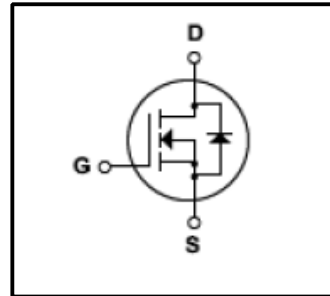


*Silicon N-Channel MOSFET*

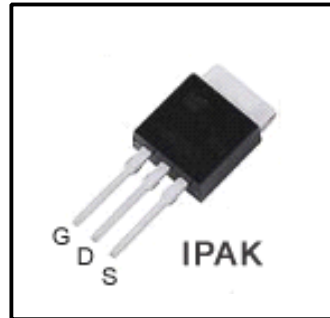
**Features**

- 4A,600V. $R_{DS(on)}$ (Max 2.5 $\Omega$ )@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 16nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Isolation Voltage ( VISO = 4000V AC )
- 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 half bridge and full bridge resonant topology line a Electronic lamp ballast.



**Absolute Maximum Ratings**

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain Source Voltage	600	V
$I_D$	Continuous Drain Current(@ $T_c=25^{\circ}C$ )	4	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$ )	2.5	A
$I_{DM}$	Drain Current Pulsed (Note1)	16	A
$V_{GS}$	Gate to Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy (Note 2)	240	mJ
$E_{AR}$	Repetitive Avalanche Energy (Note 1)	10	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
$P_D$	Total Power Dissipation(@ $T_c=25^{\circ}C$ )	80	W
	Derating Factor above 25 $^{\circ}C$	0.78	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	-	-	1.56	$^{\circ}C/W$
$R_{QJA}$	Thermal Resistance, Junction-to-Ambient*			50	$^{\circ}C/W$
$R_{QJA}$	Thermal Resistance, Junction-to-Ambient	-	-	110	$^{\circ}C/W$

\*When mounted on the minimum pad size recommended(PCB Mount)

**Electrical Characteristics (Tc = 25° C)**

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit	
Gate leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ± 30 V, V <sub>DS</sub> = 0 V	-	-	± 100	nA	
Gate-source breakdown voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> = ± 10 μA, V <sub>DS</sub> = 0 V	± 30	-	-	V	
Drain cut-off current	I <sub>DSS</sub>	V <sub>DS</sub> = 600 V, V <sub>GS</sub> = 0 V	-	-	10	μA	
		V <sub>DS</sub> = 480 V, T <sub>c</sub> = 125°C	-	-	100	μA	
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 250 μA, V <sub>GS</sub> = 0 V	600	-	-	V	
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 250 μA	2	-	4	V	
Drain-source ON resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3.25A	-	1.8	2.5	Ω	
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25 V,	-	545	670	pF	
Reverse transfer capacitance	C <sub>rss</sub>	V <sub>GS</sub> = 0 V,	-	7	10		
Output capacitance	C <sub>oss</sub>	f = 1 MHz	-	70	90		
Switching time	Rise time	t <sub>r</sub>	V <sub>DD</sub> = 300 V,	-	10	30	ns
	Turn-on time	t <sub>on</sub>	I <sub>D</sub> = 4.4 A	-	35	80	
	Fall time	t <sub>f</sub>	R <sub>G</sub> = 25 Ω	-	45	100	
	Turn-off time	t <sub>off</sub>	(Note4,5)	-	20	50	
Total gate charge (gate-source plus gate-drain)	Q <sub>g</sub>	V <sub>DD</sub> = 480 V, V <sub>GS</sub> = 10 V,	-	16	20	nC	
Gate-source charge	Q <sub>gs</sub>	I <sub>D</sub> = 4.4A	-	3.4	-		
Gate-drain ("miller") Charge	Q <sub>gd</sub>	(Note4,5)	-	7	-		

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I <sub>DR</sub>	-	-	-	4	A
Pulse drain reverse current	I <sub>DRP</sub>	-	-	-	17.6	A
Forward voltage (diode)	V <sub>DSF</sub>	I <sub>DR</sub> = 4.4 A, V <sub>GS</sub> = 0 V	-	-	1.4	V
Reverse recovery time	t <sub>rr</sub>	I <sub>DR</sub> = 4.4 A, V <sub>GS</sub> = 0 V,	-	390	-	ns
Reverse recovery charge	Q <sub>rr</sub>	dI <sub>DR</sub> / dt = 100 A / μs	-	2.2	-	μC

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

2.L=18.5mH,I<sub>AS</sub>=4.4A,V<sub>DD</sub>=50V,R<sub>G</sub>=0Ω,Starting T<sub>J</sub>=25°C

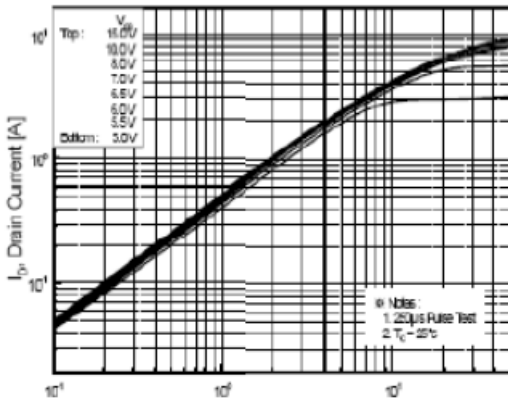
3.I<sub>SD</sub>≤4A,dI/dt≤200A/us, V<sub>DD</sub><BV<sub>DSS</sub>,STARTING T<sub>J</sub>=25°C

4.Pulse Test: Pulse Width≤300us,Duty Cycles≤2%

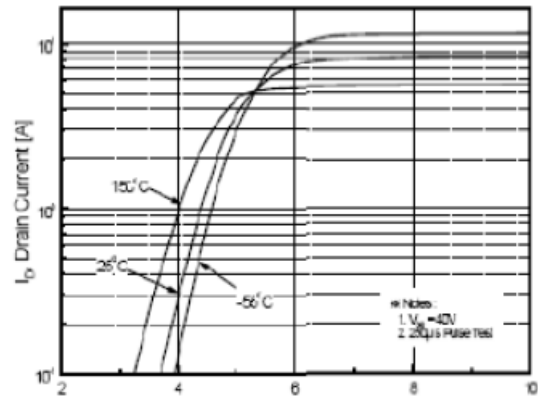
5.Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

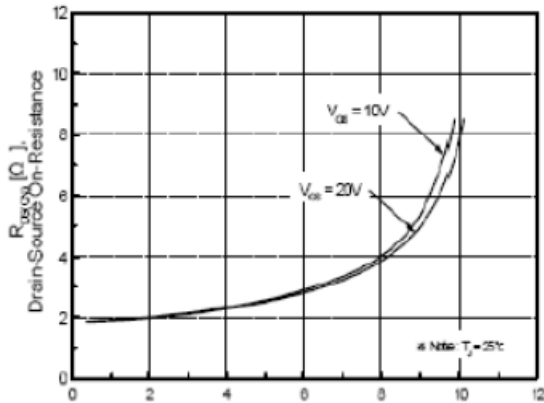
Please handle with caution



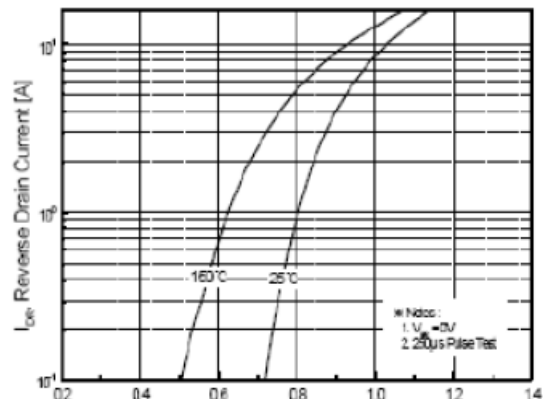
**Fig.1 On-State Characteristics**



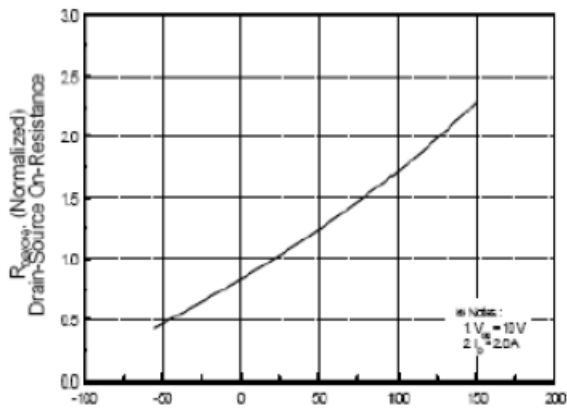
**Fig.2 Transfer Current Characteristics**



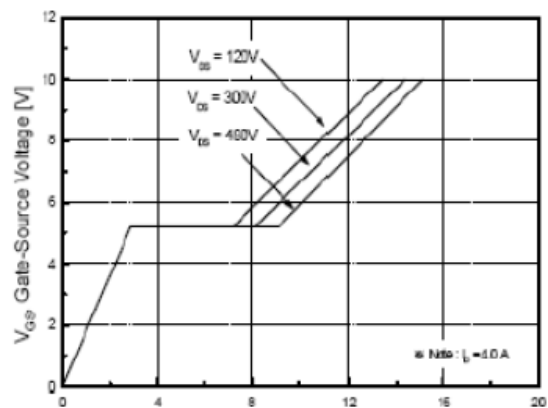
**Fig.3. On Resistance Variation vs Drain current**



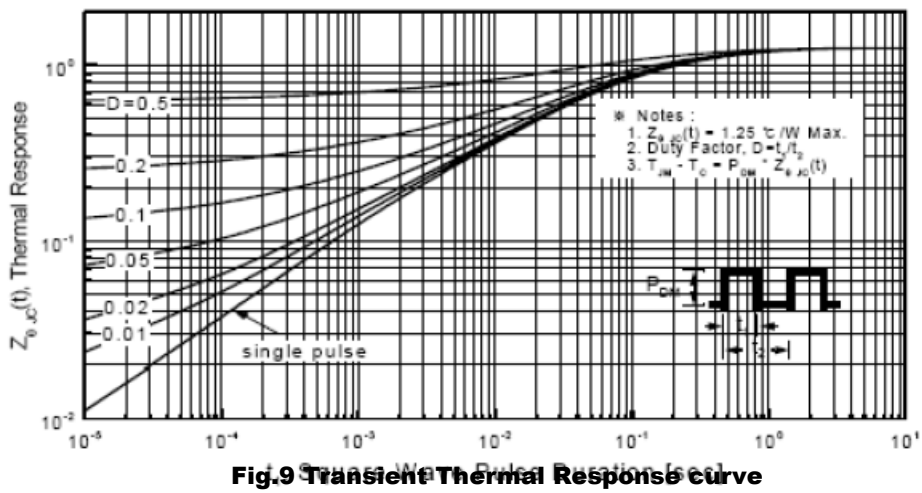
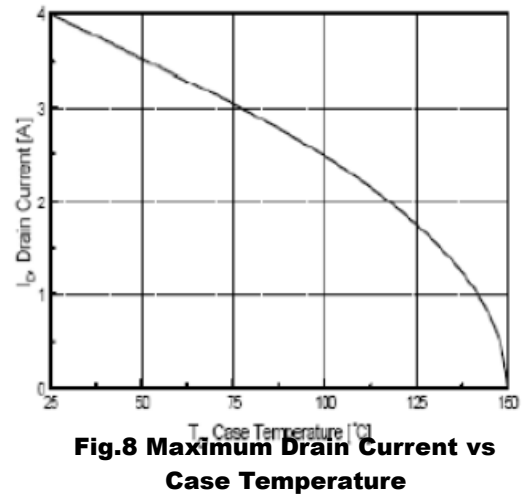
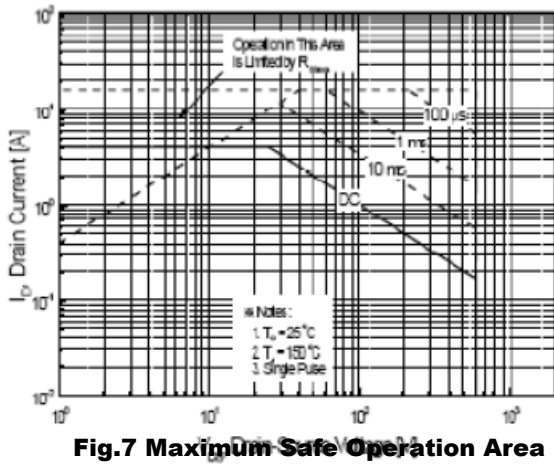
**Fig.4 Body Diode Forward Voltage Variation vs Source Current and Temperature**

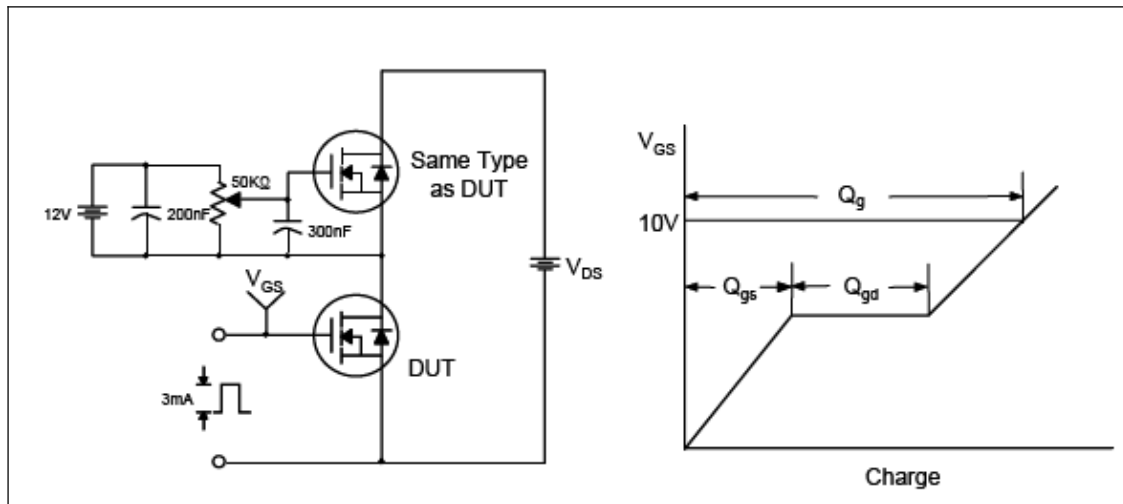


**Fig.5 On-Resistance Variation vs Junction Temperature**

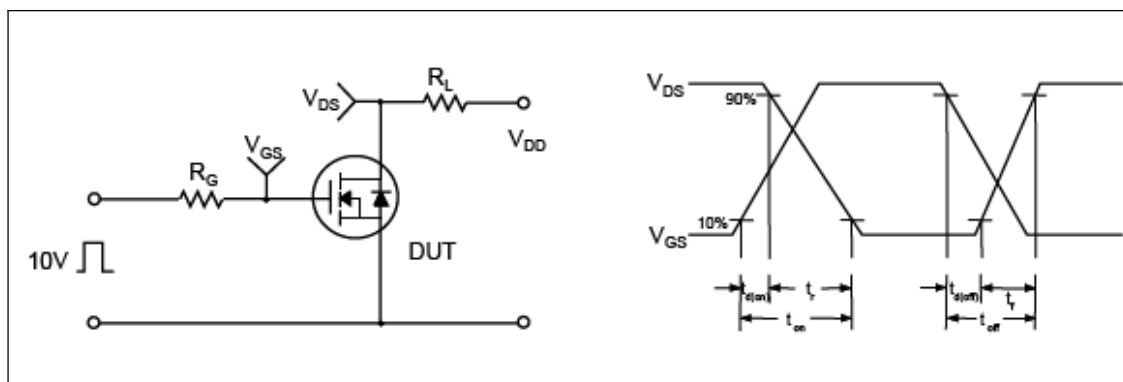


**Fig.6 Gate Charge Characteristics**

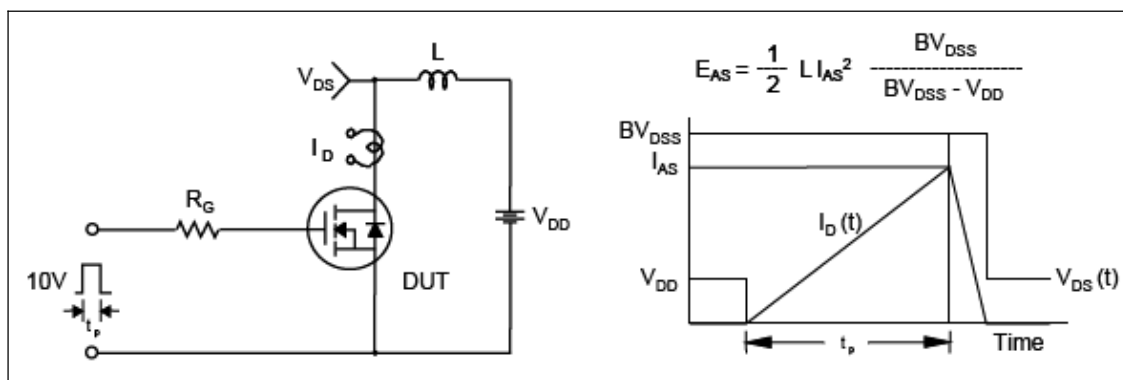




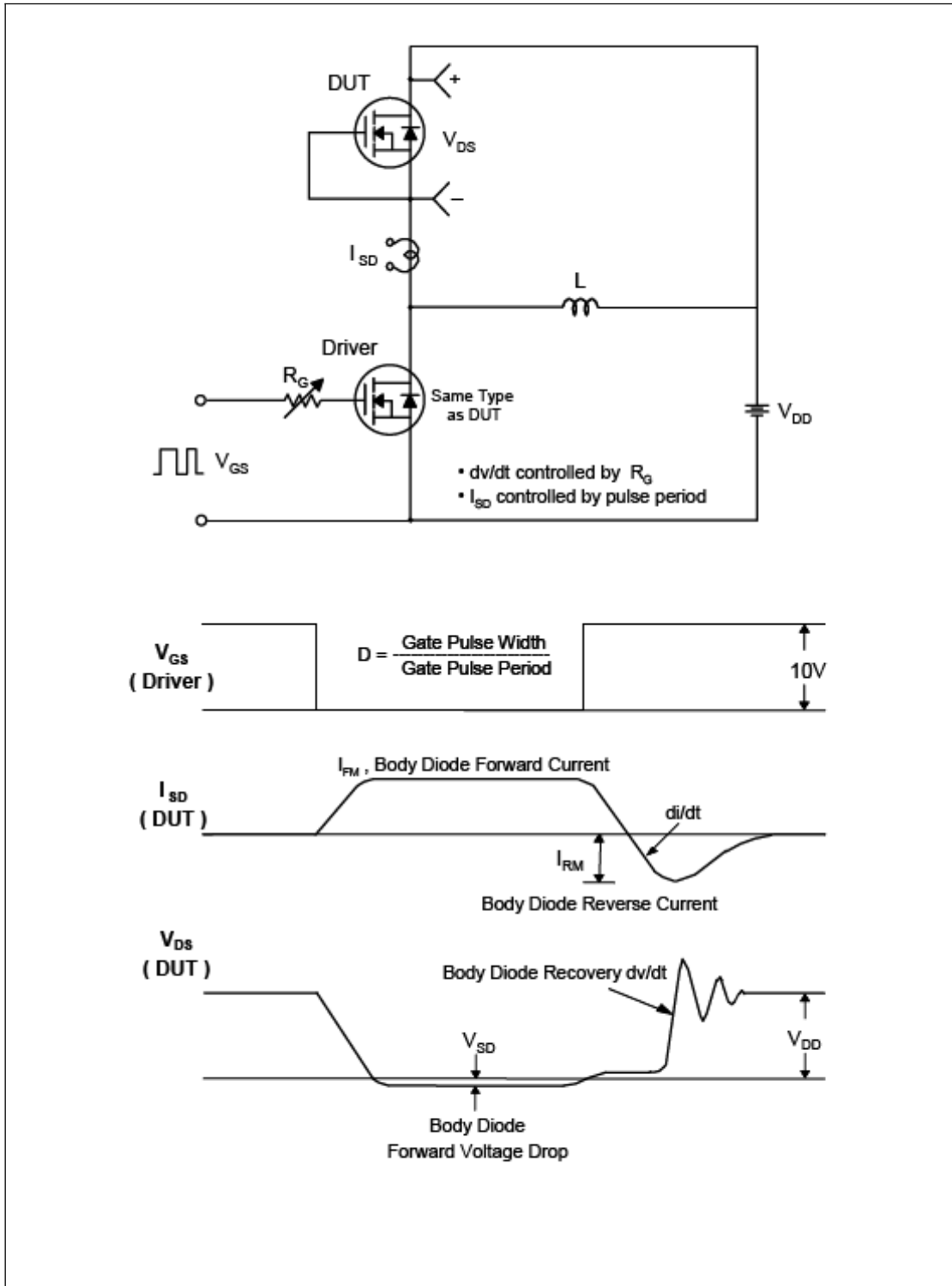
**Fig.10 Gate Test Circuit & Waveform**



**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-251 Package Dimension**

