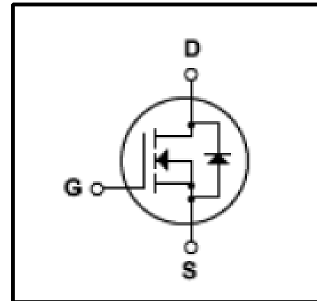
Silicon N-Channel MOSFET

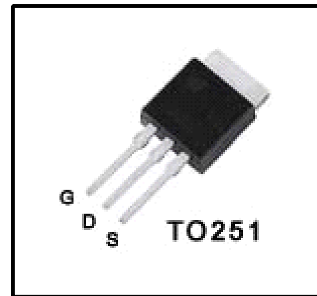
Features

- 2A,600V,$R_{DS(on)}$(Max 5.0Ω)@V_{GS}=10V
- Ultra-low Gate Charge(Typical 15.3nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150℃)



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 , electronic lamp ballasts based on half bridge and UPS.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	600	V
I_D	Continuous Drain Current(@Tc=25℃)	2.0	A
	Continuous Drain Current(@Tc=100℃)	1.3	A
I_{DM}	Drain Current Pulsed (Note1)	6.0	A
V_{GS}	Gate to Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	120	mJ
E_{AR}	Repetitive Avalanche Energy (Note1)	5.4	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	4.5	V/ ns
P_D	Total Power Dissipation(@Tc=25℃)	46	W
	Derating Factor above 25℃	0.35	W/℃
T_J,T_{stg}	Junction and Storage Temperature	-55~150	℃
T_L	Channel Temperature	300	℃

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	2.7	℃/W
R_{QCS}	Thermal Resistance , Case-to-Sink	0.5	-	-	℃/W
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	℃/W

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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	600	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=10V,I_D=250 μA	2	-	4	V
Drain -source ON resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=1A	-	3.8	5.0	Ω
Forward Transconductance	gfs	V_{DS}=50V,I_D=1A	-	2.05	-	S
Input capacitance	C_{iss}	V_{DS}=25V,	-	380	490	pF
Reverse transfer capacitance	C_{rss}	V_{GS}=0V,	-	7.6	9.9	
Output capacitance	C_{oss}	f=1MHz	-	35	46	
Switching time: Rise time	tr	V_{DD}=300V,	-	16	40	ns
Switching time: Turn-on time	ton	I_D=2A,	-	50	110	
Switching time: Fall time	tf	R_G=25Ω,	-	40	90	
Switching time: Turn-off time	toff	(Note4,5)	-	40	90	
Total gate charge(gate-source plus gate-drain)	Qg	V_{DD}=320V, V_{GS}=10V,	-	15.3	19	nC
Gate-source charge	Qgs	I_D=2A	-	1.8	-	
Gate-drain("miller") Charge	Qgd	(Note4,5)	-	7.2	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	2.0	A
Pulse drain reverse current	I_{DRP}	-	-	-	6.0	A
Forward voltage(diode)	V_{DSF}	I_{DR}=2.0A,V_{GS}=0V	-	-	1.4	V
Reverse recovery time	trr	I_{DR}=2.0A,V_{GS}=0V,	-	250	-	ns
Reverse recovery charge	Qrr	dI_{DR} / dt =100 A / μs	-	1.31	-	μC

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

2.L=55mH I_{AS}=2A,V_{DD}=50V,R_G=0Ω ,Starting T_J=25℃

3.I_{SD}≤2A,di/dt≤200A/us,V_{DD}<BV_{DSS},STARTING T_J=25℃

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

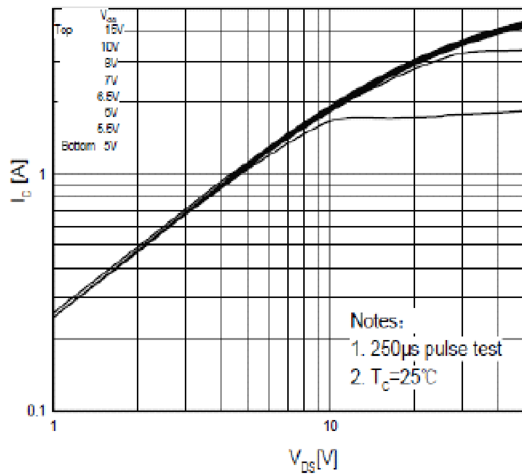

Fig.1 On-State Characteristics

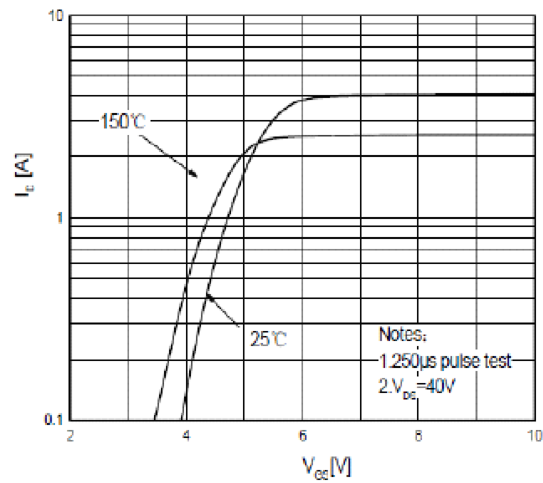

Fig.2 Transfer Current characteristics

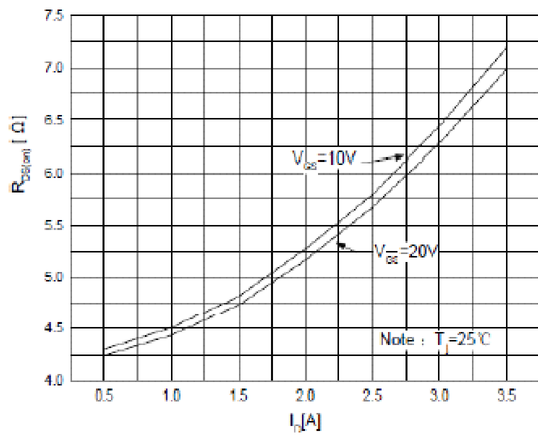

Fig.3 On Resistance variation vsDrain Current

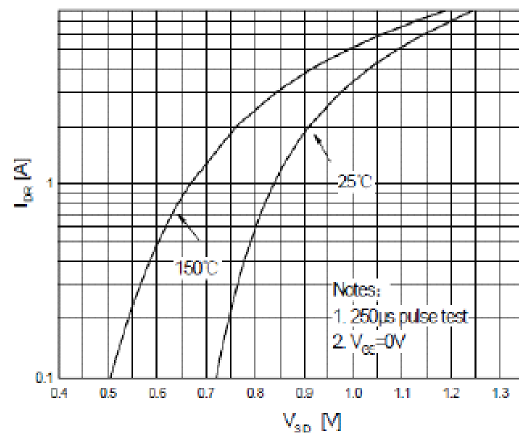

Fig.4 Body Diode Forward Voltage Variation With Source Current And temperature

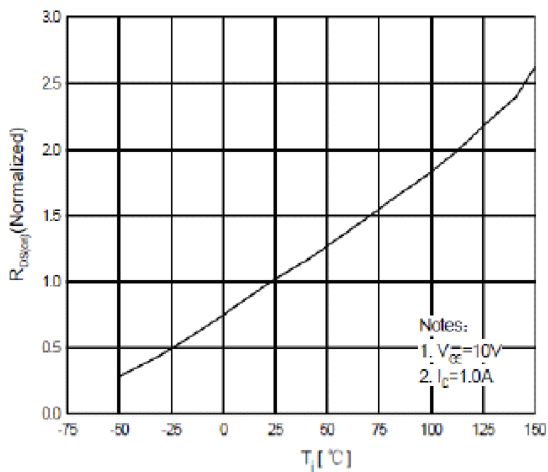

Fig.5 On-Resistance Variation vs Junction Temperature

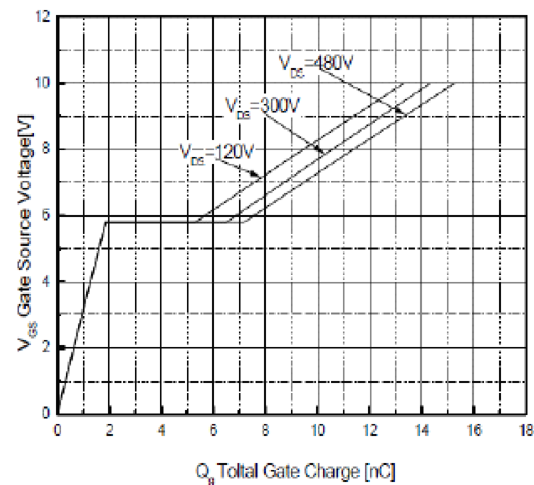

Fig.6 Gate Charge Characteristics

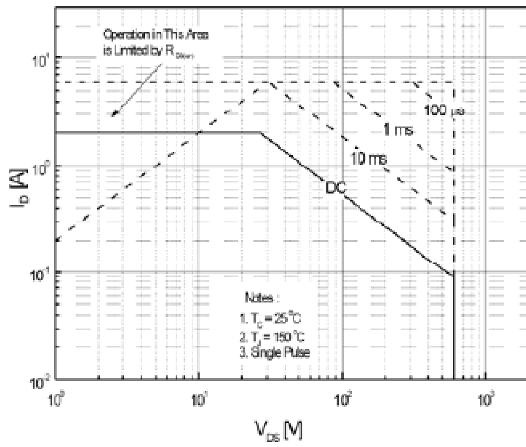

Fig.7 Maximum Safe Operation Area

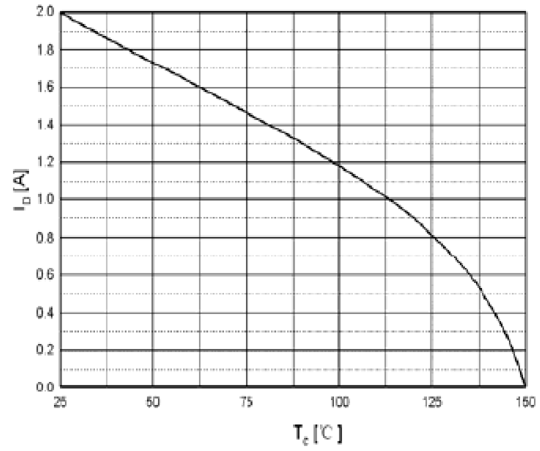

Fig.8 Maximum Drain Current vs Case Temperature

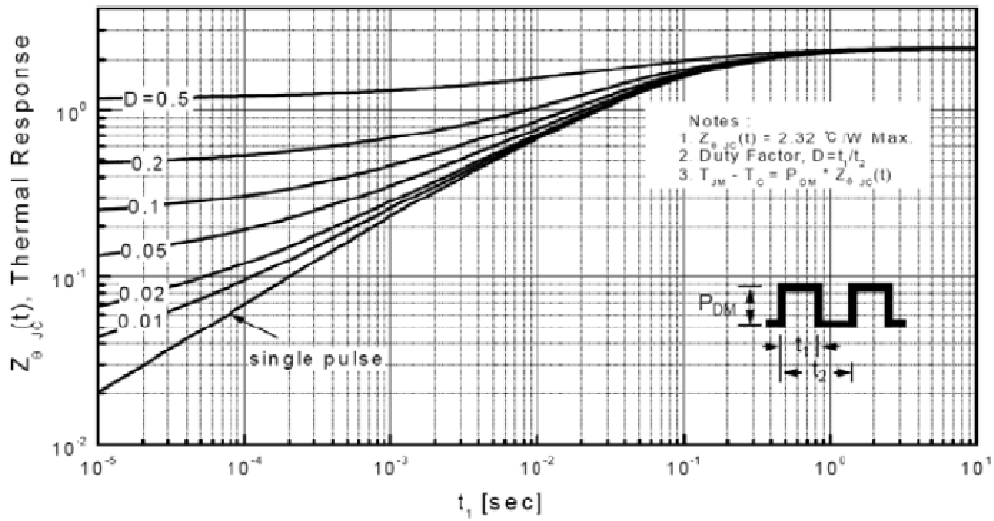

Fig.9 Transient Thermal Response curve

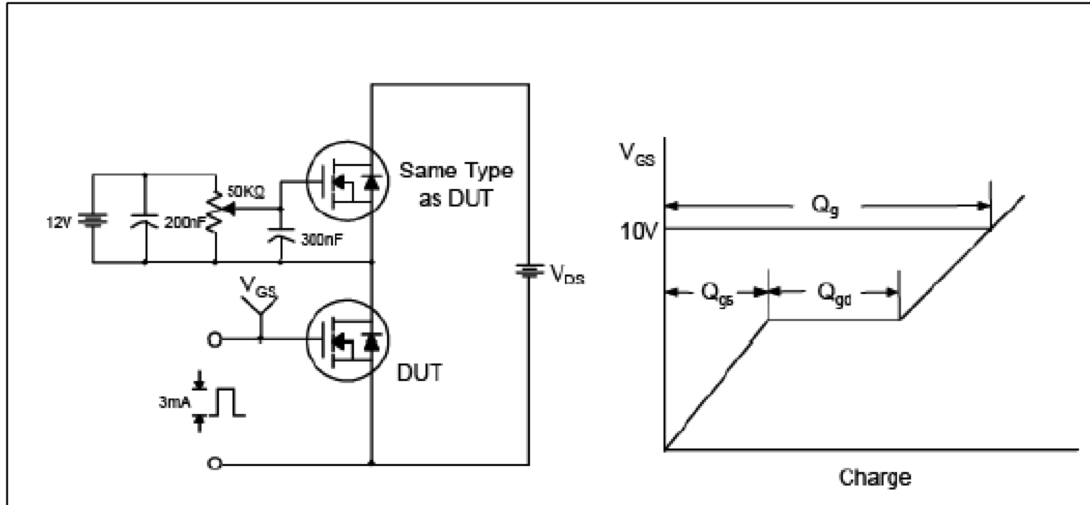

Fig.10 Gate Test circuit & Waveform

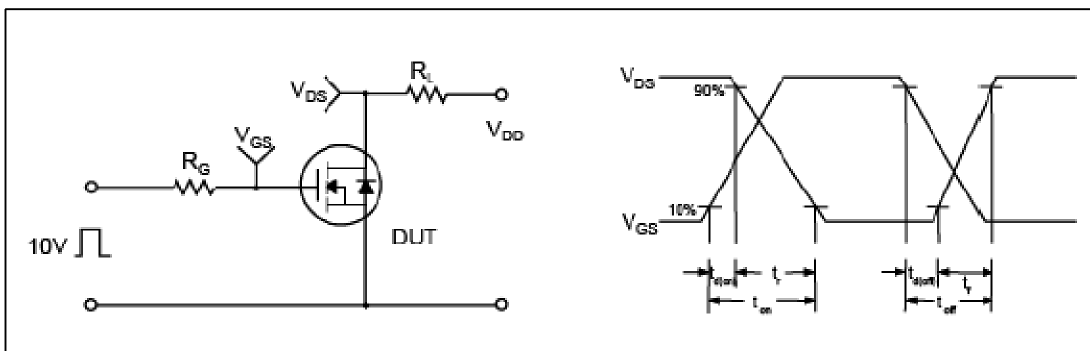

Fig.11 Resistive Switching Test Circuit & Waveform

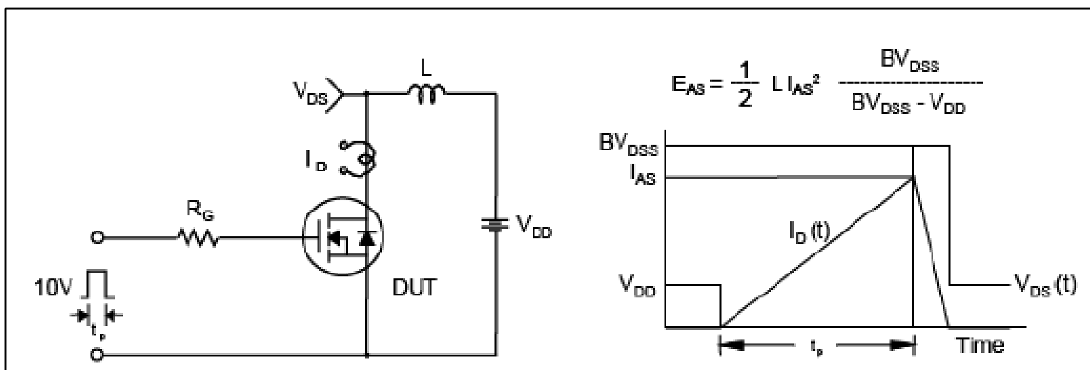

Fig.12 Uncamped Inductive Switching Test Circuit & Waveform

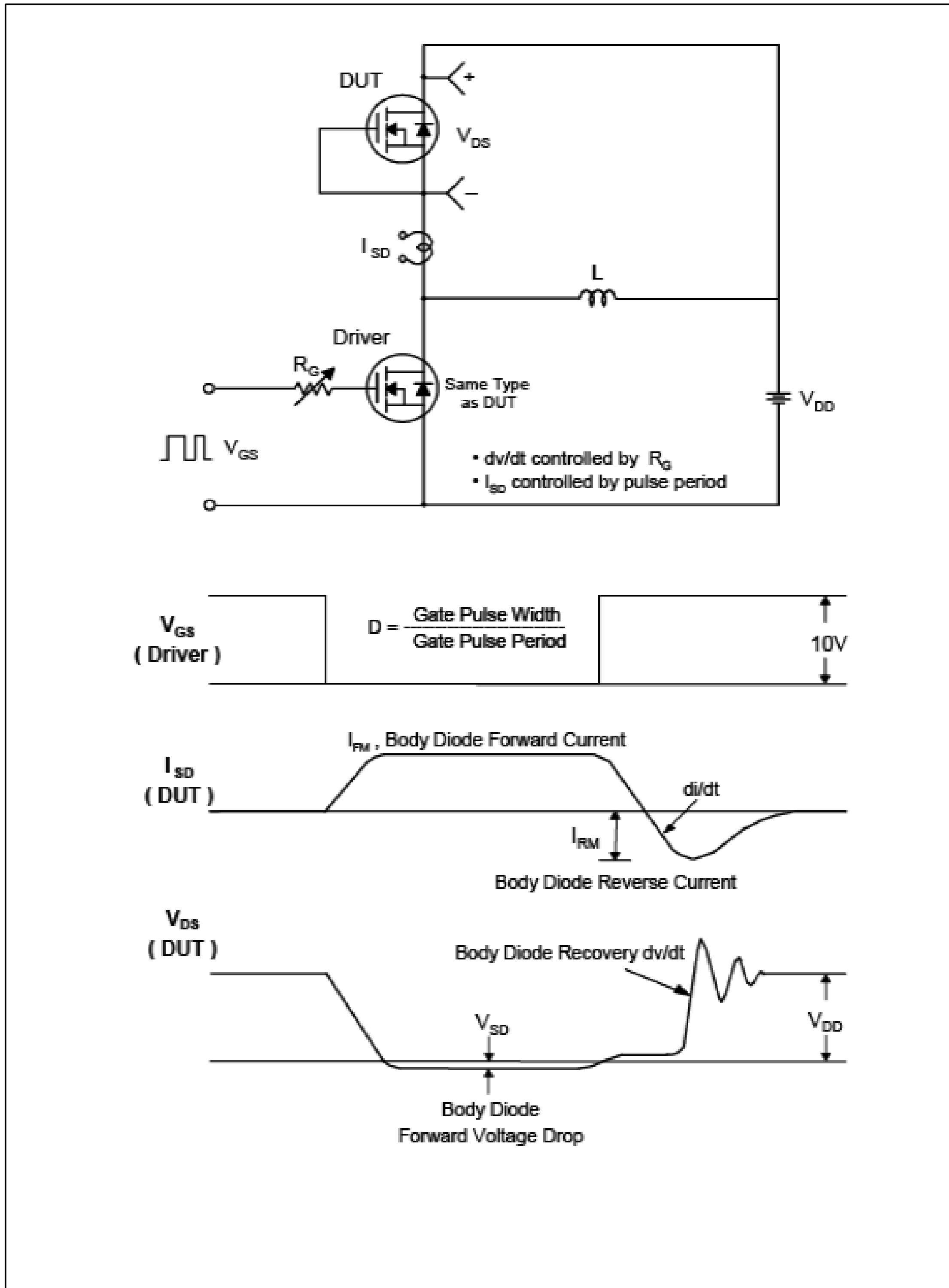

Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO251 Package Dimension

Unit:mm