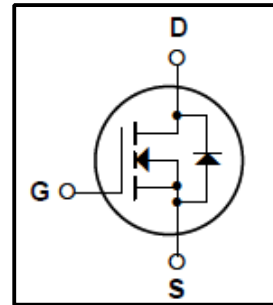
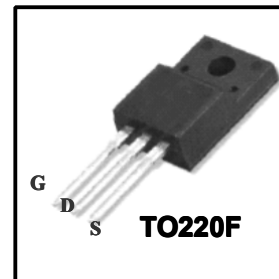


Features

- 12A, 600V, $R_{DS(on)}$ (Max 0.65 Ω) @ $V_{GS}=10V$
- Ultra-low Gate Charge (Typical 39nC)
- 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 model 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(@ $T_c=25^\circ C$)	12*	A
	Continuous Drain Current(@ $T_c=100^\circ C$)	7.6*	A
I_{DM}	Drain Current Pulsed (Note1)	48*	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	880	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	25	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
P_D	Total Power Dissipation(@ $T_c=25^\circ C$)	51	W
	Derating Factor above 25°C	0.41	W/°C
T_J, T_{stg}	Junction and Storage Temperature	-55~150	°C
T_L	Maximum lead Temperature for soldering purposes	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	-	-	2.45	°C/W
R_{QCS}	Thermal Resistance, Case to Sink	-	0.5	-	°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}	V _{GS} = ±30 V, V _{DS} = 0 V	-	-	±100	nA	
Gate-source breakdown voltage	V _{(BR)GSS}	I _G = ±10 μA, V _{DS} = 0 V	±30	-	-	V	
Drain cut-off current	I _{DSS}	V _{DS} = 600 V, V _{GS} = 0 V	-	-	1	μA	
Drain-source breakdown voltage	V _{(BR)DSS}	I _D = 250 μA, V _{GS} = 0 V	600	-	-	V	
Break Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_j}$	I _D =250μA, Referenced to 25°C	-	0.5	-	V/°C	
Gate threshold voltage	V _{GS(th)}	V _{DS} = 10 V, I _D =250 μA	3	-	4.5	V	
Drain-source ON resistance	R _{DS(ON)}	V _{GS} = 10 V, I _D =6.0A	-	-	0.65	Ω	
Forward Transconductance	g _{fs}	V _{DS} = 50 V, I _D =6.0A	-	15		S	
Input capacitance	C _{iss}	V _{DS} = 25 V,	-	1790	2355	pF	
Reverse transfer capacitance	C _{rss}	V _{GS} = 0 V,	-	23	31		
Output capacitance	C _{oss}	f = 1 MHz	-	175	232		
Switching time	Turn-on Rise time	t _r	V _{DD} =300 V,	-	133	175	ns
	Turn-on Delay time	t _{on}	I _D =12 A	-	80	100	
	Turn-off Fall time	t _f	R _G =9.1 Ω	-	100	160	
	Turn-off Delay time	t _{off}	R _D =31 Ω (Note4,5)	-	233	310	
Total gate charge (gate-source plus gate-drain)	Q _g	V _{DD} = 400 V,	-	39	52	nC	
Gate-source charge	Q _{gs}	V _{GS} = 10 V,	-	8.5	-		
Gate-drain ("miller") Charge	Q _{gd}	I _D =1 A (Note4,5)	-	19	-		

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	12	A
Pulse drain reverse current	I _{DRP}	-	-	-	48	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 12 A, V _{GS} = 0 V	-	-	1.4	V
Reverse recovery time	t _{rr}	I _{DR} = 12 A, V _{GS} = 0 V,	-	418	-	ns
Reverse recovery charge	Q _{rr}	dI _{DR} / dt = 100 A / μs	-	4.85	-	μC

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

2.L=11.2mH,I_{AS}=12A,V_{DD}=50V,R_G=25Ω,Starting T_J=25°C

3.I_{SD}≤12A,di/dt≤300A/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

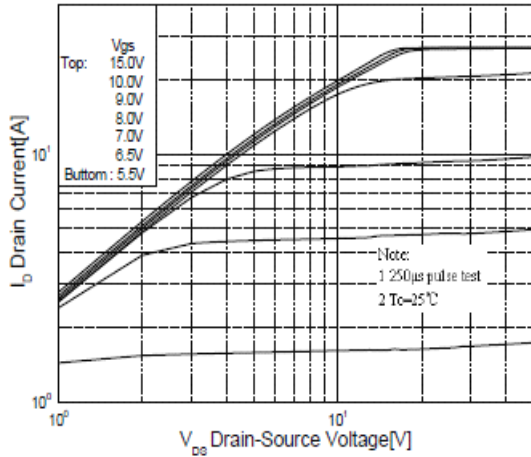


Fig. 1 On-State Characteristics

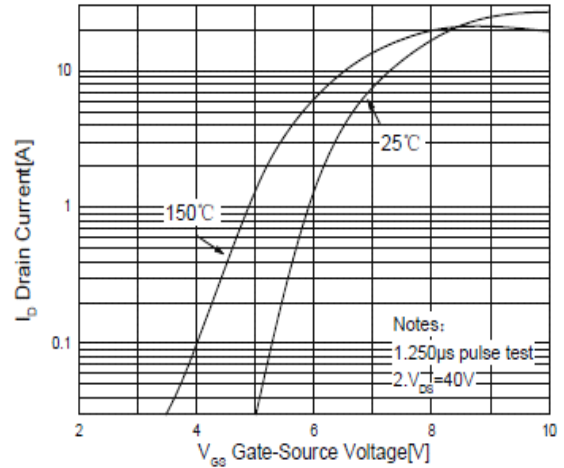


Fig. 2 Transfer Characteristics

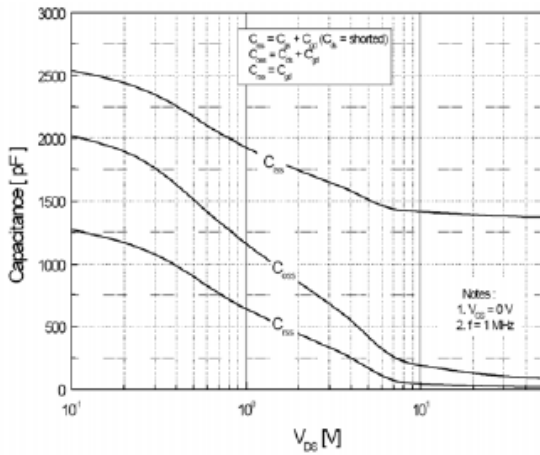


Fig. 3 Capacitance Variation vs Drain Voltage

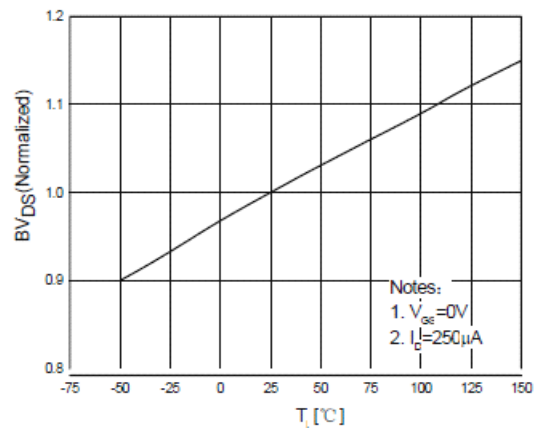


Fig. 4 Breakdown Voltage Variation vs Temperature

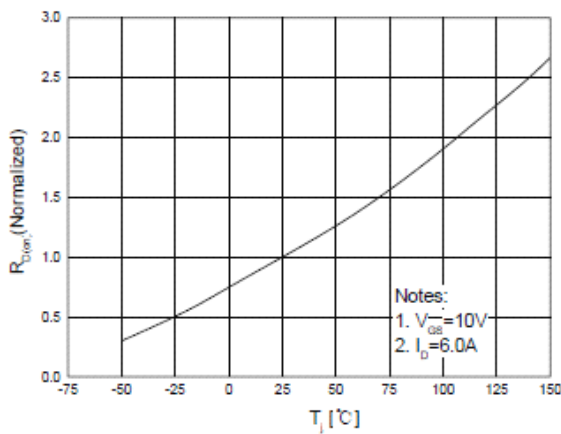


Fig. 5 On-Resistance Variation vs Junction Temperature

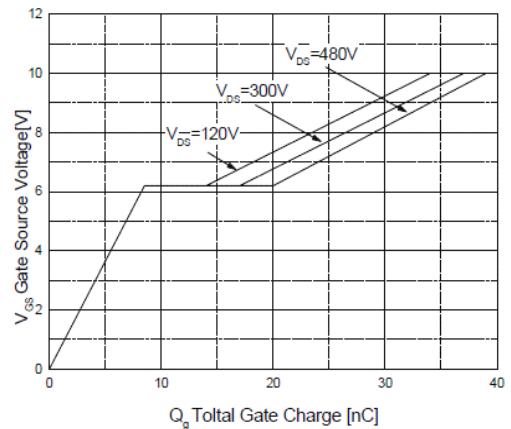


Fig. 6 Gate Charge Characteristics

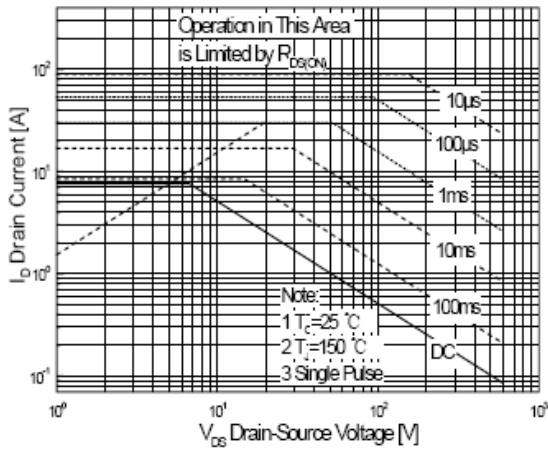


Fig.7 Maximum Safe Operation Area

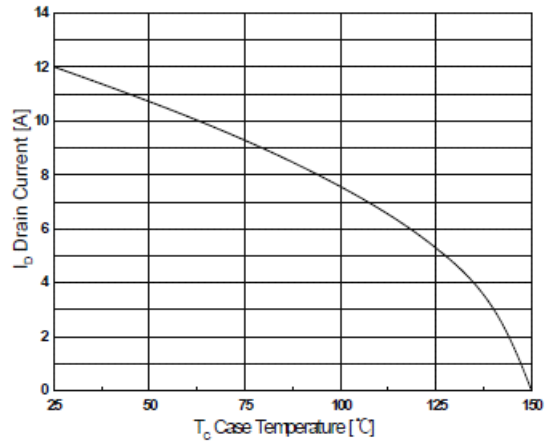


Fig.8 Maximum Drain Current vs Case Temperature

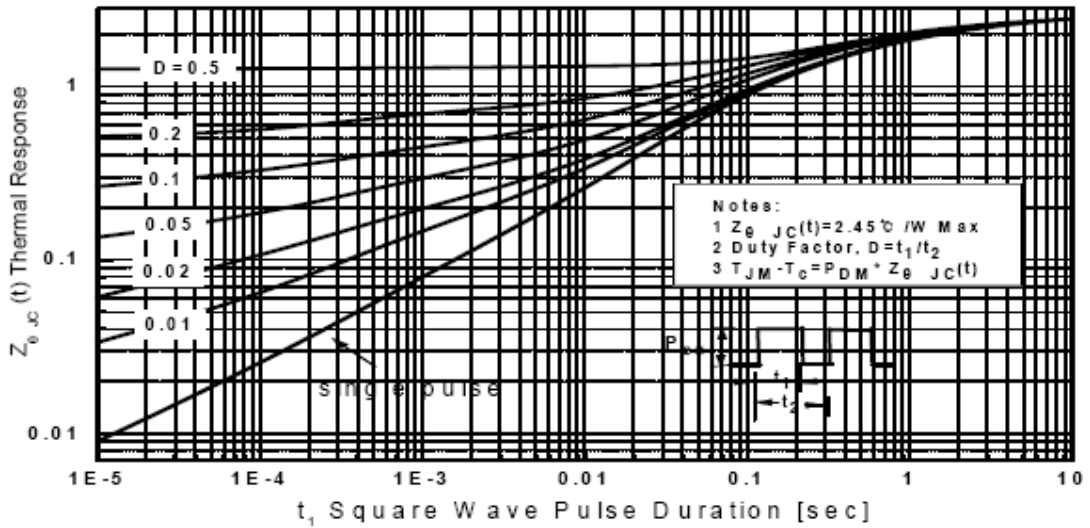


Fig.9 Transient Thermal Response Curve

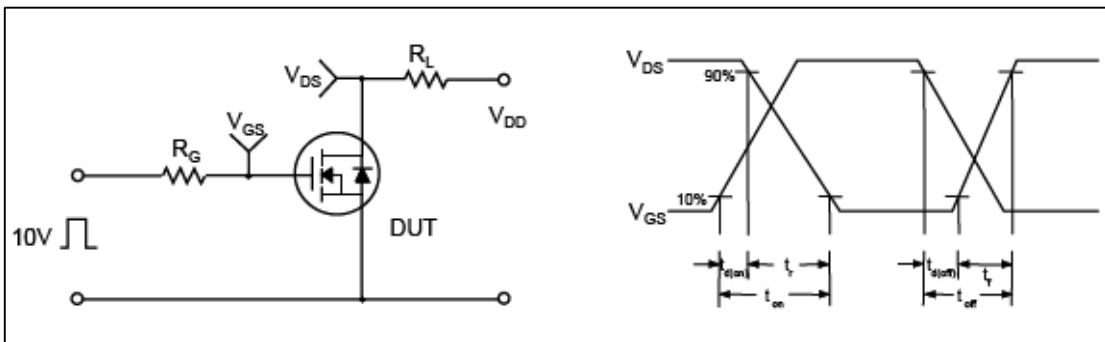
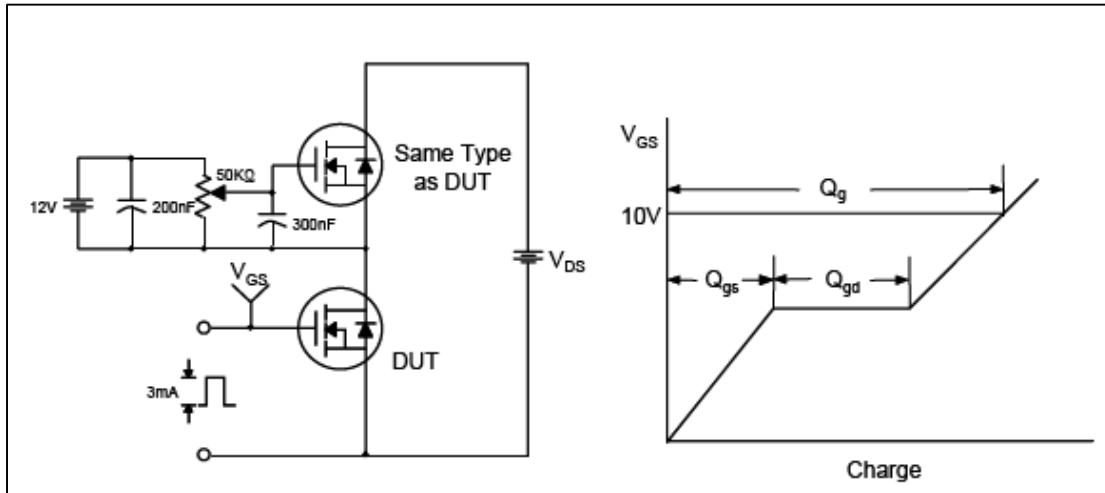


Fig.11 Resistive Switching Test Circuit & Waveform

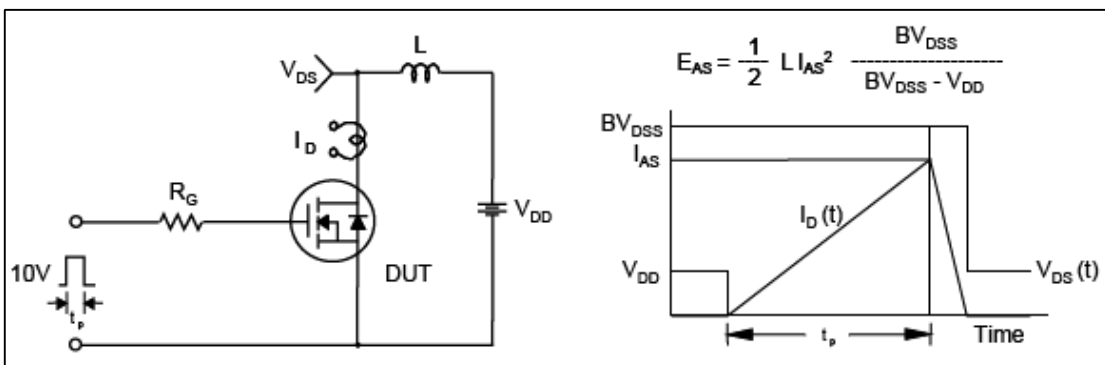


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

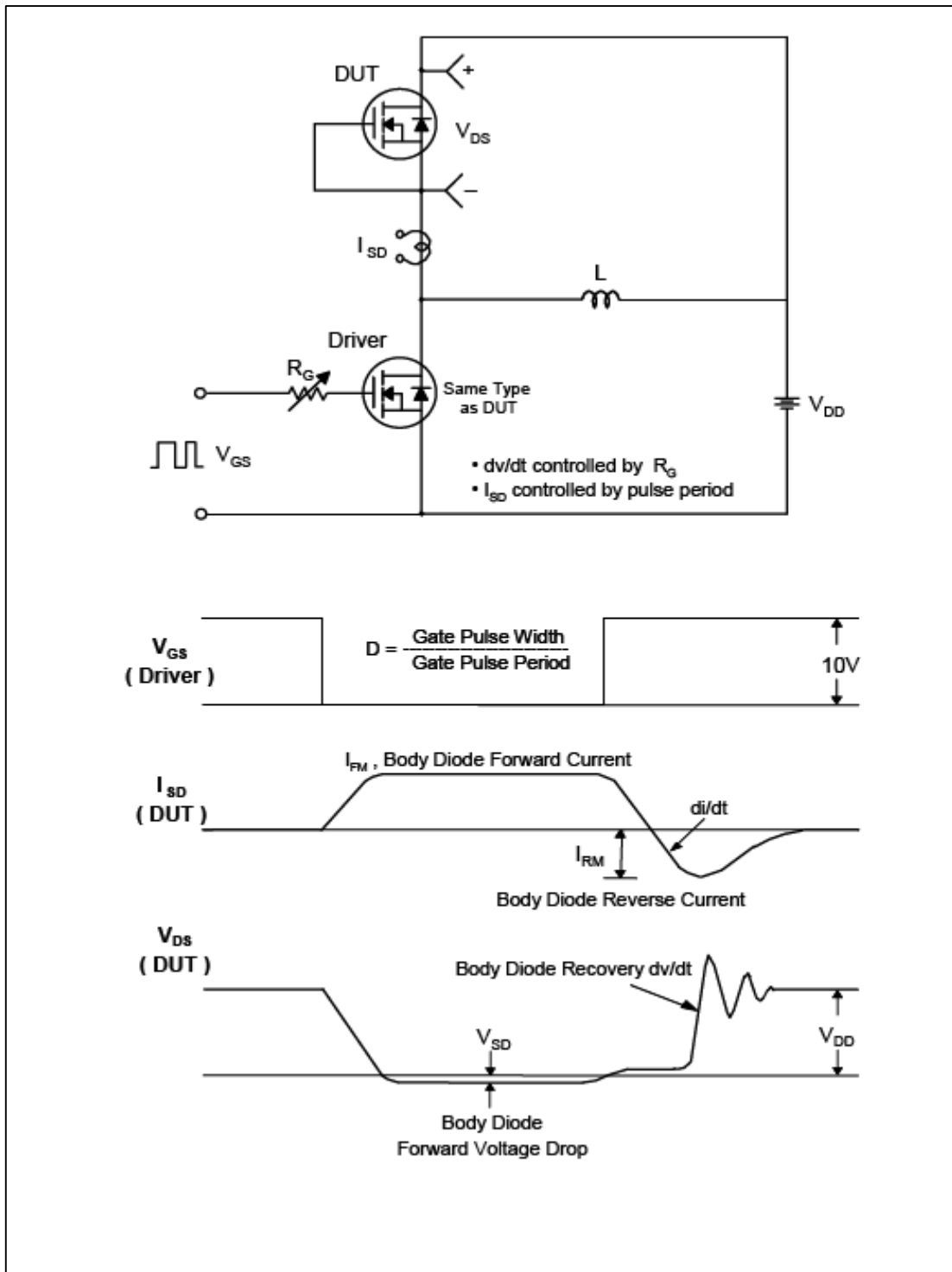


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

