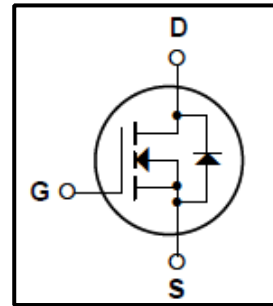


Silicon N-Channel MOSFET

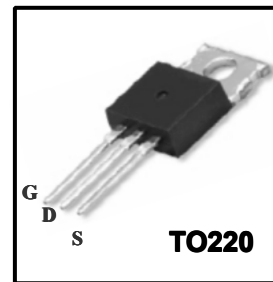
Features

- 2A,600V, $R_{DS(on)}$ (Max 5 Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 9.0nC)
- Fast Switching Capability
- 100%Avalanche Tested
- 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(@ $T_c=100^\circ C$)	1.3	A
I_{DM}	Drain Current Pulsed (Note1)	8	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)	6.4	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5	V/ns
P_D	Total Power Dissipation(@ $T_c=25^\circ C$)	54	W
	Derating Factor above 25°C	0.43	W/°C
T_J, T_{stg}	Junction and Storage Temperature	-55~150	°C
T_L	Maximum lead Temperature for soldering purposes	300	°C

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance, Junction-to-Case	-	-	2.3	°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	Typ.	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	-	-	10	μA
			V _{DS} = 480 V, T _c = 125°C	-	-	100	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	2	-	4	V
Drain-source ON resistance		R _{DS(ON)}	V _{GS} = 10 V, I _D =1A	-	4.5	5	Ω
Forward Transconductance		g _{fs}	V _{DS} = 50 V, I _D =1A	-	2.25	-	S
Input capacitance		C _{iss}	V _{DS} = 25 V,	-	190	230	pF
Reverse transfer capacitance		C _{rss}	V _{GS} = 0 V,	-	1.8	2.1	
Output capacitance		C _{oss}	f = 1 MHz	-	15	20	
Switching time	Rise time	t _r	V _{DD} =300 V, I _D = 2 A R _G =25 Ω (Note4,5)	-	23	45	ns
	Turn-on time	t _{on}		-	7	23	
	Fall time	t _f		-	24	46	
	Turn-off time	t _{off}		-	22	43	
Total gate charge (gate-source plus gate-drain)		Q _g	V _{DD} = 320 V, V _{GS} = 10 V, I _D = 2 A (Note4,5)	-	9.0	12	nC
Gate-source charge		Q _{gs}		-	1.7	-	
Gate-drain ("miller") Charge		Q _{gd}		-	4.5	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	2	A
Pulse drain reverse current	I _{DRP}	-	-	-	8	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 2 A, V _{GS} = 0 V	-	-	1.4	V
Reverse recovery time	t _{rr}	I _{DR} = 2 A, V _{GS} = 0 V, dI _{DR} / dt = 100 A / μs	-	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/μs, 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

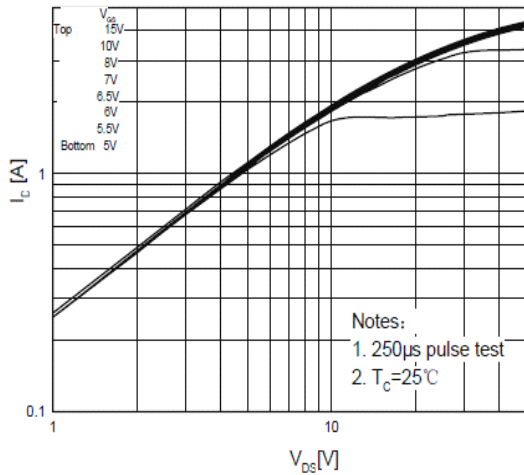


Fig. 1 On-State Characteristics

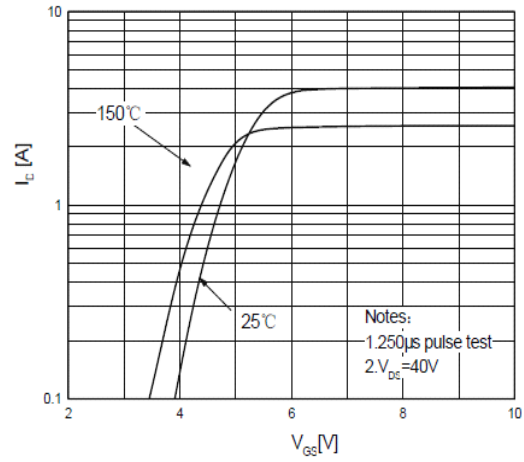


Fig. 2 Transfer Current Characteristics

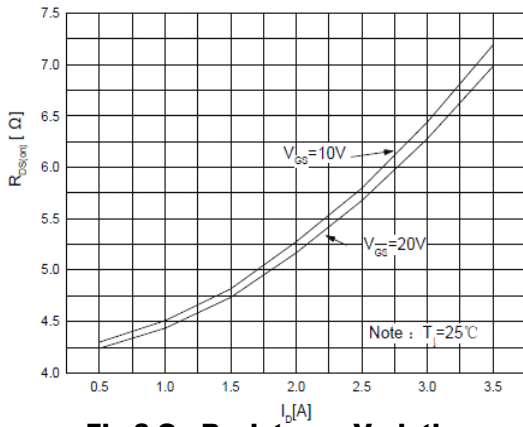


Fig. 3 On-Resistance Variation vs Drain Current

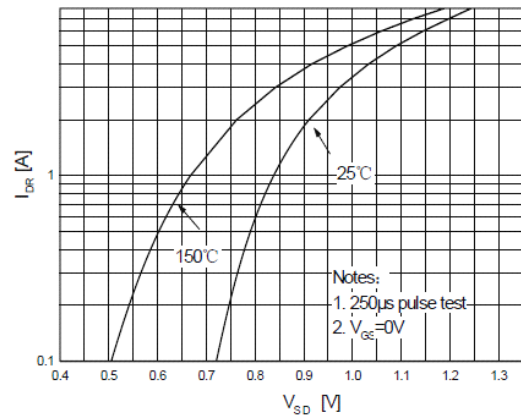


Fig. 4 Body Diode Forward Voltage Variation vs. Source Current and Temperature

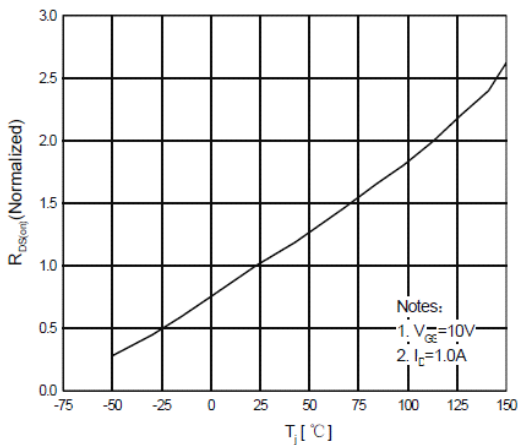


Fig. 5 On-Resistance Variation vs Junction Temperature

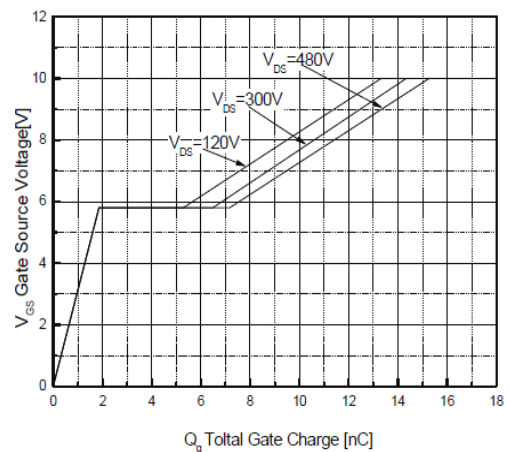


Fig. 6 Gate Charge Characteristics

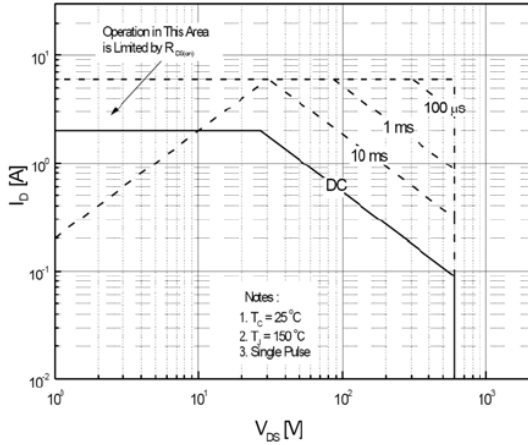


Fig.7 Maximum Safe Operation Area

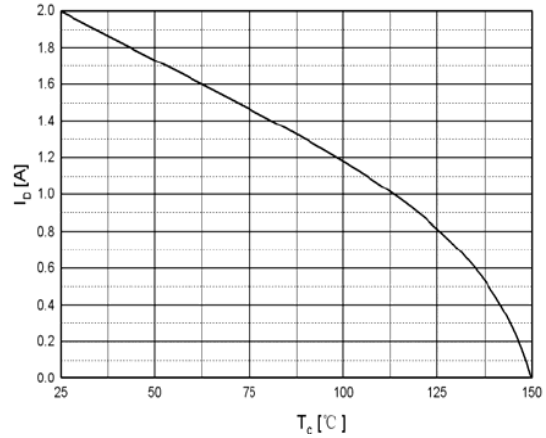


Fig.8 Maximum Drain Current vs Case Temperature

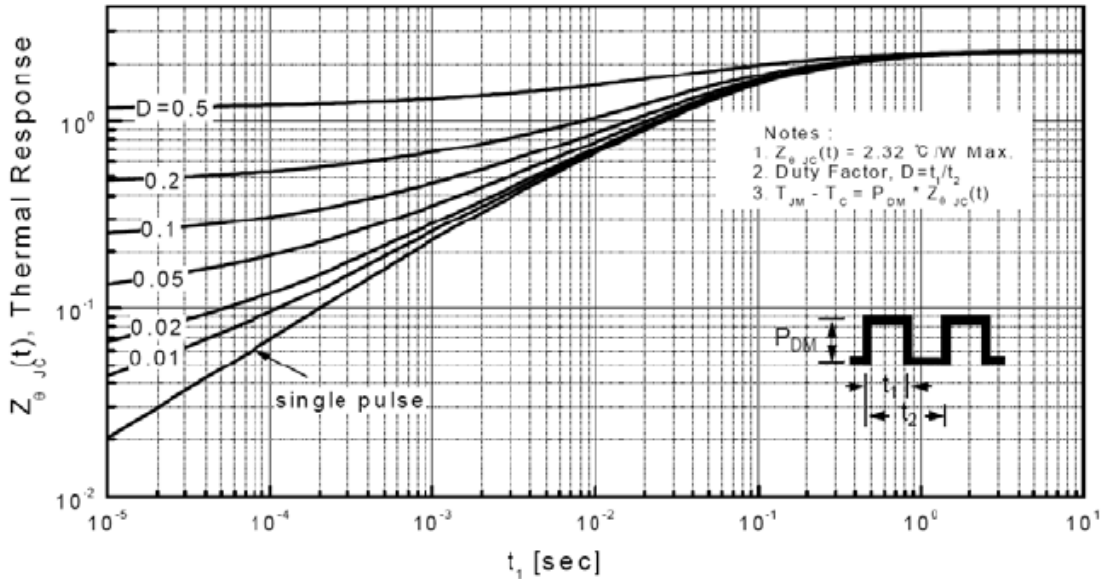


Fig.9 Transient Thermal Response Curve

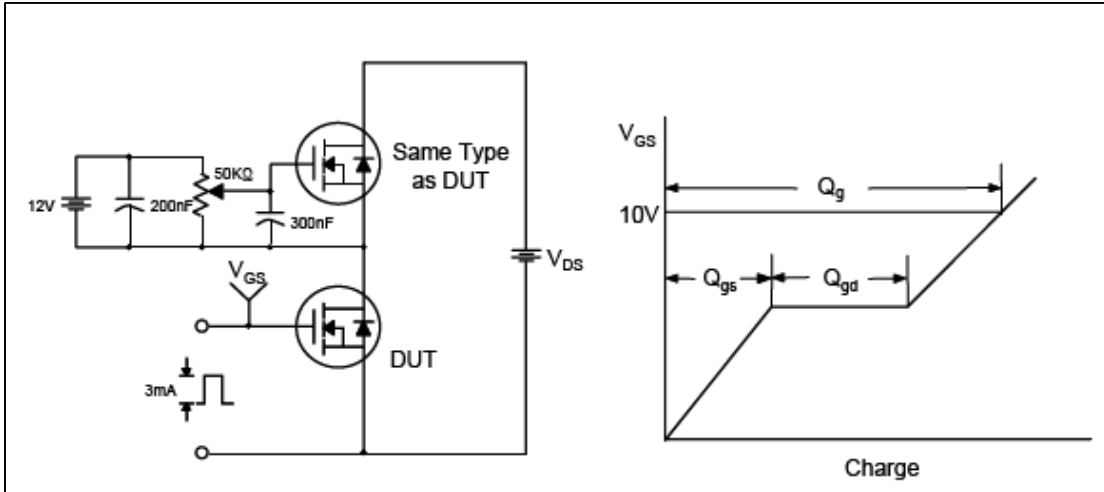


Fig.10 Gate Test Circuit & Waveform

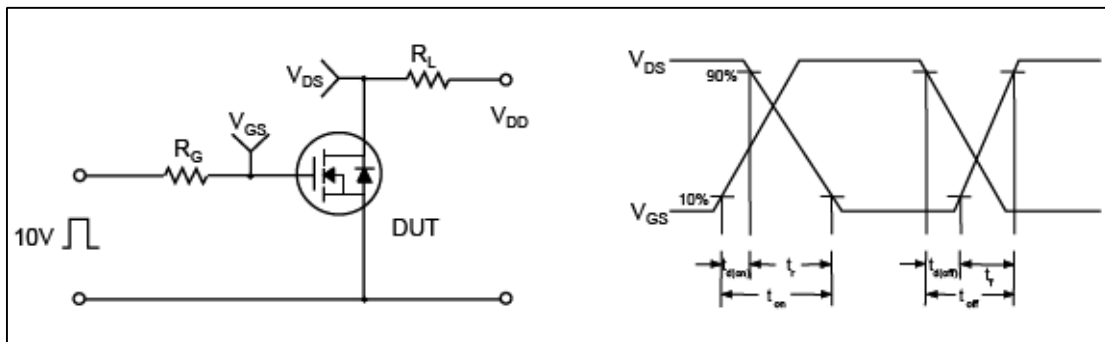


Fig.11 Resistive Switching Test Circuit & Waveform

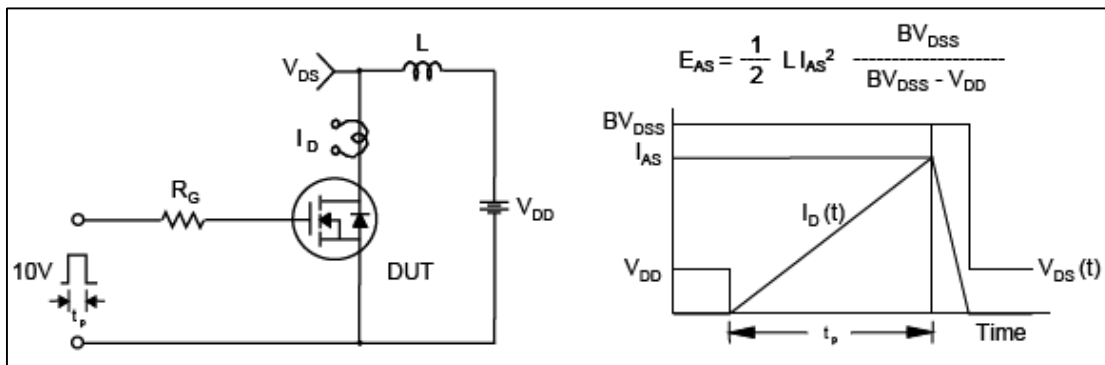


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

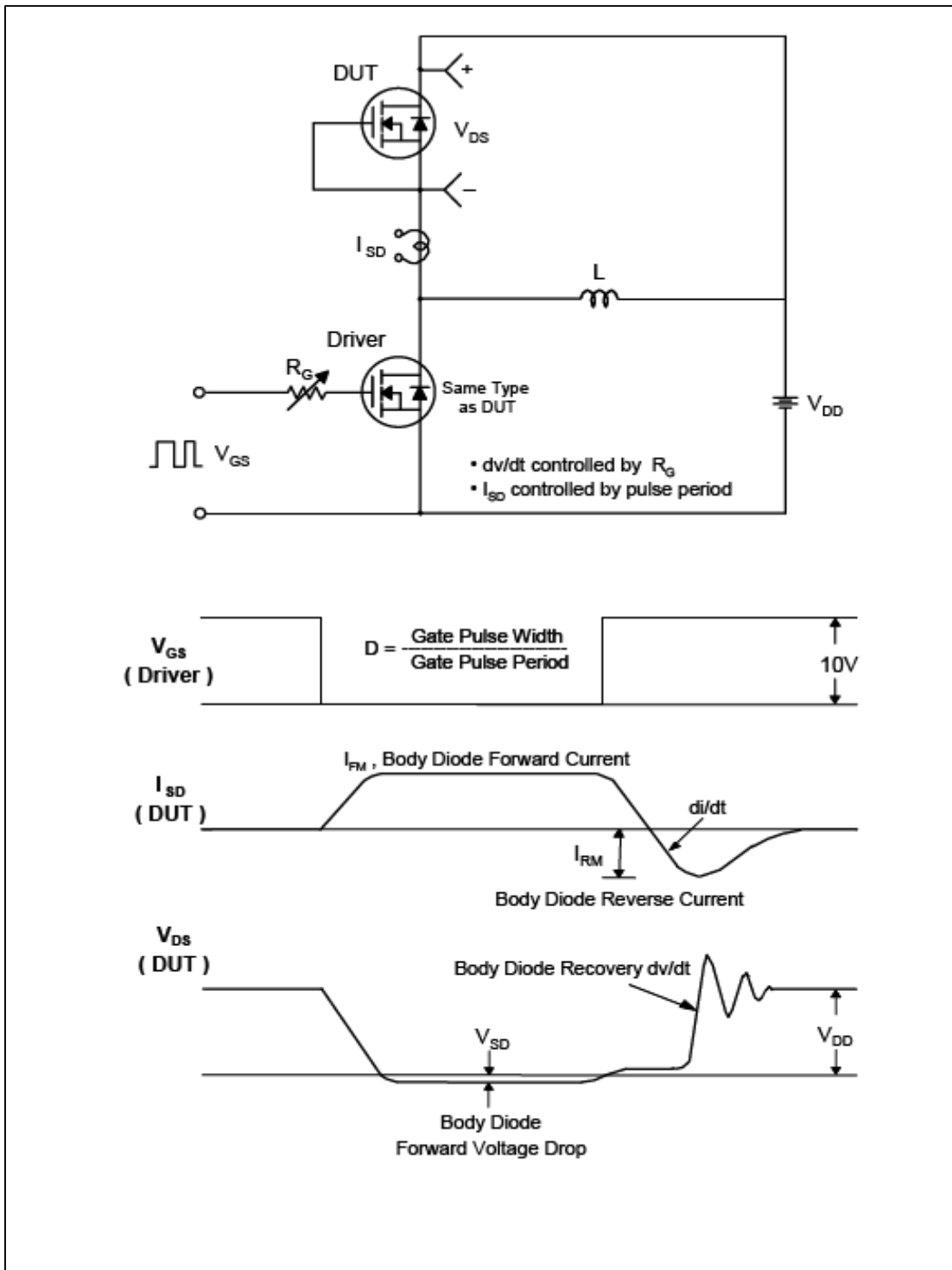


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

