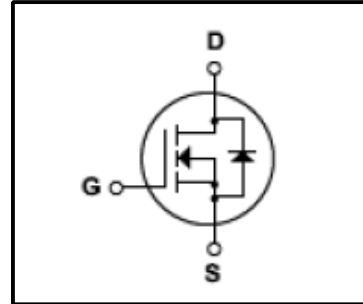


Silicon N-Channel MOSFET

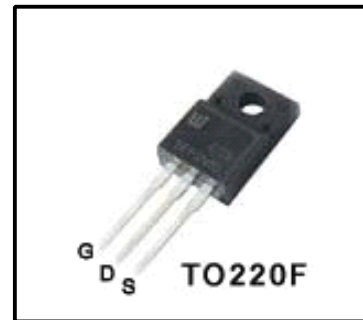
Features

- 10A,600V, $R_{DS(on)}$ (Max 0.75 Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 34nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Isolation Voltage($V_{ISO}=4000V$ AC)
- Improved dv/dt capability



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 device is specially well suited for high efficiency switch mode power supplies, power factor correction, UPS and a electronic lamp ballast base on half bridge.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	600	V
I_D	Continuous Drain Current(@ $T_c=25^\circ C$)	10*	A
	Continuous Drain Current(@ $T_c=100^\circ C$)	6.0*	A
I_{DM}	Drain Current Pulsed (Note1)	40*	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	713	mJ
E_{AR}	Repetitive Avalanche Energy (Note1)	18	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	4.5	V/ ns
P_D	Total Power Dissipation(@ $T_c=25^\circ C$)	50	W
	Derating Factor above 25 $^\circ C$	0.4	W/ $^\circ C$
T_J, T_{stg}	Junction and Storage Temperature	-55~150	$^\circ C$
T_L	Channel Temperature	300	$^\circ C$

*Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	2.5	$^\circ C/W$
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	$^\circ C/W$

Electrical Characteristics(Tc=25°C)

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	-	-	1	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	3	-	4.5	V	
Drain -source ON resistance	R _{DS(ON)}	V _{GS} =10V,I _D =4.75A	-	0.66	0.75	Ω	
Forward Transconductance	g _{fs}	V _{DS} =50V,I _D =4.75A	-	8.2	-	S	
Input capacitance	C _{iss}	V _{DS} =25V,	-	1610	2065	pF	
Reverse transfer capacitance	C _{rss}	V _{GS} =0V,	-	19	25		
Output capacitance	C _{oss}	f=1MHz	-	156	210		
Switching time	Rise time	tr	V _{DD} =300V, I _D =10A, R _G =25Ω, (Note4,5)	-	68	91	ns
	Turn-on time	ton		-	109	150	
	Fall time	tf		-	214	300	
	Turn-off time	toff		-	85	165	
Total gate charge(gate-source plus gate-drain)	Q _g	V _{DD} =480V, V _{GS} =10V,	-	34	45	nC	
Gate-source charge	Q _{gs}	I _D =10A	-	6.9	-		
Gate-drain("miller") Charge	Q _{gd}	(Note4,5)	-	12	-		

Source-Drain Ratings and Characteristics(Ta=25°C)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	10	A
Pulse drain reverse current	I _{DRP}	-	-	-	38	A
Forward voltage(diode)	V _{DSF}	I _{DR} =10A,V _{GS} =0V	-	1.05	1.4	V
Reverse recovery time	trr	I _{DR} =10A,V _{GS} =0V,	-	442	633	ns
Reverse recovery charge	Q _{rr}	dI _{DR} / dt ≤ 100 A / μs	-	2.16	3.24	μC

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

2.L=14.5mH I_{AS}=10A,V_{DD}=50V,R_G=0Ω ,Starting T_J=25°C

3.I_{SD}≤10A,di/dt≤300A/μs,V_{DD}<BV_{DSS},STARTING T_J=25°C

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

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

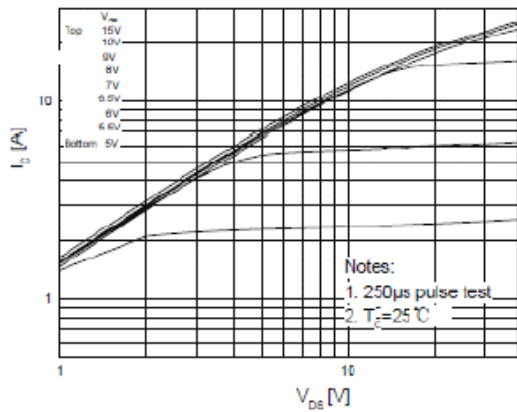


Fig.1 On-State Characteristics

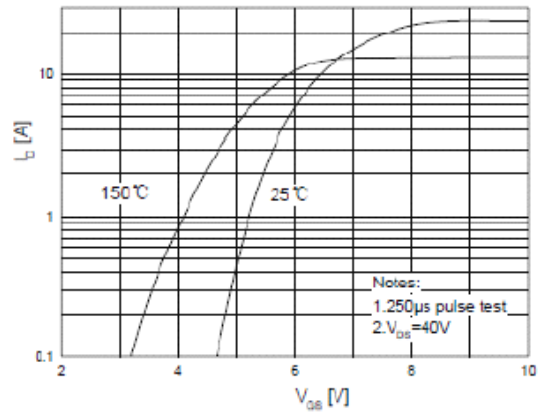


Fig.2 Transfer characteristics

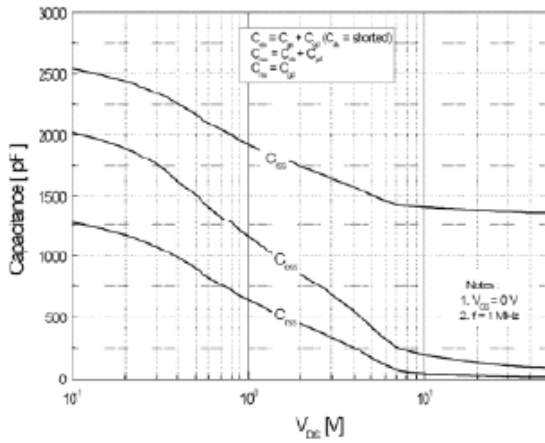


Fig.3 Capacitance Variation vs Drain voltage

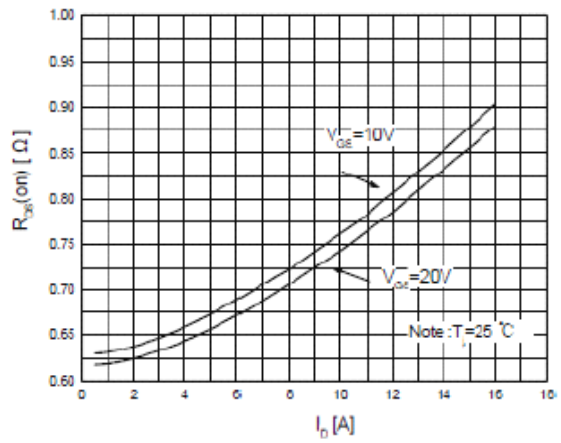


Fig.4 On-Resistance Variation Energy vs Drain current and Gate Voltage

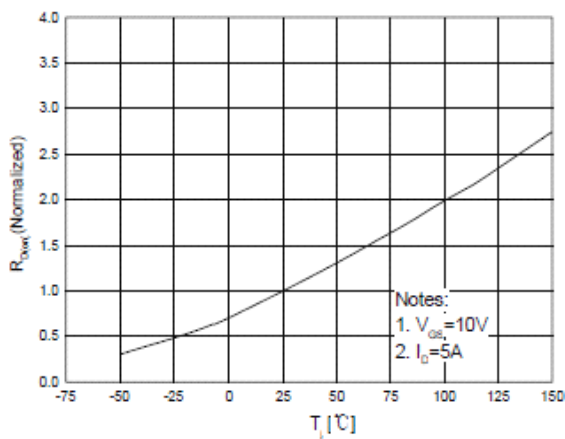


Fig.5 On-Resistance Variation vs Junction Temperature

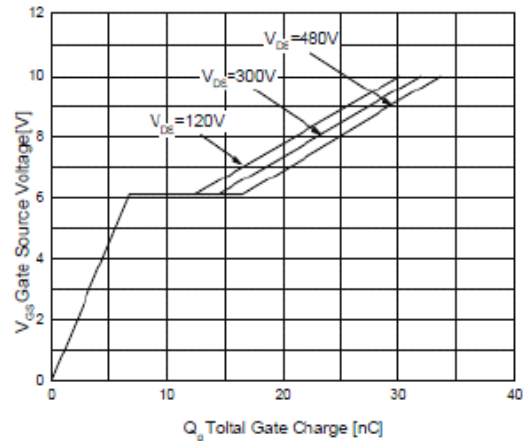


Fig.6 Gate Charge Characteristics

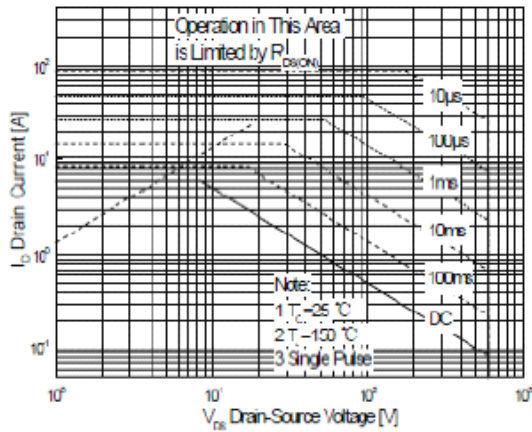


Fig.7 Maximum Safe Operation Area

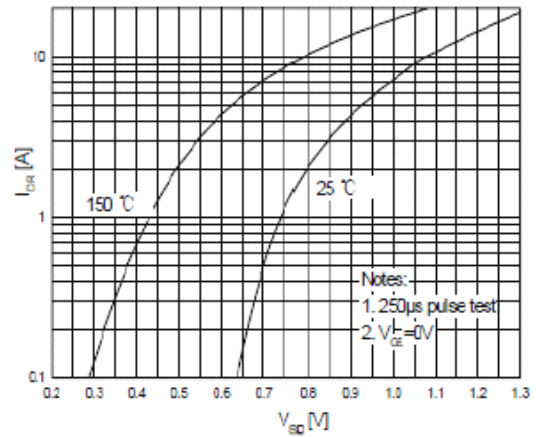


Fig.8 Diode Forward voltage Variation vs Source Current and Temperature

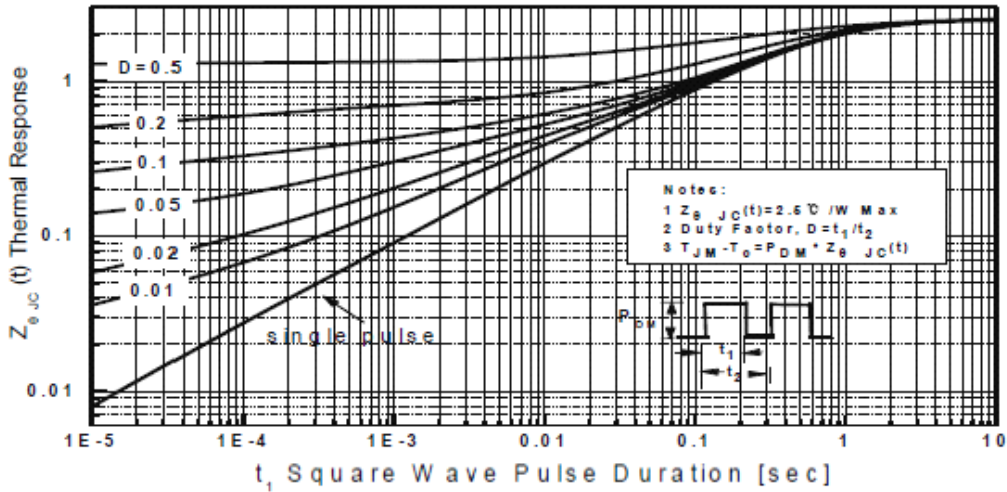


Fig.9 Transient Thermal Response curve

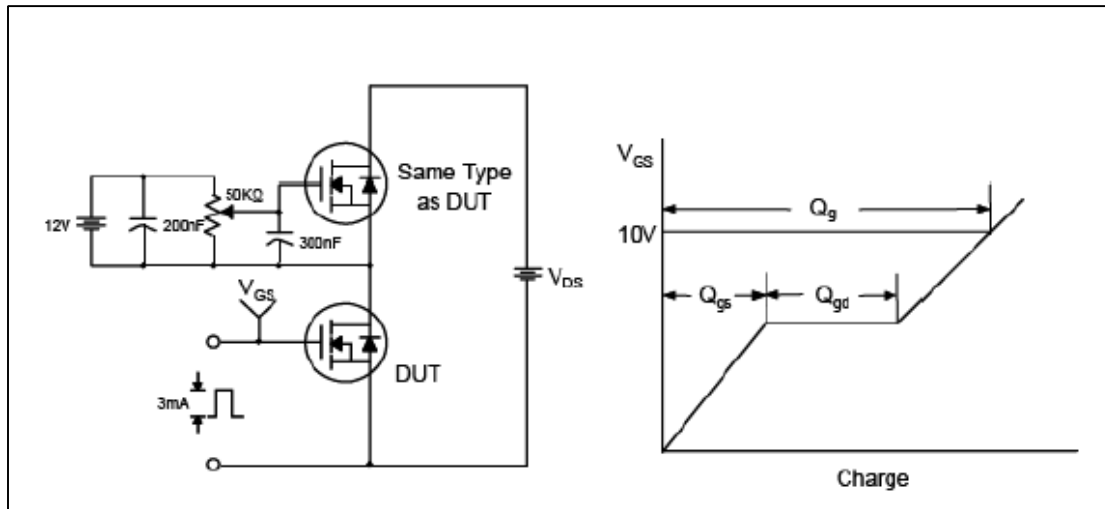


Fig.10 Gate Test circuit & Waveform

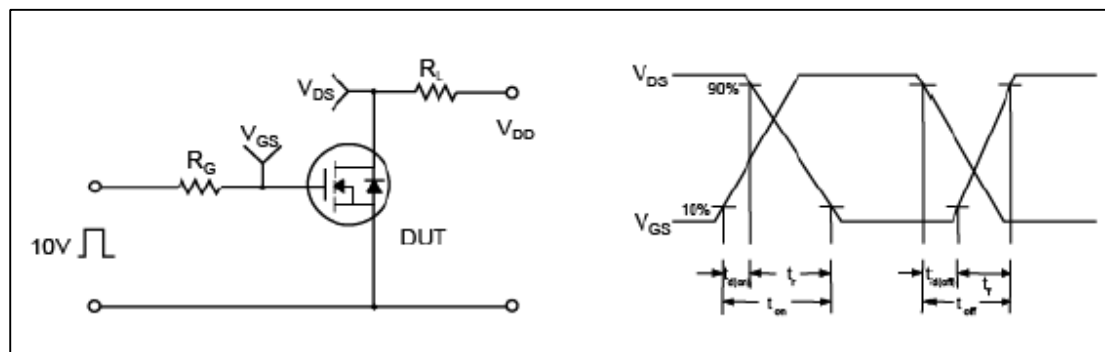


Fig.11 Resistive Switching Test Circuit & Waveform

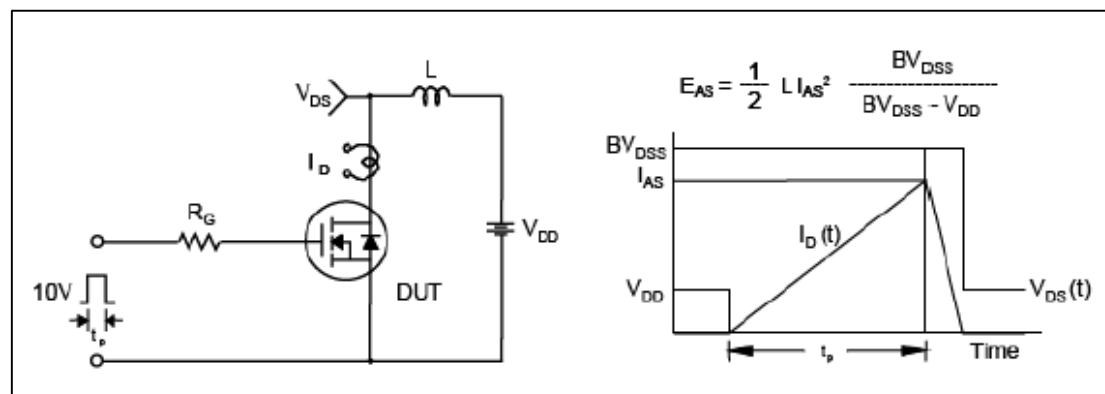


Fig.12 Uncamped Inductive Switching Test Circuit & Waveform

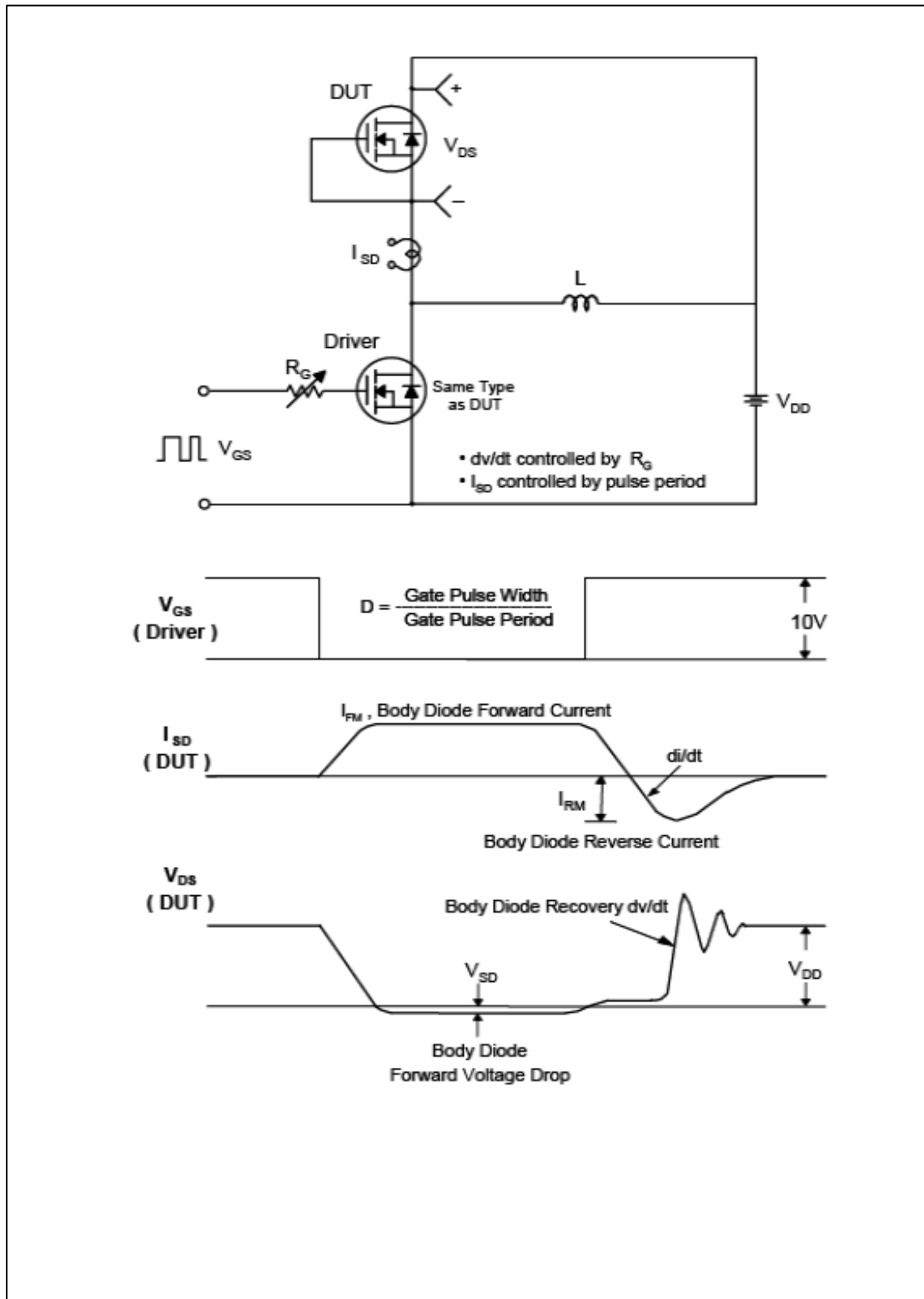


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

