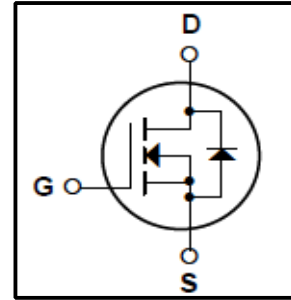
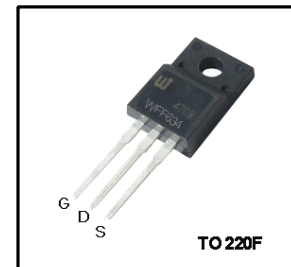


Silicon N-Channel MOSFET
Features

- 9A, 250V, $R_{DS(on)}$ (Max 0.45 Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 41nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150°C)


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 devices is specially well suited for low voltage applications such as automotive, high efficiency switching for DC/DC converters, and DC motor control.


Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	250	V
I_D	Continuous Drain Current(@ $T_c=25^\circ C$)	9	A
	Continuous Drain Current(@ $T_c=100^\circ C$)	5	A
I_{DM}	Drain Current Pulsed (Note1)	72	A
V_{GS}	Gate to Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	300	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	7.4	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.8	V/ns
P_D	Total Power Dissipation(@ $T_c=25^\circ C$)	48	W
	Derating Factor above 25°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 junction temperature

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance, Junction-to-Case	-	-	2.60	°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 (T_c = 25 °C)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V	-	-	±100	nA
Gate-source breakdown voltage		V _{(BR)GSS}	I _G = ±10 μA, V _{DS} = 0 V	±20	-	-	V
Drain cut-off current		I _{DSS}	V _{DS} = 200 V, V _{GS} = 0 V	-	-	1	μA
Drain-source breakdown voltage		V _{(BR)DSS}	I _D = 250 μA, V _{GS} = 0 V	250	-	-	V
Break Voltage Temperature Coefficient		ΔBV _{DSS} / ΔT _J	I _D =250μA, Referenced to 25°C	-	0.37	-	V/°C
Gate threshold voltage		V _{GS(th)}	V _{DS} = 10 V, I _D = 250 μA	2	-	4	V
Drain-source ON resistance		R _{DS(ON)}	V _{GS} = 10 V, I _D = 5.1A	-	-	0.45	Ω
Forward Transconductance		g _{fs}	V _{DS} = 50 V, I _D = 5.1A	1.6	-	-	S
Input capacitance		C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V,	-	1220	-	pF
Reverse transfer capacitance		C _{rss}	f = 1 MHz	-	32	-	
Output capacitance		C _{oss}		-	130	-	
Switching time	Rise time	t _r	V _{DD} = 125 V, I _D = 5.6A	-	9.6	-	ns
	Turn-on time	t _{on}	R _G = 12Ω	-	21	-	
	Fall time	t _f	(Note4,5)	-	42	-	
	Turn-off time	t _{off}		-	19	-	
Total gate charge (gate-source plus gate-drain)		Q _g	V _{DD} = 200 V, V _{GS} = 10 V, I _D = 5.6A	-	41	51.8	nC
Gate-source charge		Q _{gs}	(Note4,5)	-	6.5	-	
Gate-drain ("miller") Charge		Q _{gd}		-	22	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	8.1	A
Pulse drain reverse current	I _{DRP}	-	-	-	32	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 8.1 A, V _{GS} = 0 V	-	1.4	2	V
Reverse recovery time	t _{rr}	I _{DR} = 5.6 A, V _{GS} = 0 V, dI _{DR} / dt = 100 A / μs	-	198	-	ns
Reverse recovery charge	Q _{rr}		-	1.2	2.4	μC

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

2.L=500uH,I_{AS}=9 A,V_{DD}=50V,R_G=0Ω,Starting T_J=25°C

3.I_{SD}≤9A,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

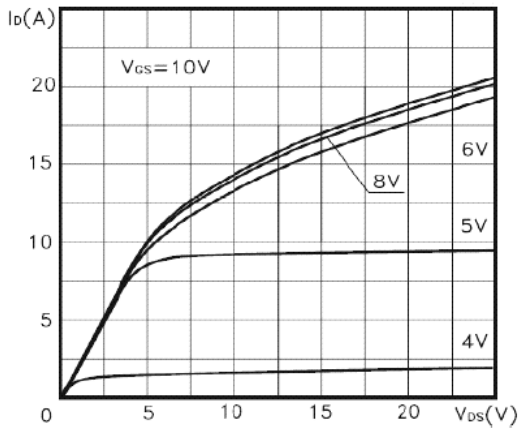


Fig. 1 On-State Characteristics

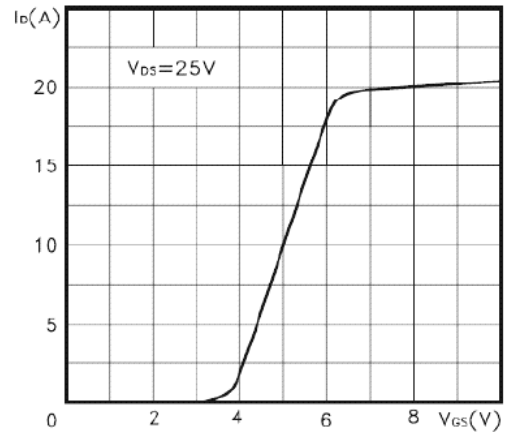


Fig.2 Transfer Characteristics

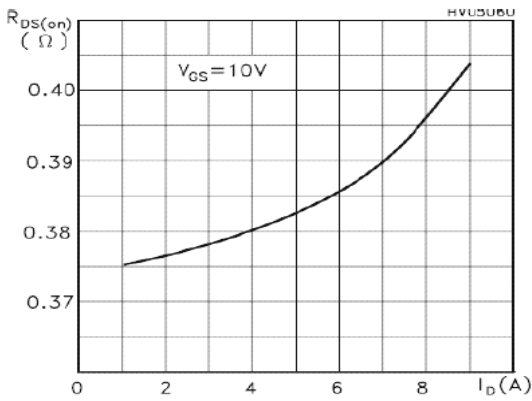


Fig.3 On-Resistance Variation vs Drain Current

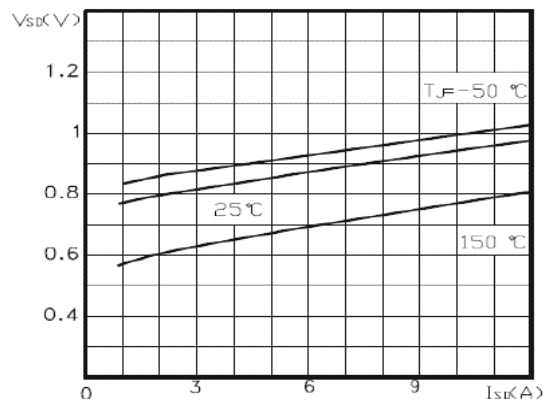


Fig.4 Body Diode Forward Voltage Variation vs. Source Current and Temperature

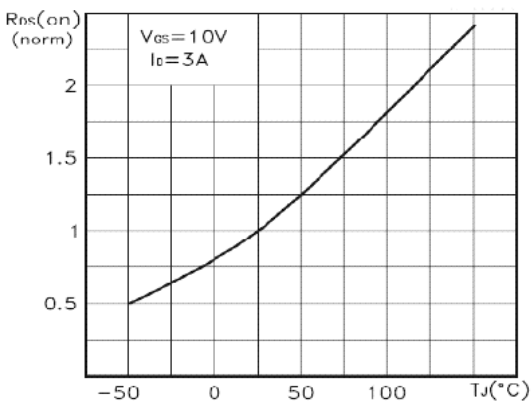


Fig.5 On-Resistance Variation vs Junction Temperature

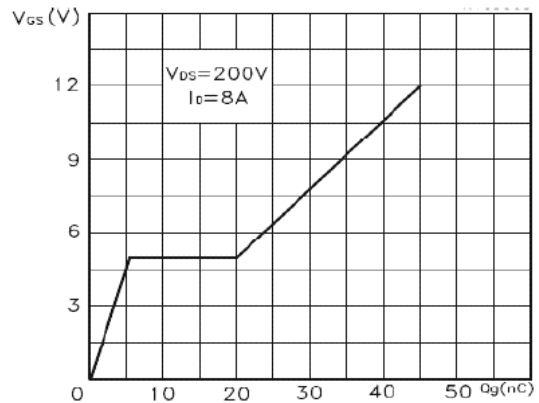


Fig.6 Gate Charge Characteristics

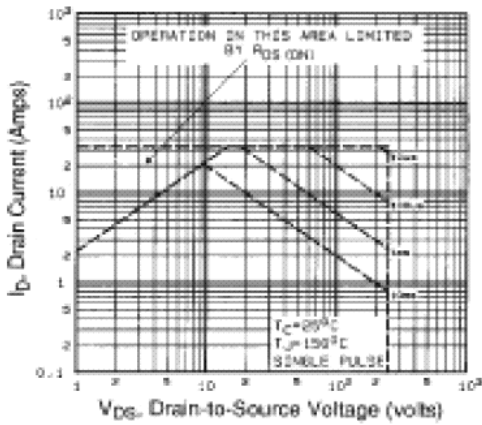


Fig.7 Maximum Safe Operation Area

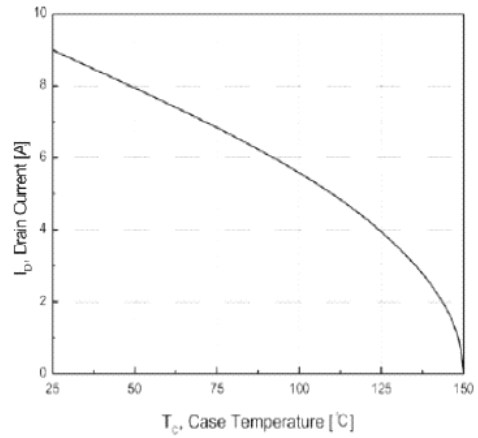


Fig.8 Maximum Drain Current vs Case Temperature

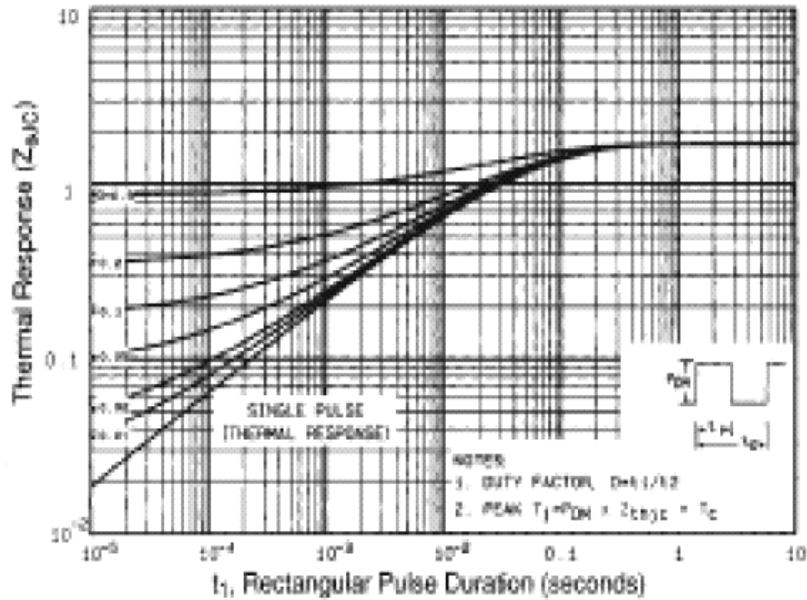


Fig.9 Transient Thermal Response Curve

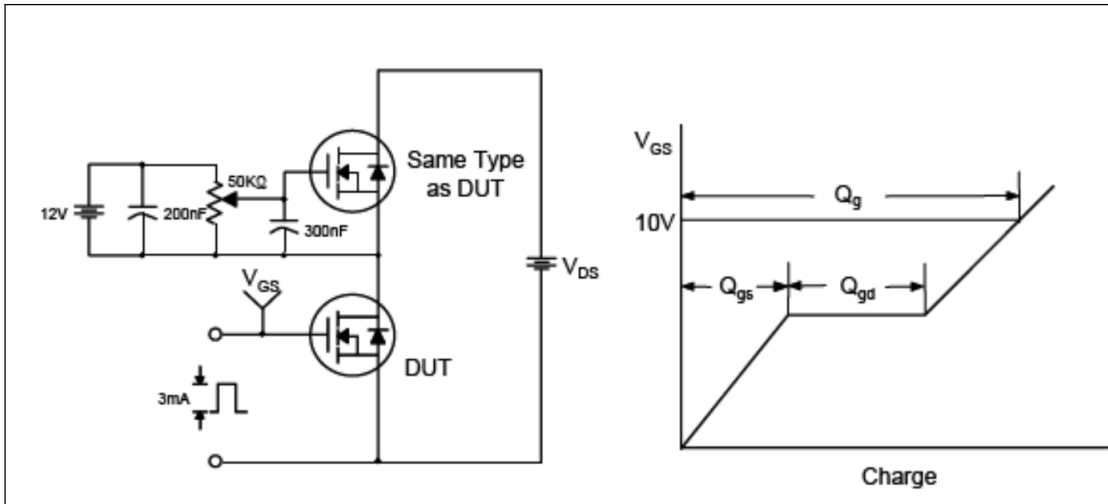


Fig.10 Gate Test Circuit & Waveform

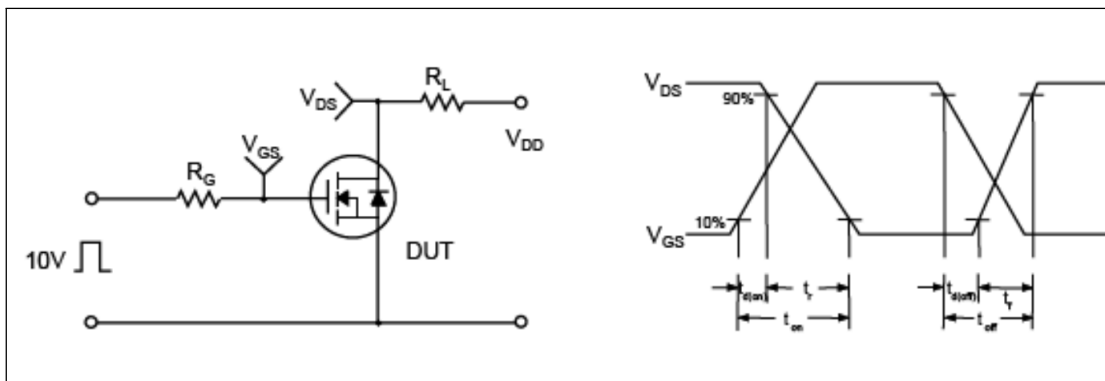


Fig.11 Resistive Switching Test Circuit & Waveform

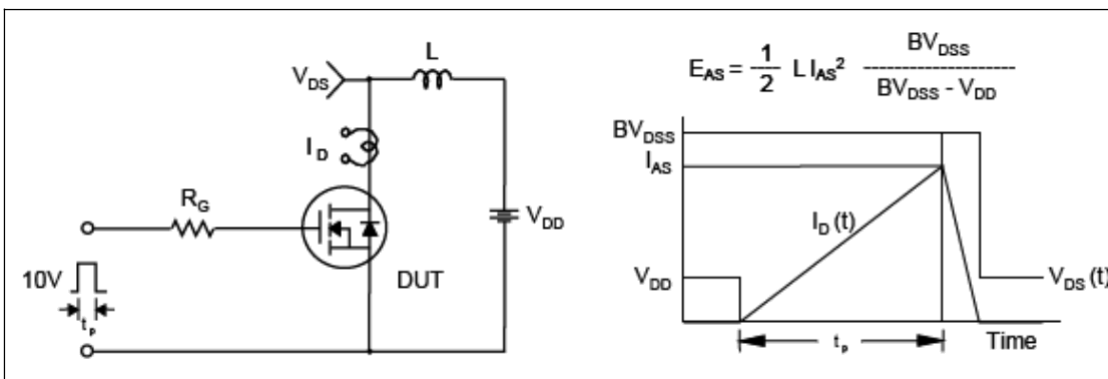


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

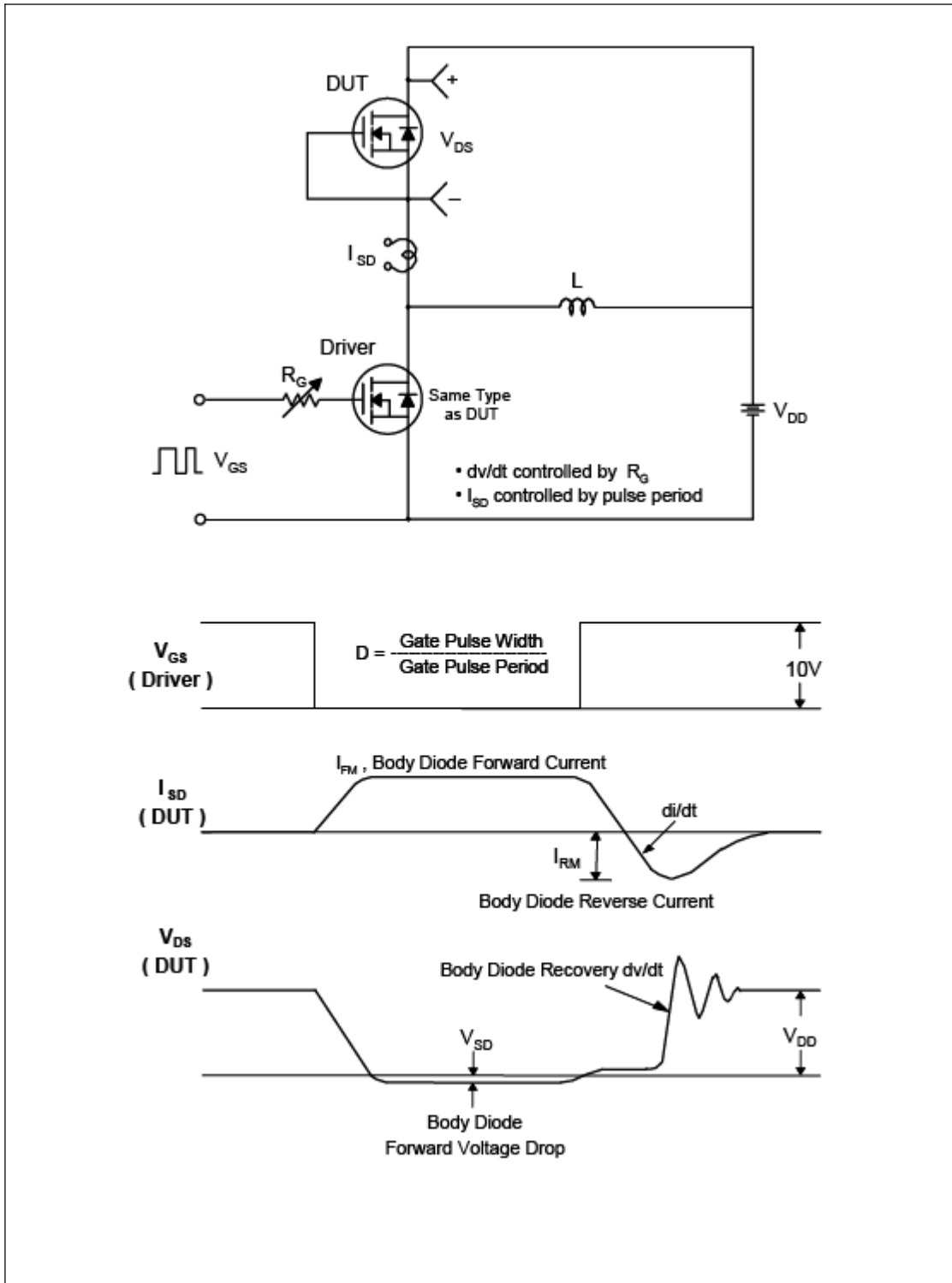


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

