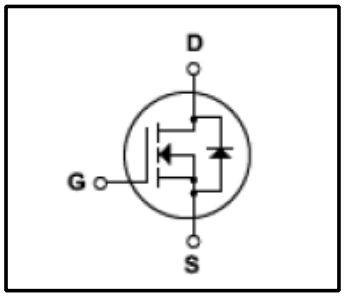
SFP3710G

Silicon N-Channel MOSFET

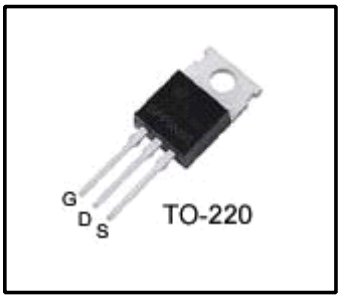
Features

- 59A,100V,$R_{DS(on)}$(Max 18mΩ)@V_{GS}=10V
- Ultra-low Gate Charge(Typical 1180nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(175℃)



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 switching regulators, switching convertors, motor and relay drivers , and drivers for high power bipolar switching transistor demanding high speed and low gate drive power.



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain Source Voltage		100	V
I_D	Continuous Drain Current(@Tc=25℃)		59	A
	Continuous Drain Current(@Tc=100℃)		42	A
I_{DM}	Drain Current Pulsed	(Note1)	240	A
V_{GS}	Gate to Source Voltage		±20	V
E_{AS}	Single Pulsed Avalanche Energy	(Note2)	170	mJ
E_{AR}	Repetitive Avalanche Energy	(Note1)	7.4	mJ
dv/dt	Peak Diode Recovery dv /dt	(Note3)	5.8	V/ ns
P_D	Total Power Dissipation(@Tc=25℃)		136	W
	Derating Factor above 25℃		1.3	W/℃
T_J,T_{stg}	Junction and Storage Temperature		-55~150	℃
T_L	Maximum lead Temperature for soldering purposes		300	℃

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	0.92	℃/W
R_{QCS}	Thermal Resistance , Case-to-Sink	-	0.5	-	℃/W
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	℃/W

Electrical Characteristics(Tc=25℃)

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	±30	-	-	V
Drain cut -off current		I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	20	μA
Drain -source breakdown voltage		$V_{(BR)DSS}$	I_D=250 μA,V_{GS}=0V	100	-	-	V
Break voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	I_D=1mA, Referenced to 25℃	-	0.1	-	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=35A	-	-	18	mΩ
Forward Transconductance		gfs	V_{DS}=50V,I_D=35A	-	35	-	S
Input capacitance		C_{iss}	V_{DS}=25V,	-	2990	-	pF
Reverse transfer capacitance		C_{rss}	V_{GS}=0V,	-	160	-	
Output capacitance		C_{oss}	f=1MHz	-	3000	-	
Switching time	Rise time	tr	V_{DD}=28V,	-	18	-	ns
	Turn-on time	ton	I_D=75A,	-	86	-	
	Fall time	tf	R_G=6.8Ω,	-	47	-	
	Turn-off time	toff	(Note4,5)	-	60	-	
Total gate charge(gate-source plus gate-drain)		Qg	V_{DD}=80V, V_{GS}=10V,	-	1180	-	nC
Gate-source charge		Qgs	I_D=35A	-	190	-	
Gate-drain("miller") Charge		Qgd	(Note4,5)	-	300	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	59	A
Pulse drain reverse current	I_{DRP}	-	-	-	240	A
Forward voltage(diode)	V_{DSF}	I_S=35A,V_{GS}=0V	-	-	1.5	V
Reverse recovery time	trr	I_{DR}=75A,V_{DD}=25V,	-	56	75	ns
Reverse recovery charge	Qrr	dI_{DR} / dt =100 A / μs	-	106	160	μC

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

2.L=50μH I_{AS}=59A,V_{DD}=50V,R_G=25Ω ,Starting T_J=25℃

3.I_{SD}≤59A,di/dt≤300A/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

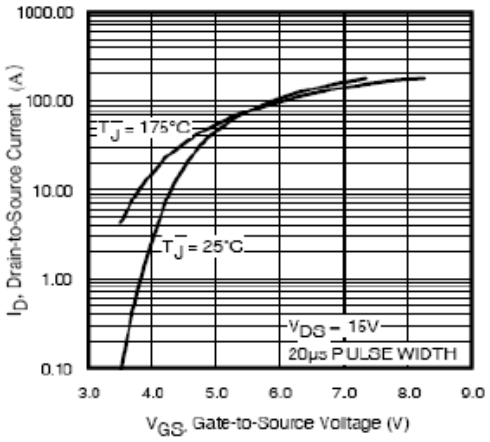


Fig.1 On -State Characteristics

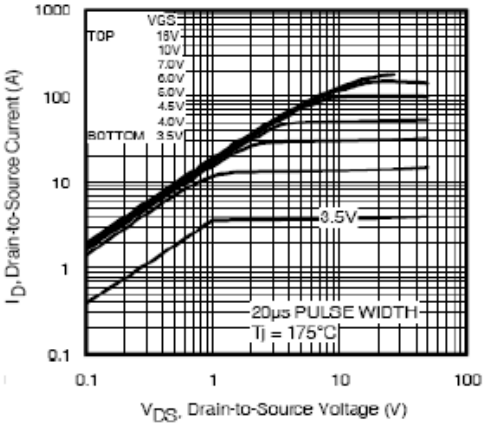


Fig.2 Typical Output Characteistics

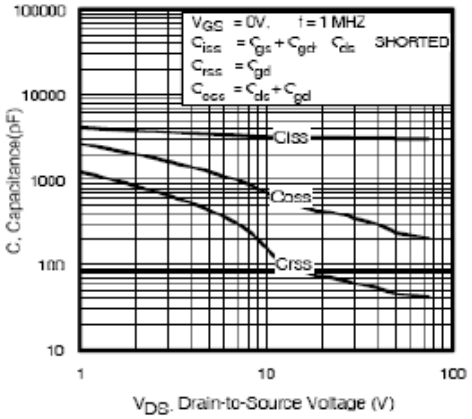


Fig.3 Typical Capacitance vs Drain Current

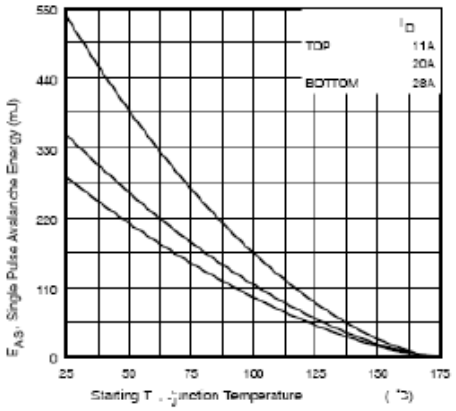


Fig.4 Maximum Avalanche Energy vs Drain Current

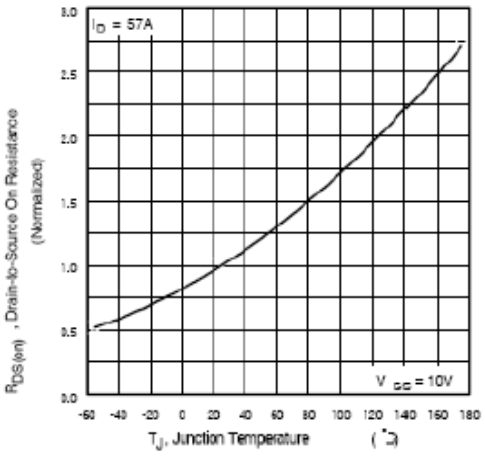


Fig.5 On-Resistance Variation vs Junction Temperature

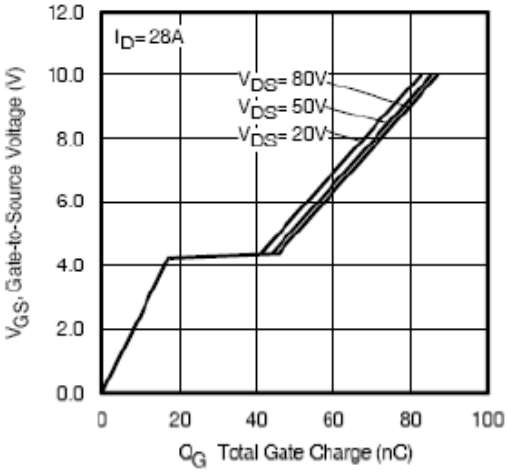


Fig.6 Gate charge Characteristics

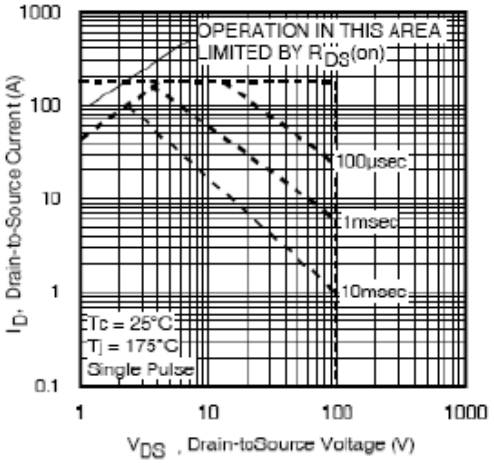


Fig.7 Maximum Safe Operation Area

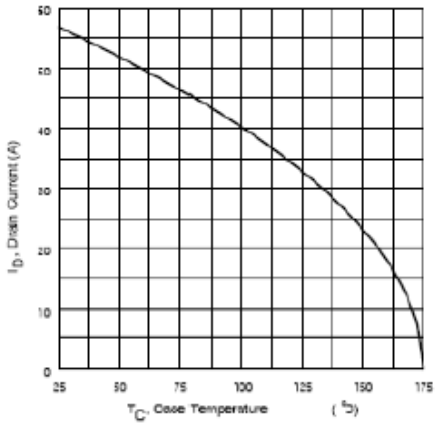


Fig.8 Maximum Drain current vs Case Temperature

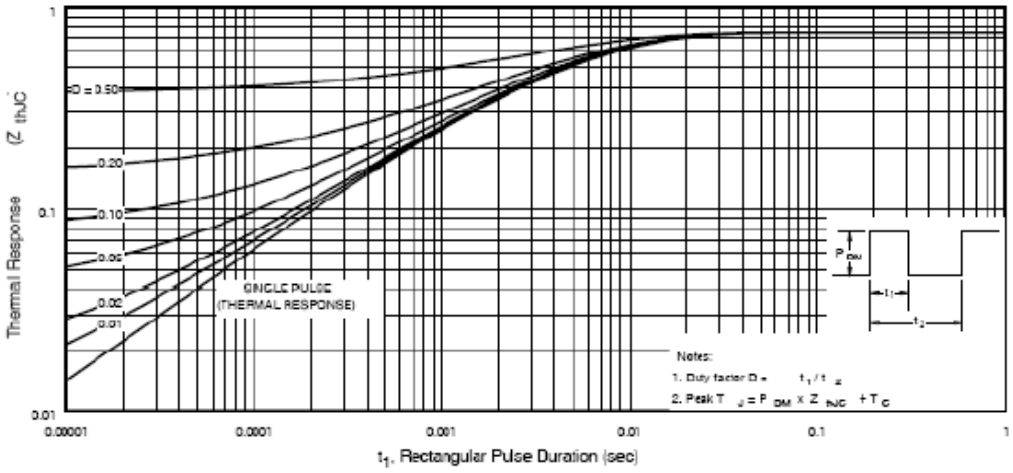


Fig.9 Transient Thermal Response Curve

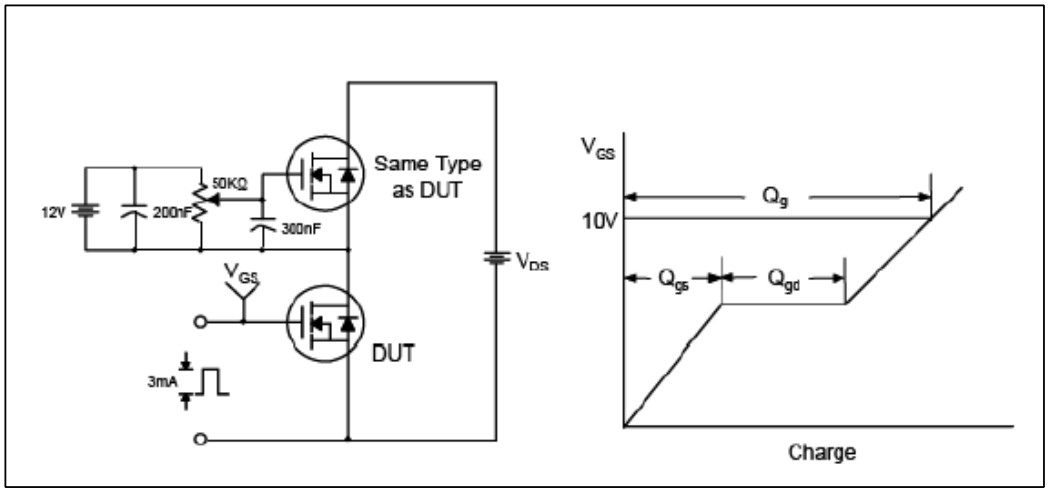


Fig.10 Gate Test circuit & Waveform

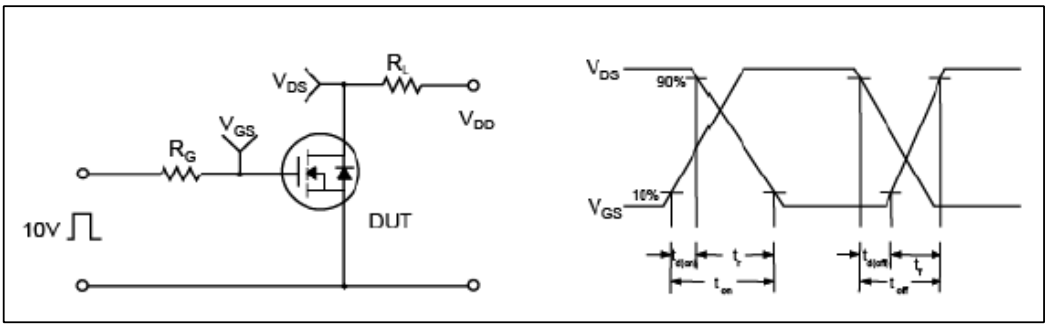


Fig.11 Resistive Switching Test Circuit & Waveform

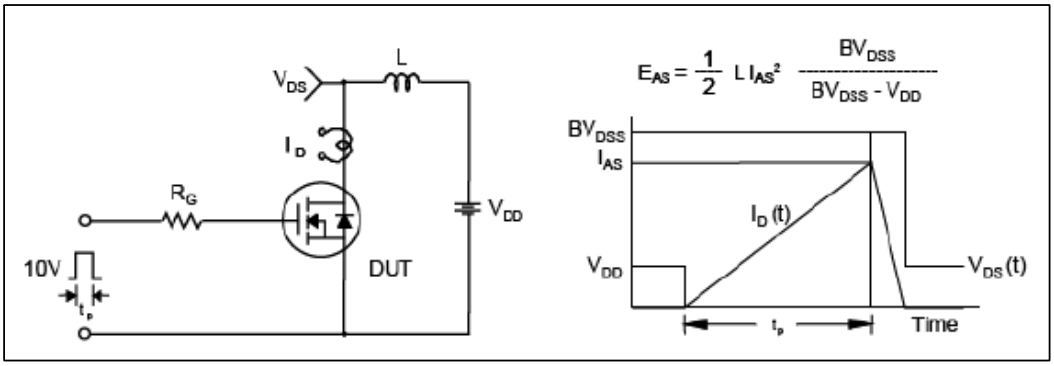


Fig.12 Uncamped Inductive Switching Test Circuit & Waveform

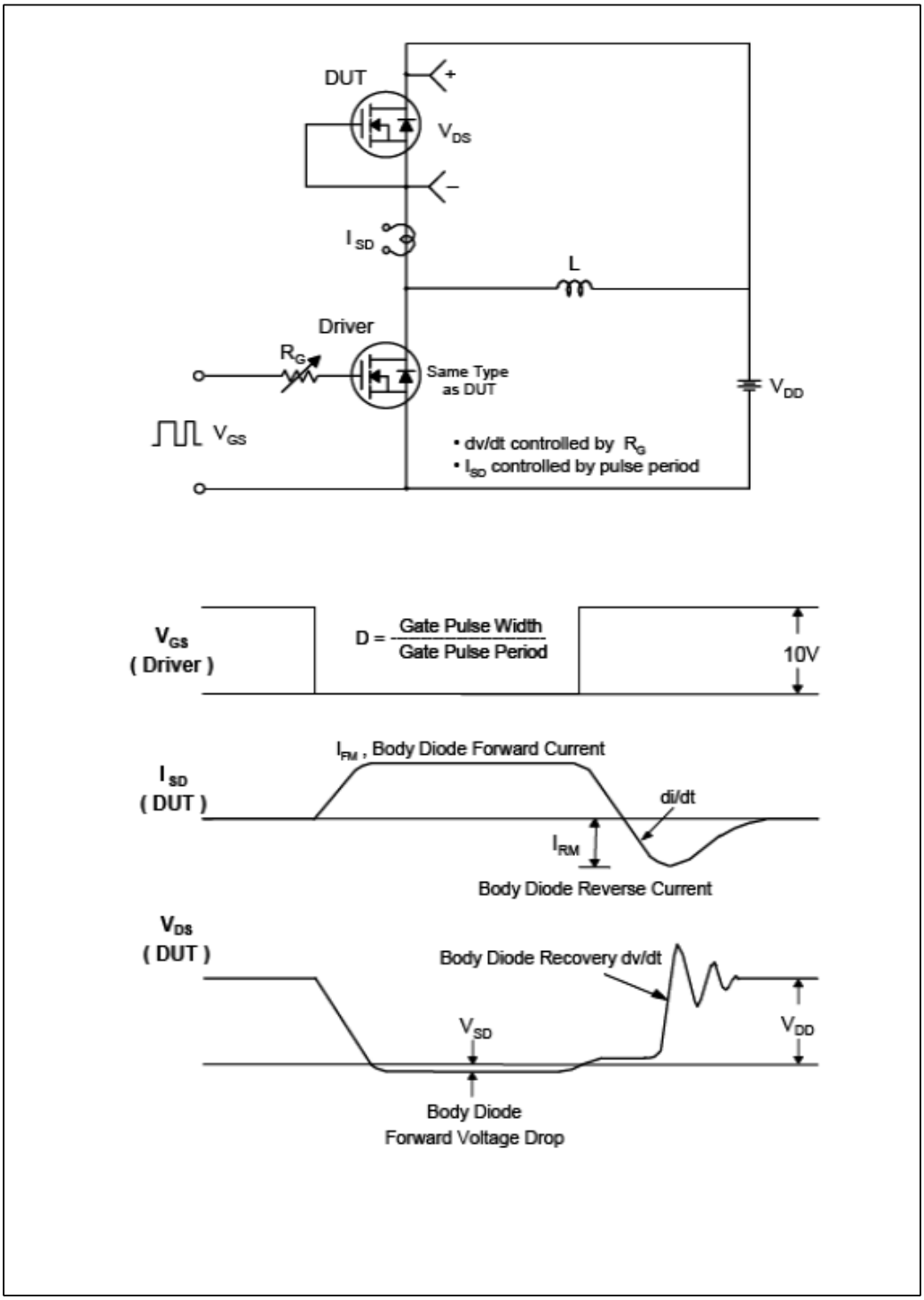


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

Unit:mm