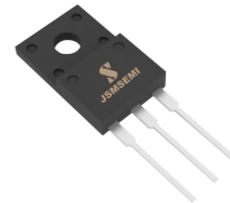
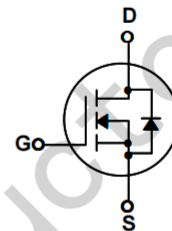


Features

- ☐ Low Intrinsic Capacitances
- ☐ Excellent Switching Characteristics
- ☐ Extended Safe Operating Area
- ☐ Unrivalled Gate Charge :Qg= 13nC (Typ.)
- ☐ BVDSS=800V,ID=3A
- ☐ $R_{DS(on)} : 5 \Omega$ (Max) @VG=10V
- ☐ 100% Avalanche Tested



TO-220F



TO-220F

G-Gate,D-Drain,S-Source

Absolute Maximum Ratings *Tc=25 °C unless other wise noted*

Symbol	Parameter	3N80C	Units
V_{DSS}	Drain-Source Voltage	800	V
I_D	Drain Current -continuous ($T_c=25^\circ\text{C}$)	3	A
	-continuous ($T_c=100^\circ\text{C}$)	1.9	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avanche Energy (Note1)	320	mJ
I_{AR}	Avalanche Current (Note2)	3	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	39	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 ~ +150	$^\circ\text{C}$
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	--	3.2	$^\circ\text{C/W}$
$R_{\theta CS}$	Thermal Resistance,Case to Sink	0.5	--	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	--	62.5	$^\circ\text{C/W}$

Electrical Characteristics Tc=25°C unless other wise noted						
Symbol	Parameter	Test Condition	Min.	Typ.	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	ID=250 μ A, VGS=0	800	--	--	V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Confficient	ID=250 μ A,Reference to 25°C	--	0.9	--	V/°C
IDSS	Zero Gate Voltage Drain Current	Vds=800V, Vgs=0V	--	--	10	μ A
		Vds=640V, Tc=125°C			100	μ A
IGSSF	Gate-body leakage Current, Forward	Vgs=+30V, Vds=0V	--	--	100	nA
IGSSR	Gate-body leakage Current, Reverse	Vgs=-30V, Vds=0V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Date Threshold Voltage	Id=250uA,Vds=Vgs	3	--	5	V
R _{DS(on)}	Static Drain-Source On-Resistance	Id=1.5A,Vgs=10V	--	--	5	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V, VGS=0, f=1.0MHz	--	530	690	pF
Coss	Output Capacitance		--	57	75	pF
Crss	Reverse Transfer Capacitance		--	7	9	pF
Switching Characteristics						
Td(on)	Turn-On Delay Time	VDD=400V, ID=3A RG=25 Ω (Note 3,4)	--	15	40	nS
Tr	Turn-On Rise Time		--	40	90	nS
Td(off)	Turn-Off Delay Time		--	30	70	nS
Tf	Turn-Off Fall Time		--	30	70	nS
Qg	Total Gate Charge	VDS=640,VGS=10V, ID=3A (Note 3,4)	--	15	19	nC
Qgs	Gate-Source Charge		--	3.5	--	nC
Qgd	Gate-Drain Charge			7.7	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximun Continuous Drain-Source Diode Forward Current		--	--	3	A
I _{SM}	Maximun Plused Drain-Source DiodeForwad Current		--	--	12	A
V _{SD}	Drain-Source Diode Forward Voltage	Id=3A	--	--	1.4	V
trr	Reverse Recovery Time	I _S =3A,V _{GS} =0V	--	180	--	nS
Qrr	Reverse Recovery Charge	di _F /dt=100A/ μ s (Note3)	--	0.72	--	μ C
*Notes	1, L=66.7mH, IAS=3.0A, 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 Characteristics

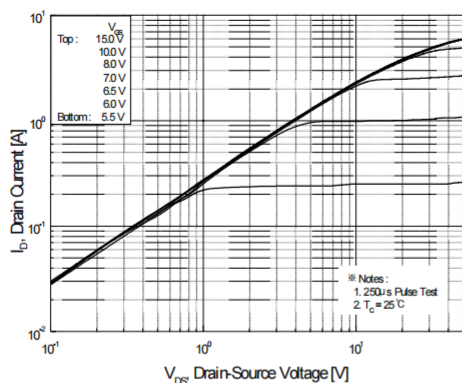


Figure 1. On-Region Characteristics

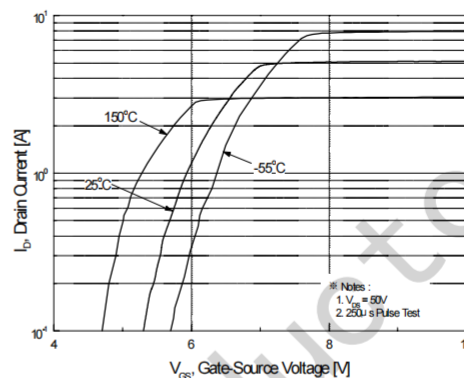


Figure 2. Transfer Characteristics

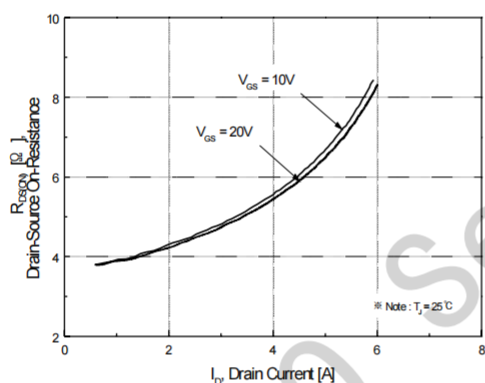


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

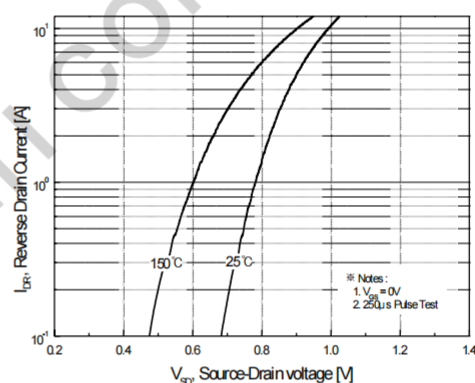


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

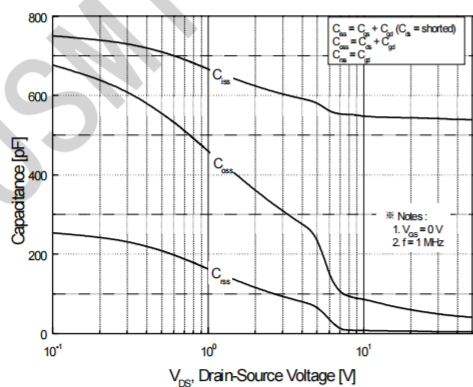


Figure 5. Capacitance Characteristics

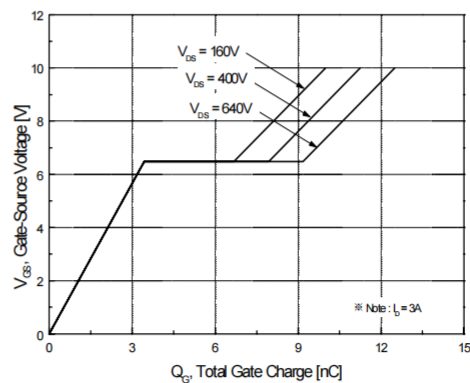


Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

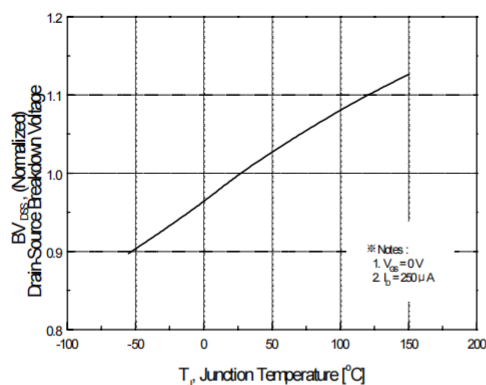


Figure 7. Breakdown Voltage Variation vs Temperature

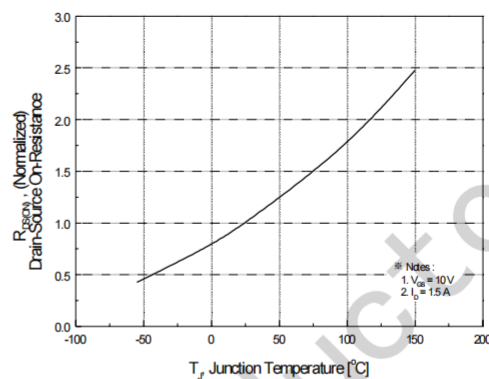


Figure 8. On-Resistance Variation vs Temperature

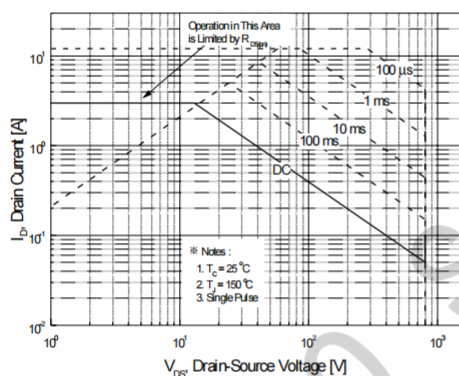


Figure 9-2. Maximum Safe Operating Area for WGF3N80

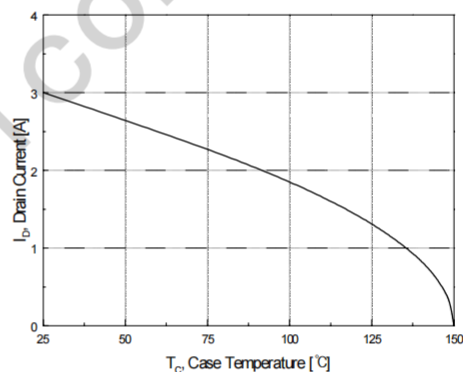


Figure 10. Maximum Drain Current vs Case Temperature

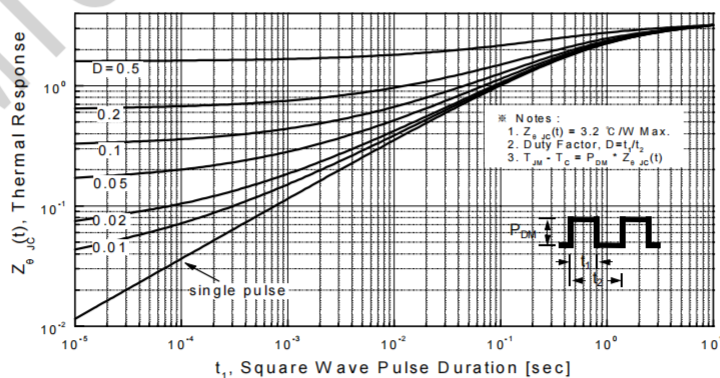
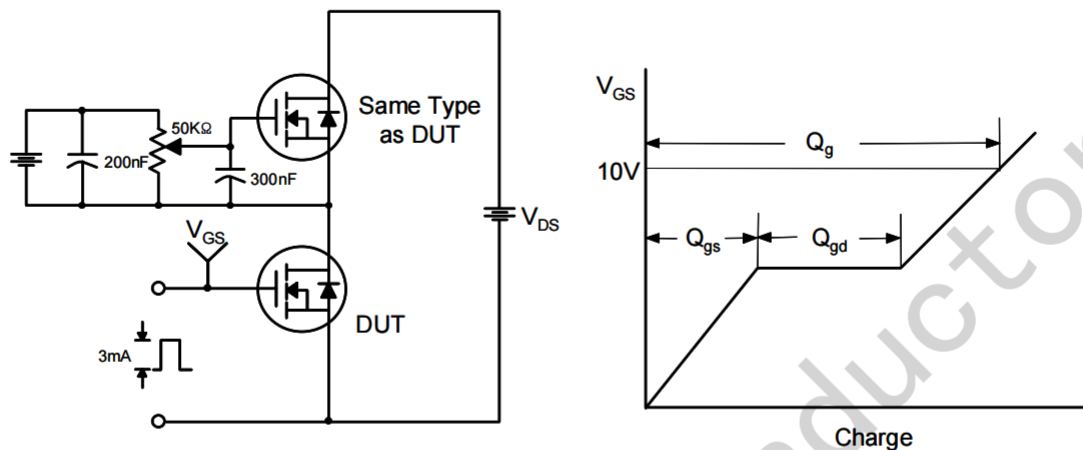
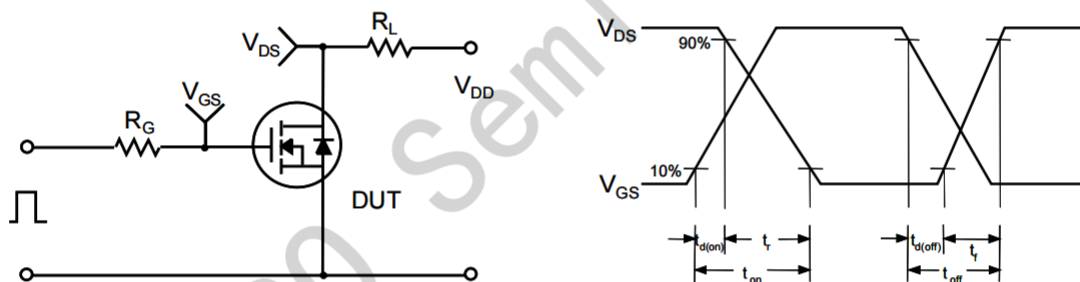
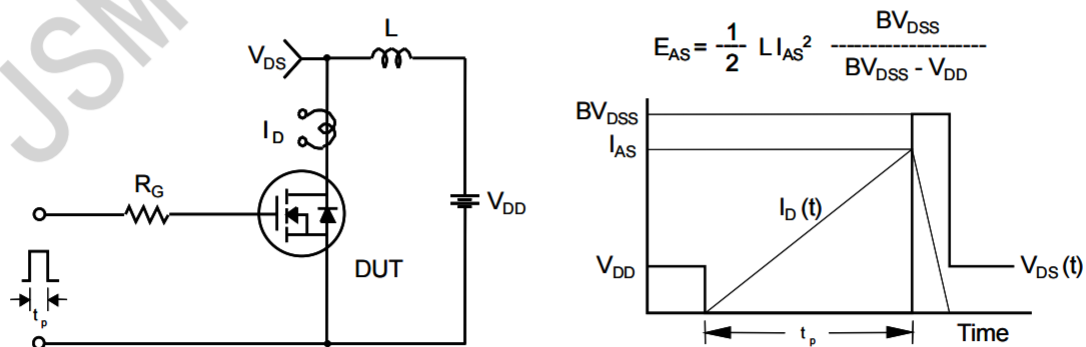
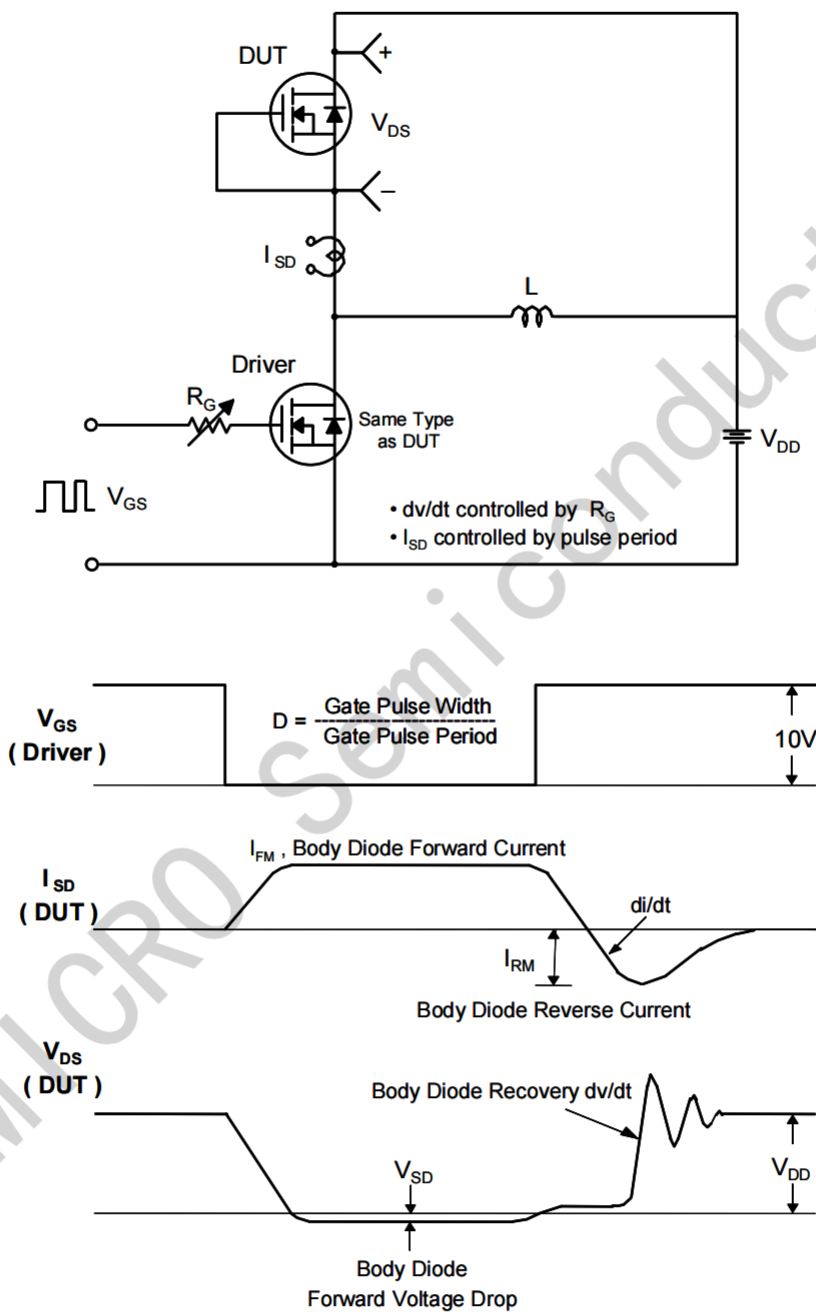


Figure 11-2. Transient Thermal Response Curve for WGF3N80

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching Test Circuit & Waveforms


Peak Diode Recovery dv/dt Test Circuit & Waveforms


Package Information

TO-220F

Dimensions in Millimeters

