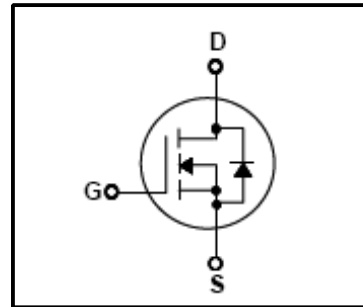


**Silicon N-Channel MOSFET**

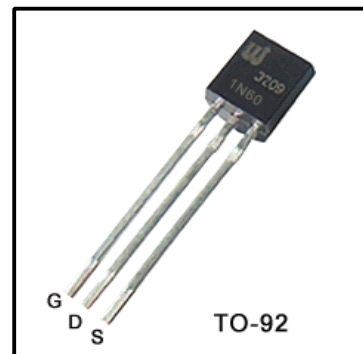
**Features**

- 1.3A,600V,  $R_{DS(on)}$ (Max8.5Ω)@ $V_{GS}=10V$
- Ultra-low Gate charge(Typical 9.1nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150℃)



**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 high efficiency switch mode power supply, electronic Lamp ballasts based on half bridge and UPS.



**Absolute Maximum Ratings**

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain Source Voltage	600	V
$I_D$	Continuous Drain Current(@ $T_c=25^{\circ}C$ )	1.3	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$ )	0.84	A
$I_{DM}$	Drain Current Pulsed (Note1)	5.0	A
$V_{GS}$	Gate to Source Voltage	±30	V
$E_{AS}$	Single Pulsed Avalanche Energy (Note2)	78	mJ
$E_{AR}$	Repetitive Avalanche Energy (Note1)	3.9	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	5.5	V/ ns
$P_D$	Total Power Dissipation(@ $T_c=25^{\circ}C$ )	5	W
	Derating Factor above 25℃	0.05	W/℃
$T_J, T_{stg}$	Junction and Storage Temperature	-55~150	℃
$T_L$	Channel Temperature	300	℃

**Thermal Characteristics**

Symbol	Parameter	Value			Units
		Min	Typ	Max	
$R_{QJC}$	Thermal Resistance , Junction -to -Case	-	-	25	℃/W
$R_{QJA}$	Thermal Resistance , Junction-to -Ambient	-	-	120	℃/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	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I <sub>D</sub> =1mA,Referenced to 25 °C	-	0.65	-	V/°C	
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =250 μA	2.0	-	4.0	V	
Drain -source ON resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V,I <sub>D</sub> =0.65A	-	7.7	8.5	Ω	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =50V,I <sub>D</sub> =6.5A	-	1.3	-	S	
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V,	-	247	319	pF	
Reverse transfer capacitance	C <sub>rss</sub>	V <sub>GS</sub> =0V,	-	4.9	6.4		
Output capacitance	C <sub>oss</sub>	f=1MHz	-	23	30		
Switching time	Turn-On Rise time	t <sub>r</sub>	V <sub>DD</sub> =300V, I <sub>D</sub> =1.3A R <sub>G</sub> =25Ω (Note4,5)	-	33	72	ns
	Turn-on delay time	T <sub>d(on)</sub>		-	11	26	
	Turn-On Fall time	t <sub>f</sub>		-	26	59	
	Turn-off delay time	T <sub>d(off)</sub>		-	26	59	
Total gate charge(gate-source plus gate-drain)	Q <sub>g</sub>	V <sub>DD</sub> =480V, V <sub>GS</sub> =10V,	-	9.1	12	nC	
Gate-source charge	Q <sub>gs</sub>	I <sub>D</sub> =1.3A	-	1.2	-		
Gate-drain("miller") Charge	Q <sub>gd</sub>	(Note4,5)	-	4.5	-		

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I <sub>DR</sub>	-	-	-	1.3	A
Pulse drain reverse current	I <sub>DRP</sub>	-	-	-	5.0	A
Forward voltage(diode)	V <sub>DSF</sub>	I <sub>DR</sub> =1.3A,V <sub>GS</sub> =0V	-	-	1.4	V
Reverse recovery time	t <sub>rr</sub>	I <sub>DR</sub> =1.3A,V <sub>GS</sub> =0V,	-	163	-	ns
Reverse recovery charge	Q <sub>rr</sub>	dI <sub>DR</sub> / dt =100 A / μs	-	0.85	-	μC

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

2.L=92mH I<sub>AS</sub>=1.3A,V<sub>DD</sub>=50V,R<sub>G</sub>=25Ω,Starting T<sub>J</sub>=25 °C

3.I<sub>SD</sub>≤1.3A,di/dt≤200A/us,V<sub>DD</sub><BV<sub>DSS</sub>,STARTING T<sub>J</sub>=25 °C

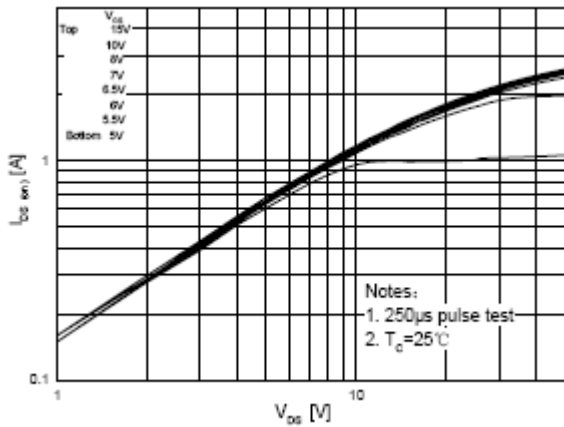
4.Pulse Test:Pulse Width≤300us,Duty Cycle≤2%

5. Essentially independent of operating temperature.

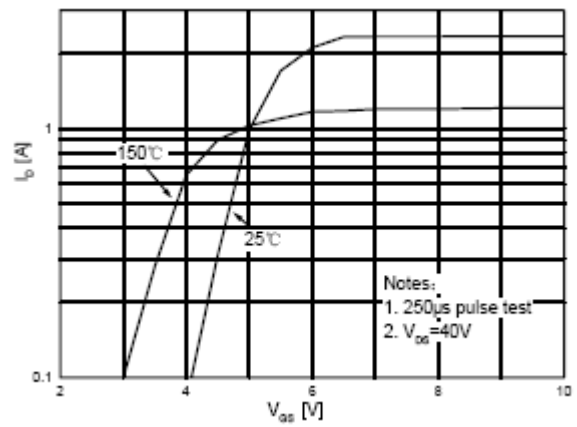
This transistor is an electrostatic sensitive device

Please handle with caution

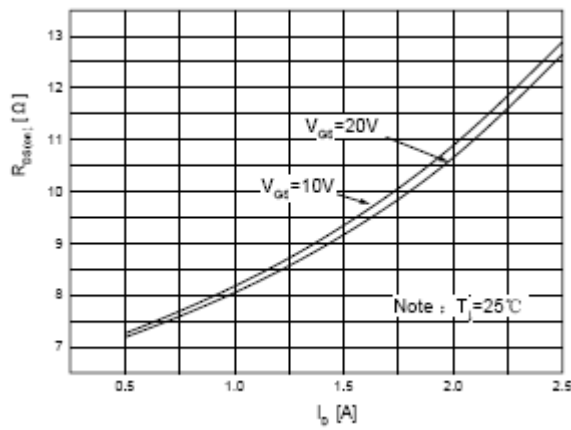




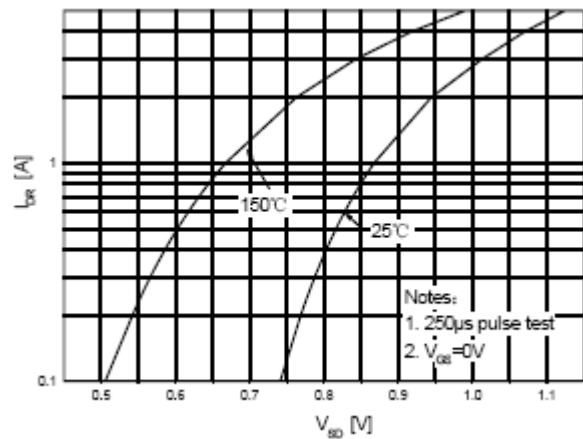
**Fig.1 On State Characteristics**



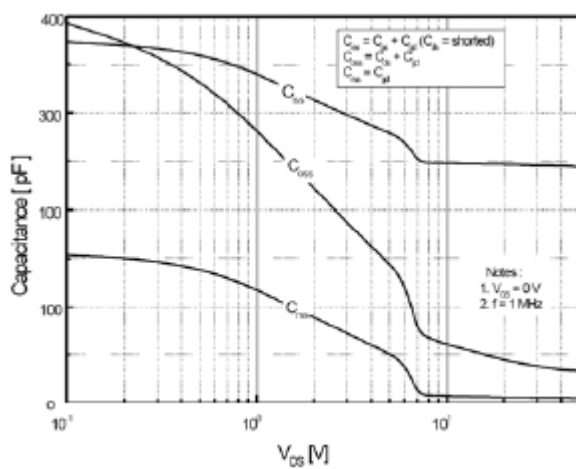
**Fig.2 Transfer Characteristics**



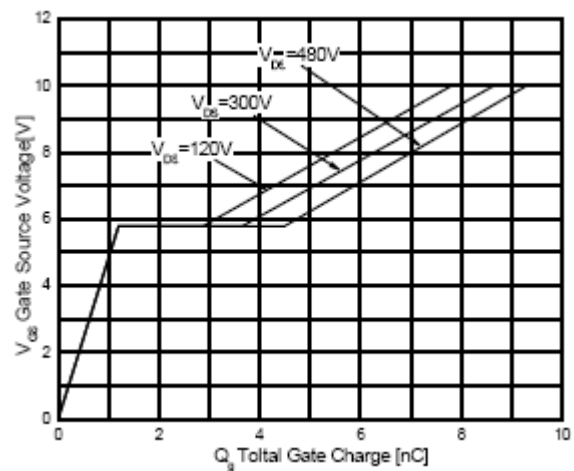
**Fig.3 On-Resistance Variation vs Drain current and gate voltage**



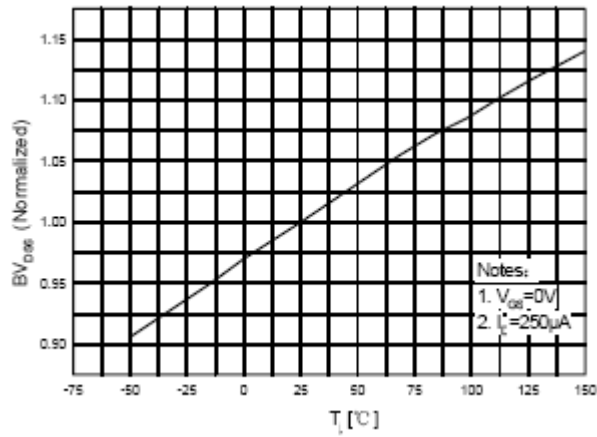
**Fig.4 Body diode Forward voltage variation vs source current and temperature**



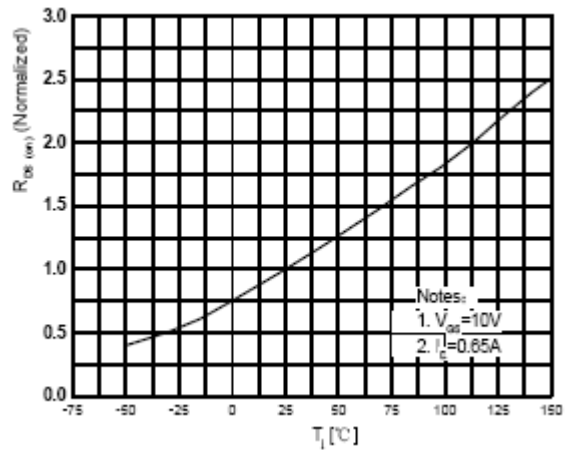
**Fig.5 Capacitance characteristics**



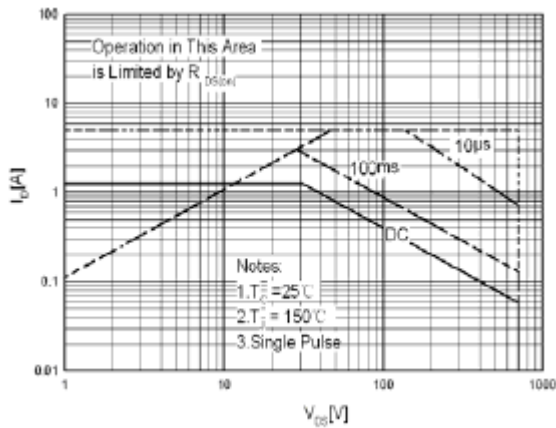
**Fig.6 Gate Charge Characteristics**



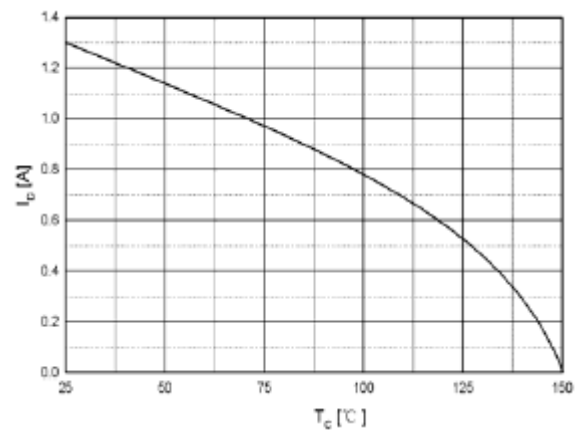
**Fig.7 Breakdown voltage variation vs temperature**



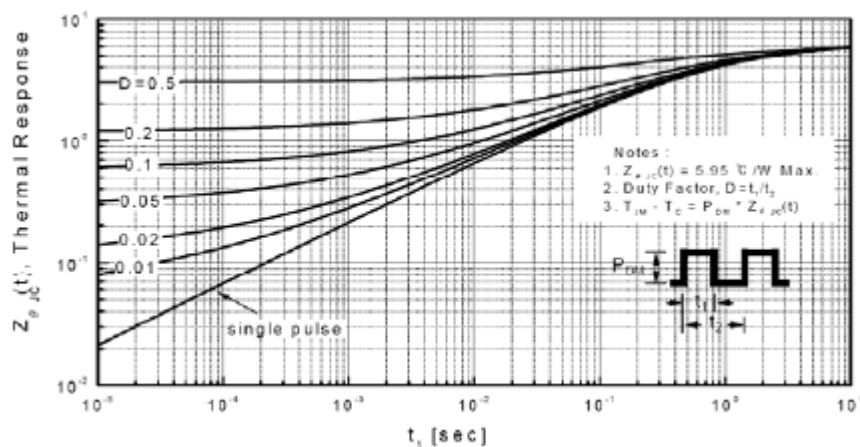
**Fig.8 On-Resistance variation vs temperature**



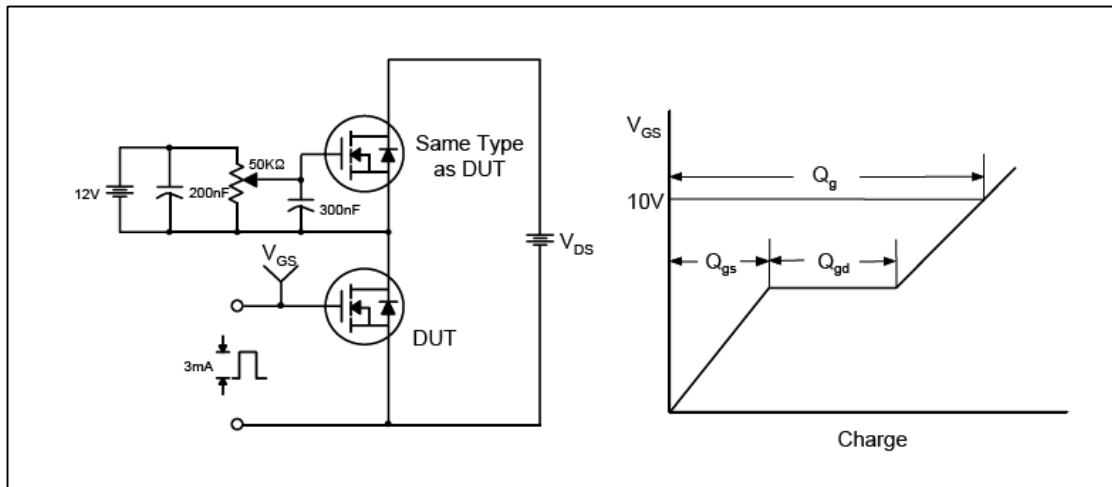
**Fig.7 Maximum Safe Operation Area**



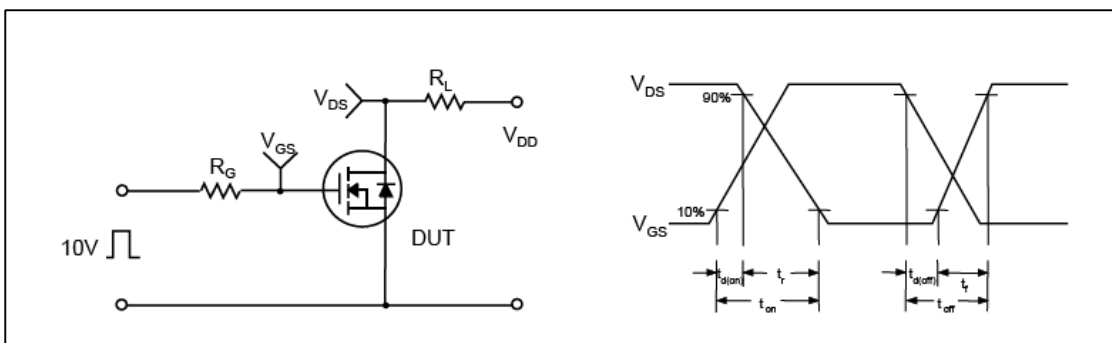
**Fig.8 Maximum Drain Current vs Case temperature**



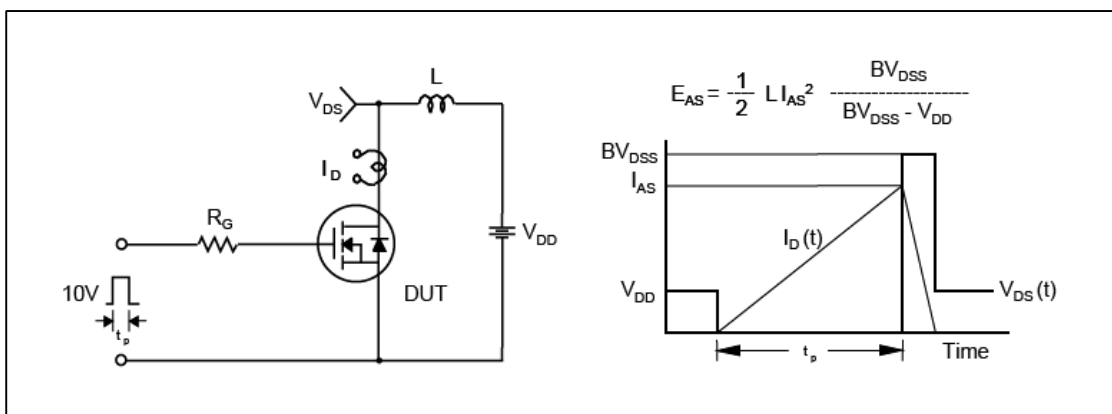
**Fig.9 Transient thermal Response Curve**



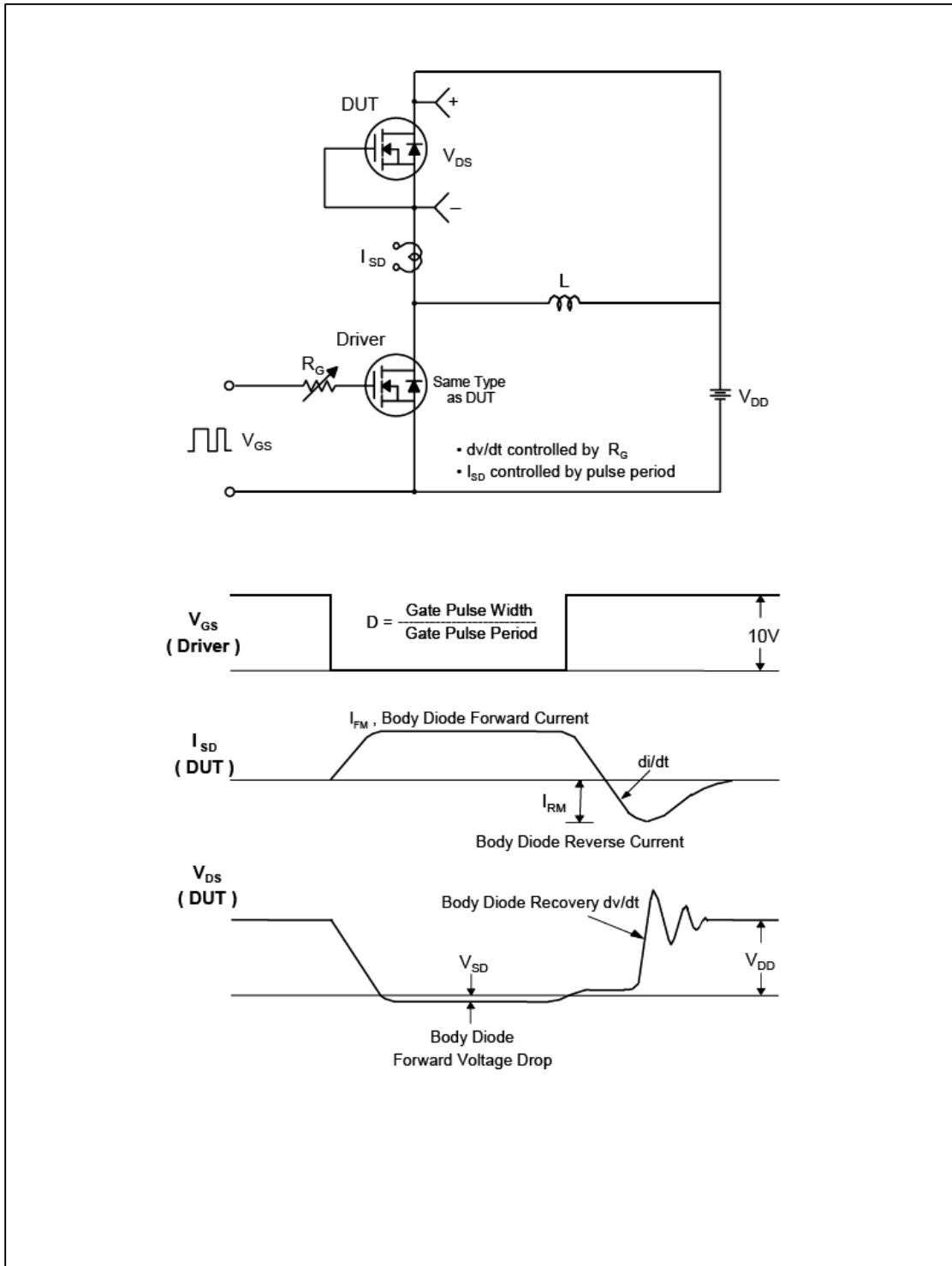
**Fig.10 Gate Test circuit & Waveform**



**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**

**TO92 Package Dimension**

Unit:mm

