

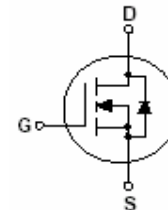
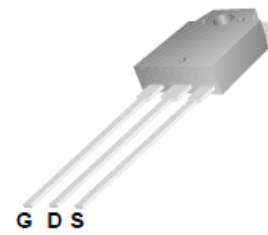


WFW20N60

600V N-Channel MOSFET

Features

- Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Extended Safe Operating Area
- Unrivalled Gate Charge :98 nC (Typ.)
- BVDSS=600V, ID=20A
- Lower $R_{DS(on)}$: 0.45Ω (Max) @VG=10V
- 100% Avalanche Tested



TO-3P

G-Gate,D-Drain,S-Source

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

Symbol	Parameter	WFW20N60	Units
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current -continuous ($T_c=25^\circ C$)	20	A
	-continuous ($T_c=100^\circ C$)	12.7	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Plused Avanche Energy (Note1)	690	mJ
I_{AR}	Avalanche Current (Note2)	20	A
P_D	Power Dissipation ($T_c=25^\circ C$)	208	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 ~ +150	$^\circ C$
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	--	0.48	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	--	41.7	$^\circ C/W$

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	600	--	--	V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	ID=250 μ A, Reference to 25°C	--	0.6	--	V/°C
IDSS	Zero Gate Voltage Drain Current	Vds=600V, Vgs=0V	--	--	1	μ A
		Vds=480V, Tc=125°C			10	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)}	Gate Threshold Voltage	Id=250uA, Vds=Vgs	2	--	4	V
R _{DS(on)}	Static Drain-Source On-Resistance	Id=10A, Vgs=10V	--	--	0.3	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V, VGS=0, f=1.0MHz	--	1730	2250	pF
Coss	Output Capacitance		--	960	1150	pF
Crss	Reverse Transfer Capacitance		--	85	--	pF
Switching Characteristics						
Td(on)	Turn-On Delay Time	VDD=300V, ID=20A, RG=25 Ω (Note 3,4)	--	46	90	nS
Tr	Turn-On Rise Time		--	140	280	nS
Td(off)	Turn-Off Delay Time		--	175	350	nS
Tf	Turn-Off Fall Time		--	100	200	nS
Qg	Total Gate Charge	VDS=480, VGS=10V, ID=20A (Note 3,4)	--	57	72	nC
Qgs	Gate-Source Charge		--	11.5	14	nC
Qgd	Gate-Drain Charge			28	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	20	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	60	A
V _{SD}	Drain-Source Diode Forward Voltage	Id=20A	--	--	1.4	V
trr	Reverse Recovery Time	I _S =20A, V _{GS} =0V	--	450	--	nS
Qrr	Reverse Recovery Charge	di _F /dt=100A/ μ s (Note3)	--	8.2	--	μ C
*Notes	1, L=3.2mH, IAS=20.0A, VDD=50V, RG=25Ω, Starting T _J =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

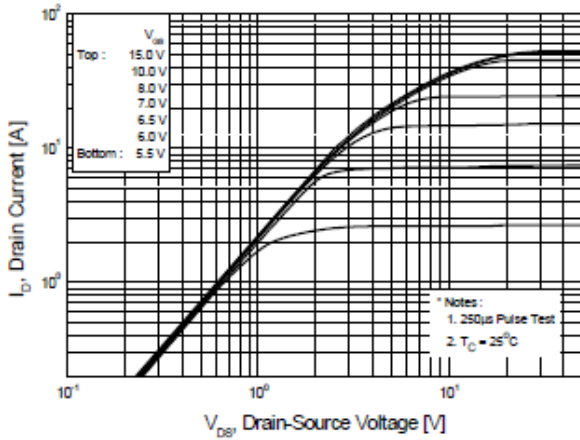


Figure 2. Transfer Characteristics

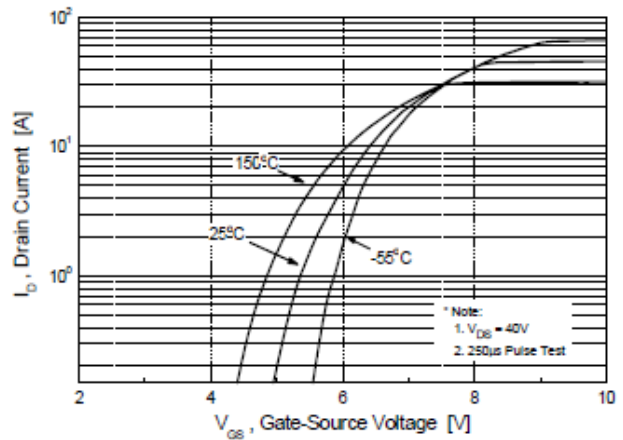


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

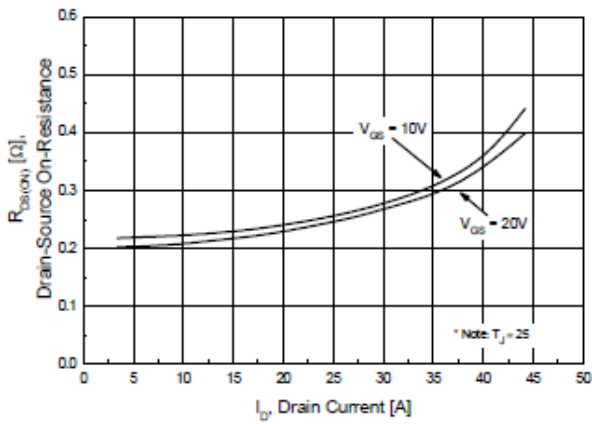


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

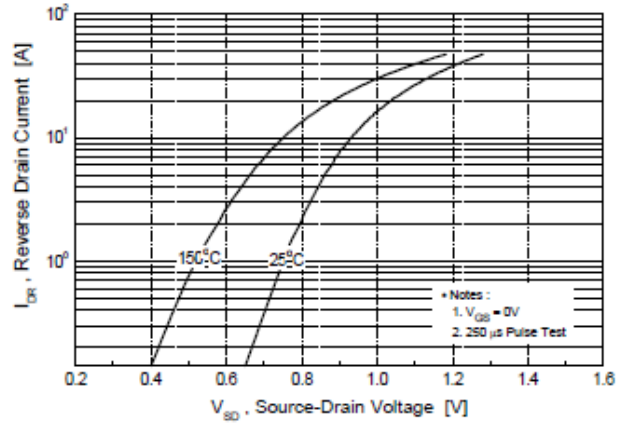


Figure 5. Capacitance Characteristics

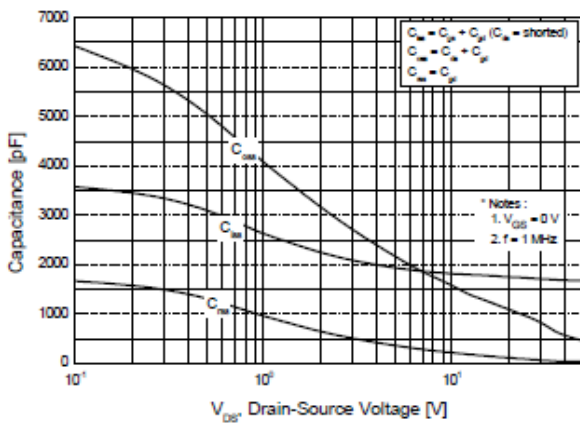
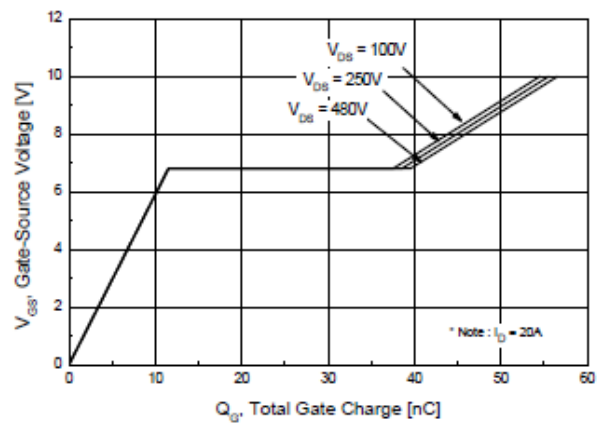


Figure 6. Gate Charge Characteristics



Typical Characteristics (Continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

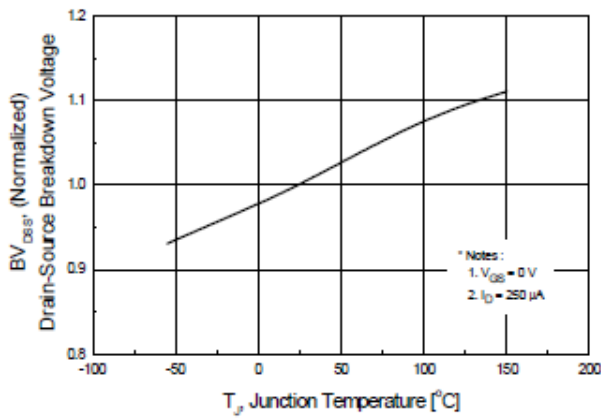


Figure 8. On-Resistance Variation vs. Temperature

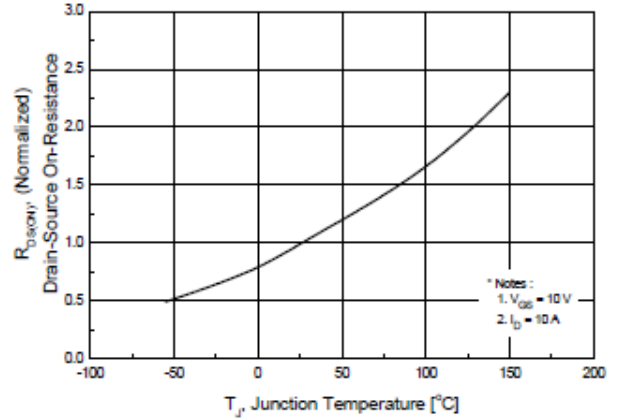


Figure 9. Maximum Safe Operating Area

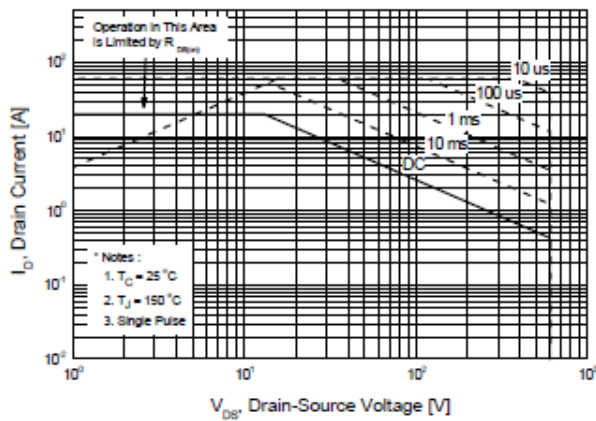


Figure 10. Maximum Drain Current vs. Case Temperature

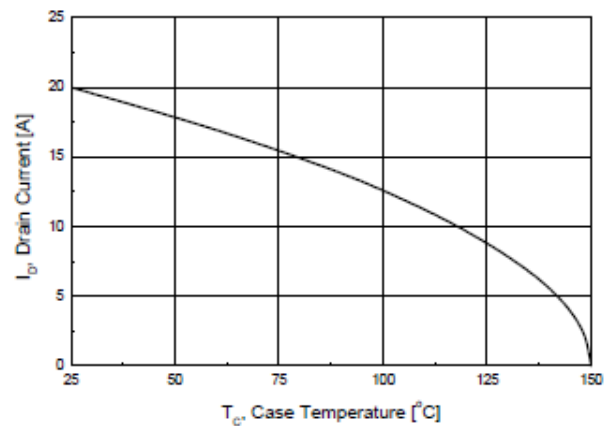
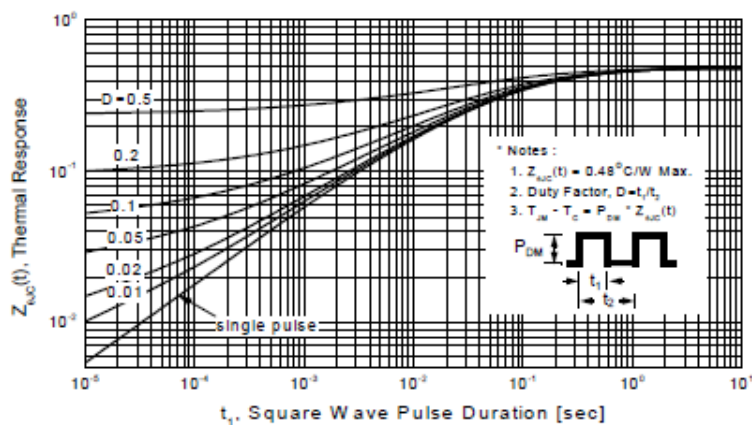
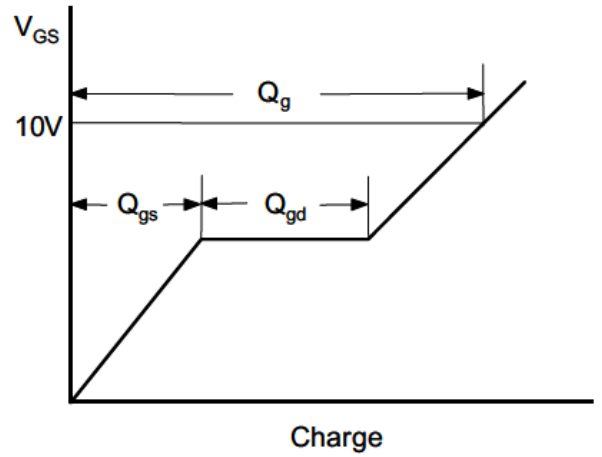
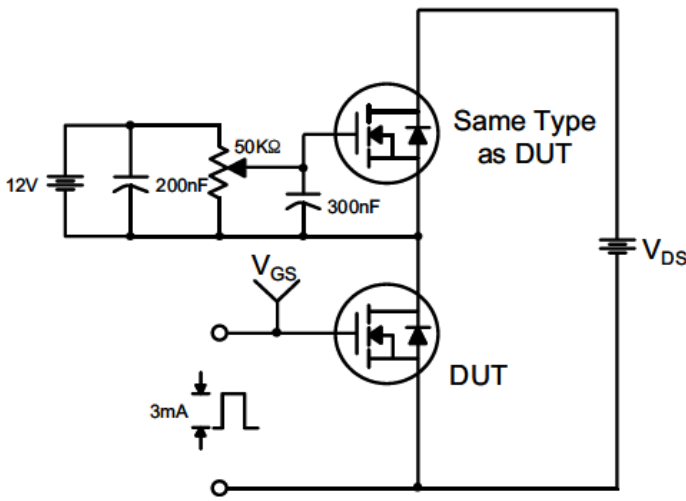


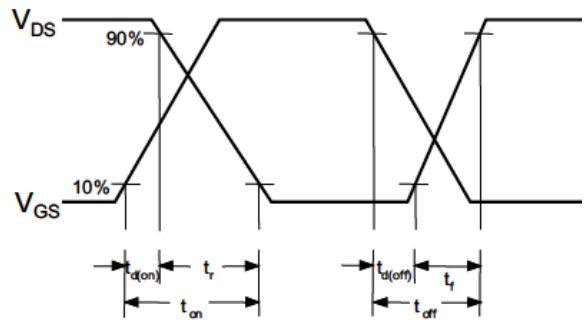
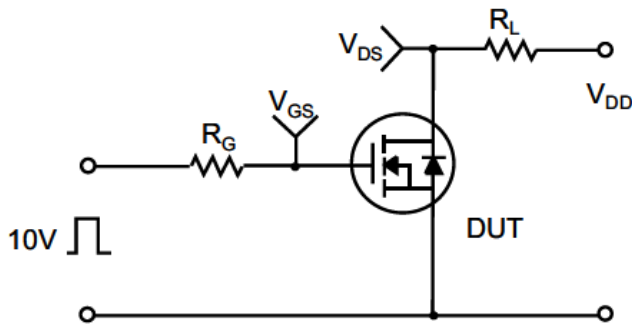
Figure 11. Transient Thermal Response Curve



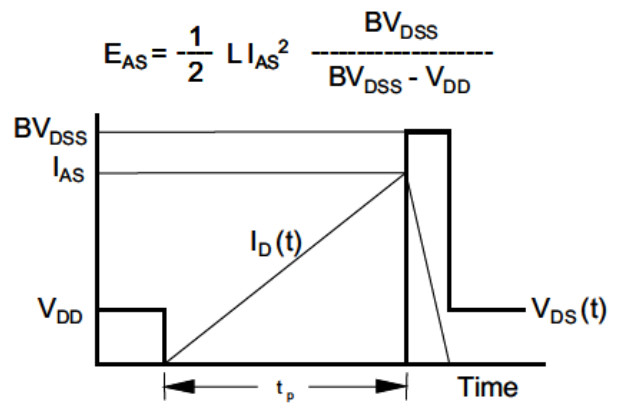
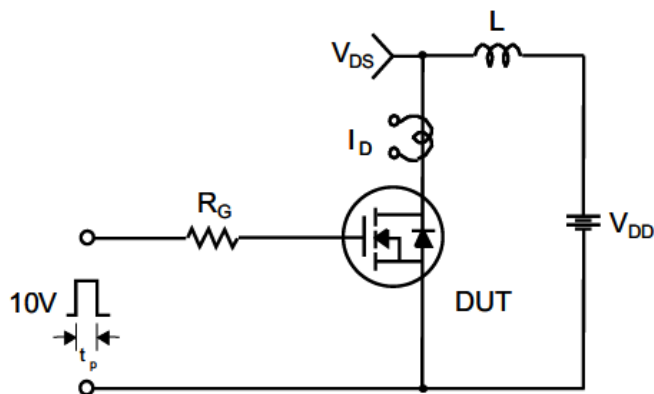
Gate Charge Test Circuit & Waveform



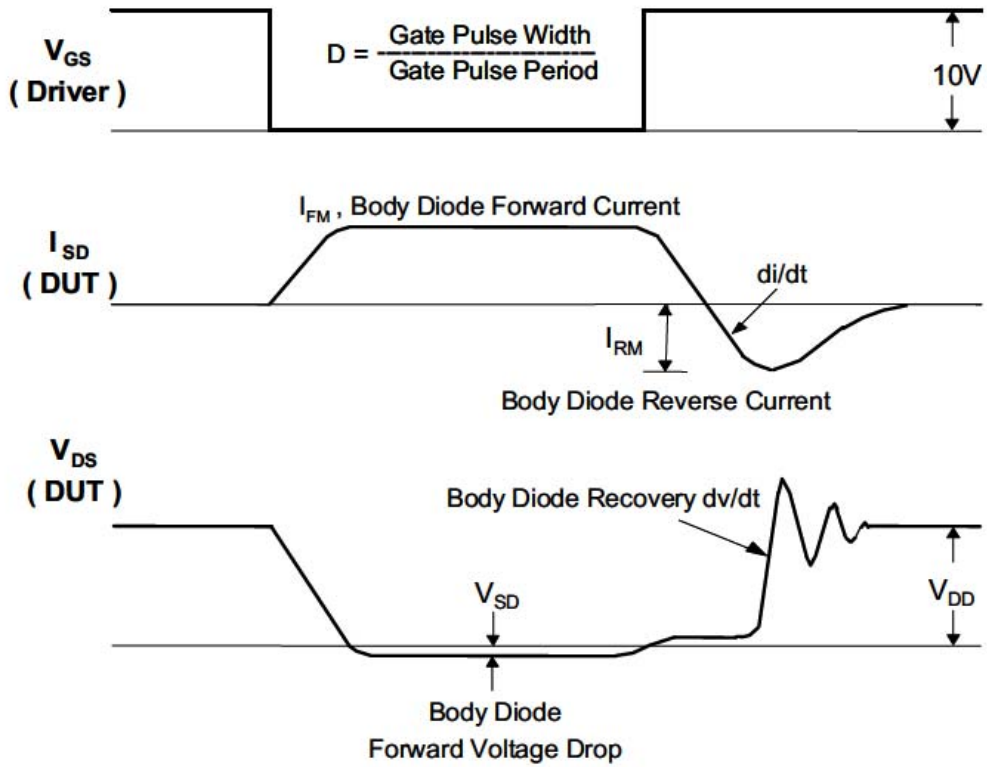
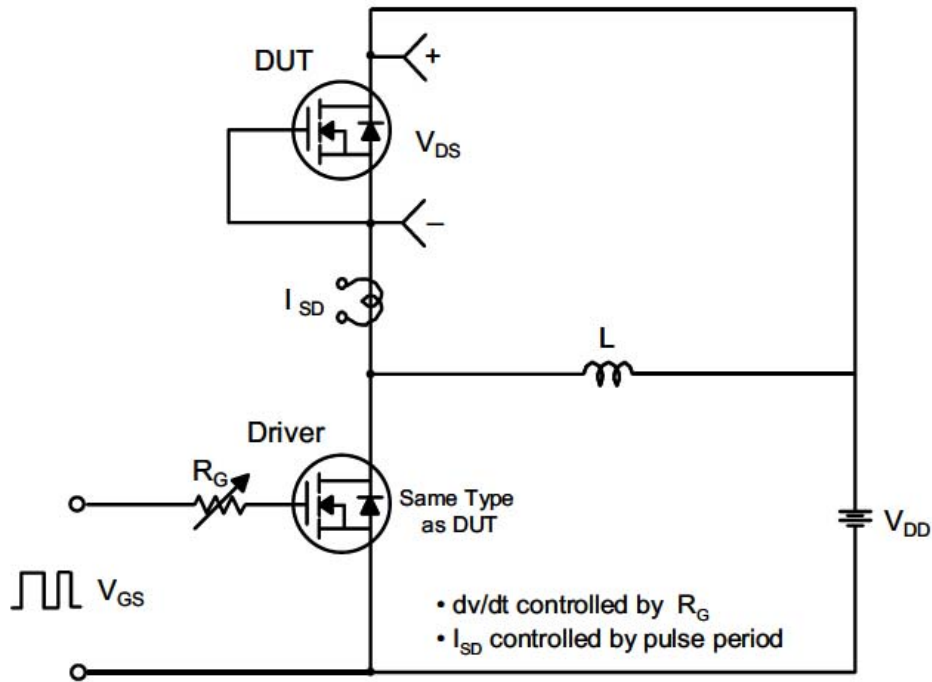
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms



Package Dimension

TO-3P

