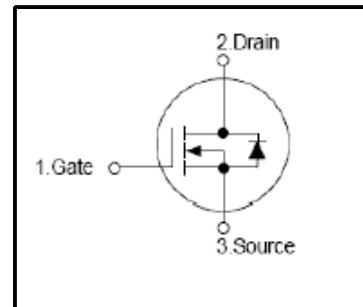
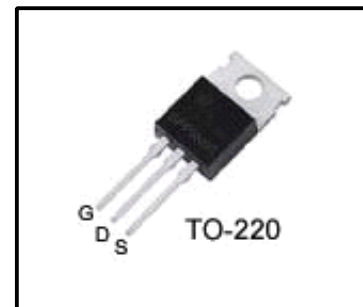


Silicon N-Channel MOSFET
Features

- $R_{DS(on)}$ (Max 22m Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 31nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150 $^{\circ}C$)


General Description

This Power MOSFET is produced using Winsemi's trench Layout -based process .This technology improves the performances Compared with standard parts form various sources.All of these power MOSFETs are designed for applications in switching regulators , switching converters, motor and relay drivers ,and drivers for high power bipolar switching transistors demanding high speed and low gate drive power.


Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	60	V
I_D	Continuous Drain Current(@ $T_c=25^{\circ}C$)	50	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$)	38	A
I_{DM}	Drain Current Pulsed (Note1)	200	A
V_{GS}	Gate to Source Voltage	± 25	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	480	mJ
E_{AR}	Repetitive Avalanche Energy (Note1)	13	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	5.8	V/ ns
P_D	Total Power Dissipation(@ $T_c=25^{\circ}C$)	130	W
	Derating Factor above 25 $^{\circ}C$	1.3	W/ $^{\circ}C$
T_J, T_{stg}	Junction and Storage Temperature	-55~150	$^{\circ}C$
T_L	Channel Temperature	300	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	0.96	$^{\circ}C/W$
R_{QCS}	Case-to-Sink,Flat, Greased Surface	-	0.5	-	$^{\circ}C/W$
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	$^{\circ}C/W$

Electrical Characteristics(Tc=25 °C)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Gate-source breakdown voltage		V _{(BR)GSS}	I _G =±10 μA, V _{DS} =0V	±20	-	-	V
Drain cut -off current		I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	μA
			V _{DS} =60V, Tc=125 °C	-	-	250	μA
Drain -source breakdown voltage		V _{(BR)DSS}	I _D =250 μA, V _{GS} =0V	60	-	-	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 =25A	-	20	22	mΩ
Forward Transconductance		g _{fs}	V _{DS} =25V, I _D =25A	-	22	-	S
Input capacitance		C _{iss}	V _{DS} =25V,	-	1180	1540	pF
Reverse transfer capacitance		C _{rss}	V _{GS} =0V,	-	440	580	
Output capacitance		C _{oss}	f=1MHz	-	65	90	
Switching time	Rise time	t _r	V _{DD} =30V,	-	15	40	ns
	Turn-on time	t _{on}	I _D =25A,	-	105	220	
	Fall time	t _f	R _G =25Ω,	-	60	130	
	Turn-off time	t _{off}	V _{GS} =10V (Note4,5)	-	65	140	
Total gate charge(gate-source plus gate-drain)		Q _g	V _{DD} =48V, V _{GS} =10V,	-	31	41	nC
Gate-source charge		Q _{gs}	I _D =50A	-	8	-	
Gate-drain("miller") Charge		Q _{gd}	(Note4,5)	-	13	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	50	A
Pulse drain reverse current	I _{DRP}	-	-	-	200	A
Forward voltage(diode)	V _{DSF}	I _{DR} =50A, V _{GS} =0V	-	-	1.5	V
Reverse recovery time	t _{rr}	I _{DR} =50A, V _{GS} =0V,	-	52	-	ns
Reverse recovery charge	Q _{rr}	dI _{DR} / dt =100 A / μs	-	75	-	μC

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

2.L=0.5mH I_{AS}=50A, V_{DD}=25V, V_{GS}=10V ,Starting T_J=25 °C

3. I_{SD}≤50A, di/dt≤380A/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

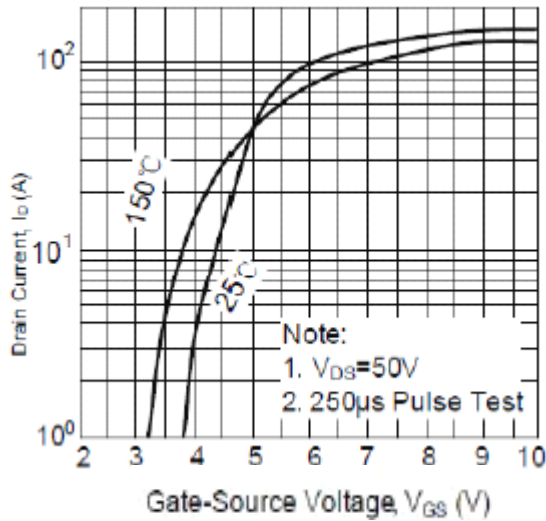


Fig.1 Transfer characteristics

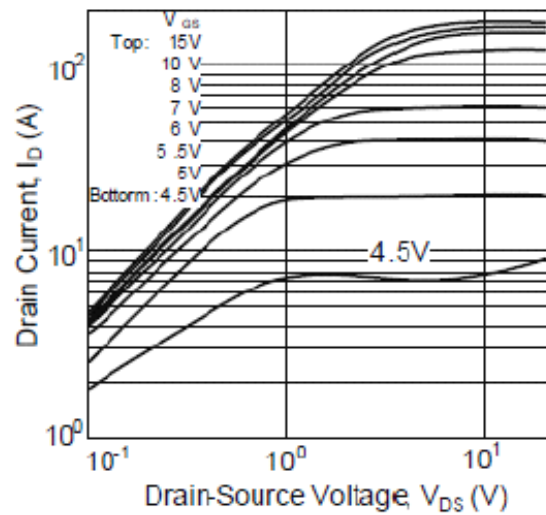


Fig.2 On-state Characteristics

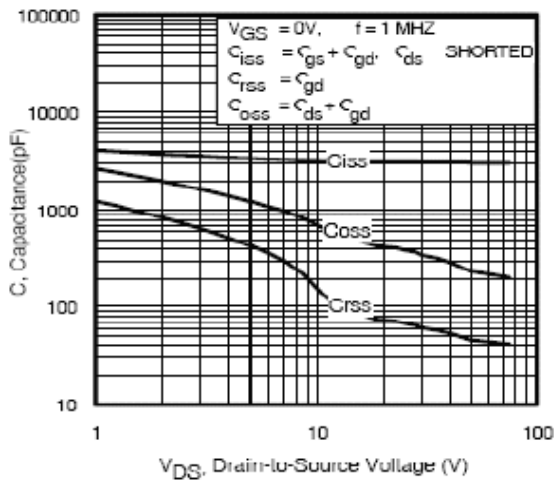


Fig.3 Typical Capacitance vs Drain Current

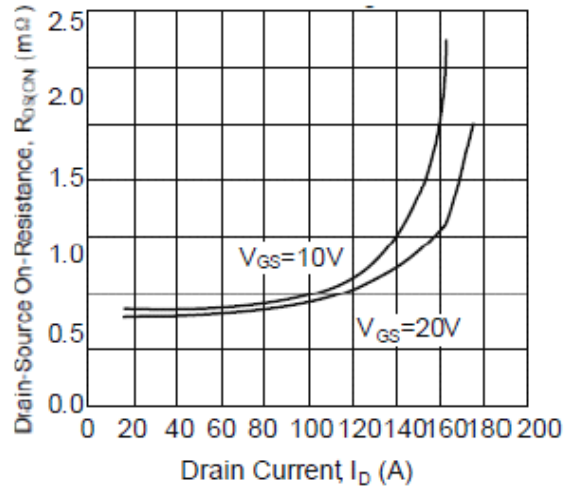


Fig.4 On-resistance Variation vs Drain current and gate Voltage

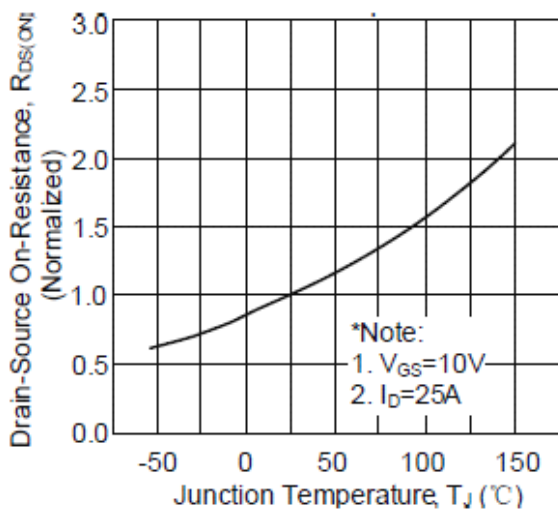


Fig.5 On-resistance variation vs Junction Temperature

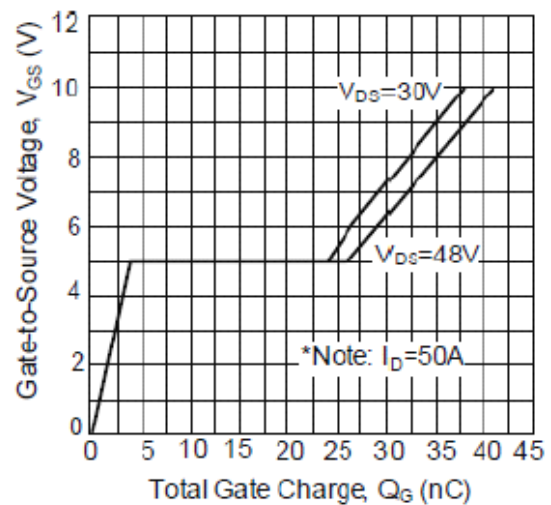


Fig.6 Gate charge Characteristics

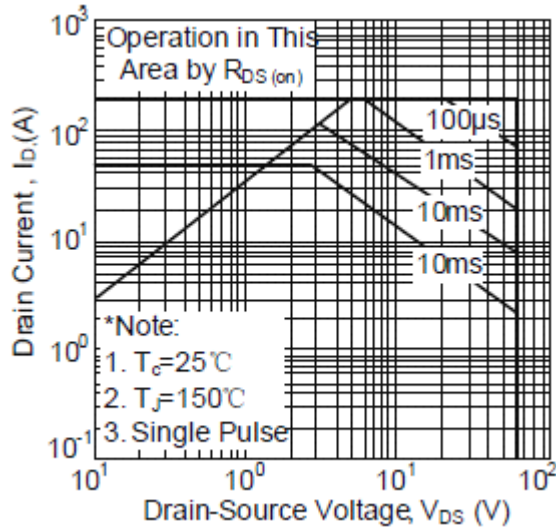


Fig.7 Maximum Safe Operation Area

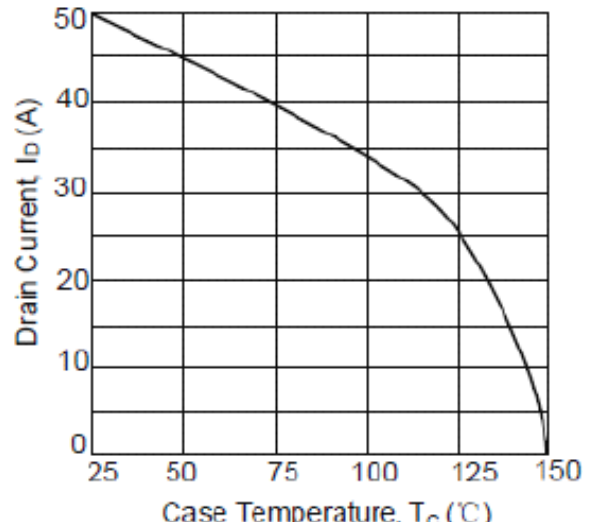


Fig.8 Maximum Drain current vs Case Temperature

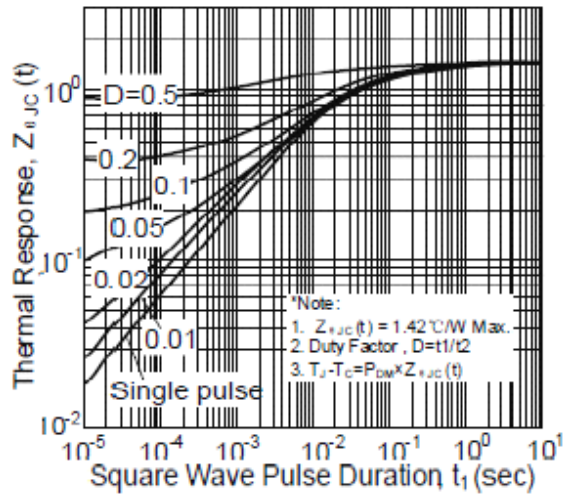


Fig.9 Transient Thermal Response Curve

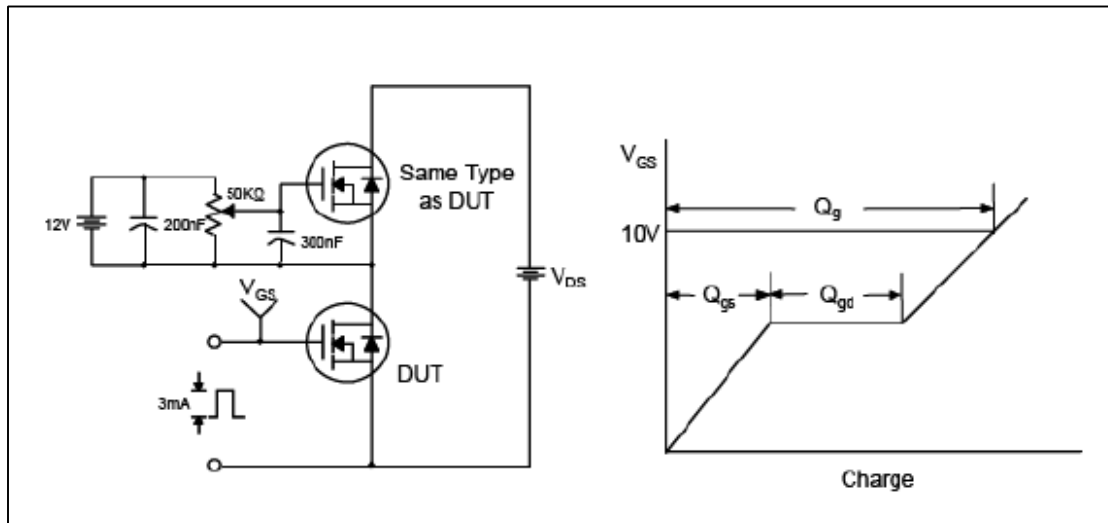


Fig.10 Gate Test circuit & Waveform

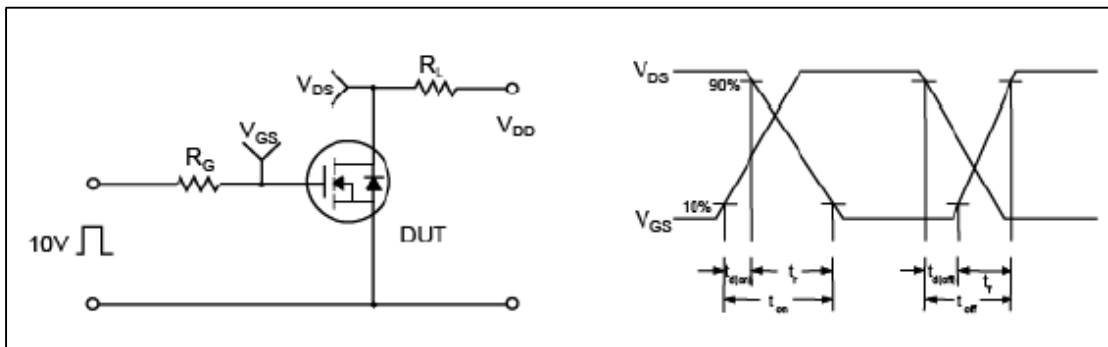


Fig.11 Resistive Switching Test Circuit & Waveform

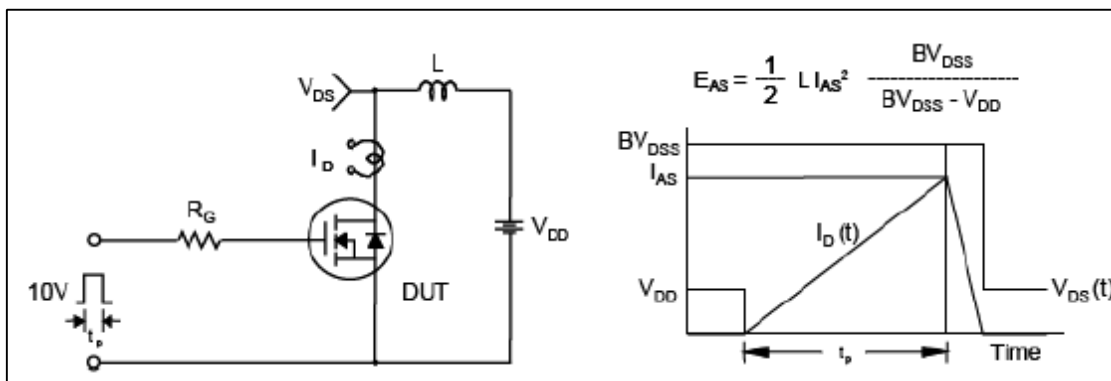


Fig.12 Uncamped Inductive Switching Test Circuit & Waveform

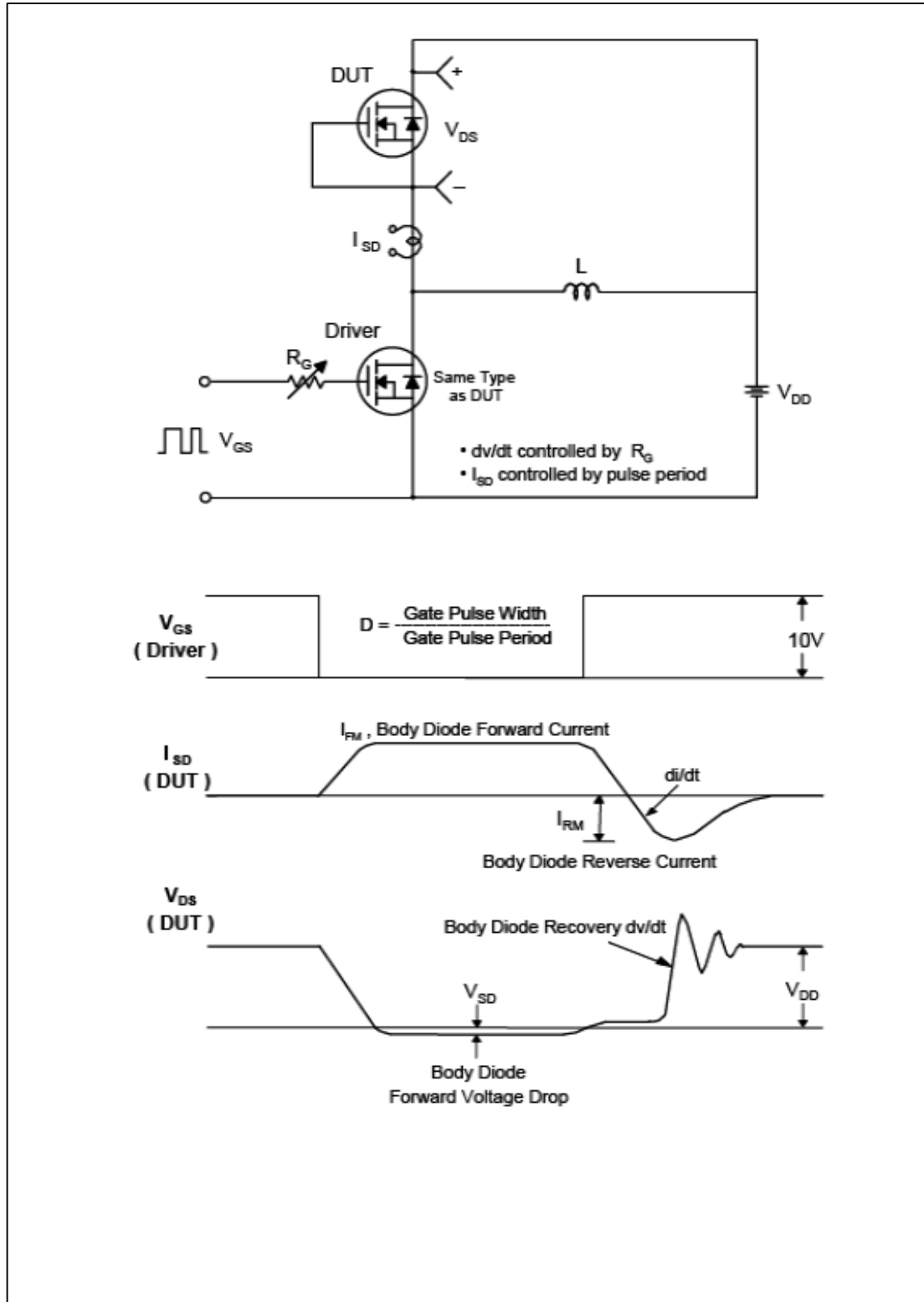


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

