900	-	-	V
△BVDSS/△TJ	Breakdown Voltage Temperature Coefficient	I_D=250μA ,Reference to 25℃	-	0.9	-	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=900V, V_{GS}=0V	-	-	10	μA
		V_{DS}=720V, Tc=125℃			100	
I_{GSSF}	Gate-body leakage Current, Forward	V_{GS}=+30V, V_{DS}=0V	-	-	100	nA
I_{GSSR}	Gate-body leakage Current, Reverse	V_{GS}=-30V, V_{DS}=0V	-	-	-100	
On Characteristics						
$V_{GS(TH)}$	Date Threshold Voltage	I_D=250μA,V_{DS}=V_{GS}	3	-	5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	I_D=4.5A,V_{GS}=10V	-	0.85	1.0	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	V_{DS}=25V，V_{GS}=0，f=1.0MHz	-	2630	-	pF
Coss	Output Capacitance		-	190	-	
Crss	Reverse Transfer Capacitance		-	18	-	
Switching Characteristics						
Td(on)	Turn-On Delay Time	V_{DD}=450V，I_D=9A R_G=25Ω (Note 3,4)	-	64	110	ns
Tr	Turn-On Rise Time		-	105	250	
Td(off)	Turn-Off Delay Time		-	155	210	
Tf	Turn-Off Rise Time		-	84	160	
Qg	Total Gate Charge	V_{DS}=720,V_{GS}=10V，I_D=9A	-	60	-	nC
Qgs	Gate-Source Charge		-	13	-	
Qgd	Gate-Drain Charge		-	27	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Is	Max. Diode Forward Current	-	-	-	9	A
I_{SM}	Max. Pulsed Forward Current	-	-	-	36	
V_{SD}	Diode Forward Voltage	I_D=9A	-	-	1.4	V
Trr	Reverse Recovery Time	I_S=9A,V_{GS} =0V diF/dt=100A/μs	-	575	-	nS
Qrr	Reverse Recovery Charge		-	9.9	-	μC

Notes : 1, L=20.8mH, IAS=9A, VDD=50V, RG=25Ω, Starting TJ =25°C
2, Repetitive Rating : Pulse width limited by maximum junction temperature
3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
4, Essentially Independent of Operating Temperature

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

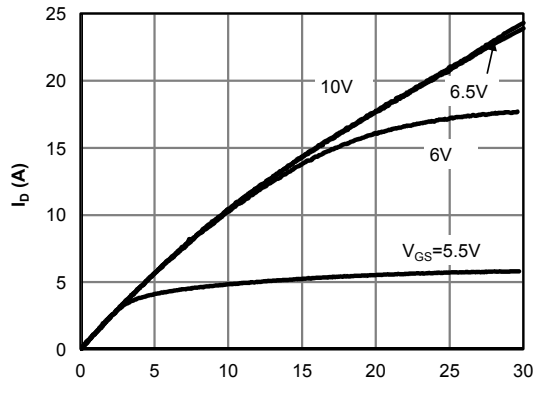


Fig 1: On-Region Characteristics

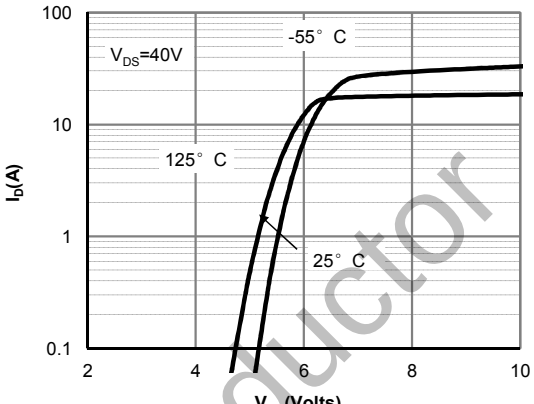


Figure 2: Transfer Characteristics

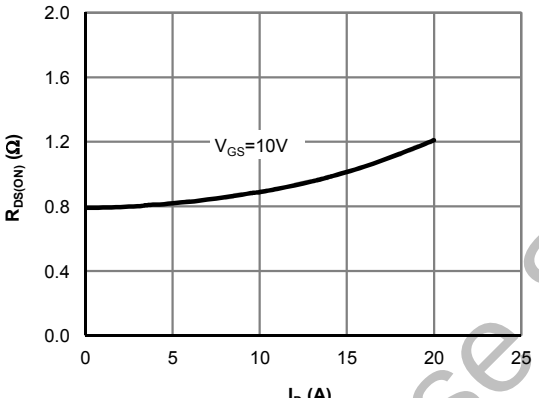


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

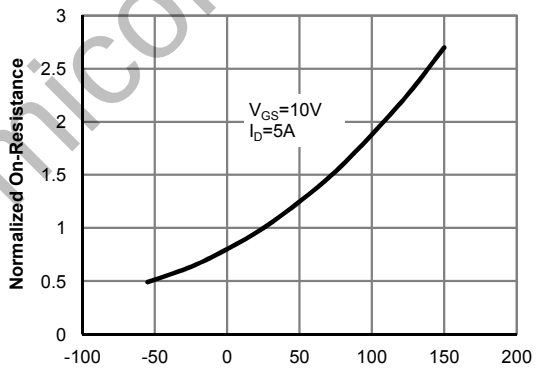


Figure 4: On-Resistance vs. Junction Temperature

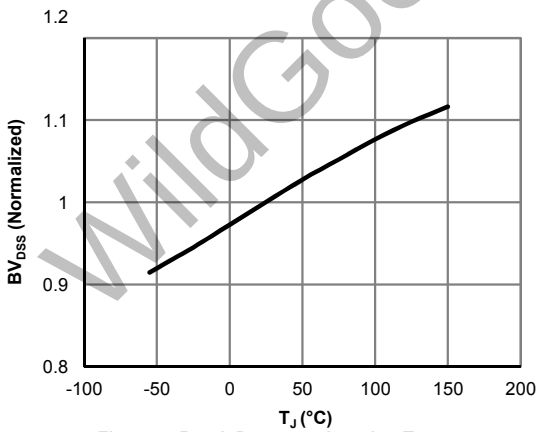


Figure 5: Break Down vs. Junction Temperature

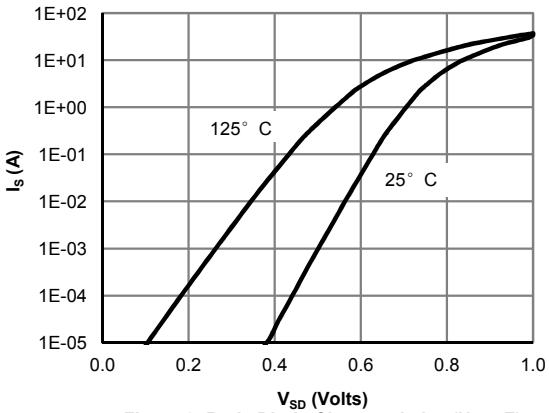


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

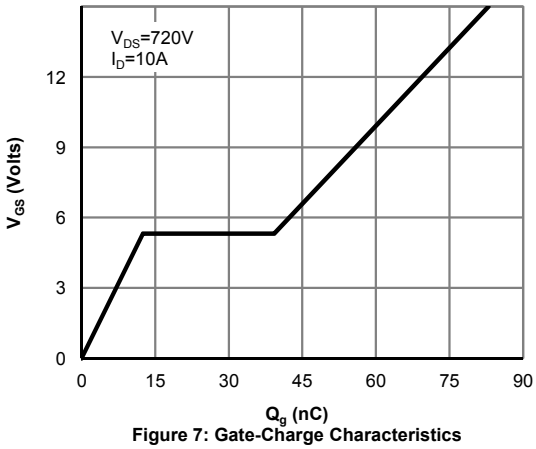


Figure 7: Gate-Charge Characteristics

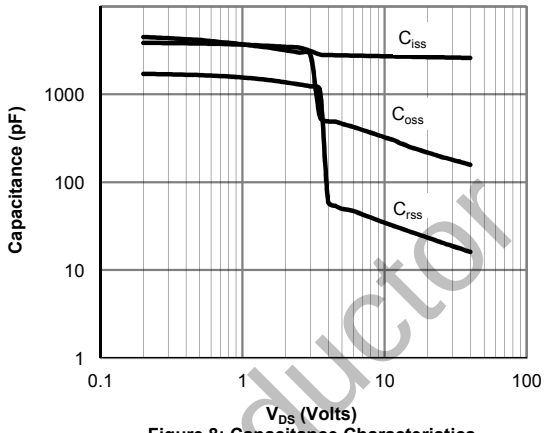


Figure 8: Capacitance Characteristics

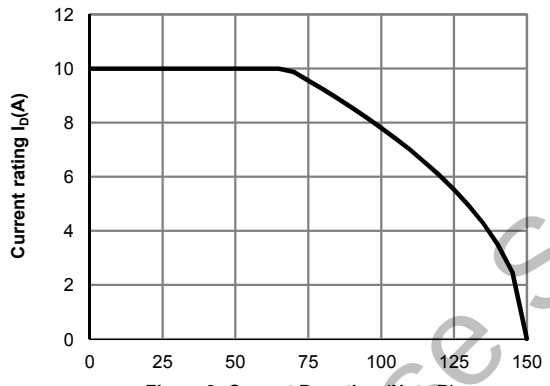


Figure 9: Current De rating (Note B)

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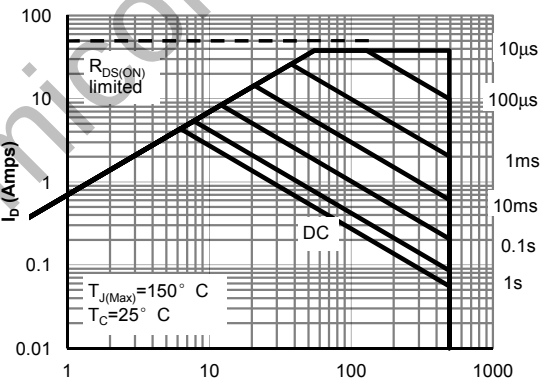


Figure 10: Maximum Forward Biased Safe Operating Area for AOTF10N90 (Note F)

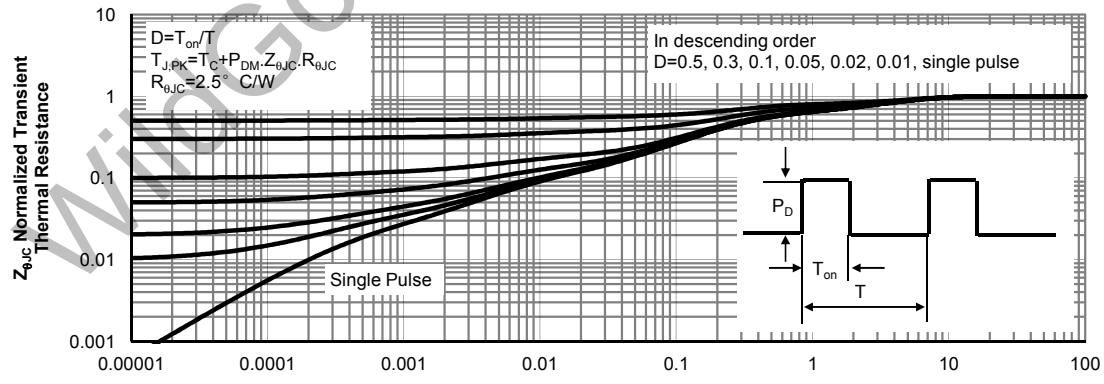
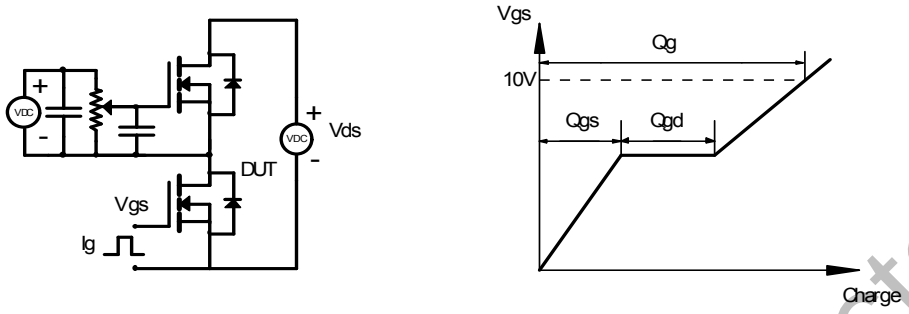
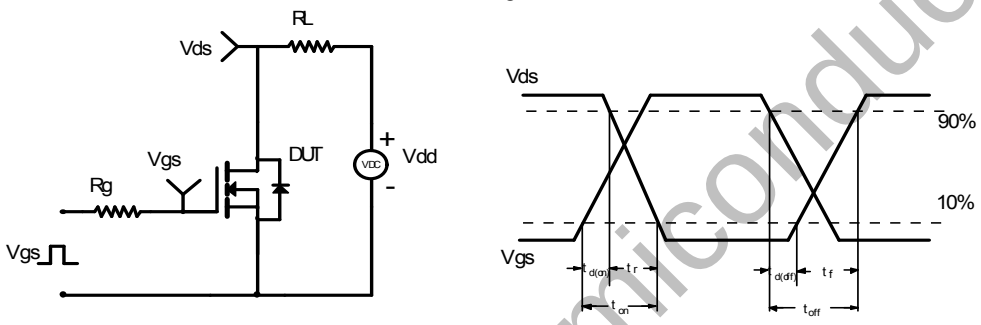


Figure 11: Normalized Maximum Transient Thermal Impedance for AOTF10N90 (Note F)

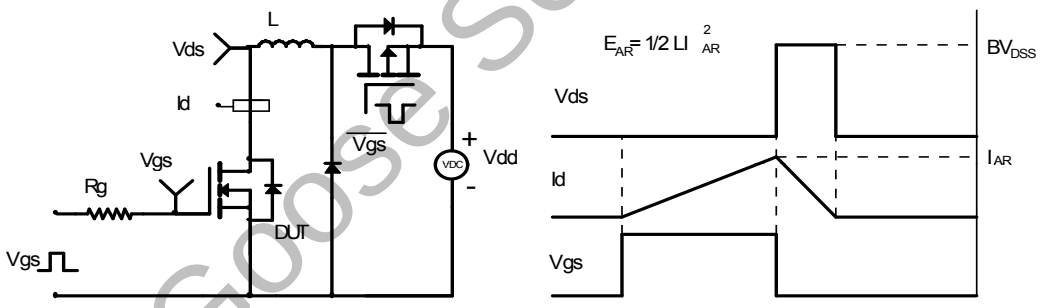
Gate Charge Test Circuit & Waveform



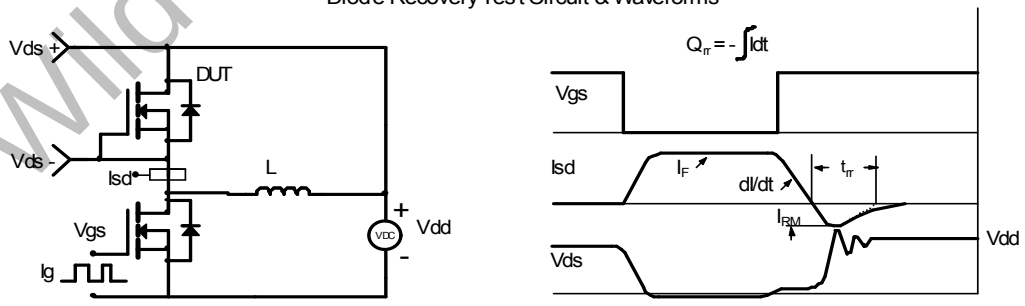
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



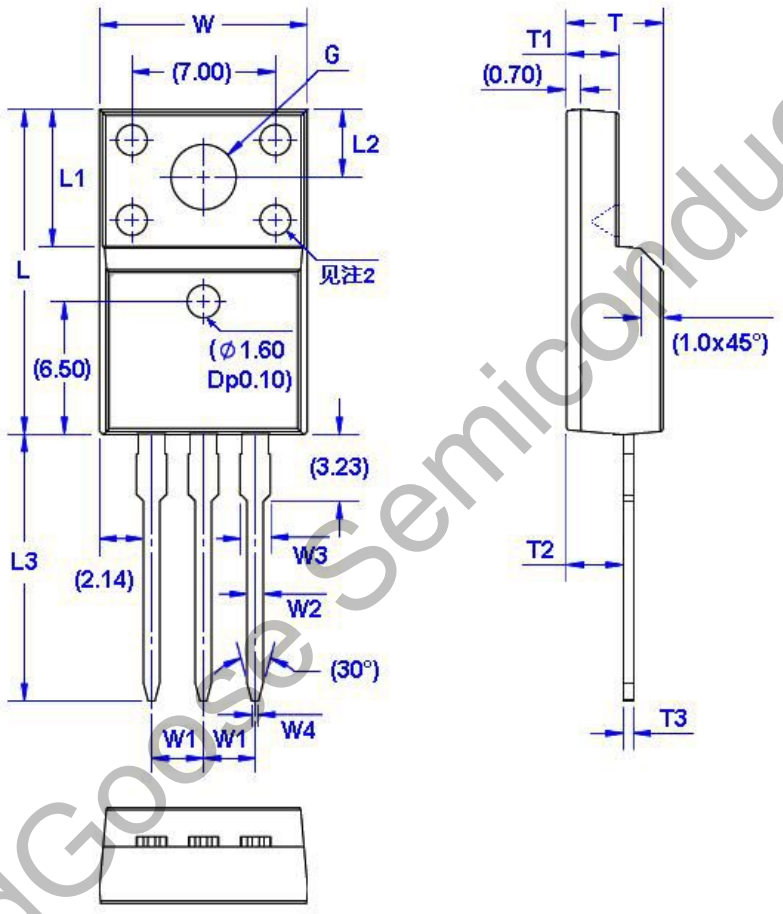
Diode Recovery Test Circuit & Waveforms



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			

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