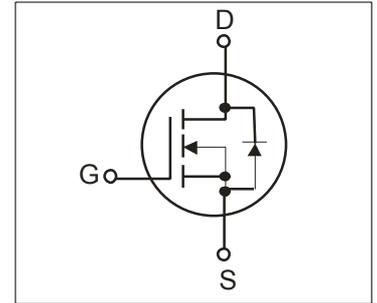


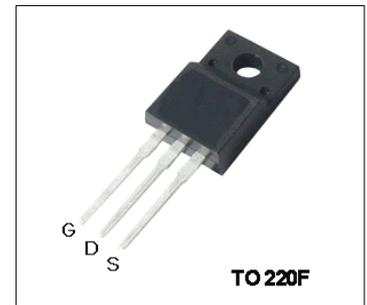
Features

- 13A,500V, $R_{DS(on)}$ (Max0.46Ω) $@V_{GS}=10V$
- Ultra-low Gate charge(Typical 37nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150 °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 device is specially well suited for high efficiency switch mode power supplies, power factor correction and half bridge and full bridge resonant topology line a electronic lamp ballast.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	500	V
I_D	Continuous Drain Current(@ $T_c=25^{\circ}C$)	13*	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$)	8*	A
I_{DM}	Drain Current Pulsed (Note1)	52*	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	845	mJ
I_{AR}	Avalanche Current (note 1)	13	A
E_{AR}	Repetitive Avalanche Energy (Note1)	5	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	4.5	V/ ns
P_D	Total Power Dissipation(@ $T_c=25^{\circ}C$)	50	W
	Derating Factor above 25°C	0.4	W/°C
T_J, T_{stg}	Junction and Storage Temperature	-55~150	°C
T_L	Channel Temperature	300	°C

*Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	2.5	°C/W
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	°C/W

Electrical Characteristics(Tc=25°C)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I _{GSS}	V _{GS} =±30V,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} =500V,V _{GS} =0V	-	-	1	μA
			V _{DS} =400V,TC=125°C	-	-	10	μA
Drain -source breakdown voltage		V _{(BR)DSS}	I _D =250 μA,V _{GS} =0V	500	-	-	V
Breakdown voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA,Referenced to 25°C	-	0.6	-	V/°C
Gate threshold voltage		V _{GS(th)}	V _{DS} =10V,I _D =250 μA	3	-	4.5	V
Drain -source ON resistance		R _{DS(ON)}	V _{GS} =10V,I _D =6.5A	-	0.37	0.46	Ω
Forward Transconductance		g _{fs}	V _{DS} =40V,I _D =6.5A	-	15	-	S
Input capacitance		C _{iss}	V _{DS} =25V,	-	1560	2090	pF
Reverse transfer capacitance		C _{rss}	V _{GS} =0V,	-	25	30	
Output capacitance		C _{oss}	f=1MHz	-	210	260	
Switching time	Turn-On rise time	t _r	V _{DD} =250V,	-	160	270	ns
	Turn-On delay time	t _{d(on)}	I _D =13A	-	90	180	
	Turn-Off Fall time	t _f	R _G =25Ω	-	60	140	
	Turn-Off delay time	t _{d(off)}	(Note4,5)	-	150	260	
Total gate charge(gate-source plus gate-drain)		Q _g	V _{DD} =400V, V _{GS} =10V,	-	37	50	nC
Gate-source charge		Q _{gs}	I _D =13A	-	10.9	-	
Gate-drain("miller") Charge		Q _{gd}	(Note4,5)	-	17.2	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	13	A
Pulse drain reverse current	I _{DRP}	-	-	-	52	A
Forward voltage(diode)	V _{DSF}	I _{DR} =13A,V _{GS} =0V	-	-	1.4	V
Reverse recovery time	t _{rr}	I _{DR} =13A,V _{GS} =0V,	-	410	-	ns
Reverse recovery charge	Q _{rr}	dI _{DR} / dt =100 A / μs	-	4.5	-	μC

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

2.L=9.0mH I_{AS}=13A,V_{DD}=50V,R_G=25Ω,Starting T_J=25°C

3.I_{SD}≤13A,di/dt≤200A/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

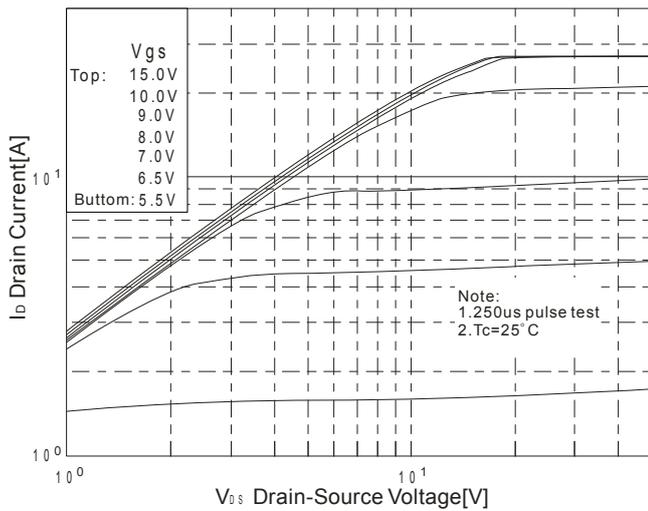


Fig.1 On Region Characteristics

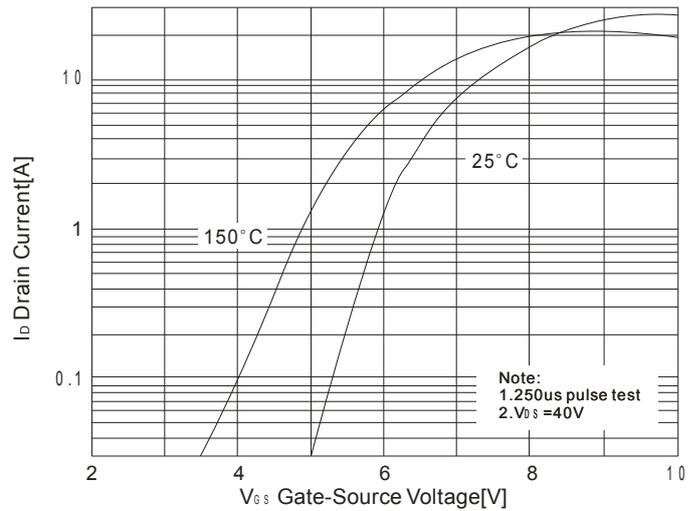


Fig.2 Transfer Characteristics

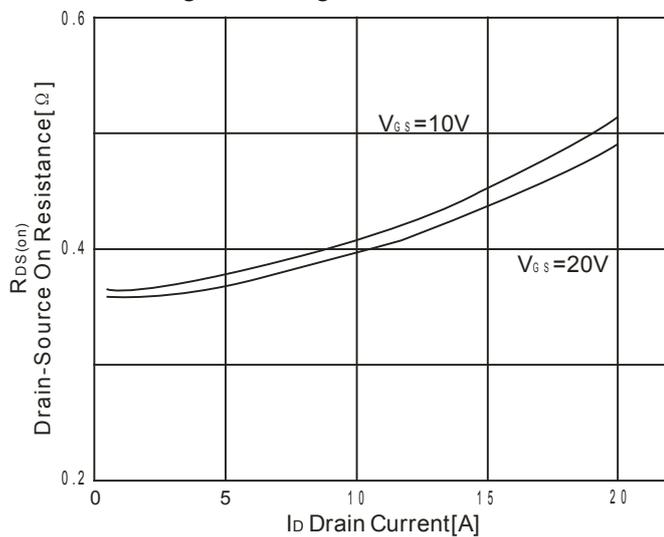


Fig.3 On-Resistance Variation vs Drain Current and Gate Voltage

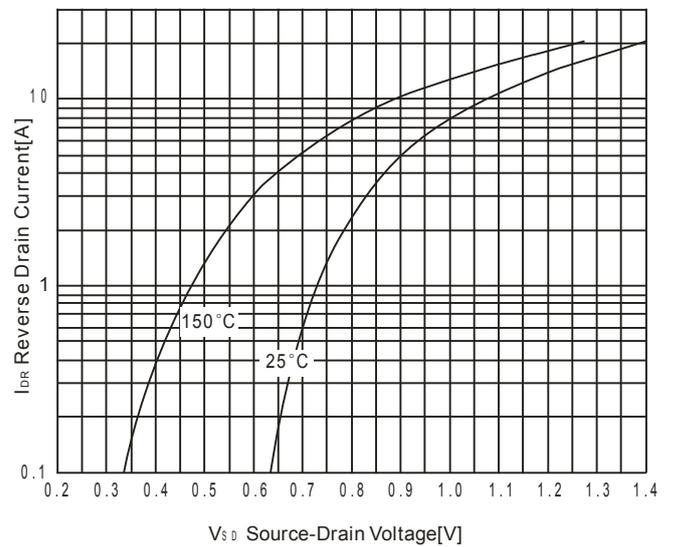


Fig.4 Body Diode Forward Voltage Variation vs. Source Current and Temperature

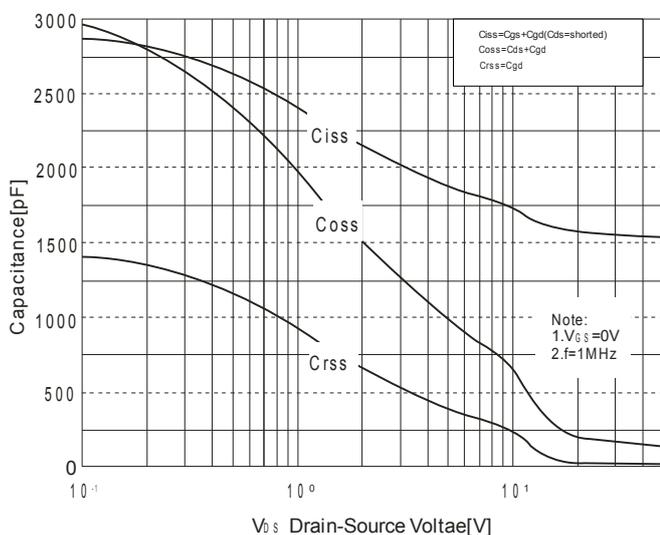


Fig.5 Capacitance Characteristics

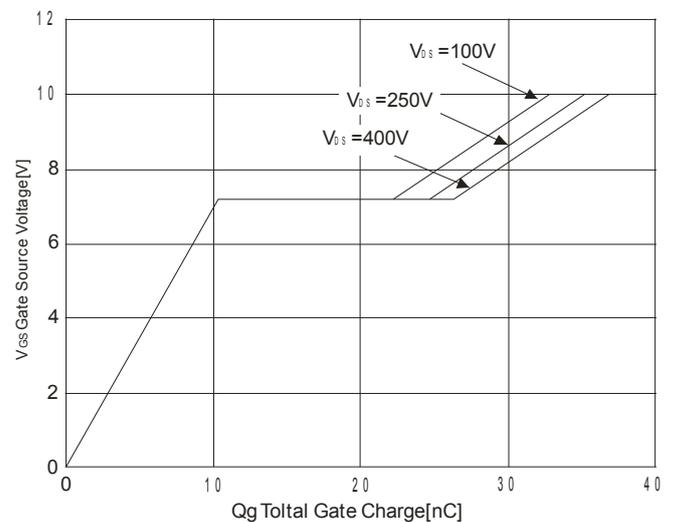


Fig.6 Gate Charge Characteristics

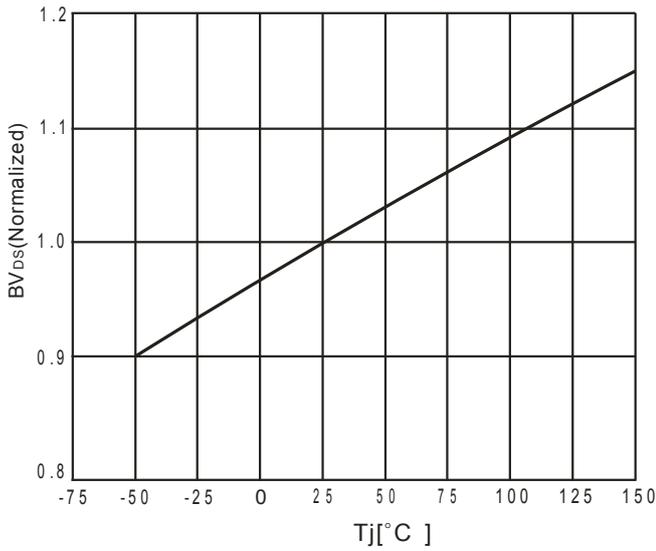


Fig.7 Breakdown Voltage Variation vs. Temperature

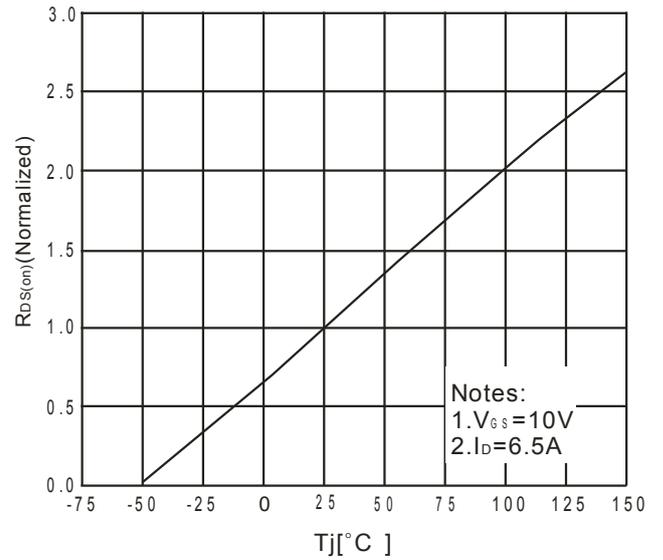


Fig.8 On-Resistance Variation vs. Temperature

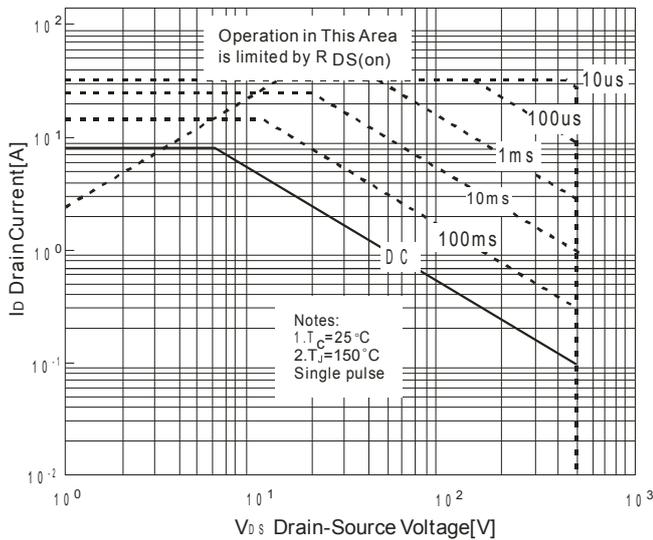


Fig.9 Maximum Safe Operation Area

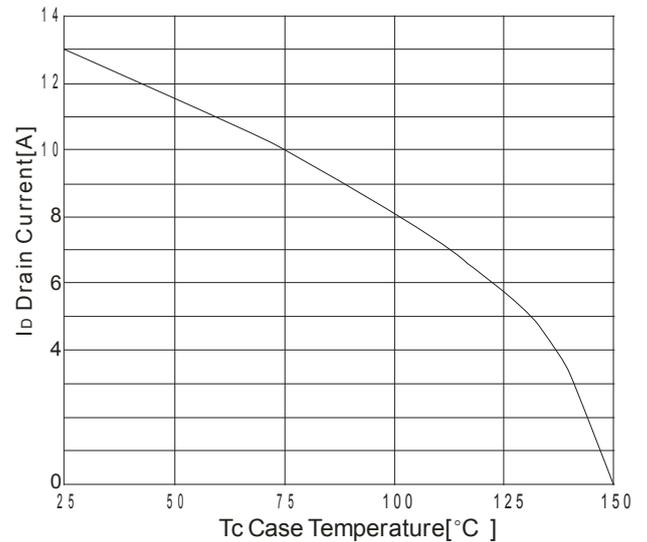


Fig.10 Maximum Drain Current vs Case temperature

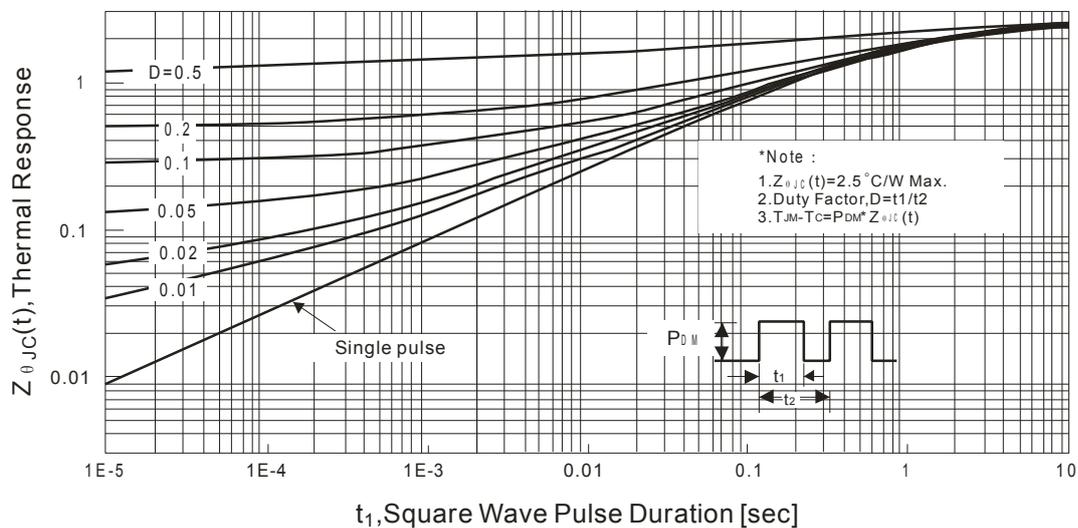


Fig.11 Transient thermal Response Curve

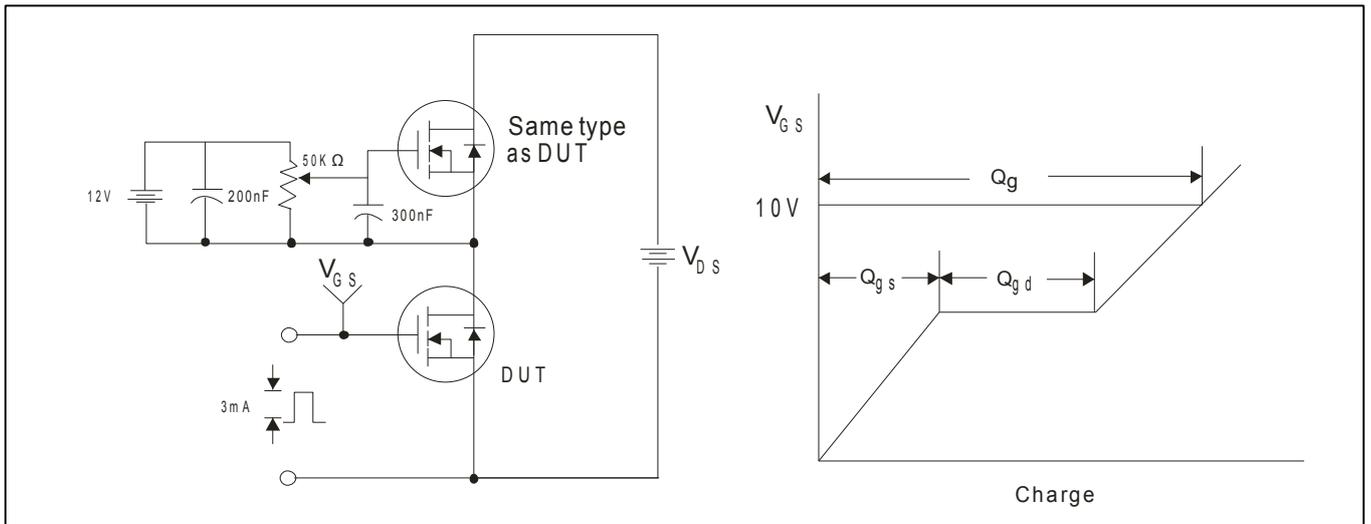


Fig.12 Gate Test circuit & Waveform

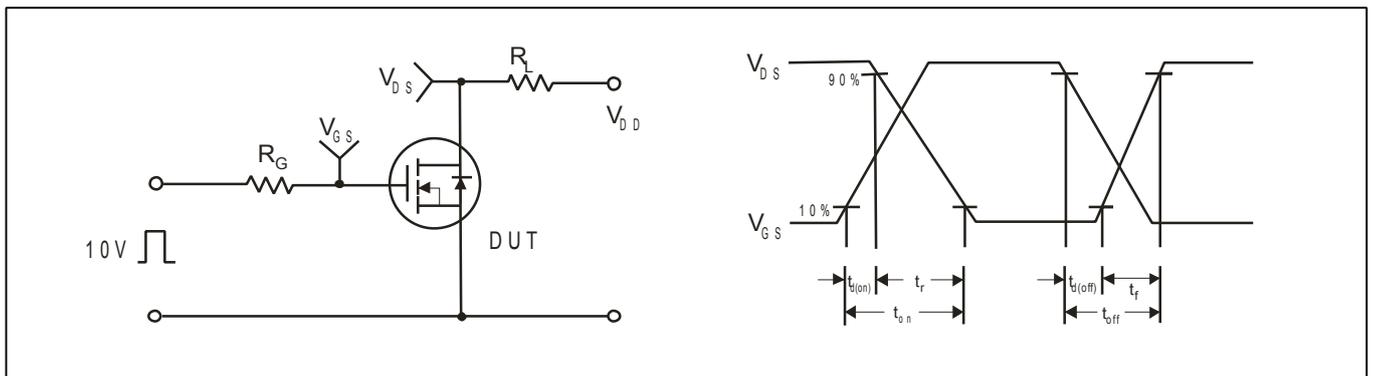


Fig.13 Resistive Switching Test Circuit & Waveform

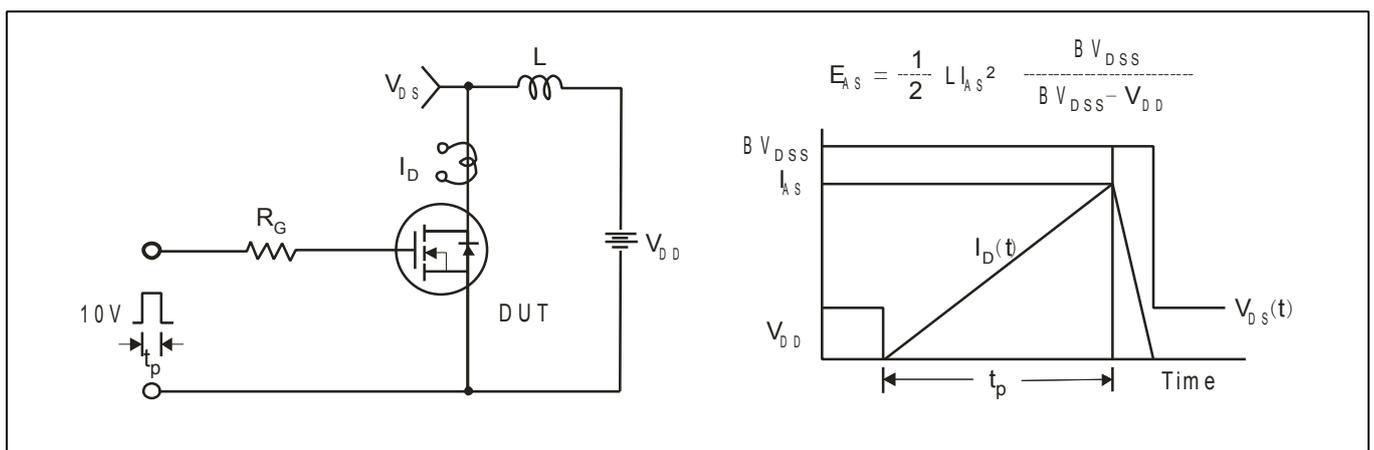


Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

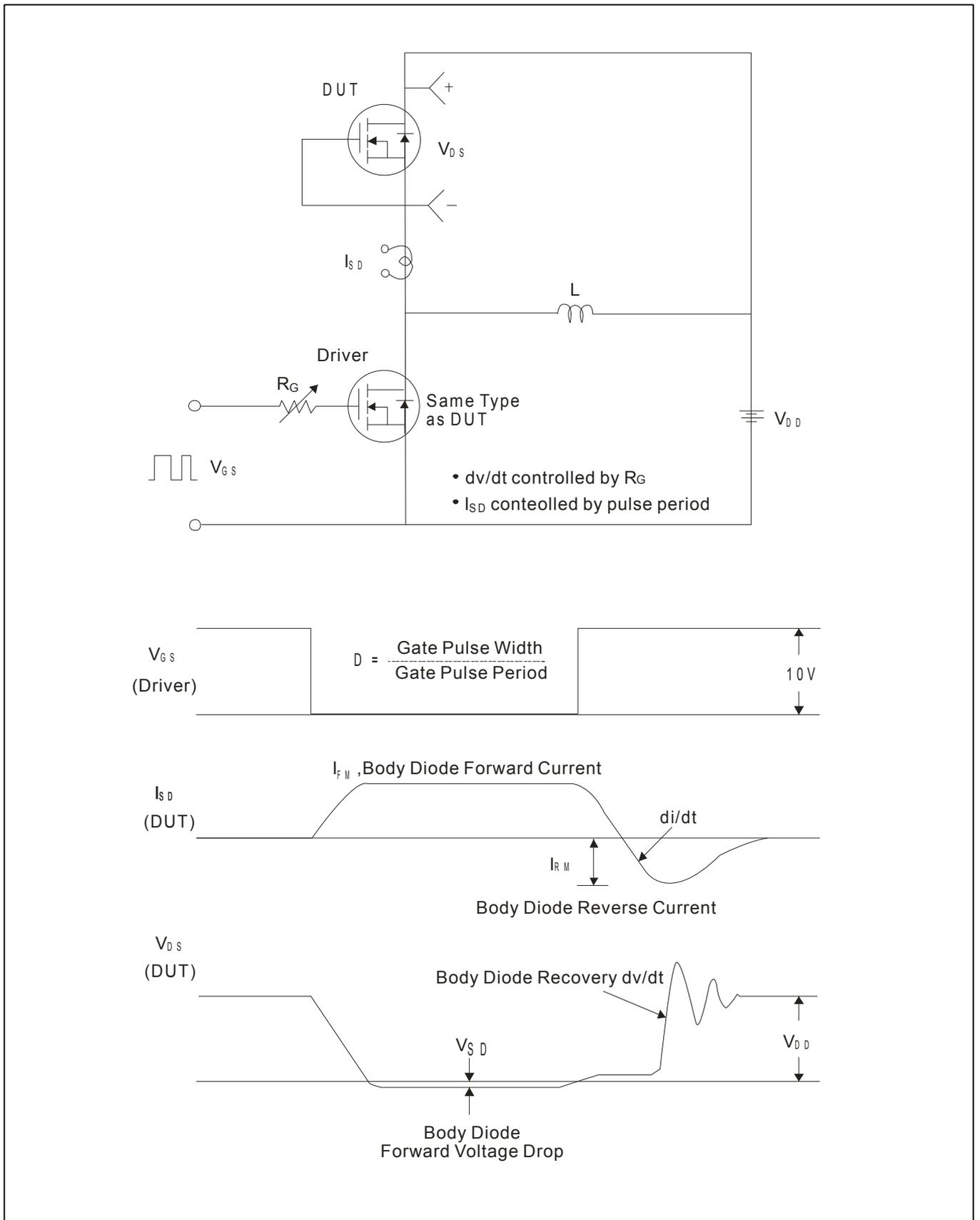
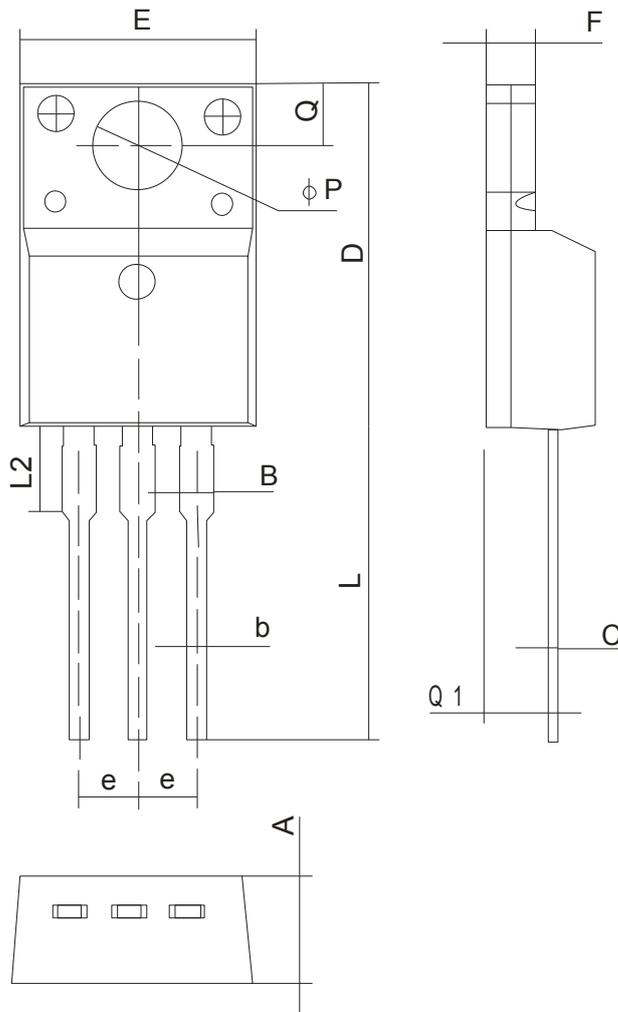


Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

Unit:mm



符号 Symbol	MIN	MAX
A	4.5	4.9
B	-	1.47
b	0.7	0.9
c	0.45	0.6
D	15.67	16.07
E	9.96	10.36
e	2.54TYPE	
F	2.34	2.74
L	12.58	13.38
L2	3.13	3.33
ϕP	3.08	3.28
Q	3.2	3.4
Q 1	2.56	2.96

NOTE:

- 1.We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don't be hesitate to contact us.
- 2.Please do not exceed the absolute maximum ratings of the device when circuit designing.
- 3.Winsemi Microelectronics Co., Ltd reserved the right to make changes in this specification sheet and is subject to change without prior notice.

CONTACT:

Winsemi Microelectronics Co., Ltd.

ADD:Futian District, ShenZhen Tian An Cyber Tech Plaza two East Wing 1002

Post Code : 518040

Tel : +86-755-8250 6288

FAX : +86-755-8250 6299

Web Site : www.winsemi.com