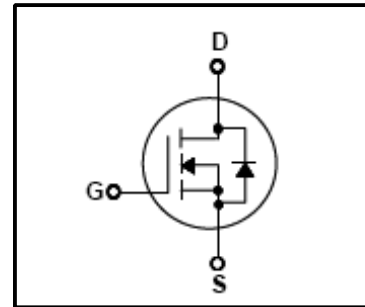


**Silicon N-Channel MOSFET**

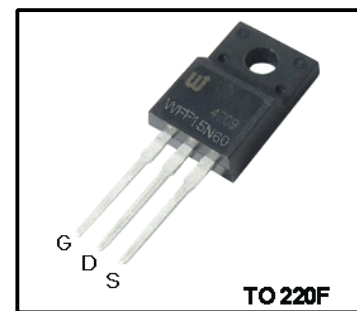
**Features**

- 15A,600V,  $R_{DS(on)}$ (Max0.52 $\Omega$ )@ $V_{GS}=10V$
- Ultra-low Gate charge(Typical 36nC)
- 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 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	600	V
$I_D$	Continuous Drain Current(@ $T_c=25^{\circ}C$ )	15*	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$ )	9.5*	A
$I_{DM}$	Drain Current Pulsed (Note1)	60*	A
$V_{GS}$	Gate to Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy (Note2)	245	mJ
$E_{AR}$	Repetitive Avalanche Energy (Note1)	23.9	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	9.8	V/ ns
$P_D$	Total Power Dissipation(@ $T_c=25^{\circ}C$ )	53	W
	Derating Factor above 25 $^{\circ}C$	0.42	W/ $^{\circ}C$
$T_J, T_{stg}$	Junction and Storage Temperature	-55~150	$^{\circ}C$
$T_L$	Channel Temperature	300	$^{\circ}C$

\*Drain current limited by maximum junction temperature

**Thermal Characteristics**

Symbol	Parameter	Value			Units
		Min	Typ	Max	
$R_{QJC}$	Thermal Resistance , Junction -to -Case	-	-	2.36	$^{\circ}C/W$
$R_{QJA}$	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 <sub>GSS</sub>	V <sub>GS</sub> =±30V,V <sub>DS</sub> =0V	-	-	±100	nA
Gate-source breakdown voltage		V <sub>(BR)GSS</sub>	I <sub>G</sub> =±10 μA,V <sub>DS</sub> =0V	±30	-	-	V
Drain cut -off current		I <sub>DSS</sub>	V <sub>DS</sub> =600V,V <sub>GS</sub> =0V	-	-	10	μA
			V <sub>DS</sub> =480V,TC=125 °C			100	μA
Drain -source breakdown voltage		V <sub>(BR)DSS</sub>	I <sub>D</sub> =250 μA,V <sub>GS</sub> =0V	600	-	-	V
Breakdown voltage Temperature Coefficient		$\Delta BV_{DSS} / \Delta T_J$	I <sub>D</sub> =250μA,Referenced to 25 °C	-	0.79	-	V/°C
Gate threshold voltage		V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =250 μA	3	-	5	V
Drain -source ON resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V,I <sub>D</sub> =7.5A	-	0.45	0.52	Ω
Forward Transconductance		g <sub>fs</sub>	V <sub>DS</sub> =40V,I <sub>D</sub> =7.5A	-	19.8	-	S
Input capacitance		C <sub>iss</sub>	V <sub>DS</sub> =25V,	-	2270	3000	pF
Reverse transfer capacitance		C <sub>rss</sub>	V <sub>GS</sub> =0V,	-	23	37	
Output capacitance		C <sub>oss</sub>	f=1MHz	-	300	405	
Switching time	Turn-On Rise time	t <sub>r</sub>	V <sub>DD</sub> =250V,	-	78	162	ns
	Turn-on delay time	T <sub>d(on)</sub>	I <sub>D</sub> =15A	-	50	101	
	Turn-On Fall time	t <sub>f</sub>	R <sub>G</sub> =25Ω	-	66	128	
	Turn-off delay time	T <sub>d(off)</sub>	(Note4,5)	-	120	261	
Total gate charge(gate-source plus gate-drain)		Q <sub>g</sub>	V <sub>DD</sub> =480V, V <sub>GS</sub> =10V,	-	36	60	nC
Gate-source charge		Q <sub>gs</sub>	I <sub>D</sub> =15A	-	9	-	
Gate-drain("miller") Charge		Q <sub>gd</sub>	(Note4,5)	-	16	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I <sub>DR</sub>	-	-	-	15	A
Pulse drain reverse current	I <sub>DRP</sub>	-	-	-	60	A
Forward voltage(diode)	V <sub>DSF</sub>	I <sub>DR</sub> =15A,V <sub>GS</sub> =0V	-	-	1.4	V
Reverse recovery time	t <sub>rr</sub>	I <sub>DR</sub> =15A,V <sub>GS</sub> =0V,	-	600	-	ns
Reverse recovery charge	Q <sub>rr</sub>	dI <sub>DR</sub> / dt =100 A / μs	-	7.2	-	μC

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

2.L=2.0mH I<sub>AS</sub>=15A,V<sub>DD</sub>=50V,R<sub>G</sub>=25Ω,Starting T<sub>J</sub>=25 °C

3.I<sub>SD</sub>≤15A,di/dt≤200A/μs,V<sub>DD</sub><BV<sub>DSS</sub>,STARTING T<sub>J</sub>=25 °C

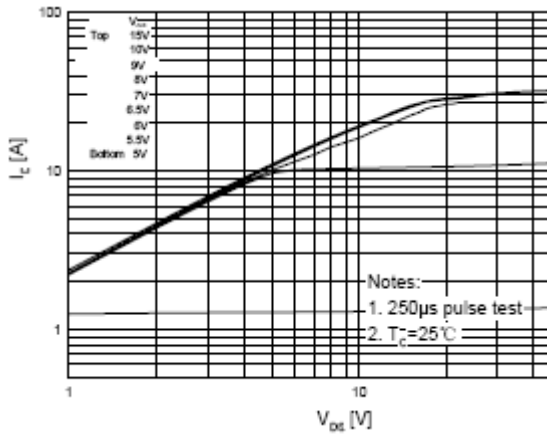
4.Pulse Test:Pulse Width≤300us,Duty Cycle≤2%

5. Essentially independent of operating temperature.

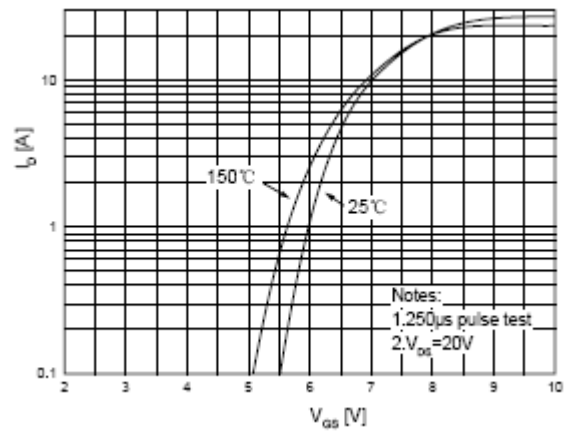
This transistor is an electrostatic sensitive device

Please handle with caution

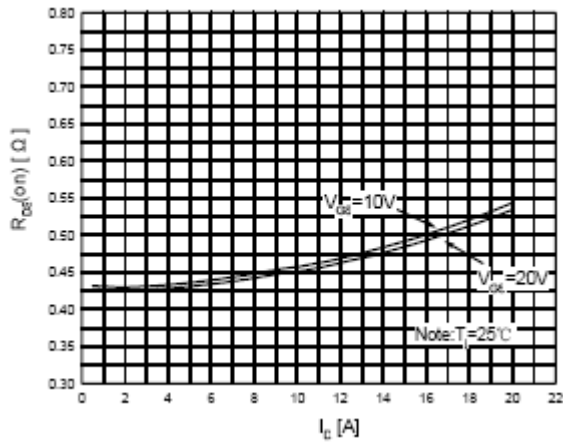




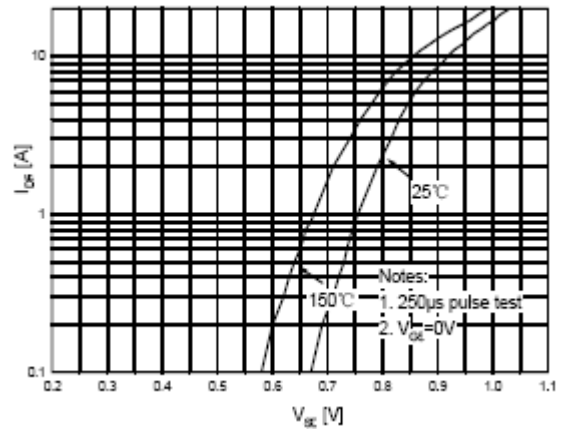
**Fig.1 On region Characteristics**



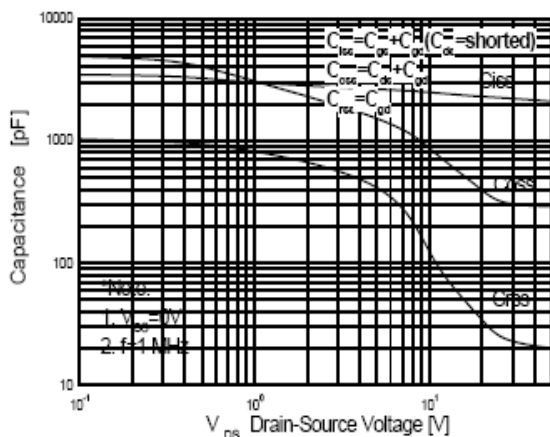
**Fig.2 Transfer Characteristics**



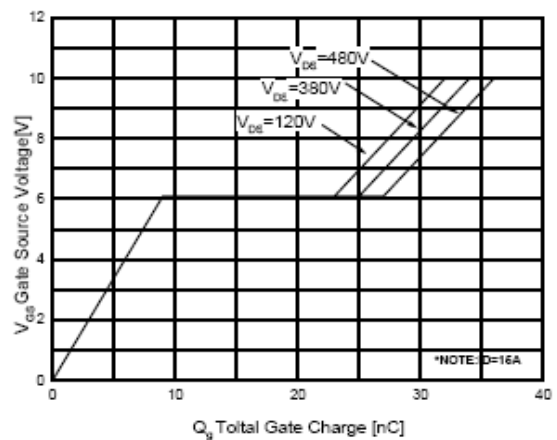
**Fig.3 On-Resistance Variation vs Drain current and gate voltage**



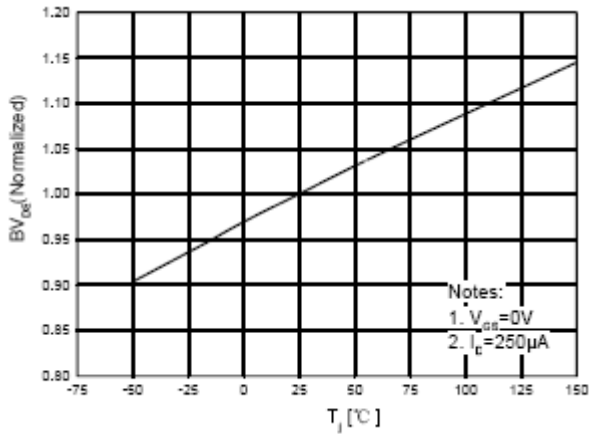
**Fig.4 Body diode Forward voltage variation vs source current and temperature**



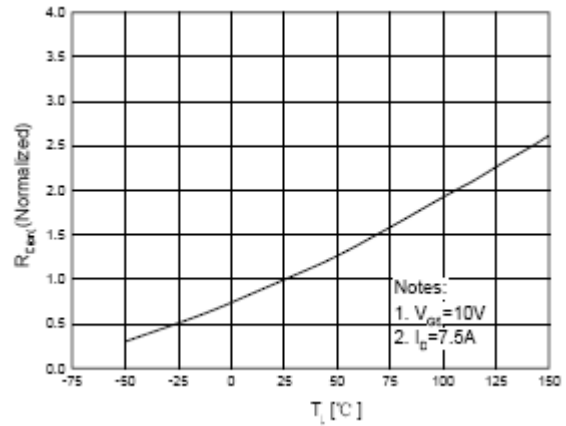
**Fig.5 Capacitance characteristics**



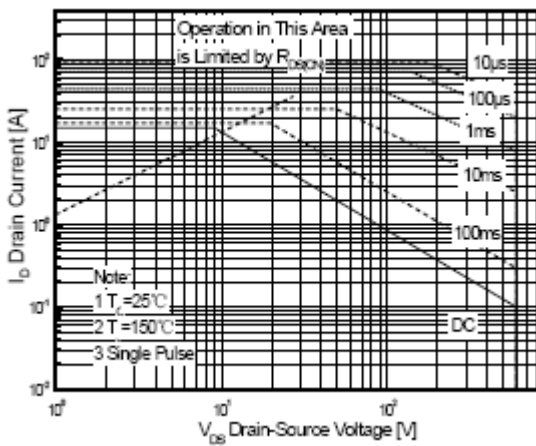
**Fig.6 Gate Charge Characteristics**



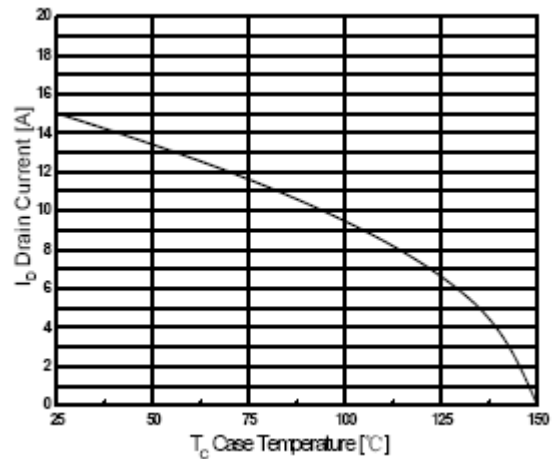
**Fig.7 Breakdown voltage variation vs temperature**



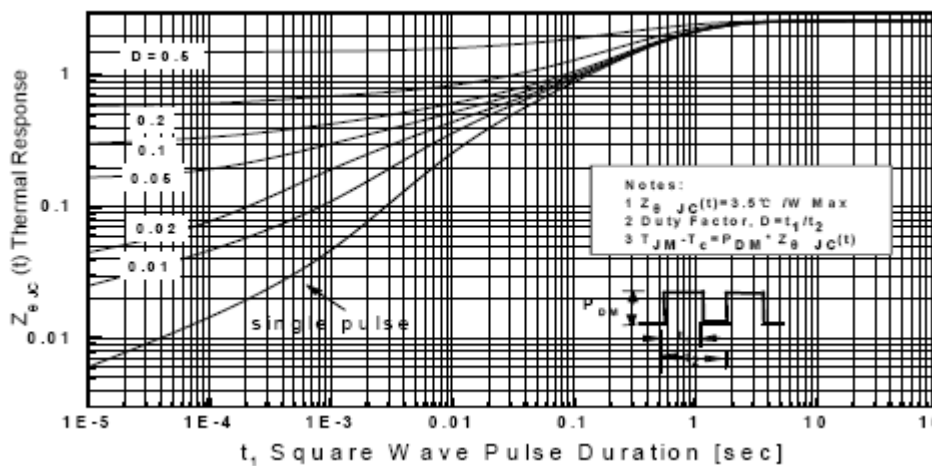
**Fig.8 On-Resistance variation vs temperature**



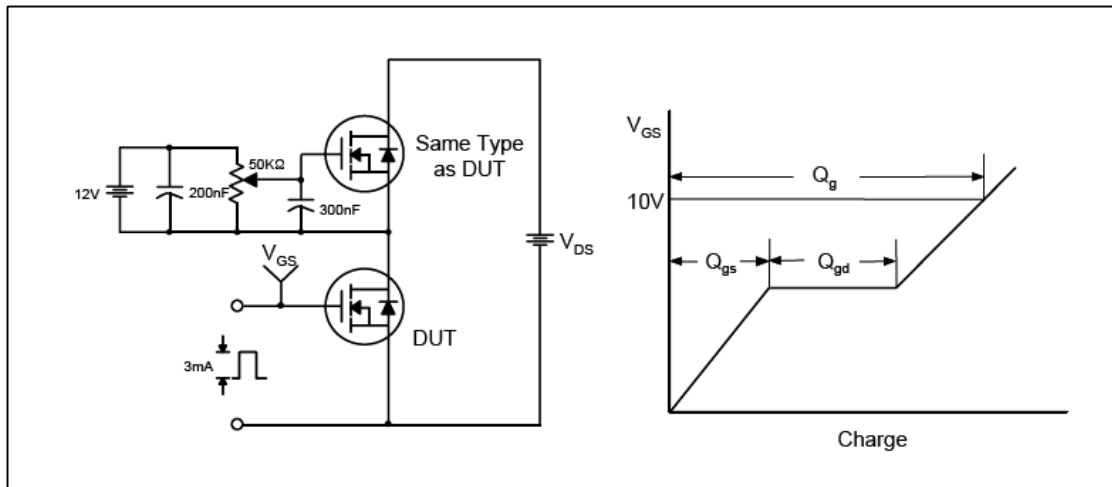
**Fig.7 Maximum Safe Operation Area**



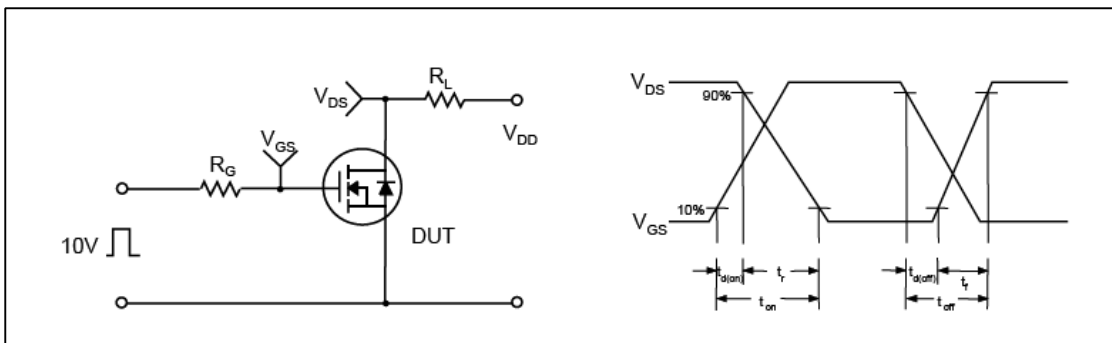
**Fig.8 Maximum Drain Current vs Case temperature**



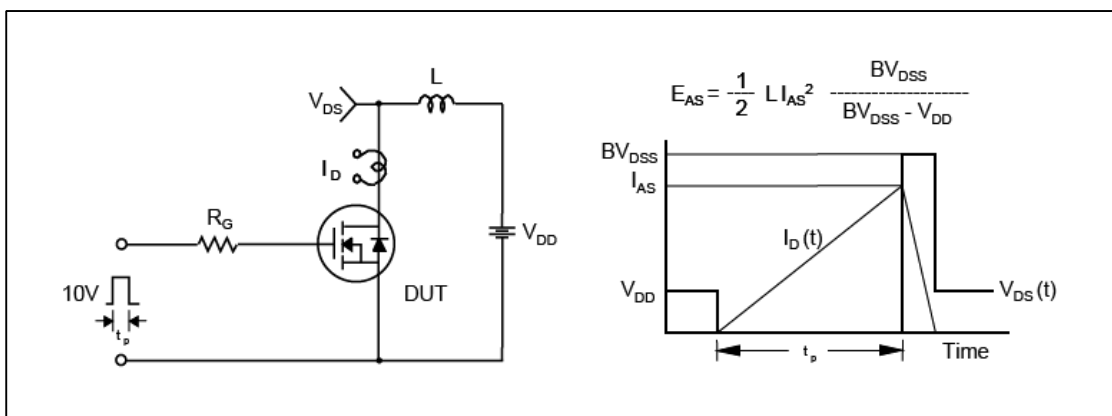
**Fig.9 Transient thermal Response Curve**



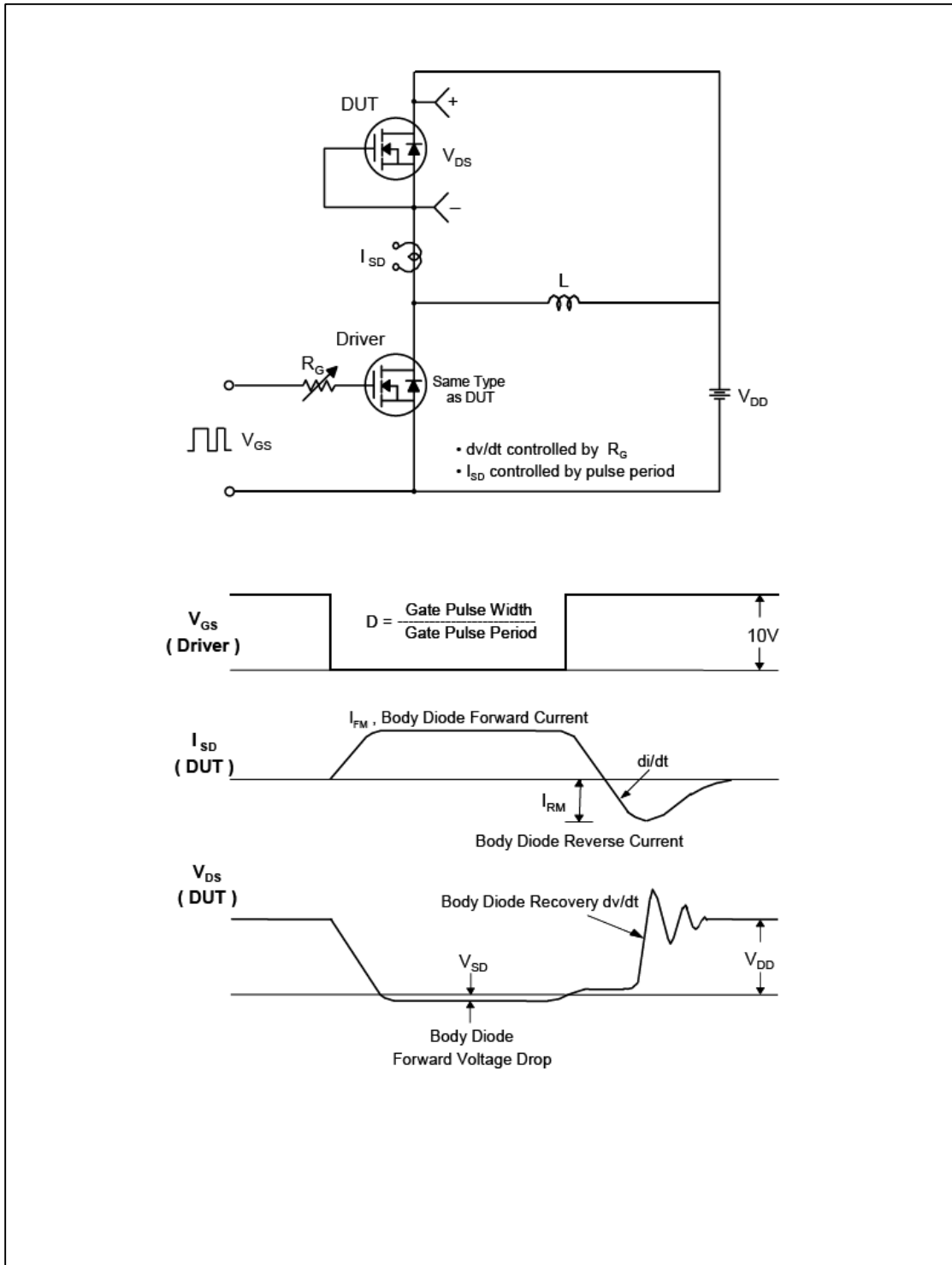
**Fig.10 Gate Test circuit & Waveform**



**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-220F Package Dimension**

