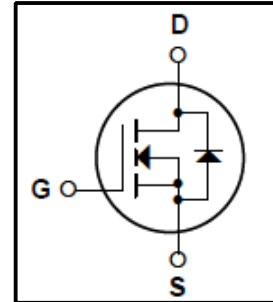


Silicon N-Channel MOSFET

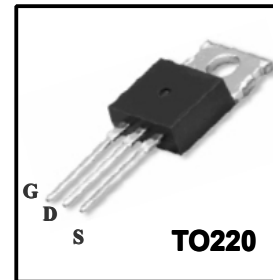
Features

- $R_{DS(on)}$ (Max 15m Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 80nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(175 $^{\circ}C$)



General Description

This power MOSFET is produced in Winsemi with advanced DMOS process, planar stripe. This technology enable power MOSFET to have better characteristics, such as fast switchingtime, low on resistance, low gate charge and especially excellent avalanche characteristics. This Devices are well suited for low voltage application such as automotive, DC/DC Converters, and high efficiency switch for power management in portable and battery operated products



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	80	V
I_D	Continuous Drain Current(@ $T_c=25^{\circ}C$)	75	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$)	52.6	A
I_{DM}	Drain Current Pulsed (Note1)	300	A
V_{GS}	Gate to Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	13100	mJ
I_{AR}	Avalanche current	75	A
E_{AR}	Repetitive Avalanche Energy (Note 2)	17.3	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	7.3	V/ns
P_D	Total Power Dissipation(@ $T_c=25^{\circ}C$)	173	W
	Derating Factor above 25 $^{\circ}C$	1.15	W/ $^{\circ}C$
T_J	Junction Temperature	175	$^{\circ}C$
T_{stg}	Storage Temperature	-55~150	
T_L	Maximum lead temperature for soldering purposes (for 5 seconds)	300	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance, Junction-to-Case	-	-	0.87	$^{\circ}C/W$
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} = ±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} = 80 V, V _{GS} = 0 V	-	-	10	μA	
		V _{DS} = 64V, Tc = 125°C	-	-	100	μA	
Drain-source breakdown voltage	V _{(BR)DSS}	I _D = 250 μA, V _{GS} = 0 V	80	-	-	V	
Breakdown Voltage Temperature Coefficient	ΔBVDS/ ΔT _J	I _D = 1mA, Referenced to 25°C	-	0.08	-	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 = 37.5A	-	12	15	mΩ	
Forward Transconductance	g _{fs}	V _{DS} =25V, I _D = 37.5A	-	15	-	s	
Input capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	-	2600	3380	pF	
Reverse transfer capacitance	C _{riss}		-	940	1229		
Output capacitance	C _{oss}		-	210	275		
Switching time	Rise time	tr	V _{DD} =40V I _D =75A R _G =25 Ω V _{GS} =10V (Note4,5)	-	30	70	ns
	Turn-on time	ton		-	225	460	
	Fall time	tf		-	165	340	
	Turn-off time	toff		-	155	320	
Total gate charge (gate-source plus gate-drain)	Qg	V _{DD} = 64 V, V _{GS} = 10 V, I _D = 48 A (Note4,5)	-	80	105	nC	
Gate-source charge	Qgs		-	15	-		
Gate-drain ("miller") Charge	Qgd		-	32	-		

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	75	A
Pulse drain reverse current	I _{DRP}	-	-	-	300	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 75A, V _{GS} = 0 V	-	-	1.4	V
Reverse recovery time	trr	I _{DR} = 75A, V _{GS} = 0 V,	-	90	-	ns
Reverse recovery charge	Qrr	dI _{DR} / dt = 100 A / μs	-	250	-	μC

- Note
1. Repeativity rating: pulse width limited by junction temperature
 2. L=19.5mH, I_{AS}=75A, R_G=20Ω, Starting T_J=25°C
 3. I_{SD}≤48A, di/dt≤300A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25°C
 4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%
 5. Essentially independent of operating temperature

This transistor is an electrostatic sensitive device
Please handle with caution

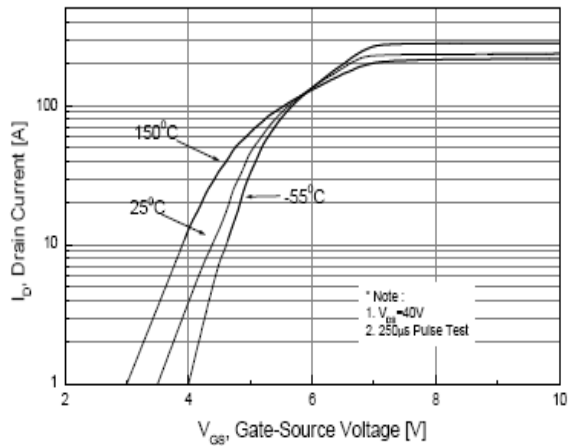


Fig. 1 Transfer Characteristics

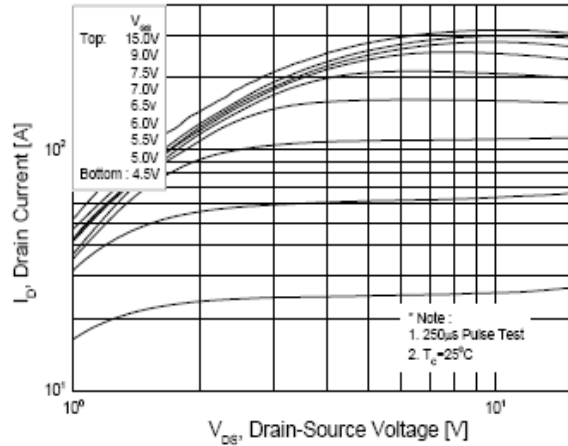


Fig.2 On-Statet Characteristics

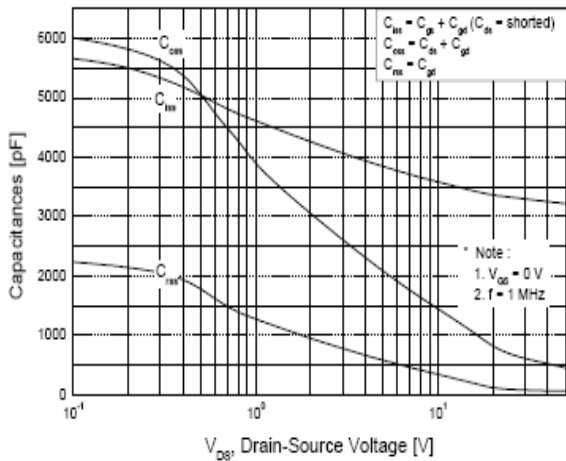


Fig.3 Typical Capacitance Characteristics

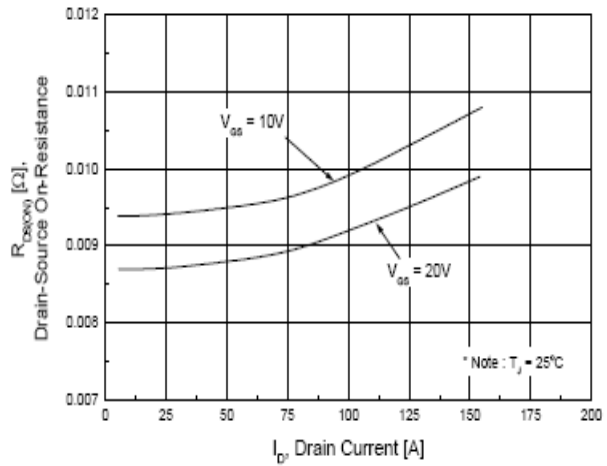


Fig.4 On-Resistance Variation vs Drain Current and Gate Voltage

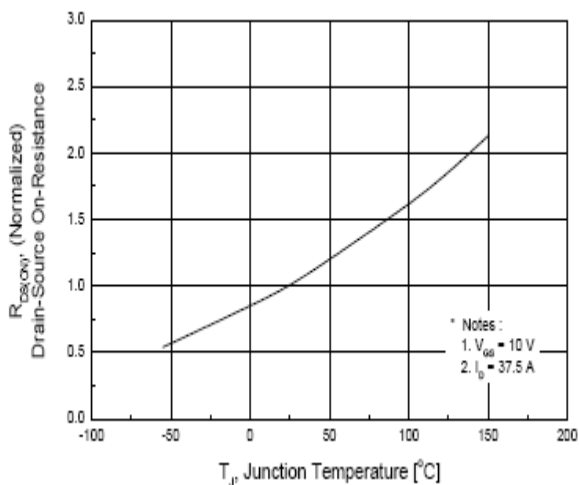


Fig.5 On-Resistance Variation vs Junction Temperature

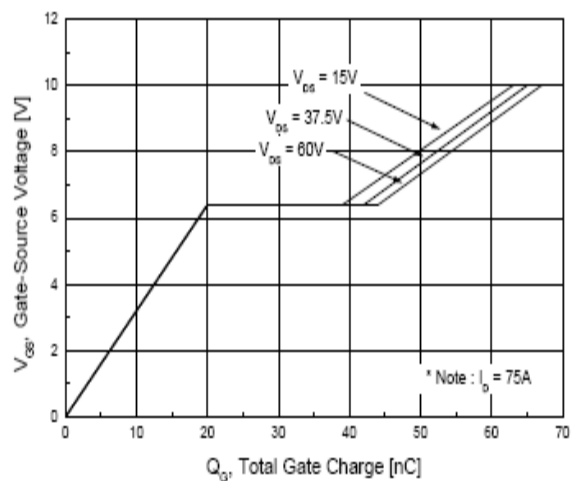


Fig.6 Gate Charge Characteristics

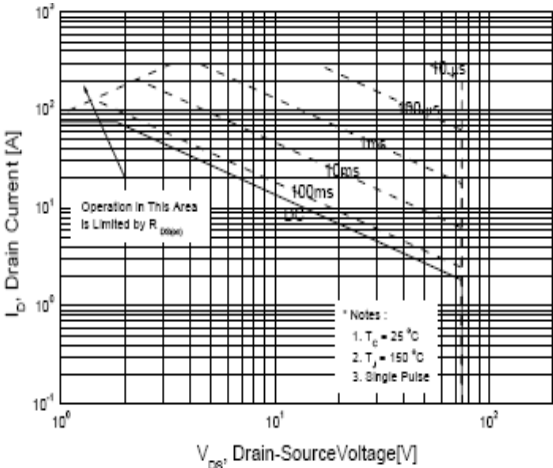


Fig.7 Maximum Safe Operation Area

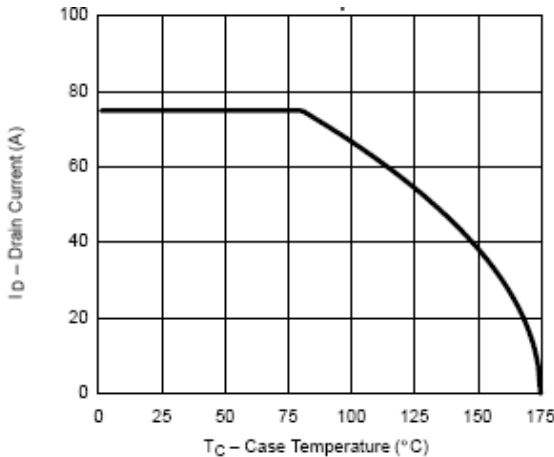


Fig.8 Maximum Drain Current vs Case Temperature

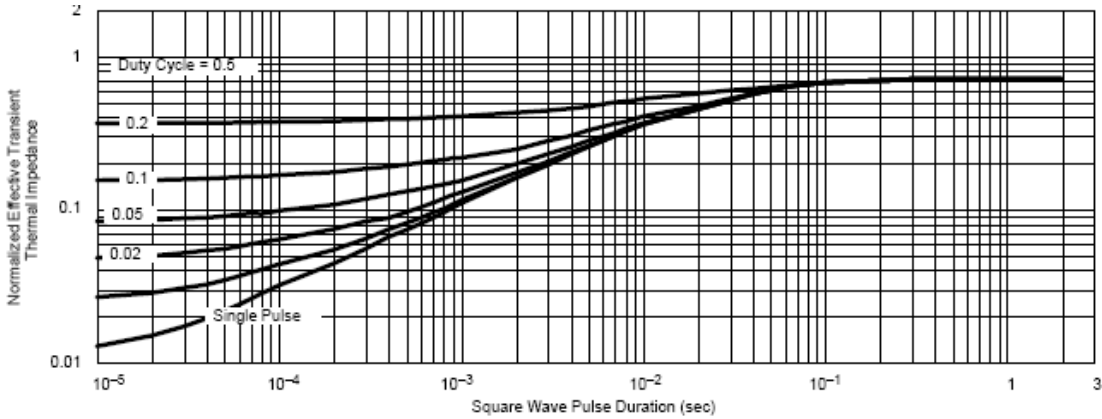


Fig.9 Transient Thermal Response Curve

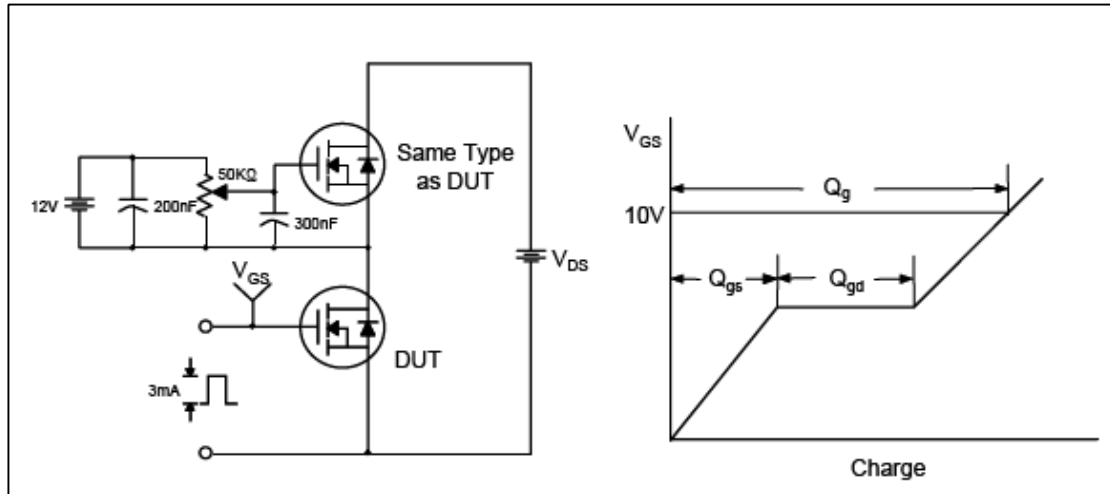


Fig.10 Gate Test Circuit & Waveform

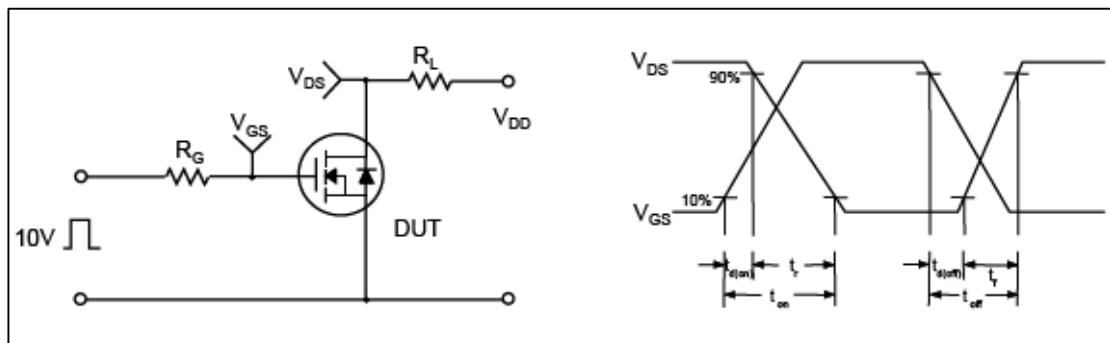


Fig.11 Resistive Switching Test Circuit & Waveform

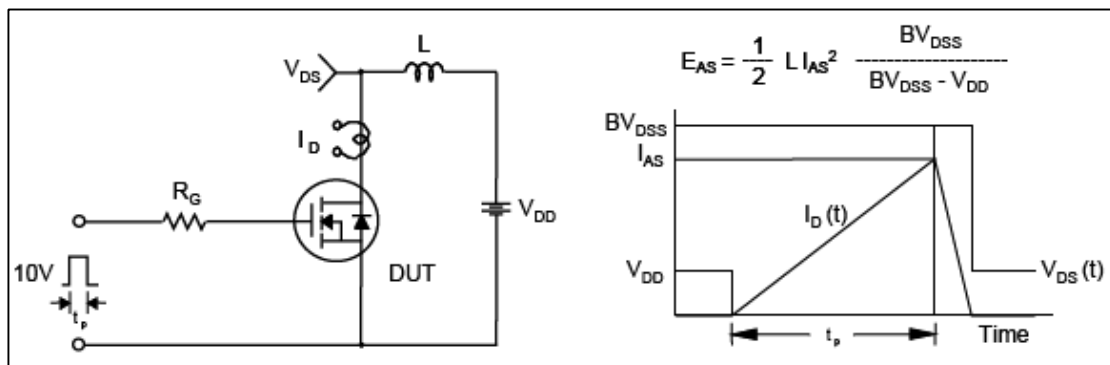


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

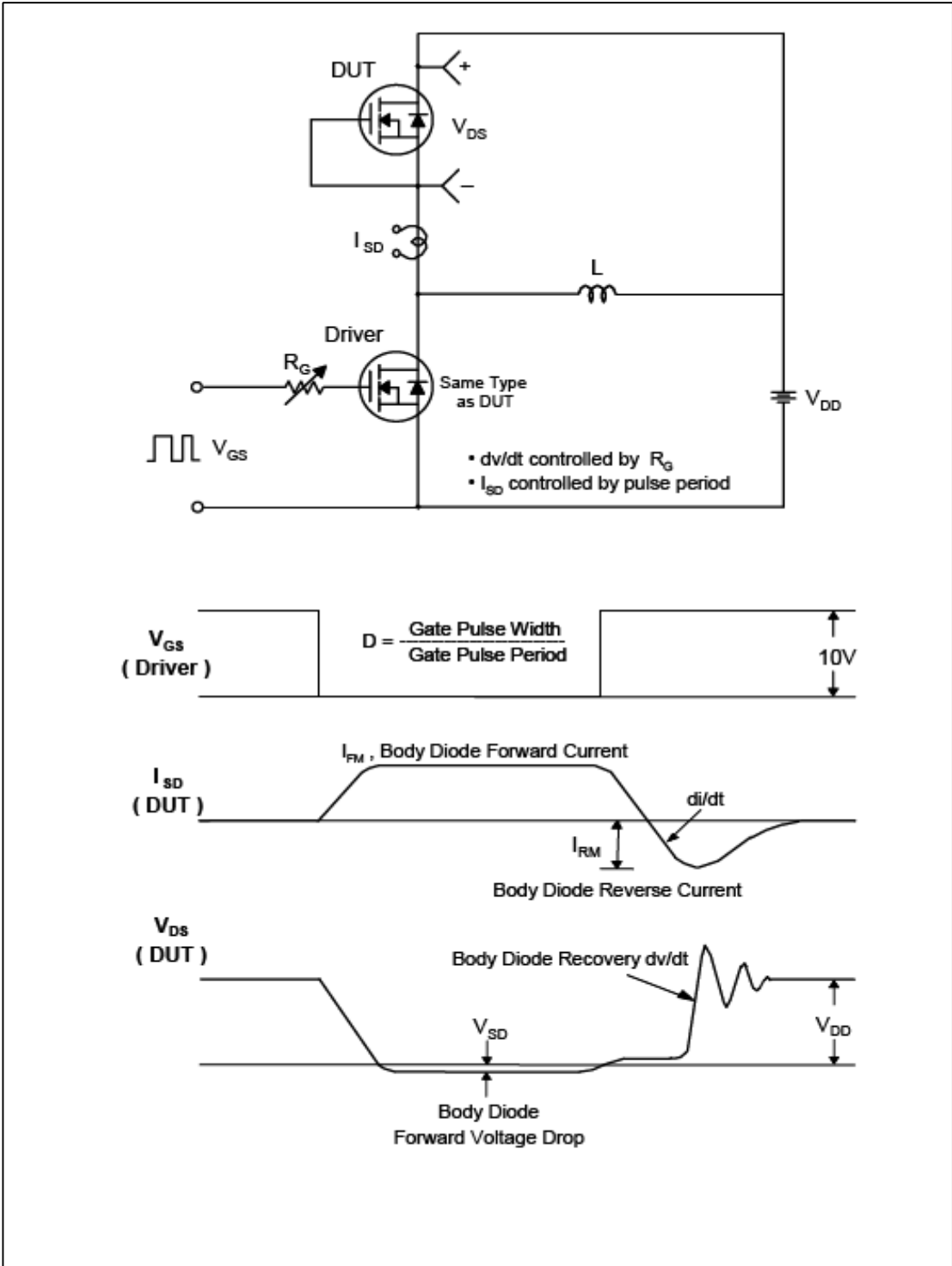


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

