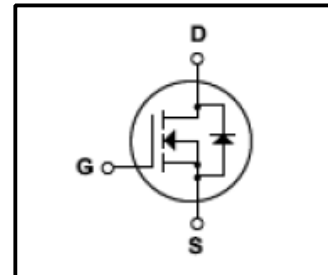
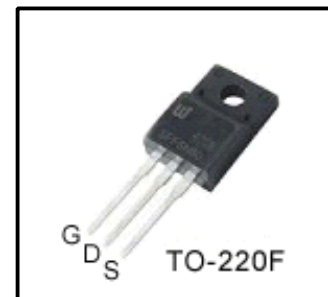


Silicon N-Channel MOSFET
Features

- 10A,650V, $R_{DS(on)}$ (Max 0.95 Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 43nC)
- 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 devices is specially well suited for AC-DC switching power supplies,DC-DC power converters,high voltage h-bridge motor drive PWM.


Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	650	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)	748	mJ
E_{AR}	Repetitive Avalanche Energy (Note1)	15.6	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℃)

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	650	-	-	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	-	0.84	0.95	Ω
Forward Transconductance	g _{fs}	V _{DS} =50V,I _D =4.75A	-	6.4	-	S
Input capacitance	C _{iss}	V _{DS} =25V,	-	1430	-	pF
Reverse transfer capacitance	C _{rss}	V _{GS} =0V,	-	2.5	-	
Output capacitance	C _{oss}	f=1MHz	-	117	-	
Switching time	Rise time	tr	V _{DD} =300V,	-	46	ns
	Turn-on time	ton	I _D =10A,	-	74	
	Fall time	tf	R _G =25Ω,	-	340	
	Turn-off time	toff	(Note4,5)	-	66	
Total gate charge(gate-source plus gate-drain)	Q _g	V _{DD} =480V, V _{GS} =10V,	-	43	-	nC
Gate-source charge	Q _{gs}	I _D =10A	-	9	-	
Gate-drain("miller") Charge	Q _{gd}	(Note4,5)	-	15	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	10	A
Pulse drain reverse current	I _{DRP}	-	-	-	40	A
Forward voltage(diode)	V _{DSF}	I _{DR} =10A,V _{GS} =0V	-	-	1.4	V
Reverse recovery time	trr	I _{DR} =10A,V _{GS} =0V,	-	450	-	ns
Reverse recovery charge	Q _{rr}	dI _{DR} / dt =100 A / μs	-	2.4	-	μC

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

2.L=14.5mH I_{AS}=9.7A,V_{DD}=90V,R_G=25Ω ,Starting T_J=25℃

3.I_{SD}≤10A,di/dt≤200A/us,V_{DD}<BV_{DSS},STARTING T_J=25℃

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

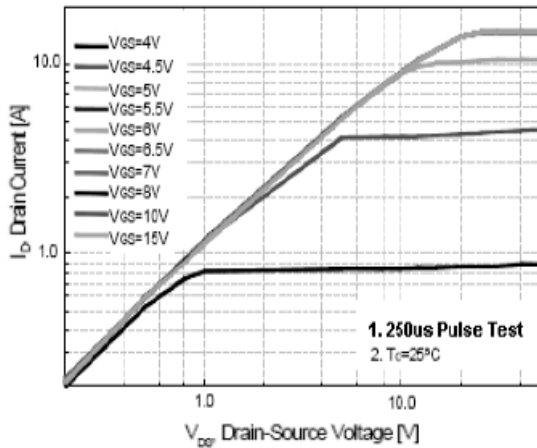


Fig.1 On-State Characteristics

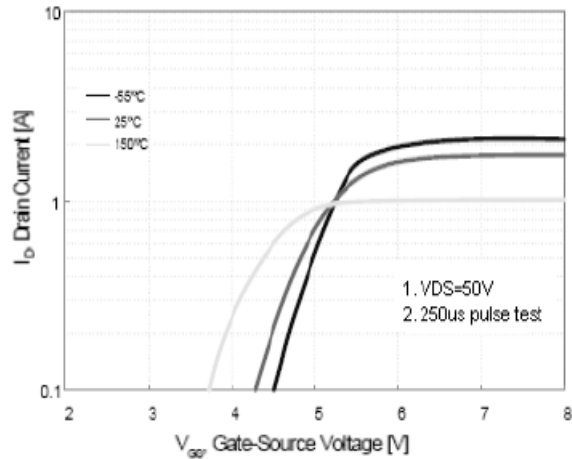
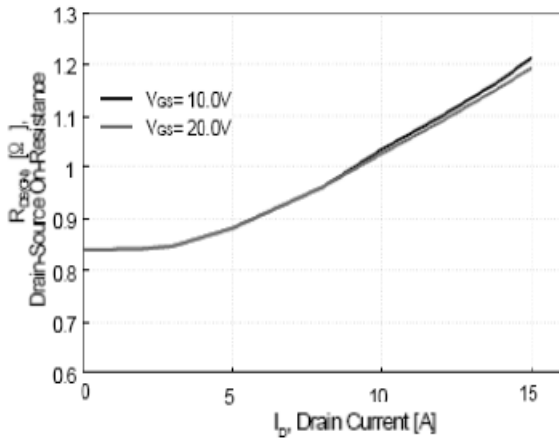
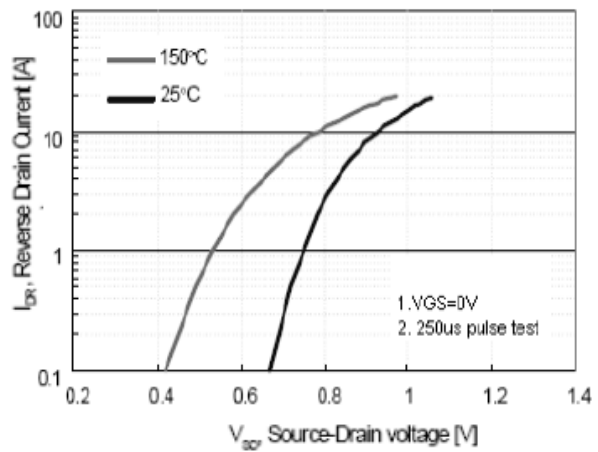


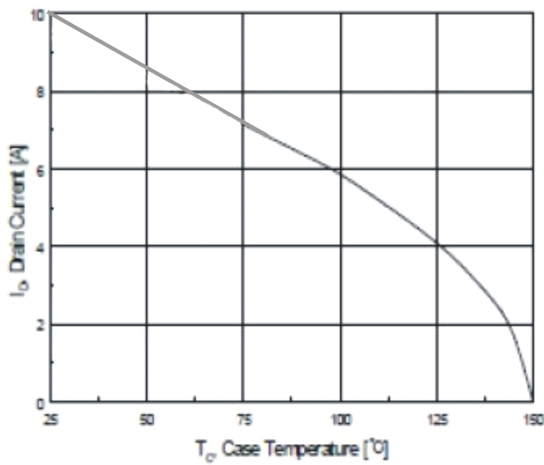
Fig.2 Transfer Current Characteristics



**Fig.3 On-Resistance variation
vs Drain Current**



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



**Fig.5 Maximum Drain Current vs
Case Temperature**

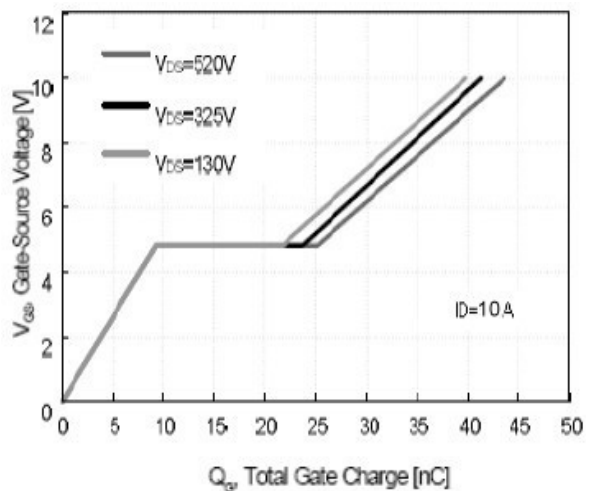


Fig.6 Gate Charge Characteristics

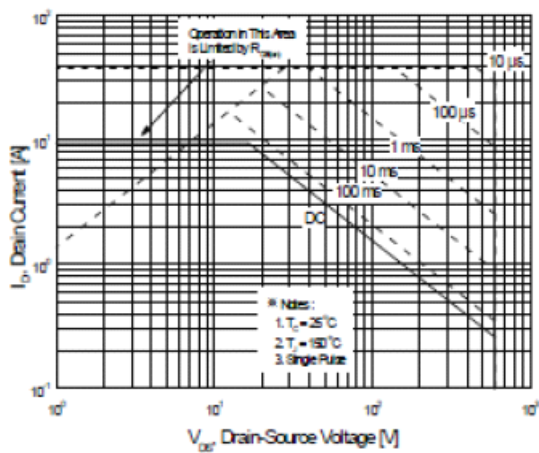


Fig.7 Maximum Safe Operation Area

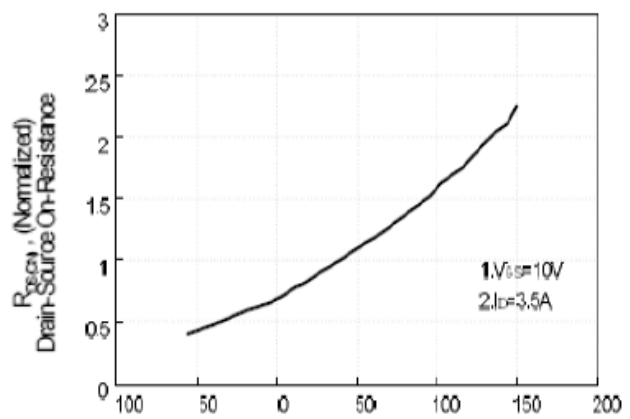


Fig.8 On-Resistance Variation vs. Junction Temperature

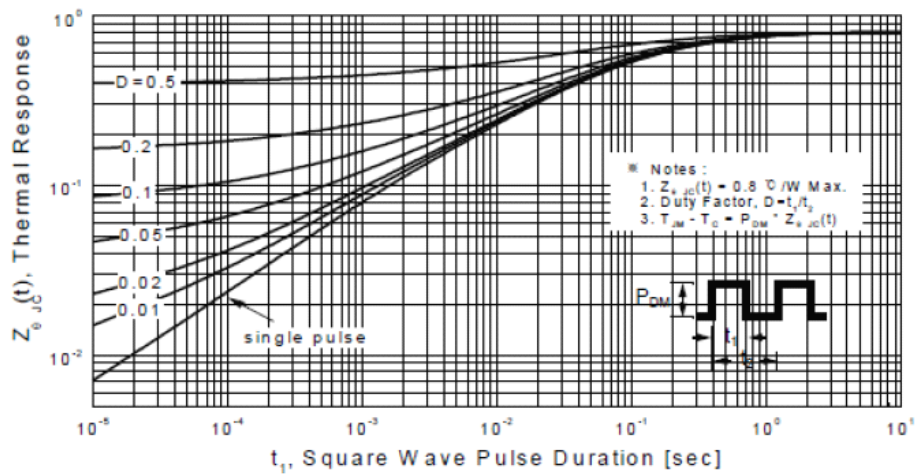


Fig.9 Transient Thermal Response curve

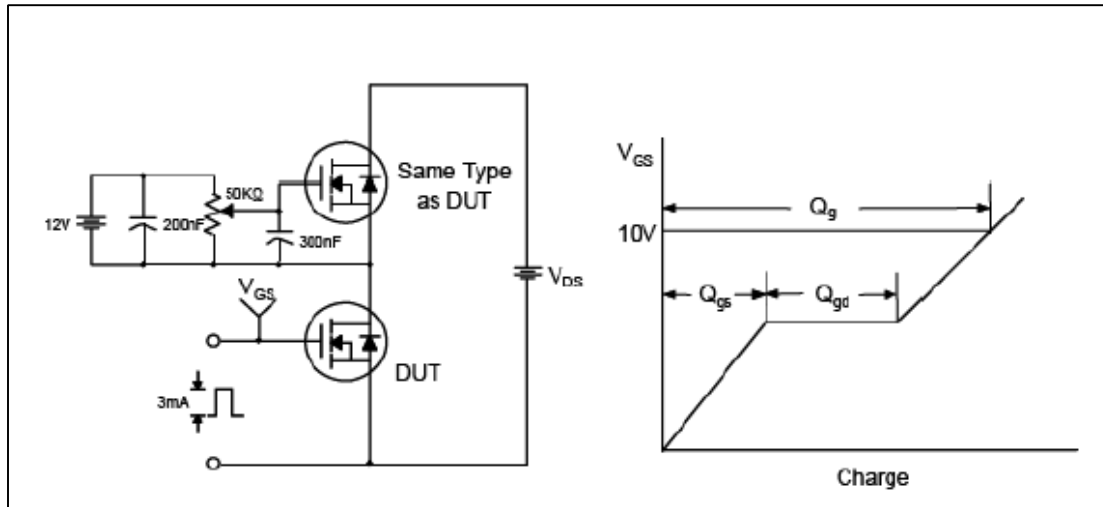


Fig.10 Gate Test circuit & Waveform

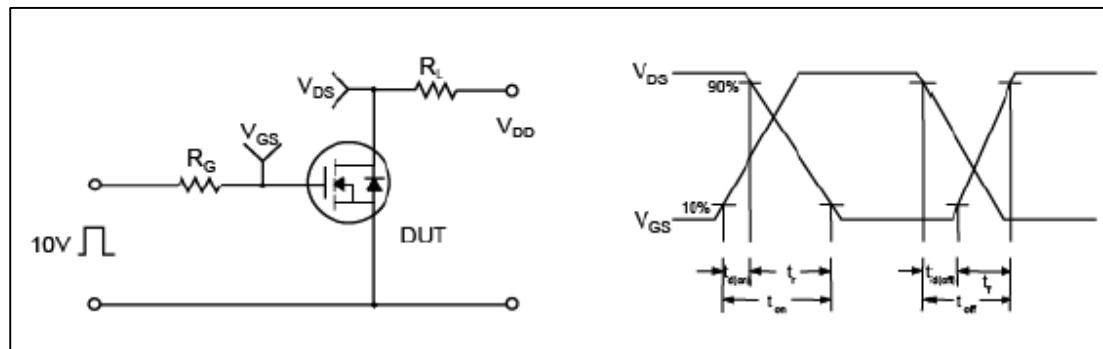


Fig.11 Resistive Switching Test Circuit & Waveform

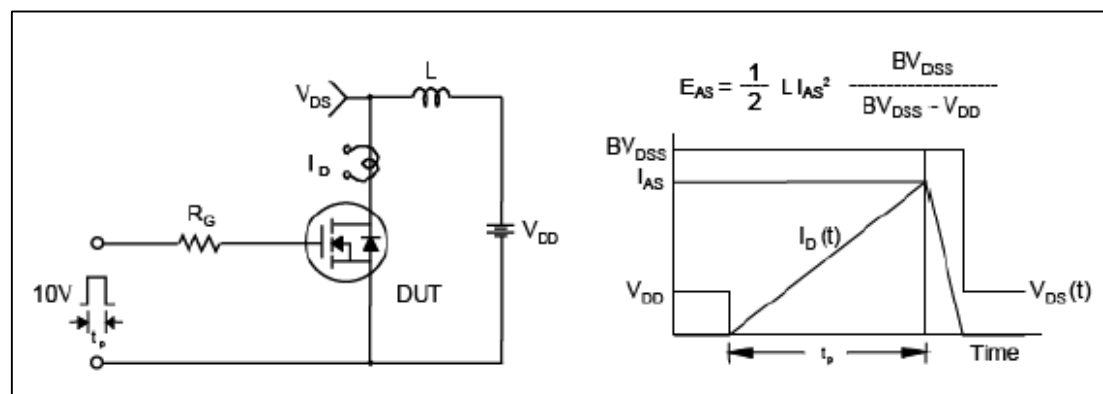


Fig.12 Uncamped Inductive Switching Test Circuit & Waveform

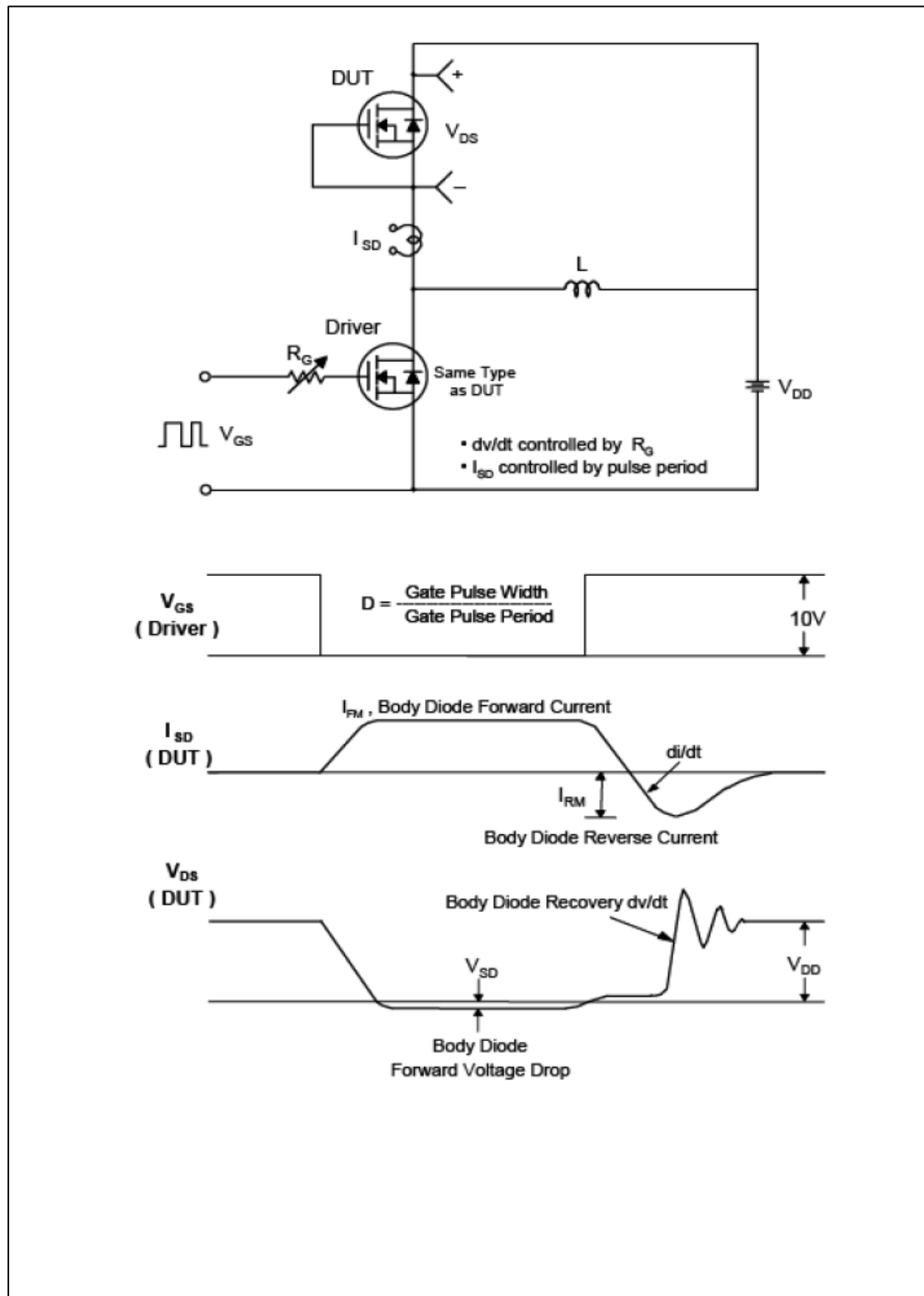


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

Unit:mm

