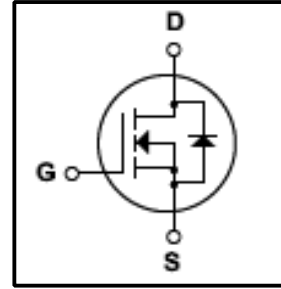


Silicon N-Channel MOSFET

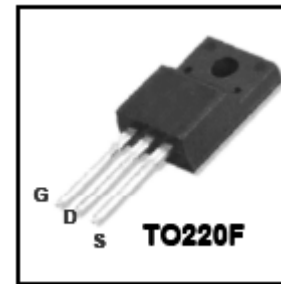
Features

- 2A, 600V, $R_{DS(on)}$ (Max 5 Ω) @ $V_{GS}=10V$
- Ultra-low Gate Charge (Typical 9.0nC)
- Fast Switching Capability
- 100% Avalanche Tested
- Isolation Voltage ($V_{ISO} = 4000V$ AC)
- Maximum Junction Temperature Range (150°C)



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 high efficiency switch mode power supply.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	600	V
I_D	Continuous Drain Current (@ $T_c=25^\circ C$)	2.0*	A
	Continuous Drain Current (@ $T_c=100^\circ C$)	1.5*	A
I_{DM}	Drain Current Pulsed (Note1)	9.5*	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	140	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	2.8	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
P_D	Total Power Dissipation (@ $T_c=25^\circ C$)	23	W
	Derating Factor above 25°C	0.18	W/°C
T_J, T_{stg}	Junction and Storage Temperature	-55~150	°C
T_L	Channel Temperature	300	°C

*Drain current limited by junction temperature

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance, Junction-to-Case	-	-	5.5	°C/W
R_{QJA}	Thermal Resistance, Junction-to-Ambient	-	-	62.5	°C/W

Electrical Characteristics (Tc = 25°C)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I _{GSS}	VGS = ±30 V, VDS = 0 V	-	-	±100	nA
Gate-source breakdown voltage		V _{(BR)GSS}	IG = ±10 μA, VDS = 0 V	±30	-	-	V
Drain cut-off current		IDSS	VDS = 600 V, VGS = 0 V	-	-	10	μA
			VDS = 480 V, Tc = 125°C	-	-	100	μA
Drain-source breakdown voltage		V _{(BR)DSS}	ID = 250 μA, VGS = 0 V	600	-	-	V
Gate threshold voltage		V _{GS(th)}	VDS = 10 V, ID =250 μA	2	-	4	V
Drain-source ON resistance		R _{DS(ON)}	VGS = 10 V, ID =0.8A	-	4.3	5	Ω
Forward Transconductance		gfs	VDS = 50 V, ID =0.8A	-	2.0	-	S
Input capacitance		C _{iss}	VDS = 25 V, VGS = 0 V, f = 1 MHz	-	270	350	pF
Reverse transfer capacitance		C _{rss}		-	6	8	
Output capacitance		C _{oss}		-	40	50	
Switching time	Rise time	tr	VDD =300 V, ID = 2.0 A RG=25 Ω (Note4,5)	-	10	30	ns
	Turn-on time	ton		-	25	60	
	Fall time	tf		-	20	50	
	Turn-off time	toff		-	25	60	
Total gate charge (gate-source plus gate-drain)		Qg	VDD = 320 V, VGS = 10 V, ID = 6.5 A (Note4,5)	-	9.0	11	nC
Gate-source charge		Qgs		-	1.6	-	
Gate-drain ("miller") Charge		Qgd		-	4.3	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	2.0	A
Pulse drain reverse current	I_{DRP}	-	-	-	9.5	A
Forward voltage (diode)	V_{DSF}	$I_{DR} = 2 \text{ A}, V_{GS} = 0 \text{ V}$	-	-	1.4	V
Reverse recovery time	t_{rr}	$I_{DR} = 2.0 \text{ A}, V_{GS} = 0 \text{ V},$ $dI_{DR} / dt = 100 \text{ A} / \mu\text{s}$	-	180	-	ns
Reverse recovery charge	Q_{rr}		-	0.72	-	μC

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

2.L=18.5mH,I_{AS}=2.0A,V_{DD}=50V,R_G=0Ω,Starting T_J=25°C

3.I_{SD}≤2.0A,di/dt≤200A/us, V_{DD}<BV_{DSS},STARTING T_J=25°C

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

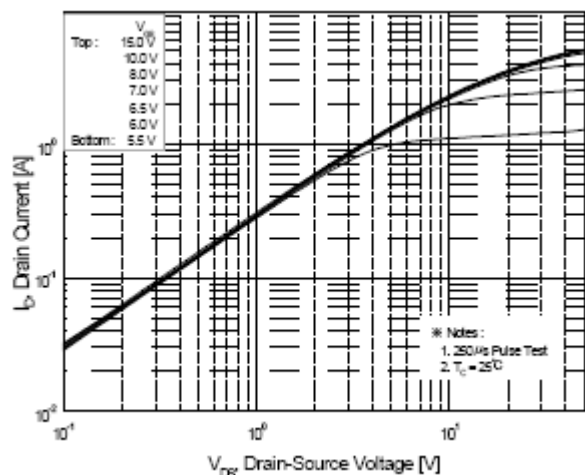


Fig. 1 On-State Characteristics

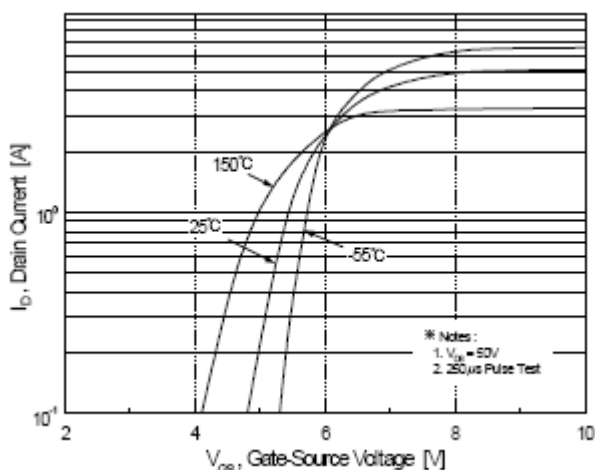


Fig.2 Transfer Current Characteristics

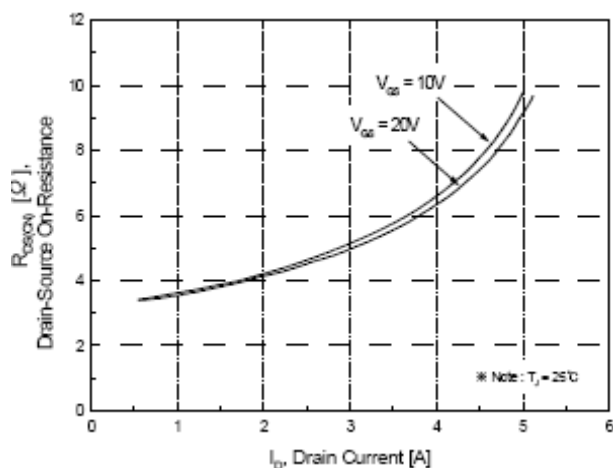


Fig.3 On-Resistance Variation vs Drain Current

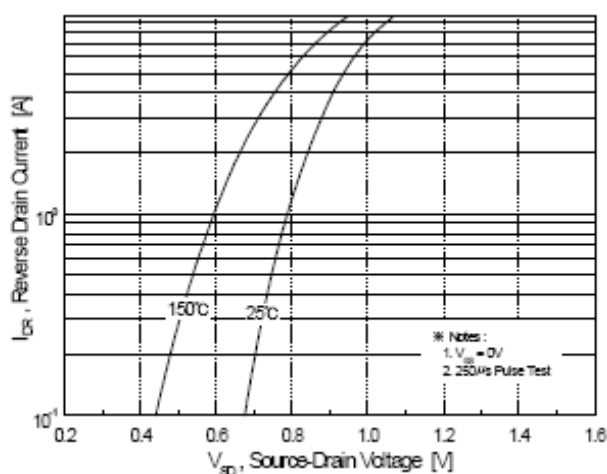


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

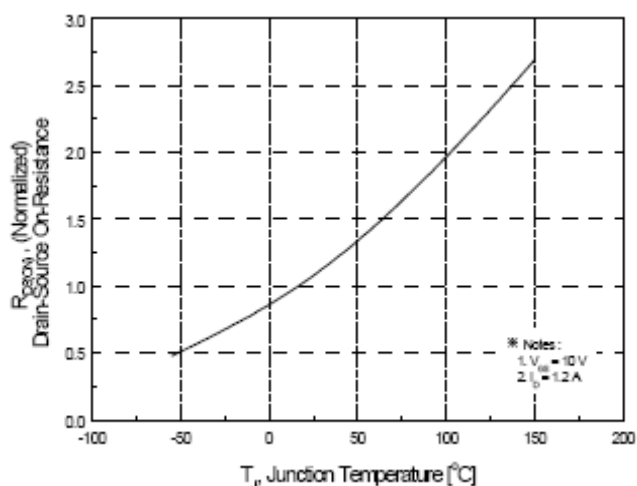


Fig.5 On-Resistance Variation vs Junction Temperature

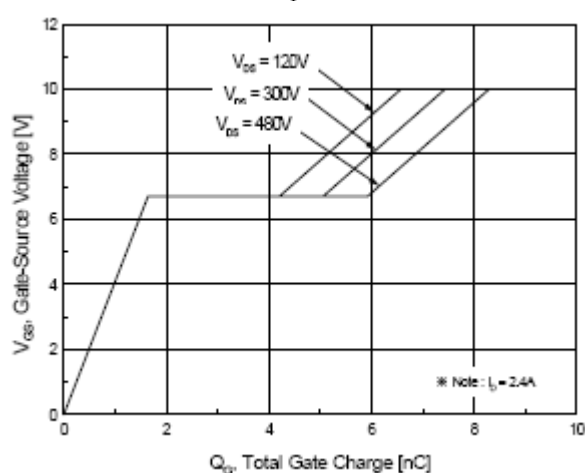


Fig.6 Gate Charge Characteristics

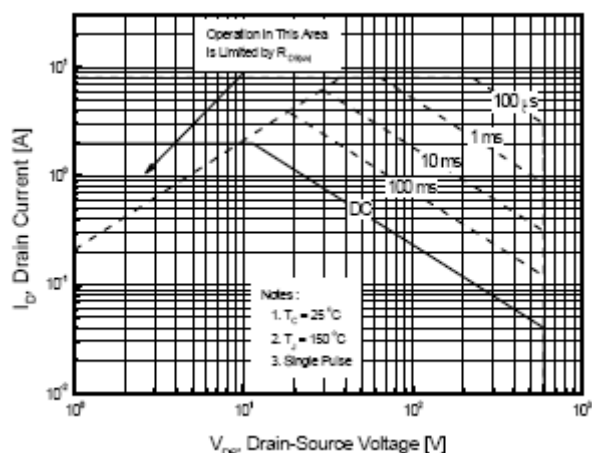


Fig.7 Maximum Safe Operation Area

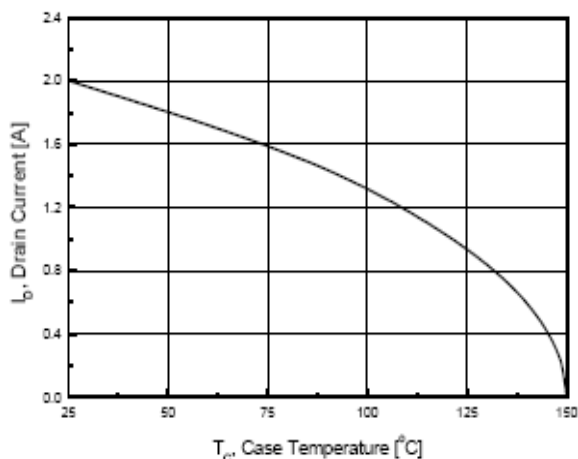


Fig.8 Maximum Drain Current vs Case Temperature

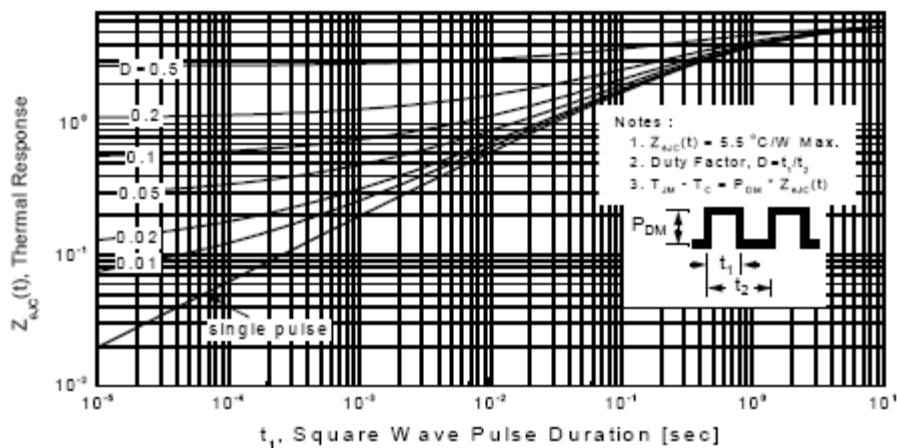


Fig.9 Transient Thermal Response Curve

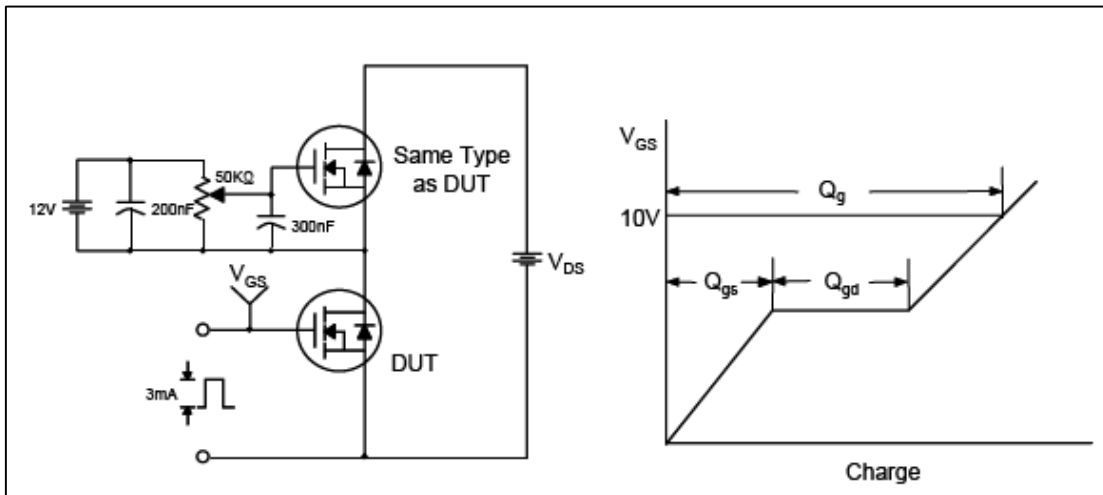


Fig.10 Gate Test Circuit & Waveform

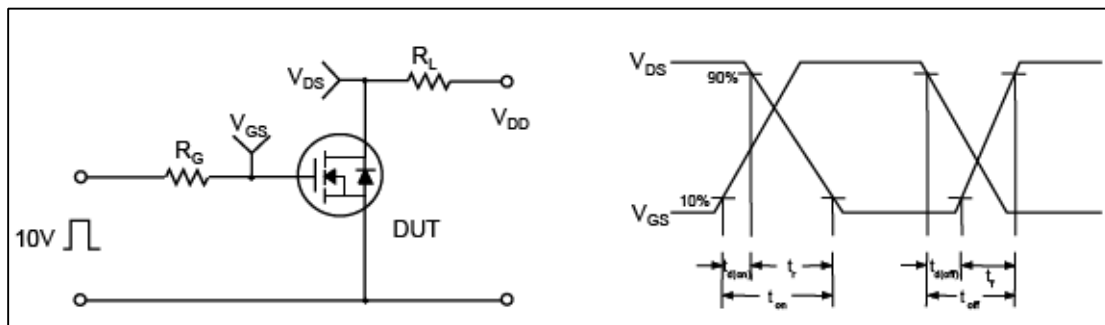


Fig.11 Resistive Switching Test Circuit & Waveform

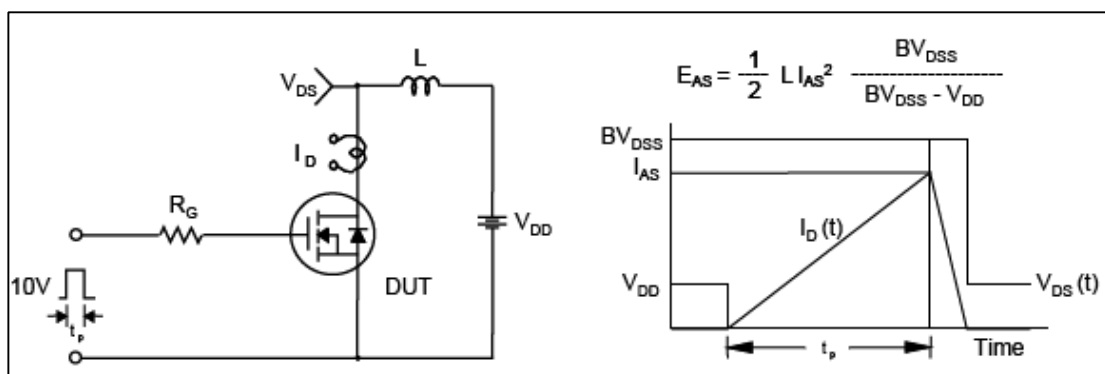


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

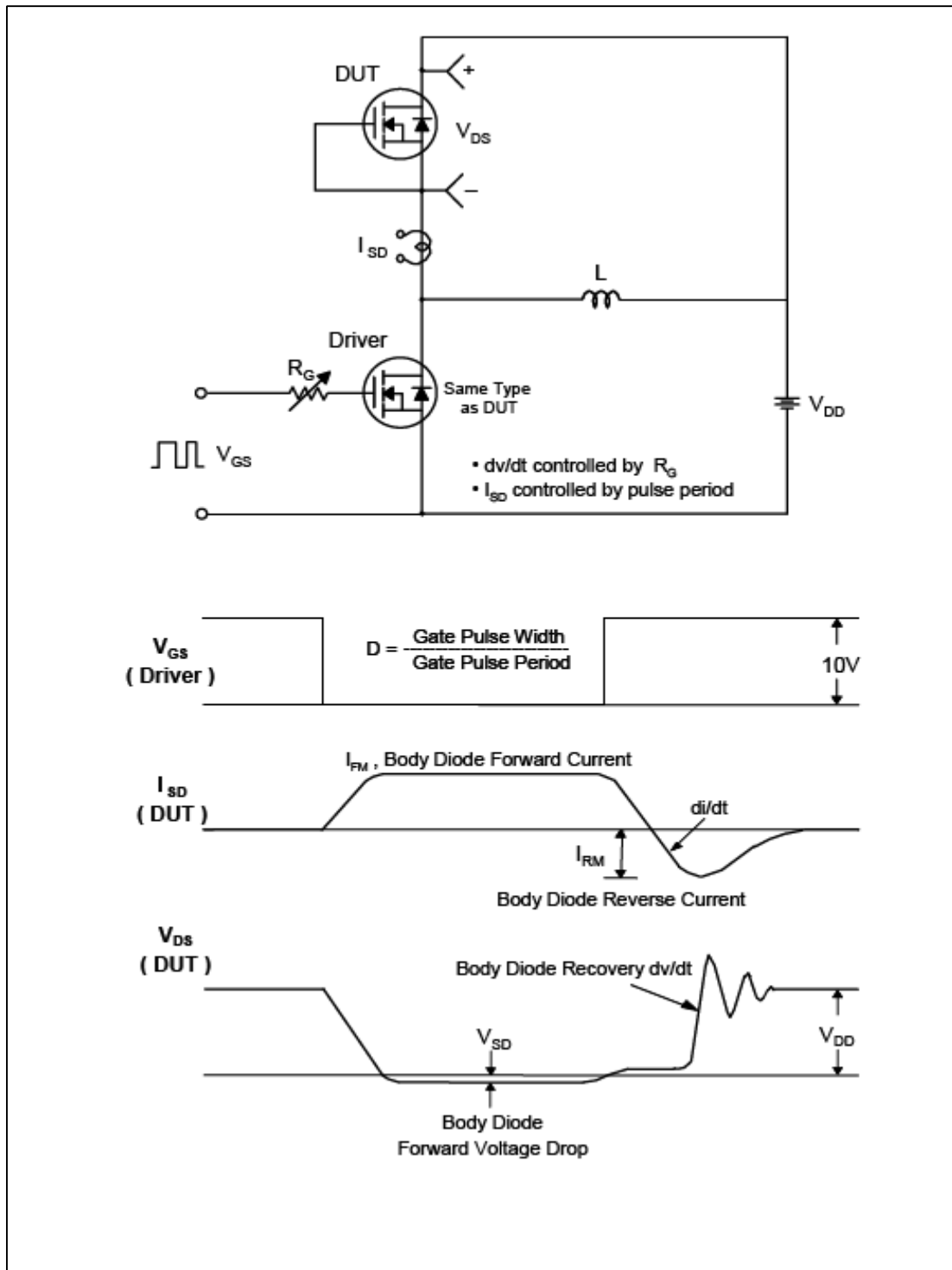


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

