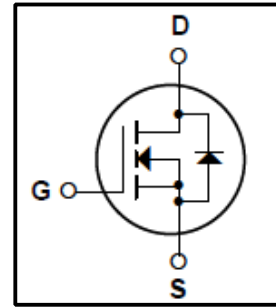


Silicon N-Channel MOSFET

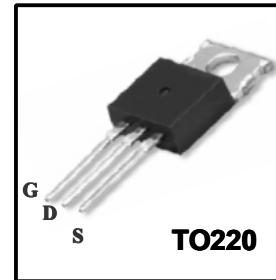
Features

- 9A, 200V, $R_{DS(on)}$ (Max 0.4 Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 43nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150 $^{\circ}C$)



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 high rugged avalanche characteristics. This devices is specially well suited for low voltage applications such as automotive, high efficiency switching for DC/DC converters, and DC motor control.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	200	V
I_D	Continuous Drain Current(@ $T_c=25^{\circ}C$)	9	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$)	5.7	A
I_{DM}	Drain Current Pulsed (Note1)	36	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	160	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	7.2	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5	V/ns
P_D	Total Power Dissipation(@ $T_c=25^{\circ}C$)	72	W
	Derating Factor above 25 $^{\circ}C$	0.57	W/ $^{\circ}C$
T_J, T_{stg}	Junction and Storage Temperature	-55~150	$^{\circ}C$
T_L	Maximum lead Temperature for soldering purposes	300	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance, Junction-to-Case	-	-	1.74	$^{\circ}C/W$
R_{QCS}	Thermal Resistance, Case to Sink	-	0.5	-	$^{\circ}C/W$
R_{QJA}	Thermal Resistance, Junction-to-Ambient	-	-	62.5	$^{\circ}C/W$

SFP630

Electrical Characteristics (Tc = 25°C)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit	
Gate leakage current	I_{GSS}	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	-	-	± 100	nA	
Gate-source breakdown voltage	$V_{(BR)GSS}$	$I_G = \pm 10\ \mu\text{A}, V_{DS} = 0\text{ V}$	± 30	-	-	V	
Drain cut-off current	I_{DSS}	$V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}$	-	-	10	μA	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 250\ \mu\text{A}, V_{GS} = 0\text{ V}$	200	-	-	V	
Break Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D = 250\ \mu\text{A}$, Referenced to 25°C	-	0.2	-	V/°C	
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = 10\text{ V}, I_D = 250\ \mu\text{A}$	2	-	4	V	
Drain-source ON resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 5.4\text{ A}$	-	-	0.4	Ω	
Forward Transconductance	g_{fs}	$V_{DS} = 50\text{ V}, I_D = 5.4\text{ A}$	3.8	-	-	S	
Input capacitance	C_{iss}	$V_{DS} = 25\text{ V},$	-	800	-	pF	
Reverse transfer capacitance	C_{rss}	$V_{GS} = 0\text{ V},$	-	240	-		
Output capacitance	C_{oss}	$f = 1\text{ MHz}$	-	76	-		
Switching time	Rise time	t_r	$V_{DD} = 100\text{ V},$ $I_D = 5.9\text{ A}$ $R_G = 12\ \Omega$ (Note4,5)	-	9.4	-	ns
	Turn-on time	t_{on}		-	28	-	
	Fall time	t_f		-	39	-	
	Turn-off time	t_{off}		-	20	-	
Total gate charge (gate-source plus gate-drain)	Q_g	$V_{DD} = 160\text{ V},$ $V_{GS} = 10\text{ V},$ $I_D = 5.9\text{ A}$ (Note4,5)	-	43	-	nC	
Gate-source charge	Q_{gs}	-	7	-			
Gate-drain ("miller") Charge	Q_{gd}	-	23	-			

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	9	A
Pulse drain reverse current	I_{DRP}	-	-	-	36	A
Forward voltage (diode)	V_{DSF}	$I_{DR} = 9\text{ A}, V_{GS} = 0\text{ V}$	-	1.4	2.0	V
Reverse recovery time	t_{rr}	$I_{DR} = 5.9\text{ A}, V_{GS} = 0\text{ V},$	-	170	340	ns
Reverse recovery charge	Q_{rr}	$dI_{DR} / dt = 100\text{ A} / \mu\text{s}$	-	1.1	2.2	μC

- Note 1.Repeativity rating :pulse width limited by junction temperature
 2.L=500uH,I_{AS}=9 A,V_{DD}=50V,R_G=0Ω,Starting T_J=25°C
 3.I_{SD}≤9A,di/dt≤300A/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

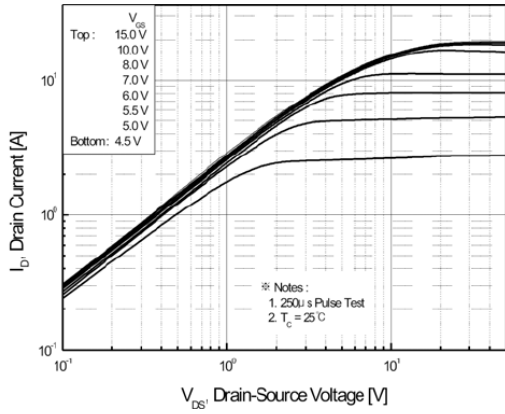


Fig. 1 On-State Characteristics

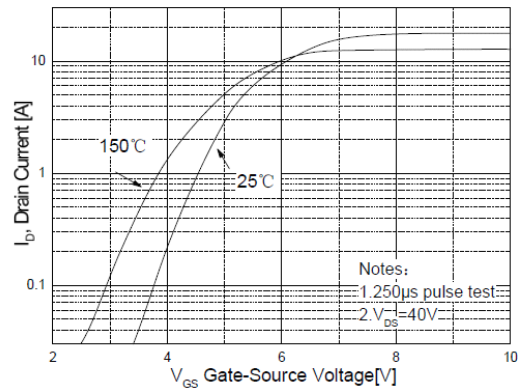


Fig. 2 Transfer Characteristics

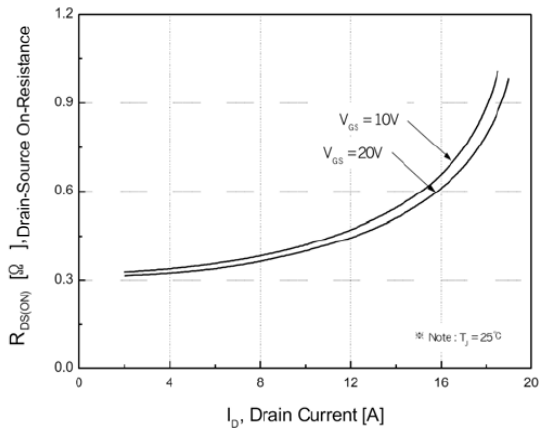


Fig. 3 On-Resistance Variation vs Drain Current

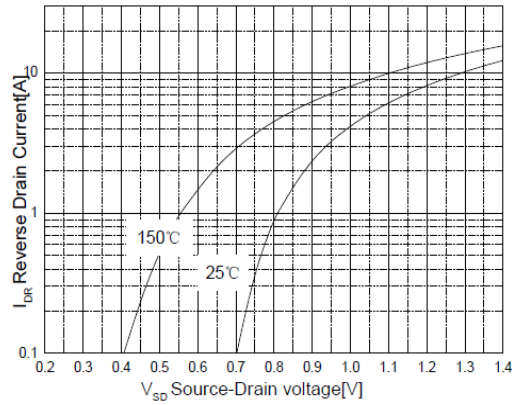


Fig. 4 Body Diode Forward Voltage Variation vs. Source Current and Temperature

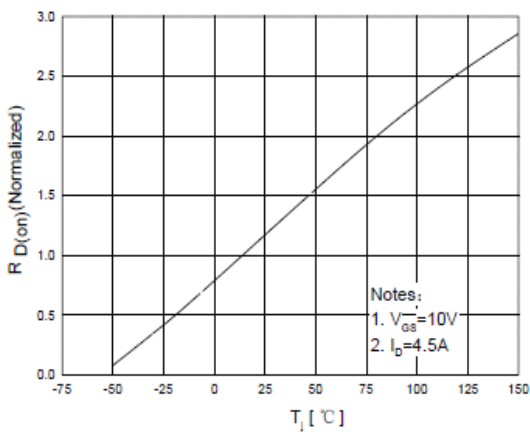


Fig. 5 On-Resistance Variation vs Junction Temperature

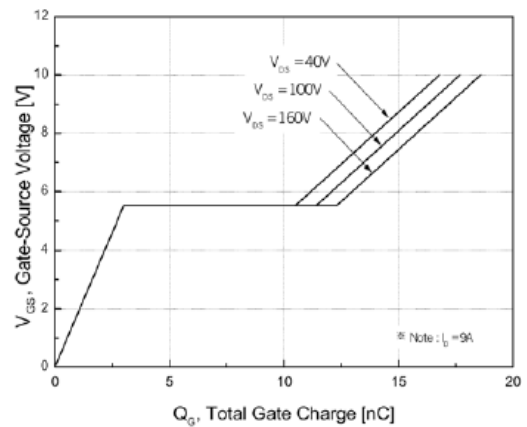


Fig. 6 Gate Charge Characteristics

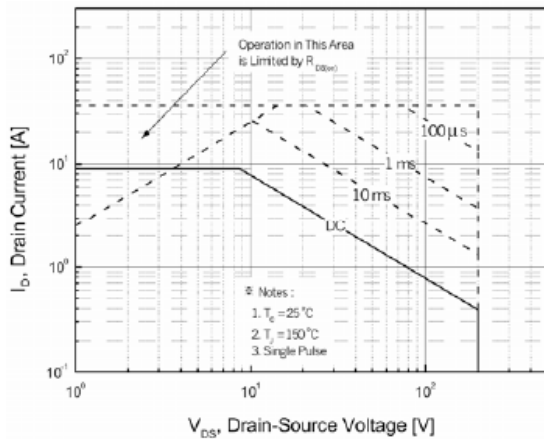


Fig.7 Maximum Safe Operation Area

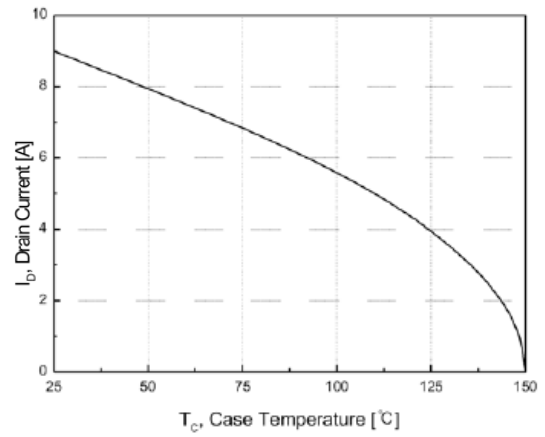


Fig.8 Maximum Drain Current vs Case Temperature

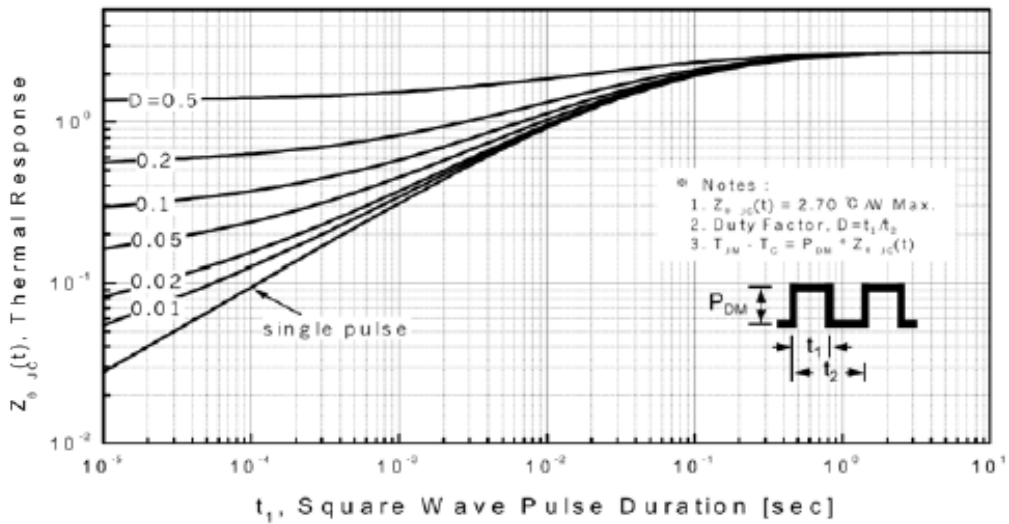


Fig.9 Transient Thermal Response Curve

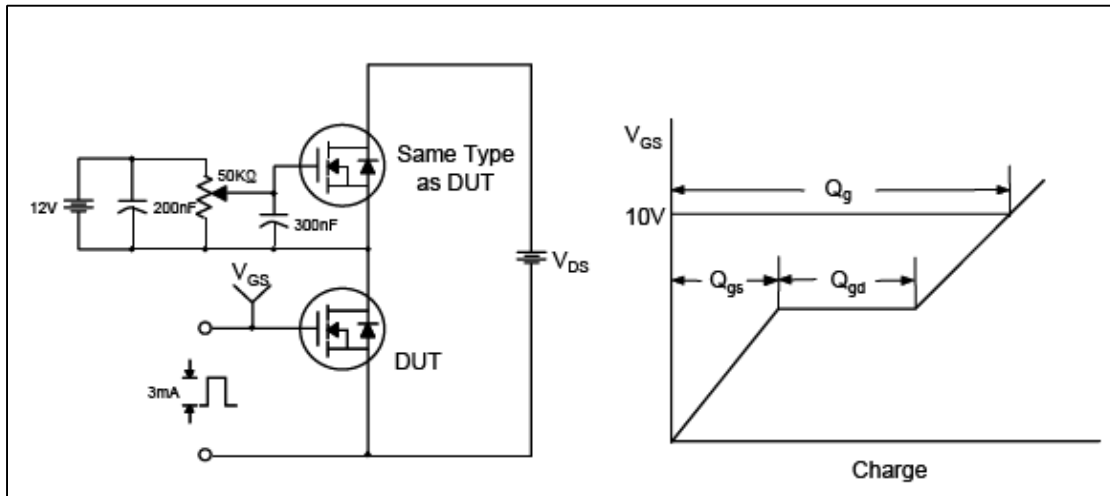


Fig.10 Gate Test Circuit & Waveform

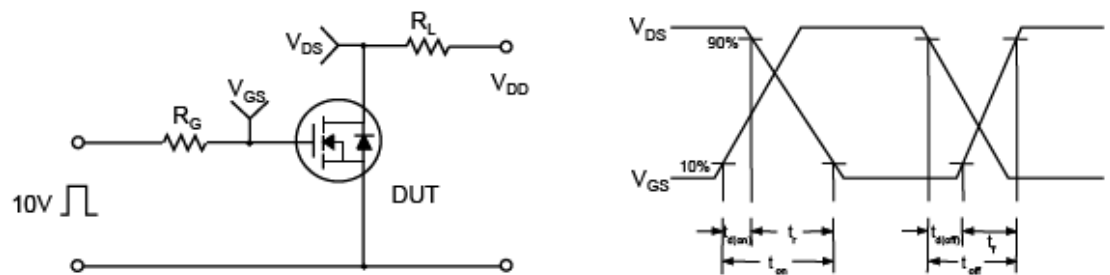


Fig.11 Resistive Switching Test Circuit & Waveform

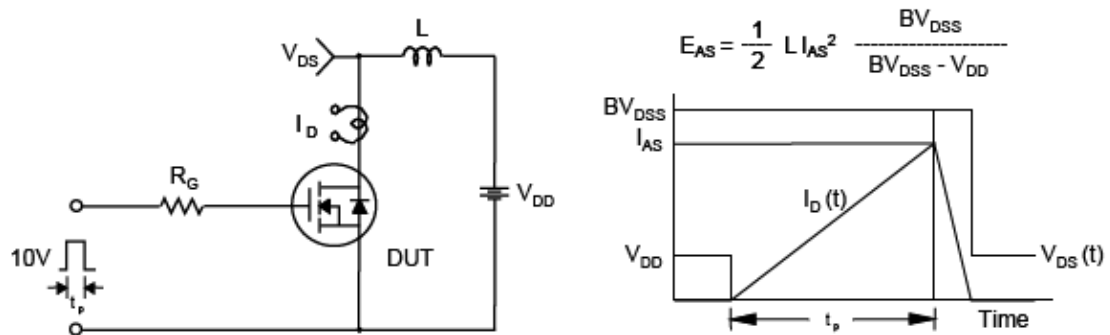


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

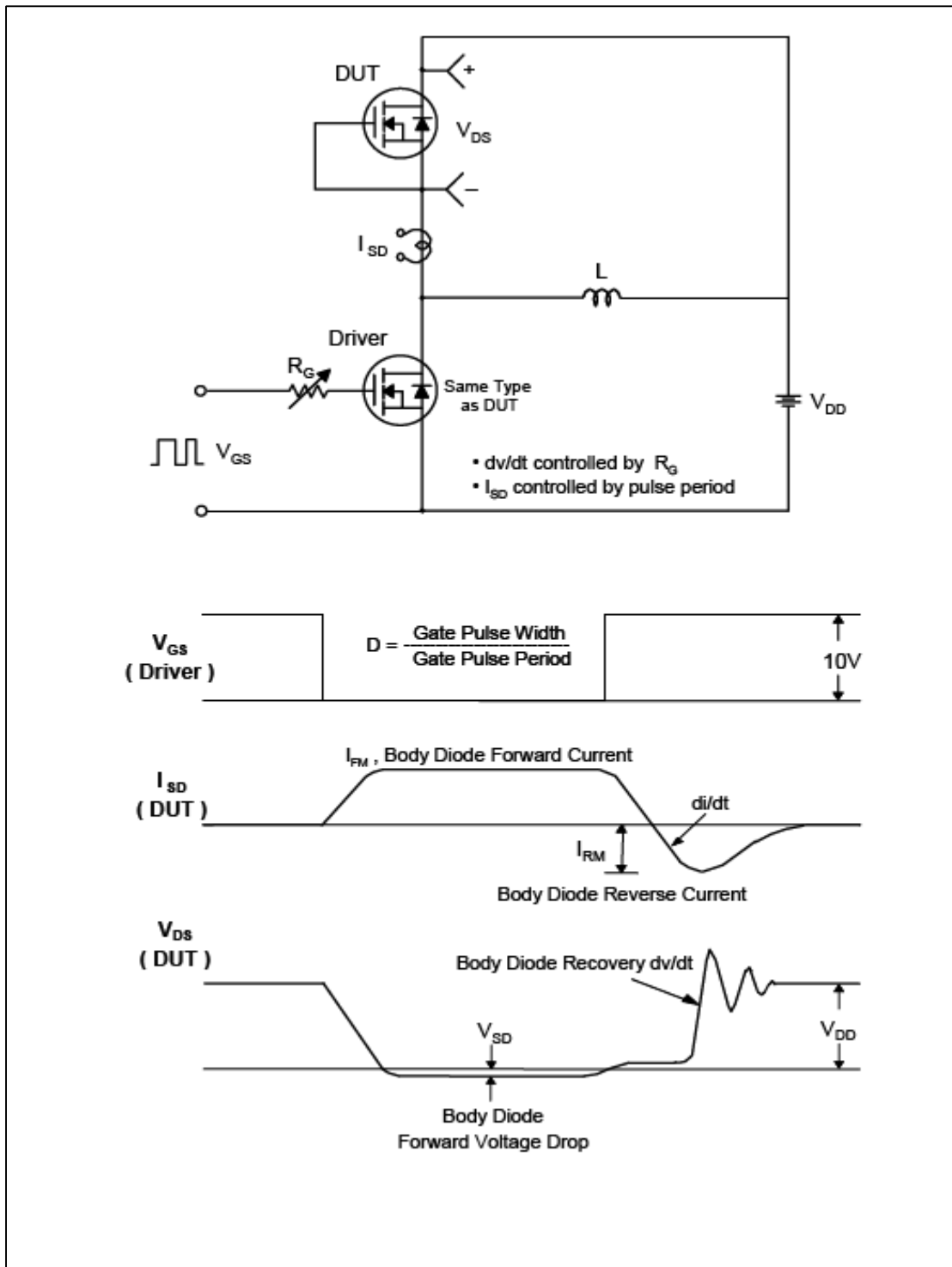


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

