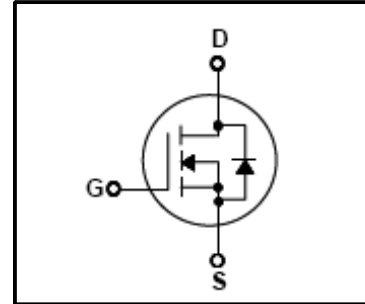


Silicon N-Channel MOSFET

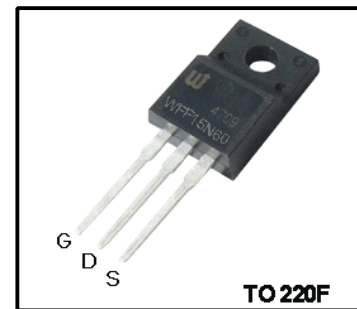
Features

- 15A,600V, $R_{DS(on)}$ (Max0.52 Ω)@ $V_{GS}=10V$
- Ultra-low Gate charge(Typical 36nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150℃)



General Description

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



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	600	V
I_D	Continuous Drain Current (@ $T_c=25^\circ C$)	15*	A
	Continuous Drain Current (@ $T_c=100^\circ C$)	9.5*	A
I_{DM}	Drain Current Pulsed (Note1)	60*	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	245	mJ
E_{AR}	Repetitive Avalanche Energy (Note1)	23.9	mJ
dv/dt	Peak Diode Recovery dv/dt (Note3)	9.8	V/ns
P_D	Total Power Dissipation (@ $T_c=25^\circ C$)	53	W
	Derating Factor above $25^\circ C$	0.42	W/°C
T_J, T_{stg}	Junction and Storage Temperature	-55~150	°C
T_L	Channel Temperature	300	°C

*Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	2.36	°C/W
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	°C/W

Electrical Characteristics(Tc=25℃)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Gate-source breakdown voltage	$V_{(BR)GSS}$	$I_G=\pm 10 \mu A, V_{DS}=0V$	± 30	-	-	V
Drain cut -off current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$	-	-	10	μA
		$V_{DS}=480V, T_C=125^\circ C$			100	μA
Drain -source breakdown voltage	$V_{(BR)DSS}$	$I_D=250 \mu A, V_{GS}=0V$	600	-	-	V
Breakdown voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=250 \mu A$, Referenced to 25℃	-	0.79	-	V/℃
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250 \mu A$	3	-	5	V
Drain -source ON resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=7.5A$	-	0.45	0.52	Ω
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=7.5A$	-	19.8	-	S
Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1MHz$	-	2270	3000	pF
Reverse transfer capacitance	C_{rss}		-	23	37	
Output capacitance	C_{oss}		-	300	405	
Switching time	Turn-On Rise time	$V_{DD}=250V,$ $I_D=15A$ $R_G=25\Omega$ (Note4,5)	-	78	162	ns
	Turn-on delay time		-	50	101	
	Turn-On Fall time		-	66	128	
	Turn-off delay time		-	120	261	
Total gate charge(gate-source plus gate-drain)	Q_g	$V_{DD}=480V,$ $V_{GS}=10V,$ $I_D=15A$ (Note4,5)	-	36	60	nC
Gate-source charge	Q_{gs}		-	9	-	
Gate-drain("miller") Charge	Q_{gd}		-	16	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	15	A
Pulse drain reverse current	I_{DRP}	-	-	-	60	A
Forward voltage(diode)	V_{DSF}	$I_{DR}=15A, V_{GS}=0V$	-	-	1.4	V
Reverse recovery time	t_{rr}	$I_{DR}=15A, V_{GS}=0V,$	-	600	-	ns
Reverse recovery charge	Q_{rr}	$di_{DR} / dt = 100 A / \mu s$	-	7.2	-	μC

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

2.L=2.0mH $I_{AS}=15A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$

3. $I_{SD} \leq 15A, di/dt \leq 200A/\mu s, V_{DD} < BV_{DSS}$, STARTING $T_J=25^\circ C$

4.Pulse Test:Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution



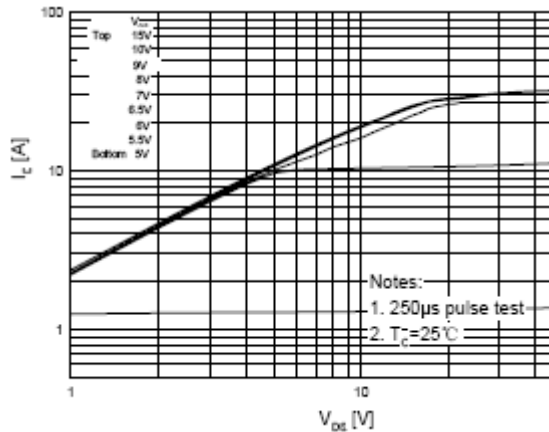


Fig.1 On region Characteristics

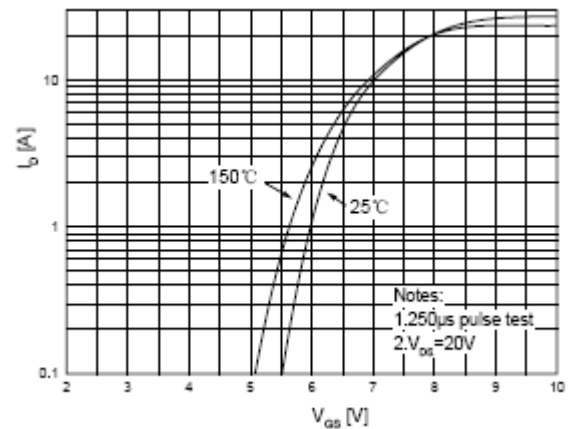


Fig.2 Transfer Characteristics

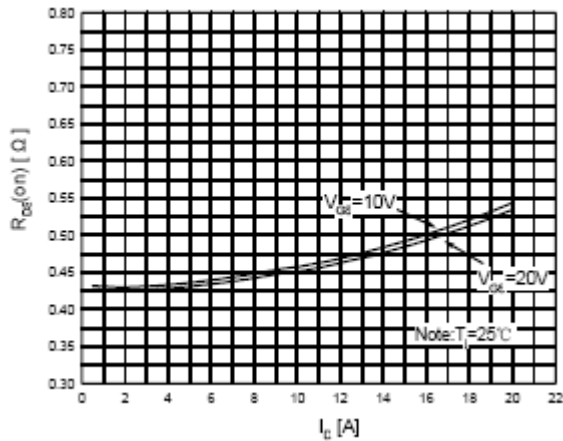


Fig.3 On-Resistance Variation vs Drain current and gate voltage

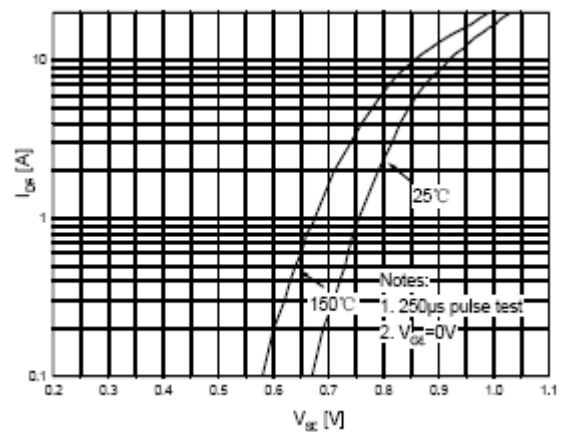


Fig.4 Body diode Forward voltage variation vs source current and temperature

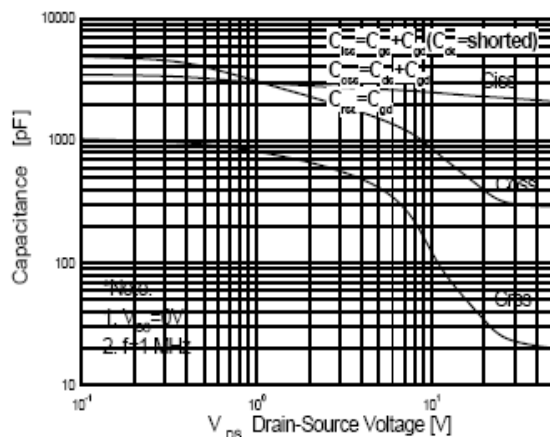


Fig.5 Capacitance characteristics

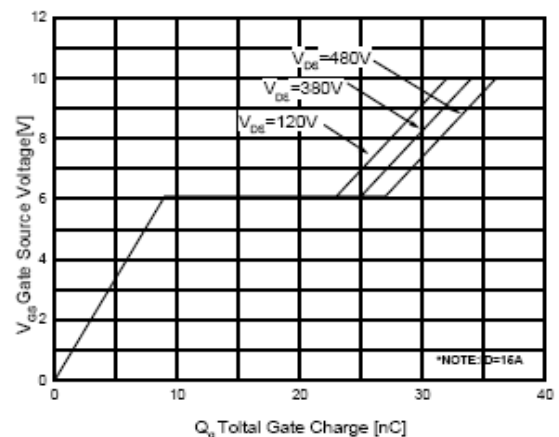
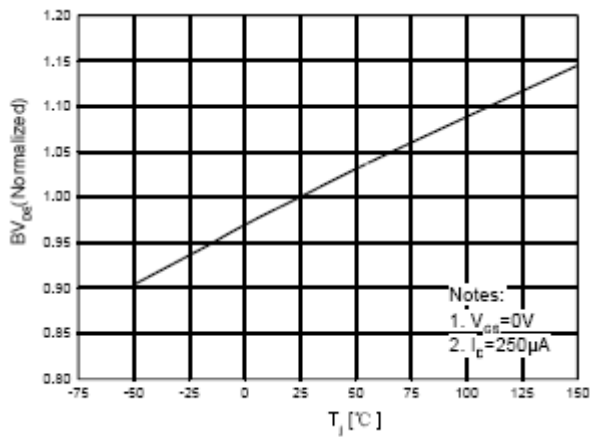
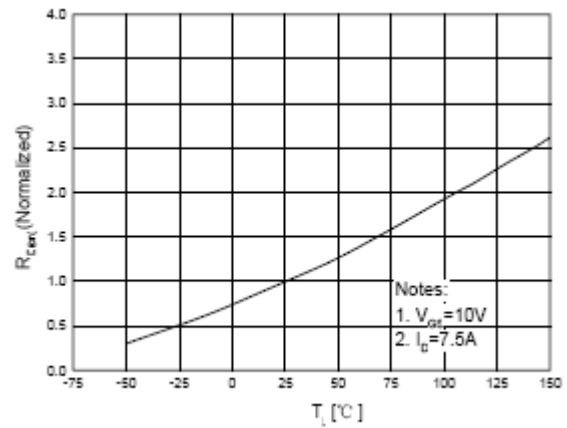


Fig.6 Gate Charge Characteristics



**Fig.7 Breakdown voltage variation
vs temperature**



**Fig.8 On-Resistance variation vs
temperature**

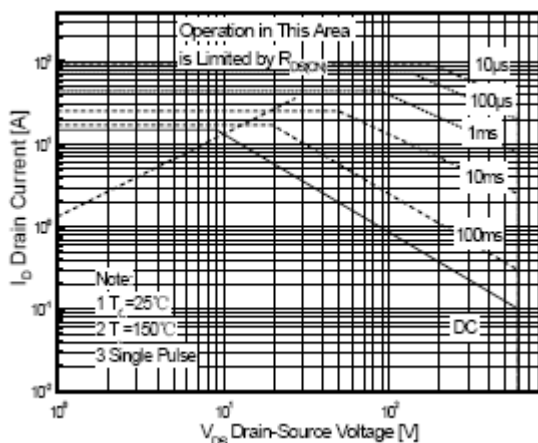
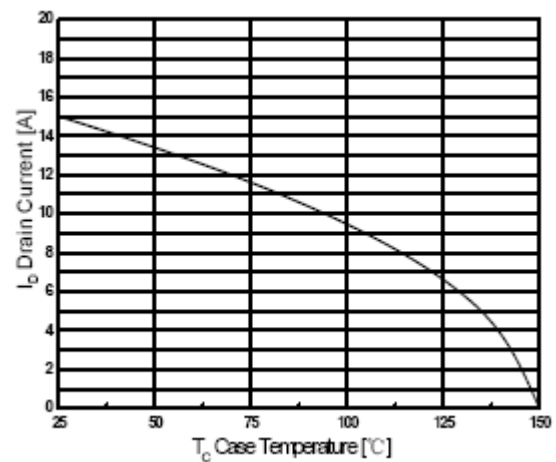


Fig.7 Maximum Safe Operation Area



**Fig.8 Maximum Drain Current vs
Case temperature**

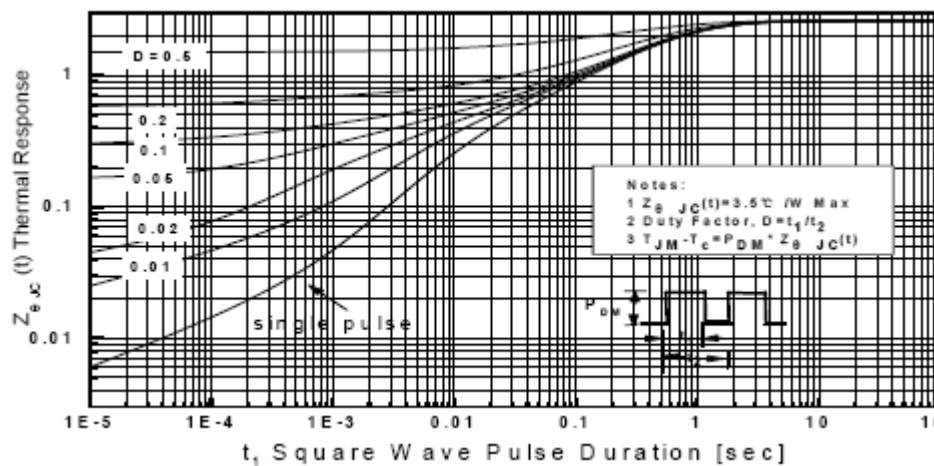


Fig.9 Transient thermal Response Curve

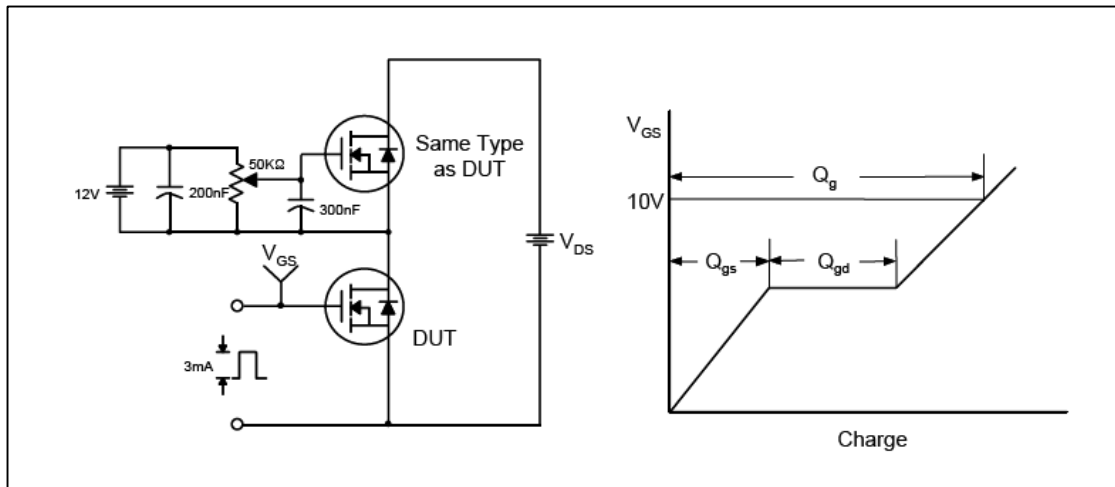


Fig.10 Gate Test circuit & Waveform

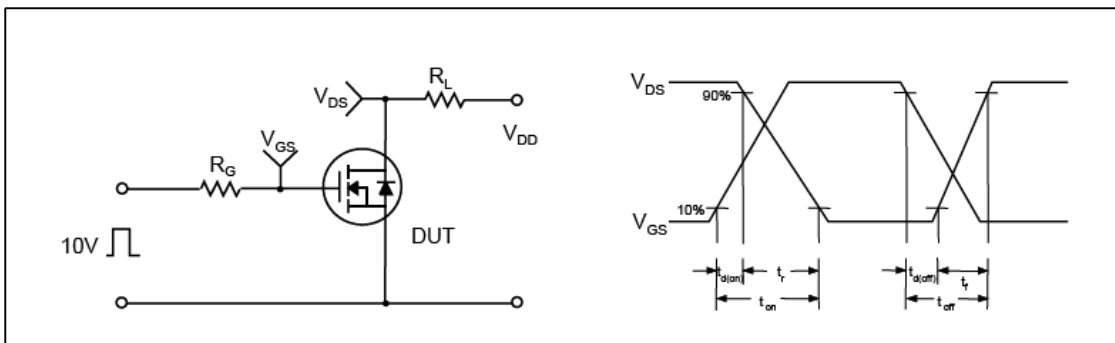


Fig.11 Resistive Switching Test Circuit & Waveform

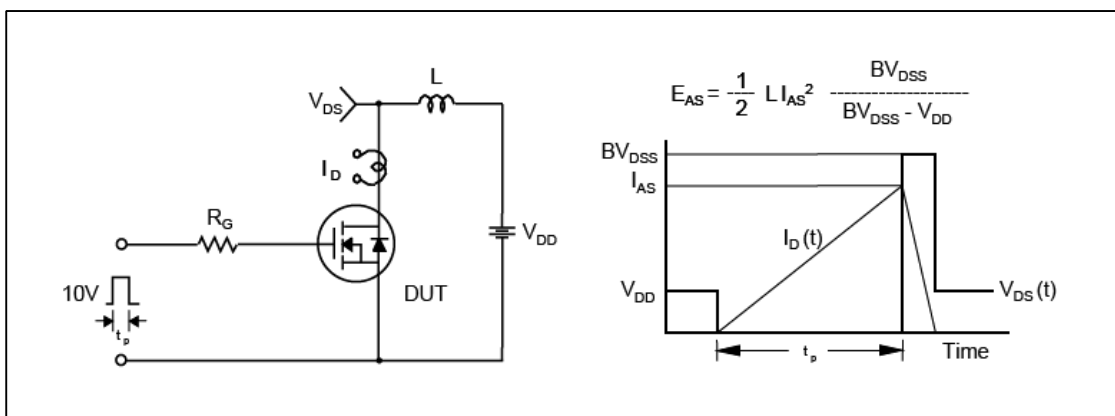


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

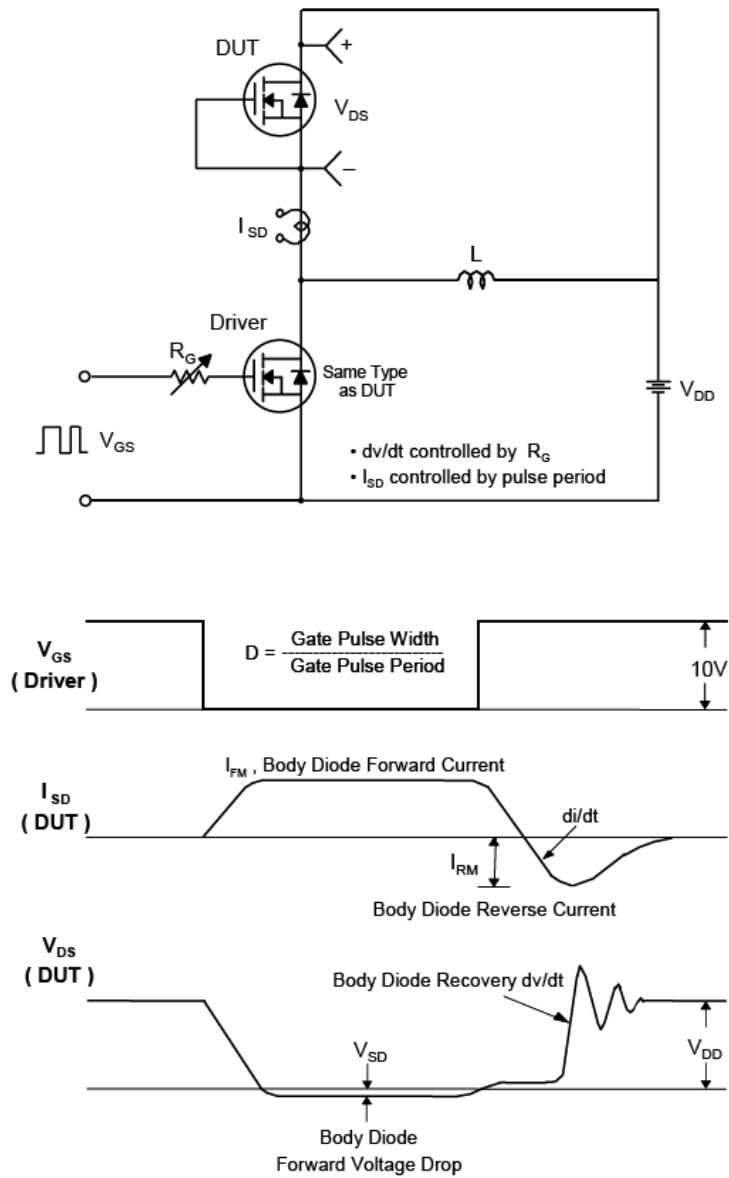


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

Unit:mm

