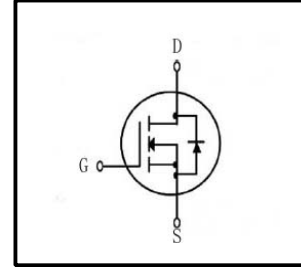**WINSEMI** SEMICONDUCTOR™

Silicon N-Channel MOSFET

## Features

- $R_{DS(on)}$(Max 0.015Ω)@V_{GS}=10v

- Gate Charge(Typical 80 nC)

- Maximum Junction Temperature Range(175℃)

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 low gate charge with superior switching performance , and rugged avalanche characteristics.This Power MOSFET is well suited for synchronous DC-DC Converters and power Management in portable and battery operated products.
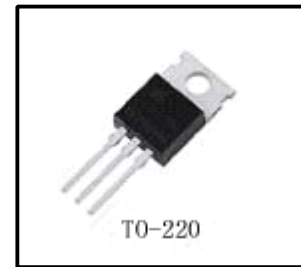
Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain to Source Voltage	80	V
I_D	Continuous Drain Current(@T_C=25℃)	75	A
	Continuous Drain Current(@T_C=100℃)	52.5	A
I_{DM}	Drain Current Pulsed	300	A
V_{GS}	Gate to Source Voltage	±20	V
E_{AS}	Single Pulsed Avalanche Energy	1310	mJ
E_{AR}	Repetitive Avalanche Energy	17.3	mJ
dv/dt	Peak Diode Recovery dv/dt	7.0	V/ns
P_D	Total Power Dissipation(@T_C=25℃)	173	W
	Derating Factor above25℃	1.15	W/℃
T_{STG}	Operating Junction Temperature	-55~175	℃
T_J	Storage Temperature	150	℃

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
R_{QJC}	Thermal Resistance,Junction-to-Case	-	-	0.87	℃/w
R_{QJA}	Thermal Resistance,Junction-to-Ambient*	-	0.5	-	℃/w
R_{QJA}	Thermal Resistance,Junction-to-Ambient	-	-	62.5	℃/w

Electrical Characteristics T_C=25℃

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	80	-	-	V
Breakdown Voltage Temperature coefficient	$\triangle BV_{DSS}/ \triangle T_J$	I_D=250uA, referenced to25℃	-	0.08	-	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V	-	-	10	uA
		V_{DS}=64V, T_C=125℃	-	-	100	uA
Gate-Source Leakage,Forward	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	100	nA
Gate-Source Leakage,Reverse		V_{GS}=-20V,V_{DS}=0V	-	-	-100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	2.0	-	4.0	V
Static Drain-Source On-state Resis-tance	$R_{DS(ON)}$	V_{GS}=10V, I_D=37.5A	-	0.012	0.015	Ω
Input Capacitance	C_{iss}	V_{GS}=0V,	-	2600	3380	pF
Output Capacitance	C_{oss}	V_{DS}=25V,	-	940	1220	
Reverse Transfer Capacitance	C_{rss}	f=1MHz	-	210	275	
Turn-on Delay Time	$td_{(on)}$	V_{DD}=40V,	-	30	70	ns
RiseTime	t_r	I_D=75A,R_G=25Ω	-	225	460	
Turn-off Delay Time	$td_{(off)}$	Pulse Width≤300us,	-	165	340	
Fall Time	t_f	Q>50	-	155	320	
Total Gate Charge	Q_g	V_{DS}=64V,	-	80	105	nC
Gate-Source Charge	Q_{gs}	V_{GS}=10V,	-	15	-	
Gate-Drain Charge(Miller Charge)	Q_{gd}	I_D=75A	-	32	-	

Source-Drain Ratings and Characteristics

Characteristics	Symbol	Test Conditions	Min	Typ	Max	units
Maximum Continuous Source-Drain Diode Forward Current	I_S	-	-	-	75	A
Maximum Pulsed Source-Drain Diode Forward	I_{SM}	-	-	-	300	
Diode Forward voltage	V_{SD}	I_S=75A,V_{GS}=0V	-	-	1.5	V
Reverse Recovery Time	t_{rr}	I_S=75A,V_{GS}=0V,	-	90	-	ns
Reverse Recovery Charge	Q_{rr}	dIF/dt=100A/us	-	250	-	uC

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

2.L=0.32mH,I_{AS}=75A,V_{DD}=50V,R_G=25Ω,Starting T_J=25℃

3.I_{SD}≤75A,di/dt≤300A/us,V_{DD}≤BV_{DSS},Starting T_J=25℃
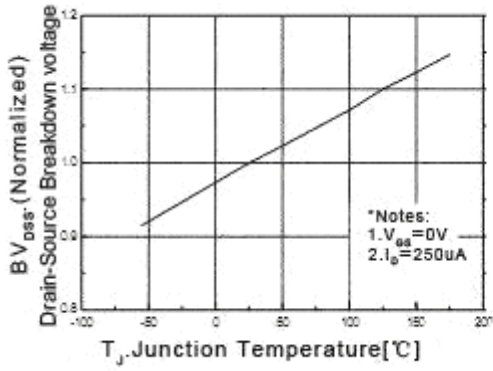
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Fig1.BreakdownVoltage Variation
vs.Junction temperature
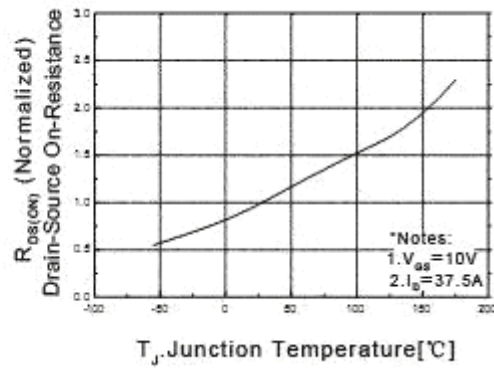

Fig2. On-Resistance Variation
vs.Junction Temperature

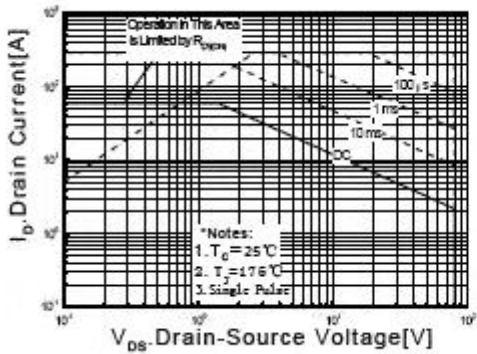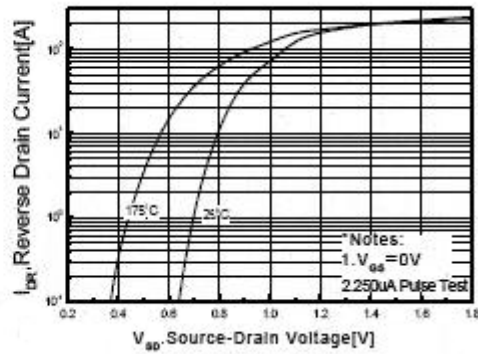
Fig3.Maximum Sate Operating Area
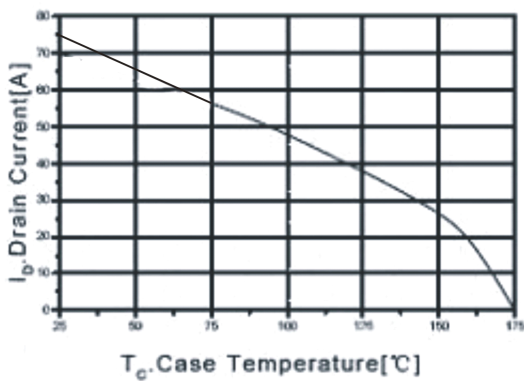

Fig4. On State Current vs.Allowable
Case Temperature

Fig5.Maximum Drain Current
vs.Case Temperature

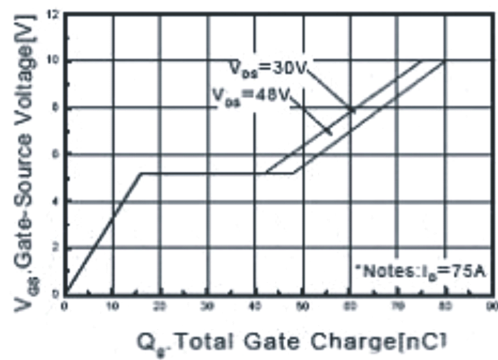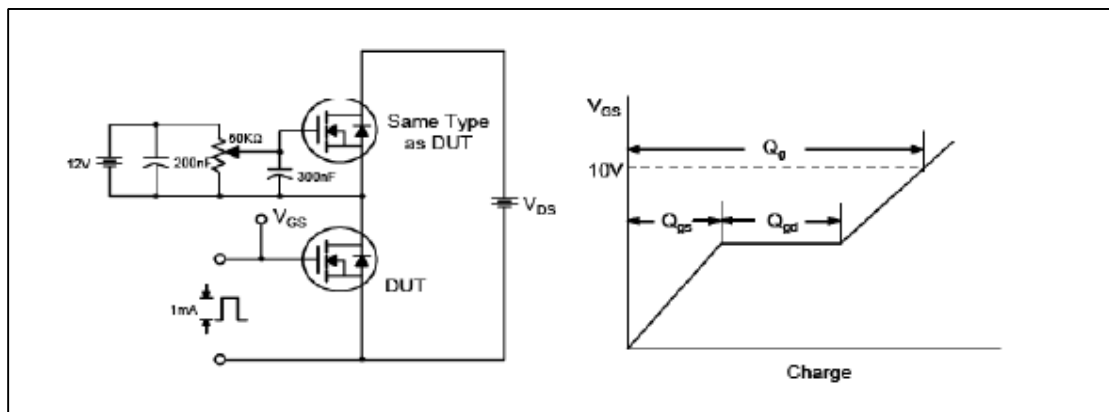Fig6.Gate Charge Characteristics

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Fig.7 Gate Charge Test Circuit&Waveforms
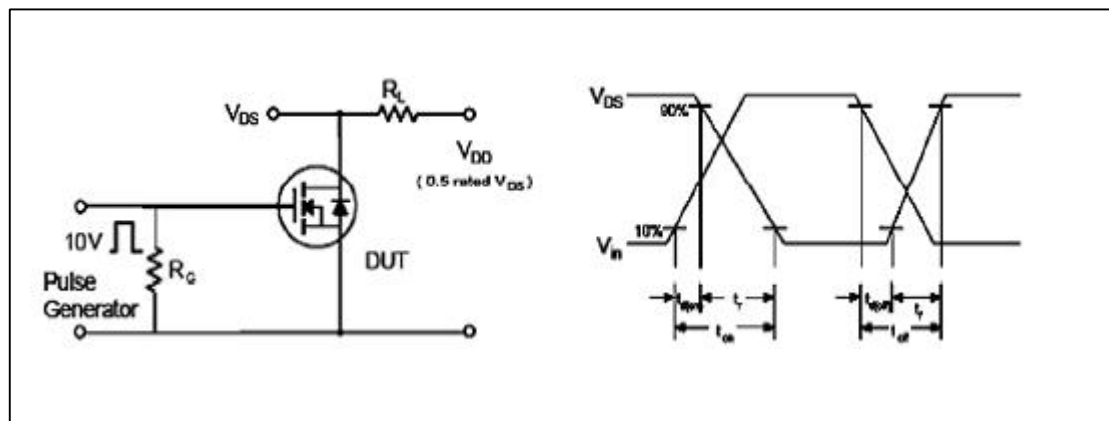
Fig8.Switching Time Test Circuit&Waveforms
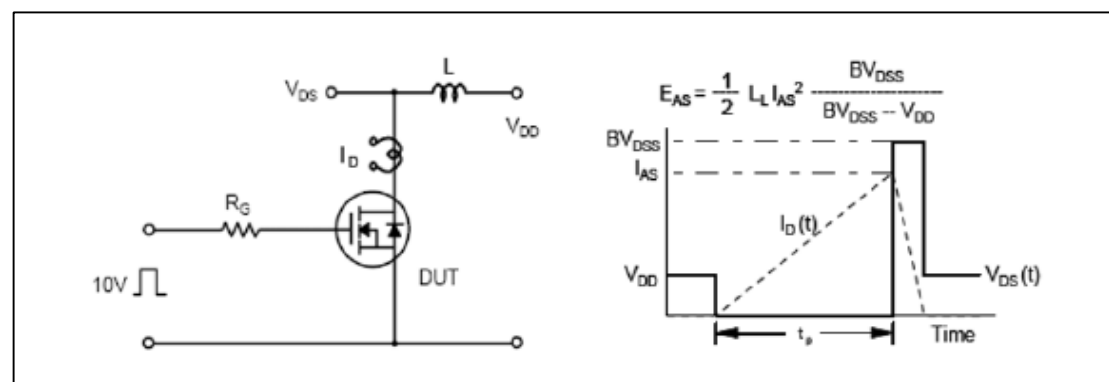
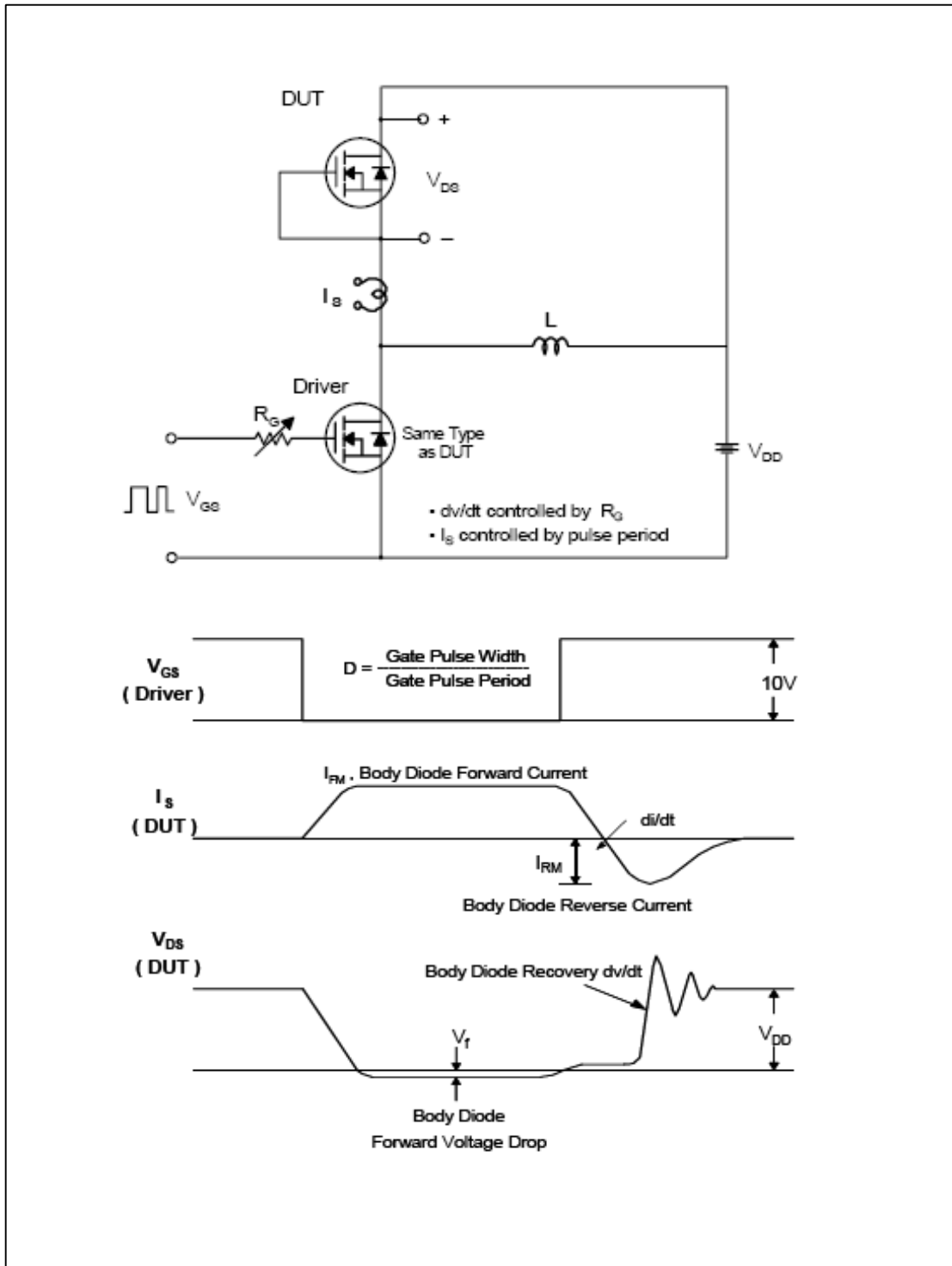

Fig9.Unclamped Inductive Switching Test Circuit&Waveforms

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Fig10.Peak Diode Recovery dy/dt Test Circuit&Waveforms

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To-220   Package Dimension

Unit:mm

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