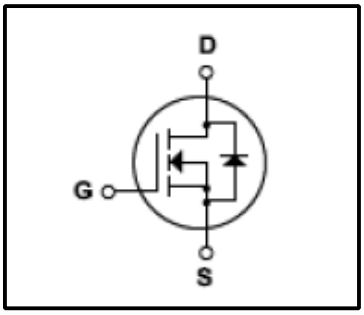
WFF7N60

Silicon N-Channel MOSFET

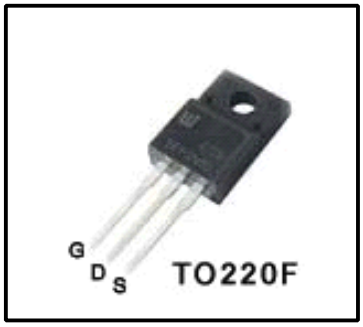
Features

- 7A,600V,$R_{DS(on)}$(Max 1.0Ω)@V_{GS}=10V
- Ultra-low Gate Charge(Typical 29nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Isolation Voltage(V_{ISO}=4000V AC)
- Maximum Junction Temperature Range(150℃)



General Description

This Power MOSFET is produced using Winsemi's advanced planar stripe,VDMOS technology. This latest technology has been especially designed to minimize on -state resistance,have a high rugged avalanche characteristics. This devices is specially well suited for half bridge and full bridge resonant topology line a electronic lamp ballast,high efficiency switched mode power supplies, active power factor correction.



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain Source Voltage		600	V
I_D	Continuous Drain Current(@Tc=25℃)		7*	A
	Continuous Drain Current(@Tc=100℃)		4.1*	A
I_{DM}	Drain Current Pulsed	(Note1)	26	A
V_{GS}	Gate to Source Voltage		±30	V
E_{AS}	Single Pulsed Avalanche Energy	(Note2)	240	mJ
E_{AR}	Repetitive Avalanche Energy	(Note1)	15	mJ
dv/dt	Peak Diode Recovery dv /dt	(Note3)	4.5	V/ ns
P_D	Total Power Dissipation(@Tc=25℃)		48	W
	Derating Factor above 25℃		0.38	W/℃
T_J,T_{stg}	Junction and Storage Temperature		-55~150	℃
T_L	Channel Temperature		300	℃

*Drain current limited by junction temperature

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
$R_{\theta JC}$	Thermal Resistance , Junction -to -Case	-	-	2.6	℃/W
$R_{\theta JA}$	Thermal Resistance , Junction-to -Ambient	-	-	62.5	℃/W

Electrical Characteristics(Tc=25℃)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I_{GSS}	V_{GS}=±30V,V_{DS}=0V	-	-	±100	nA
Gate-source breakdown voltage		$V_{(BR)GSS}$	I_G=±10 μA,V_{DS}=0V	±30	-	-	V
Drain cut -off current		I_{DSS}	V_{DS}=600V,V_{GS}=0V	-	-	10	μA
			V_{DS}=480V,Tc=125℃	-		100	μA
Drain -source breakdown voltage		$V_{(BR)DSS}$	I_D=250 μA,V_{GS}=0V	600	-	-	V
Gate threshold voltage		$V_{GS(th)}$	V_{DS}=10V,I_D=250 μA	2	-	4	V
Drain -source ON resistance		$R_{DS(ON)}$	V_{GS}=10V,I_D=3.5A	-	0.8	1.0	Ω
Forward Transconductance		gfs	V_{DS}=50V,I_D=3.5A	-	8.7	-	S
Input capacitance		C_{iss}	V_{DS}=25V,	-	1100	1430	pF
Reverse transfer capacitance		C_{rss}	V_{GS}=0V,	-	135	175	
Output capacitance		C_{oss}	f=1MHz	-	16	21	
Switching time	Rise time	tr	V_{DD}=200V,	-	30	70	ns
	Turn-on time	ton	I_D=7.0A,	-	80	170	
	Fall time	tf	R_G=25Ω,	-	65	140	
	Turn-off time	toff	(Note4,5)	-	60	130	
Total gate charge(gate-source plus gate-drain)		Qg	V_{DD}=480V,	-	29	38	nC
Gate-source charge		Qgs	V_{GS}=10V,	-	7	-	
Gate-drain("miller") Charge		Qgd	I_D=7.0A (Note4,5)	-	14.5	-	

Source-Drain Ratings and Characteristics(Ta=25℃)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	7.0	A
Pulse drain reverse current	I_{DRP}	-	-	-	28	A
Forward voltage(diode)	V_{DSF}	I_{DR}=7.4A,V_{GS}=0V	-	-	1.4	V
Reverse recovery time	trr	I_{DR}=7.4A,V_{GS}=0V,	-	320	-	ns
Reverse recovery charge	Qrr	dI_{DR} / dt =100 A / μs	-	2.4	-	μC

Note 1.Repeativity rating :pulse width limited by junction temperature

2.L=18.5mH I_{AS}=7A,V_{DD}=50V,R_G=0Ω ,Starting T_J=25℃

3.I_{SD}≤7.0A,di/dt≤200A/us,V_{DD}<BV_{DSS},STARTING T_J=25℃

4.Pulse Test:Pulse Width≤300us,Duty Cycle≤2%

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

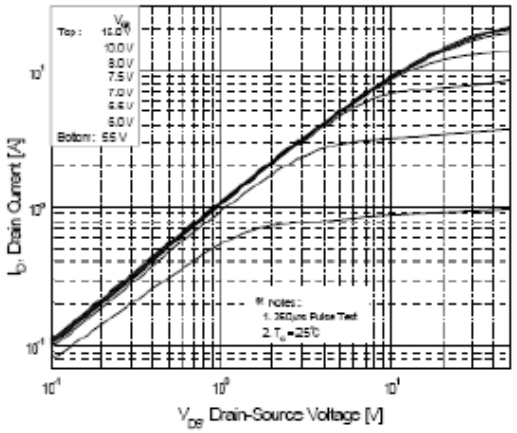


Fig.1 On-State Characteristics

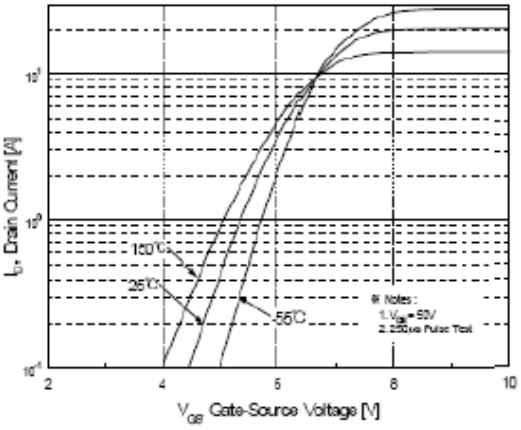


Fig.2 Transfer Current characteristics

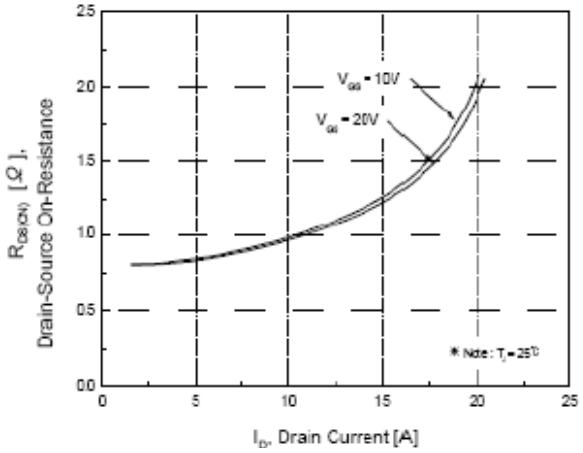


Fig.3 On Resistance variation vs Drain Current

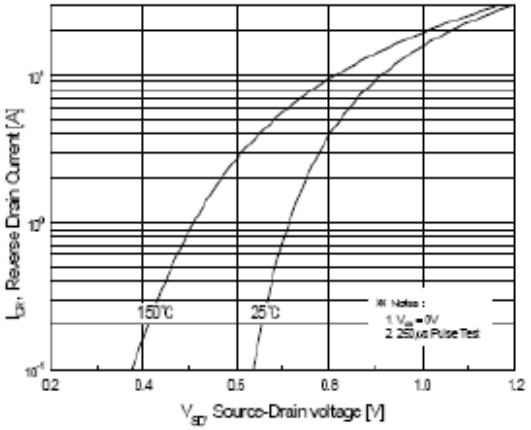


Fig.4 Body Diode Forward Voltage Variation with Source Current and temperature

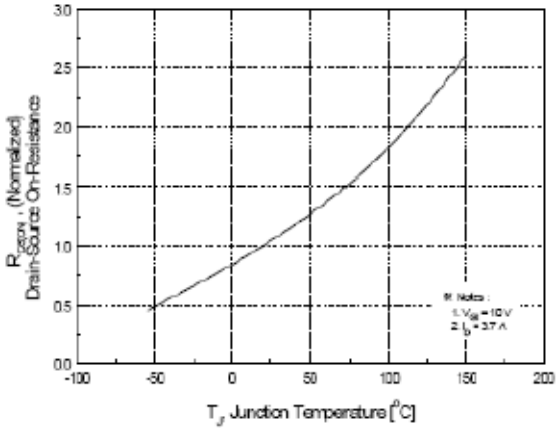


Fig.5 On-Resistance Variation vs Junction Temperature

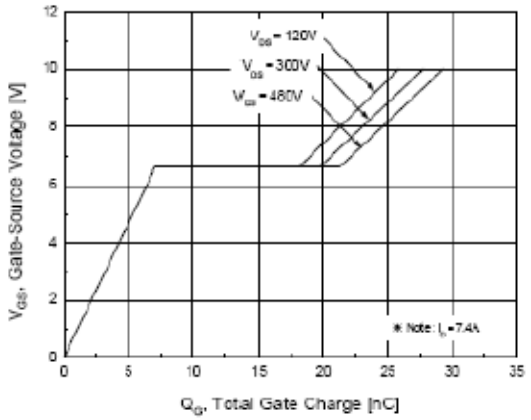


Fig.6 Gate Charge Characteristics

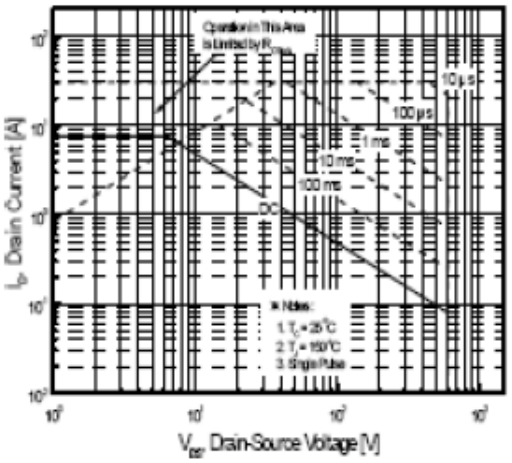


Fig.7 Maximum Safe Operation Area

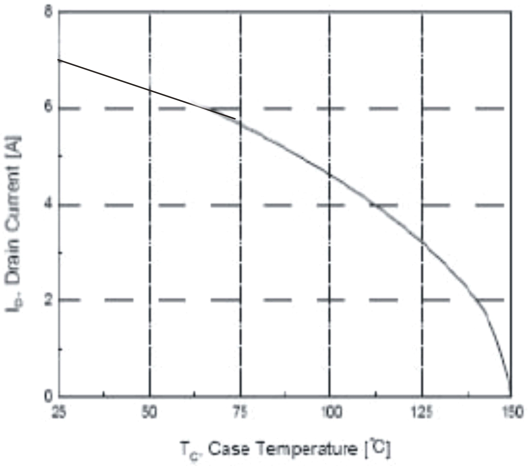


Fig.8 Maximum Drain Current vs Case Temperature

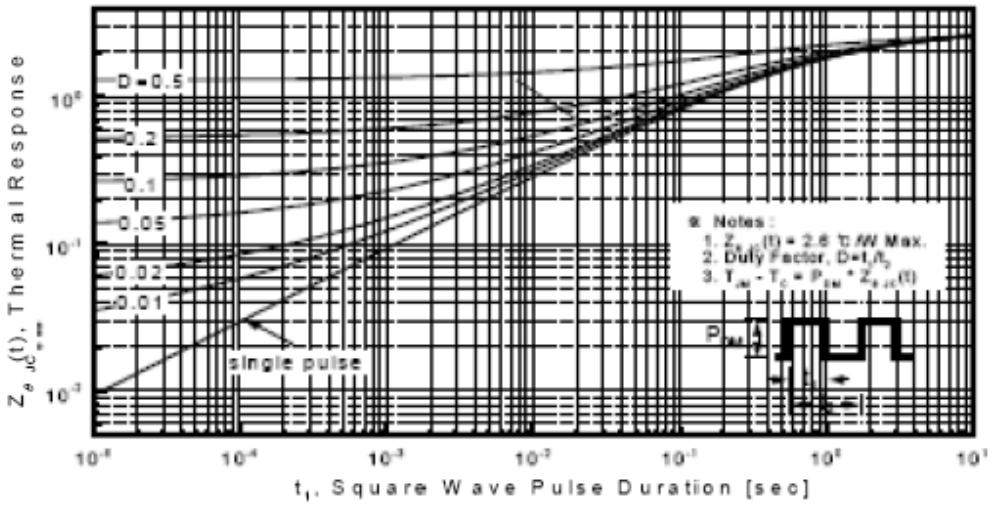


Fig.9 Transient Thermal Response curve

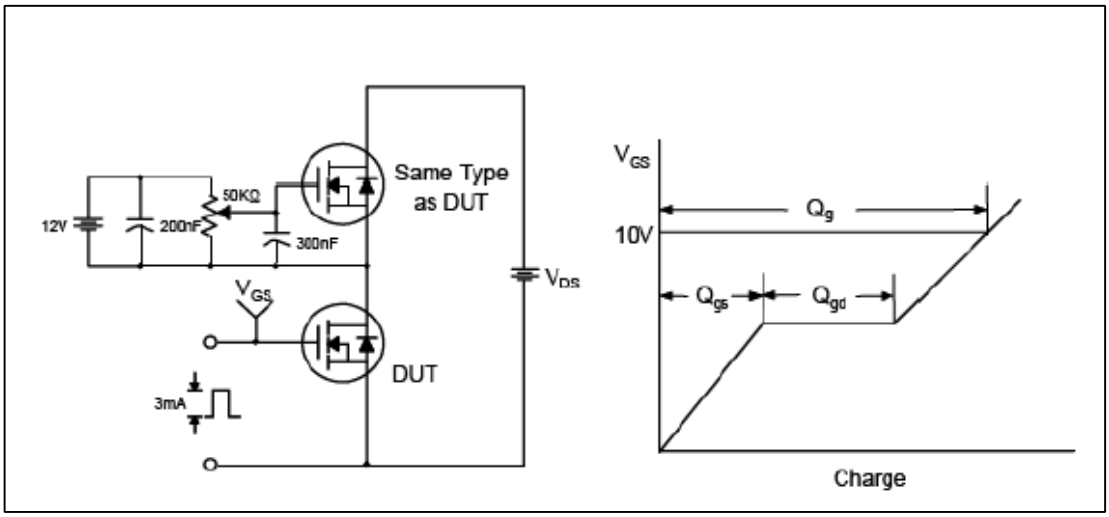


Fig.10 Gate Test circuit & Waveform

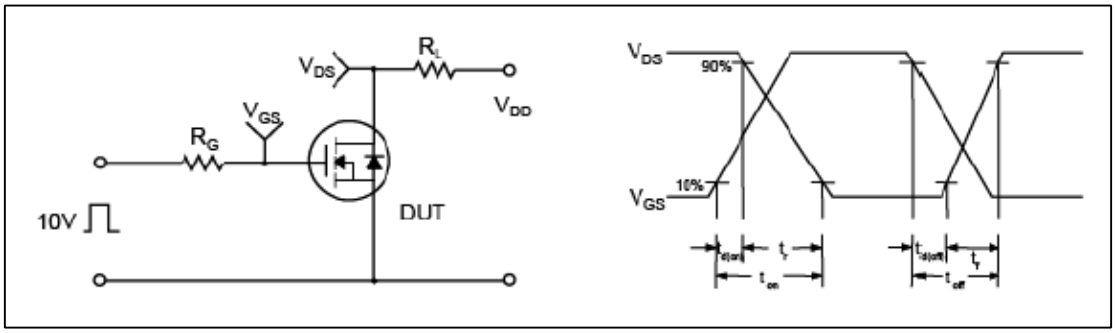


Fig.11 Resistive Switching Test Circuit & Waveform

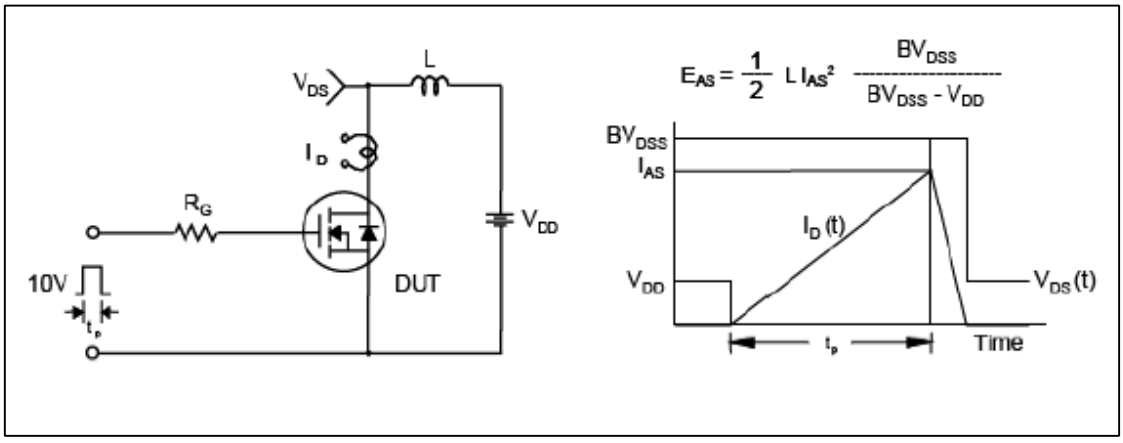


Fig.12 Uncamped Inductive Switching Test Circuit & Waveform

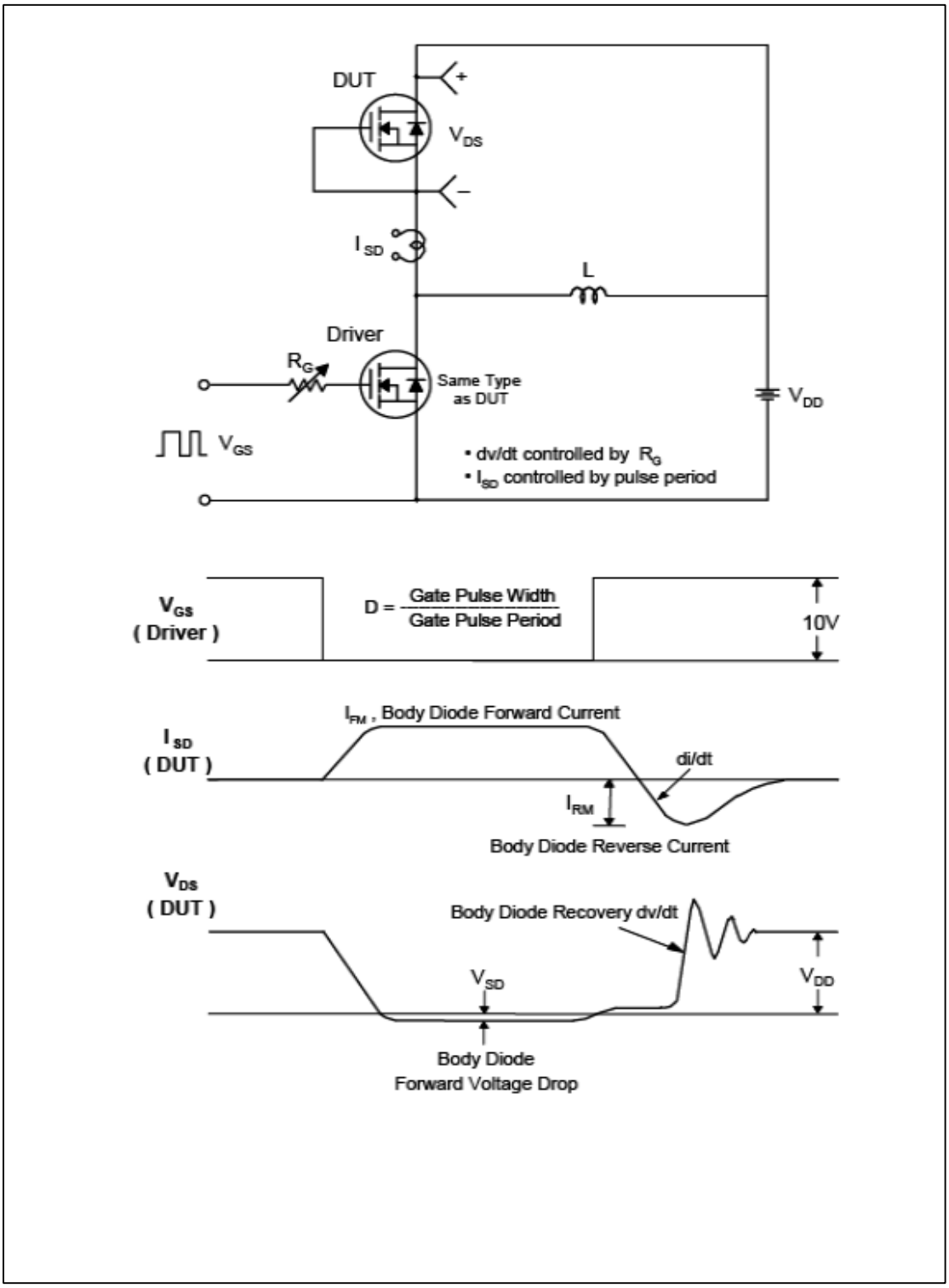


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

Unit:mm