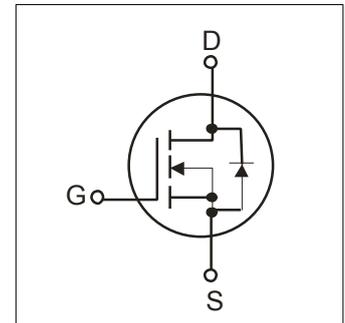


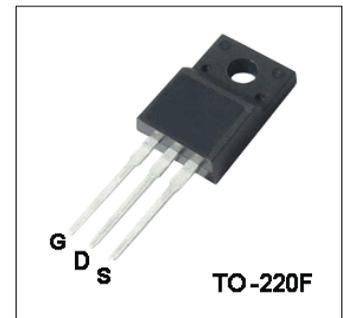
Features

- 18A,500V, $R_{DS(on)}$ (Max0.27 Ω)@ $V_{GS}=10V$
- Ultra-low Gate charge(Typical 42nC)
- 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, VDMOS 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 AC-DC switching power supplies, DC-DC power converters, high voltage H-bridge motor drive PWM.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	500	V
I_D	Continuous Drain Current(@ $T_c=25^{\circ}C$)	18*	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$)	12.7*	A
I_{DM}	Drain Current Pulsed (Note1)	71*	A
V_{GS}	Gate to Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	900	mJ
I_{AR}	Avalanche Current (note 1)	18	A
E_{AR}	Repetitive Avalanche Energy (Note1)	22.7	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	4.5	V/ ns
P_D	Total Power Dissipation(@ $T_c=25^{\circ}C$)	39	W
	Derating Factor above 25 $^{\circ}C$	0.31	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	-	-	3.2	$^{\circ}C/W$
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}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Gate-source breakdown voltage		$V_{(BR)GSS}$	$I_G=\pm 10 \mu A, V_{DS}=0V$	± 30	-	-	V
Drain cut-off current		I_{DSS}	$V_{DS}=500V, V_{GS}=0V, T_C=25^\circ C$	-	-	1	μA
			$V_{DS}=400V, T_C=125^\circ C$	-	-	10	
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D=250\mu A, V_{GS}=0V$	500	-	-	V
Breakdown voltage Temperature coefficient		$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A, \text{Referenced to } 25^\circ C$	-	0.5	-	V/°C
Gate threshold voltage		$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	3	-	5	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS}=10V, I_D=9A$	-	0.235	0.27	Ω
Forward Transconductance		g_{fs}	$V_{DS}=40V, I_D=9A$	-	24	-	S
Input capacitance		C_{iss}	$V_{DS}=25V,$	-	2300	2918	pF
Reverse transfer capacitance		C_{rss}	$V_{GS}=0V,$	-	25	40	
Output capacitance		C_{oss}	$f=1MHz$	-	355	453	
Switching time	Turn-On rise time	t_r	$V_{DD}=250V,$ $I_D=18A$ $R_G=25\Omega$ (Note4,5)	-	165	350	ns
	Turn-On delay time	$t_d(on)$		-	52	128	
	Turn-Off Fall time	t_f		-	85	200	
	Turn-Off delay time	$t_d(off)$		-	100	200	
Total gate charge(gate-source plus gate-drain)		Q_g	$V_{DD}=400V,$ $V_{GS}=10V,$ $I_D=18A$ (Note4,5)	-	42	60	nC
Gate-source charge		Q_{gs}		-	12	-	
Gate-drain("miller") Charge		Q_{gd}		-	22	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	18	A
Pulse drain reverse current	I_{DRP}	-	-	-	72	A
Forward voltage(diode)	V_{DSF}	$I_{DR}=18A, V_{GS}=0V$	-	-	1.4	V
Reverse recovery time	t_{rr}	$I_{DR}=18A, V_{GS}=0V,$ $dI_{DR} / dt = 100 A / \mu s$	-	460	-	ns
Reverse recovery charge	Q_{rr}		-	5.4	-	μC

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

2.L=5.2mH $I_{AS}=18A, V_{DD}=50V, R_G=25\Omega, \text{Starting } T_J=25^\circ C$

3. $I_{SD}\leq 18A, di/dt\leq 200A/\mu s, V_{DD}<BV_{DSS}, \text{Starting } T_J=25^\circ C$

4.Pulse Test:Pulse Width $\leq 300\mu s, \text{Duty Cycle}\leq 2\%$

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

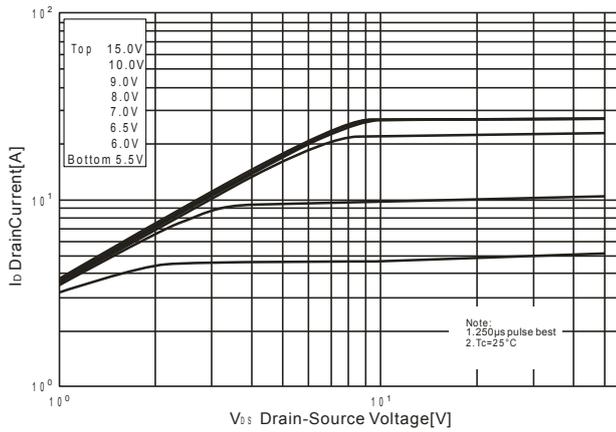


Fig.1 On Region Characteristics

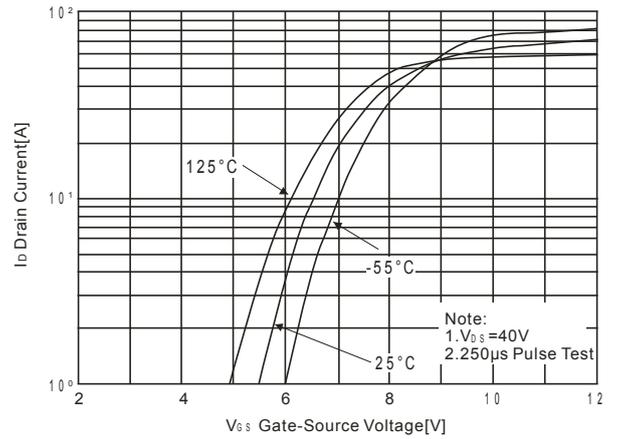


Fig.2 Transfer Characteristics

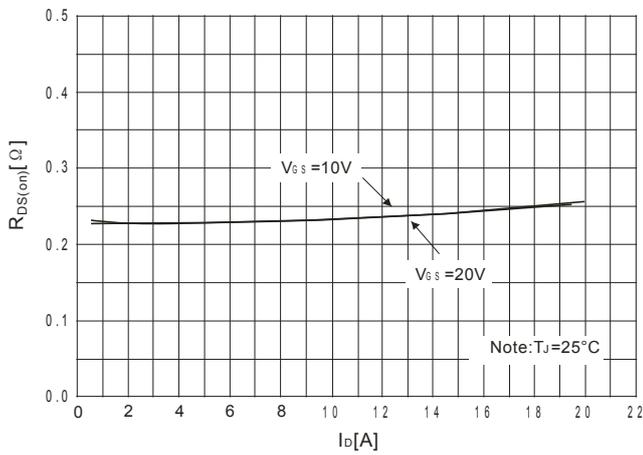


Fig.3 On-Resistance Variation vs Drain Current and Gate Voltage

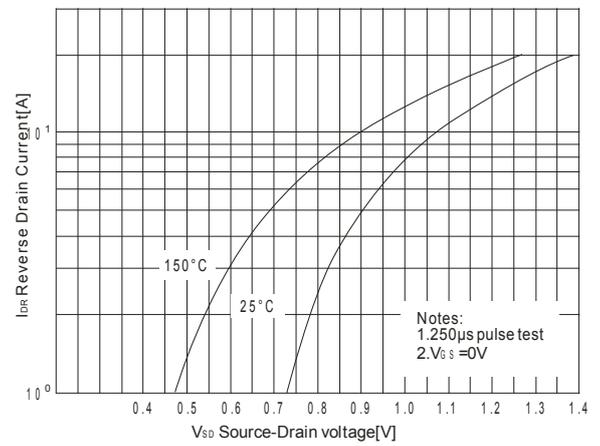


Fig.4 Body Diode Forward Voltage Variation with Source Current and Temperature

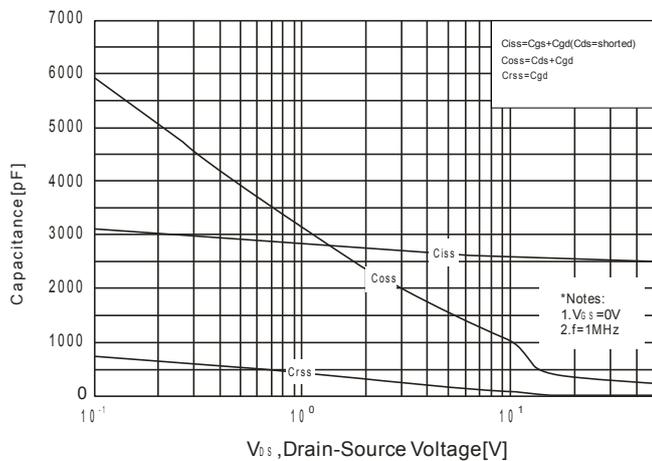


Fig.5 Capacitance Characteristics

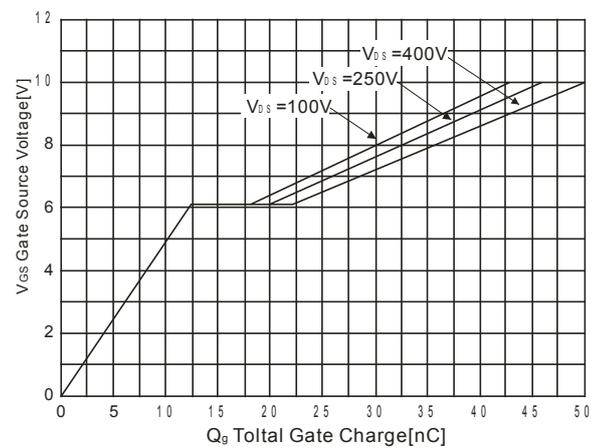


Fig.6 Gate Charge Characteristics

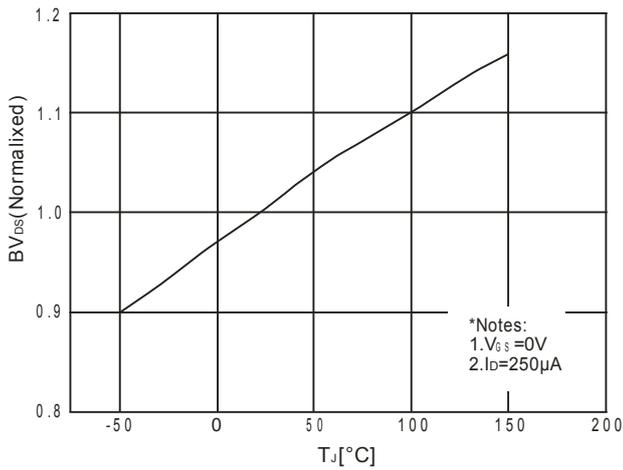


Fig.7 Breakdown Voltage Variation vs. Temperature

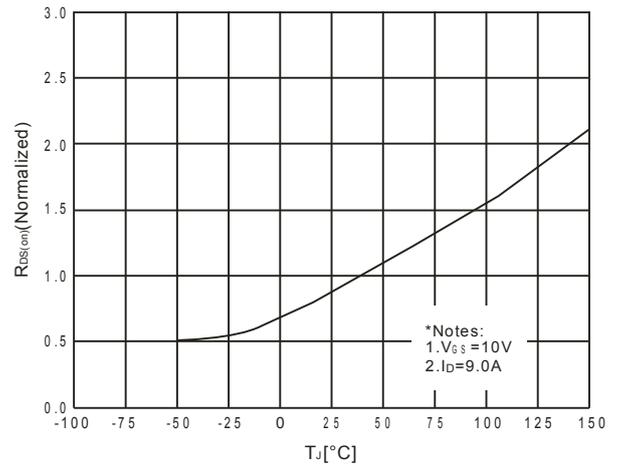


Fig.8 On-Resistance Variation vs. Temperature

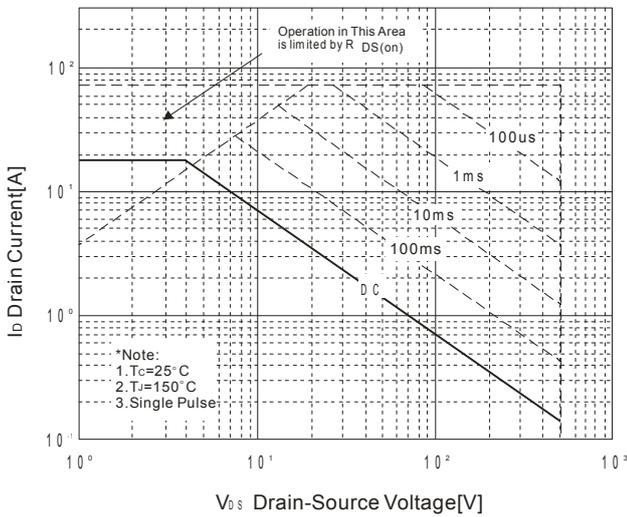


Fig.9 Maximum Safe Operation Area

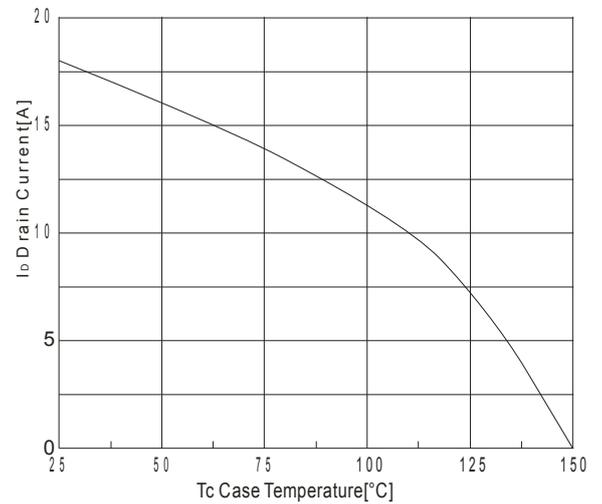


Fig.10 Maximum Drain Current vs Case Temperature

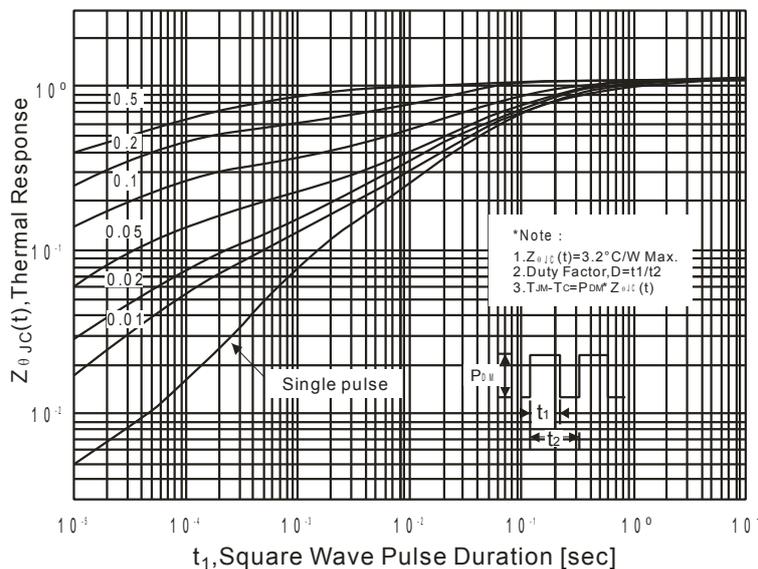


Fig.11 Transient Thermal Response Curve

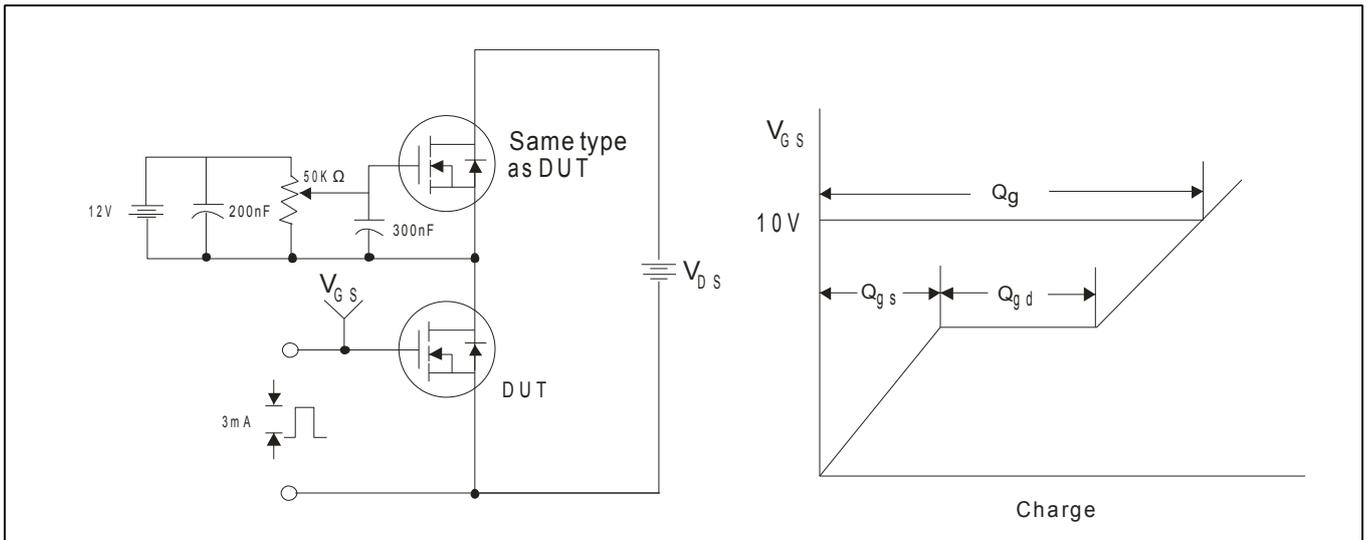


Fig.12 Gate Test Circuit & Waveform

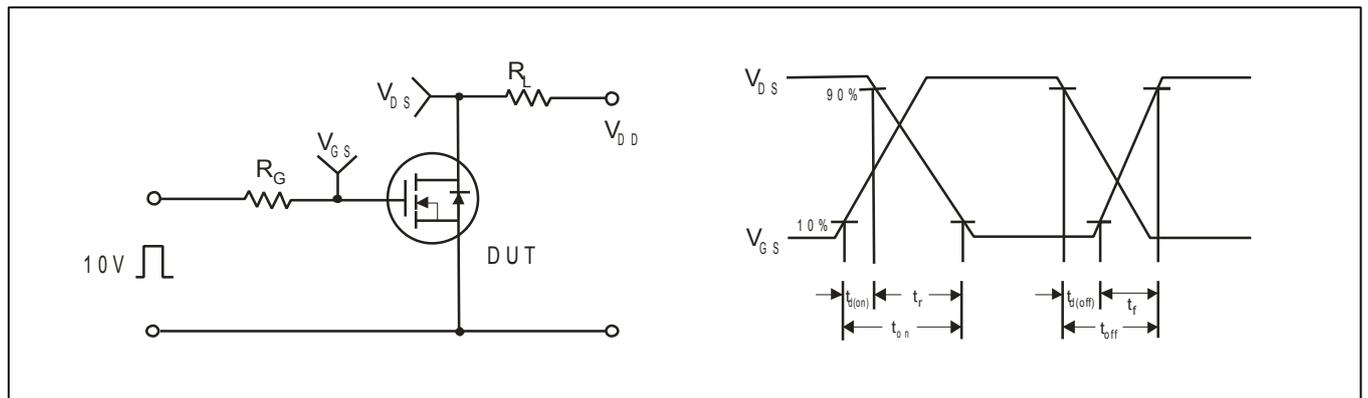


Fig.13 Resistive Switching Test Circuit & Waveform

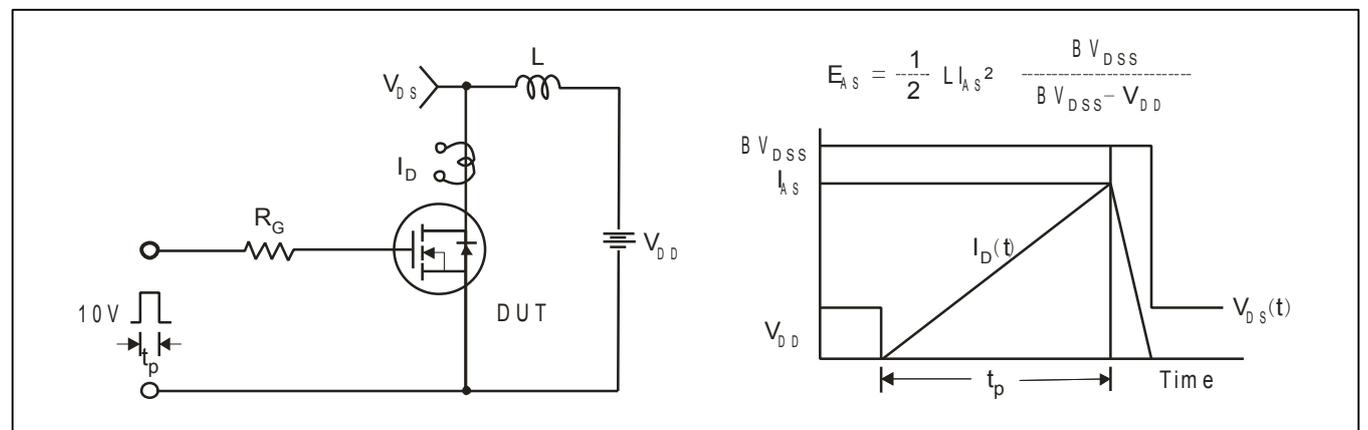


Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

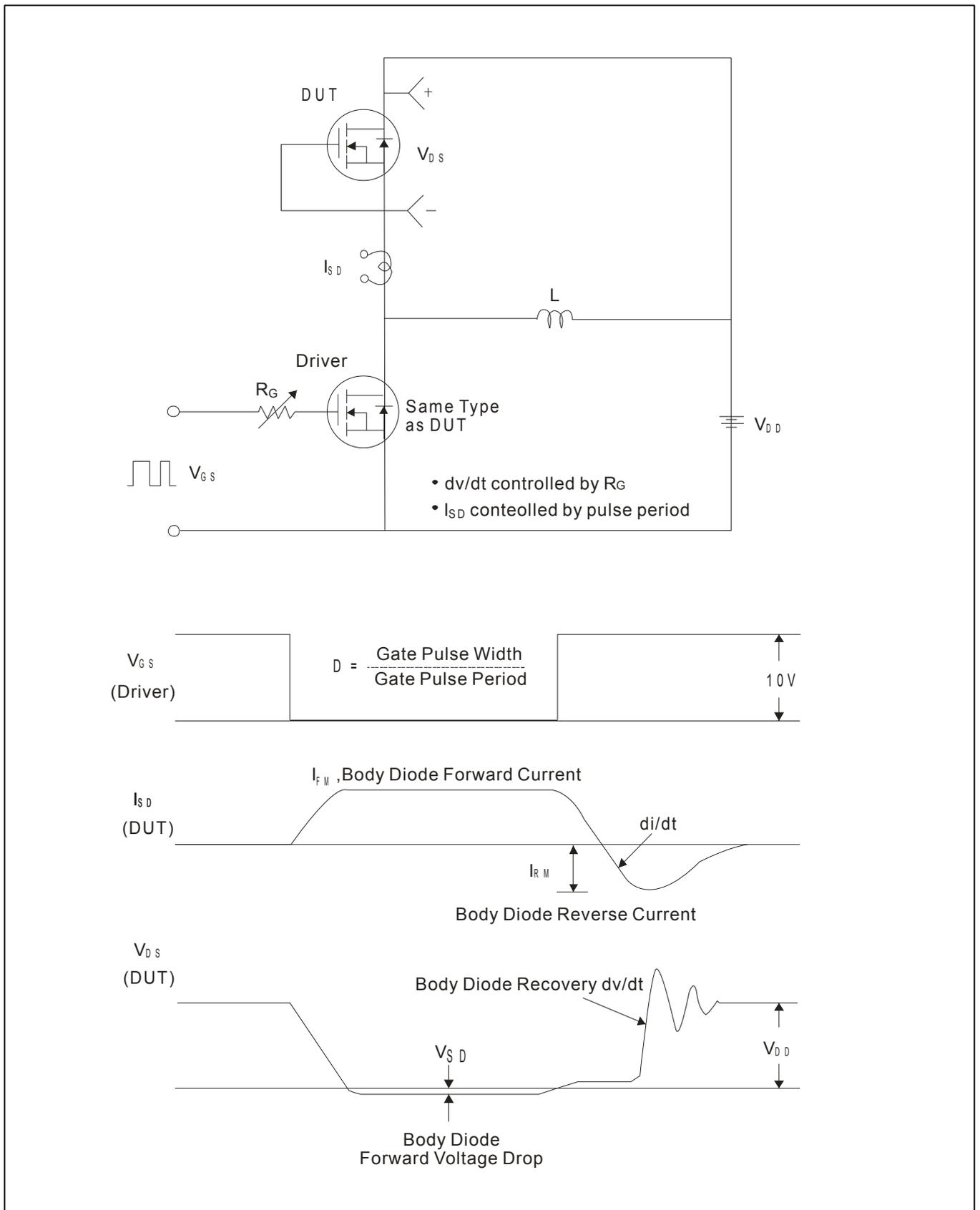
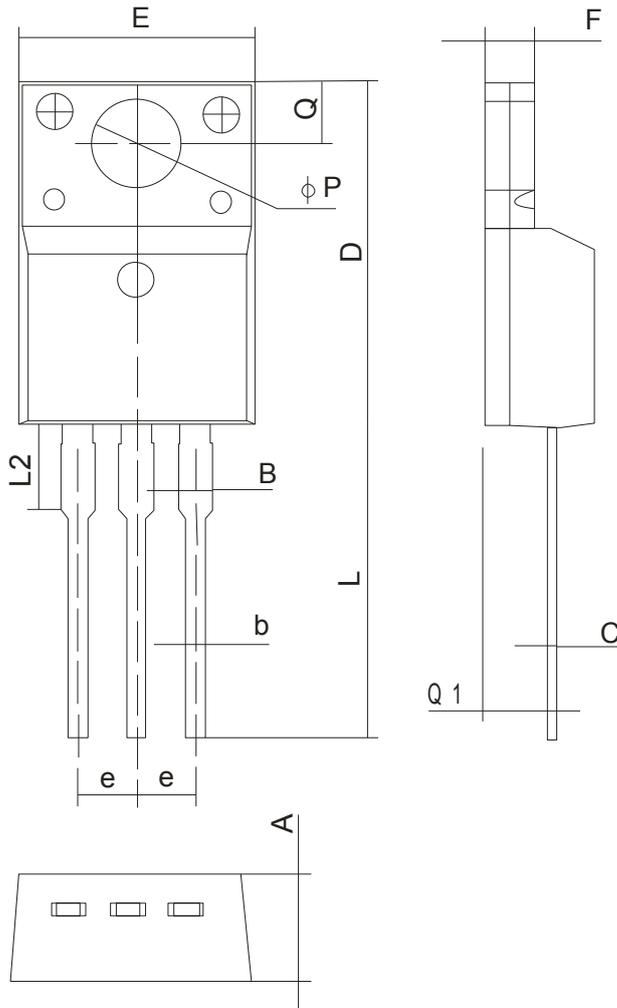


Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

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
Q1	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.

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