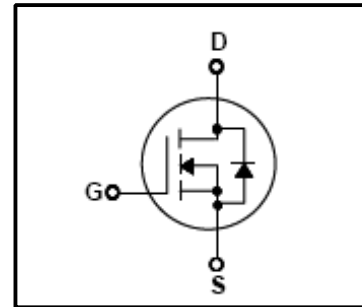


Silicon N-Channel MOSFET

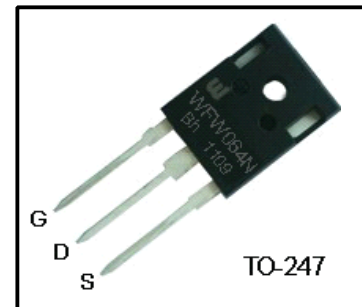
Features

- 109A,60V, $R_{DS(on)}$ (Max 8m Ω)@ $V_{GS}=10V$
- Ultra-low Gate charge(Typical 50nC)
- 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 lowgate charge with superior switching performance ,and ruggedavalanche characteristics.This Power MOSFET is well suited for synchronous DC-DC Converters and power Management inportable and battery operated products.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	60	V
I_D	Continuous Drain Current(@ $T_c=25^{\circ}C$)	109	A
	Continuous Drain Current(@ $T_c=100^{\circ}C$)	80	A
I_{DM}	Drain Current Pulsed (Note1)	390	A
V_{GS}	Gate to Source Voltage	± 20	V
E_{AR}	Repetitive Avalanche Energy (Note1)	20	mJ
dv/dt	Peak Diode Recovery dv/dt (Note3)	5.0	V/ ns
P_D	Total Power Dissipation(@ $T_c=25^{\circ}C$)	185	W
	Derating Factor above 25 $^{\circ}C$	1.1	W/ $^{\circ}C$
T_J	Junction Temperature	150	$^{\circ}C$
T_{stg}	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	-	-	0.68	$^{\circ}C/W$
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	40	$^{\circ}C/W$

Electrical Characteristics(Tc=25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit	
Gate leakage current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V	-	-	±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} =55V, V _{GS} =0V	-	-	25	μA	
		V _{DS} =44V, V _{GS} =0V, T _J =125°C	-	-	250	μA	
Drain -source breakdown voltage	V _{(BR)DSS}	I _D =250 μA, V _{GS} =0V	60	-	-	V	
Breakdown voltage Temperature Coefficient	ΔBV _{DSS} / ΔT _J	I _D =1mA, Referenced to 25°C	-	0.057	-	V/°C	
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	2	-	4	V	
Drain -source ON resistance	R _{DS(ON)}	V _{GS} =10V, I _D =55A	-	-	8.0	mΩ	
Forward Transconductance	g _{fs}	V _{DS} =25V, I _D =55A	44	-	-	S	
Input capacitance	C _{iss}	V _{DS} =25V,	-	3980	-	pF	
Reverse transfer capacitance	C _{rss}	V _{GS} =0V,	-	470	-		
Output capacitance	C _{oss}	f=1MHz	-	1290	-		
Switching time	Rise time	t _r	V _{DD} =28V,	-	100	-	ns
	Turn-on Delay time	T _{d(on)}	I _D =55A	-	14	-	
	Fall time	t _f	R _G =2.5Ω	-	70	-	
	Turn-off Delay time	T _{d(off)}	V _{GS} =10V (Note4,5)	-	43	-	
Total gate charge(gate-source plus gate-drain)	Q _g	V _{DS} =44V, I _D =55A	-	170	-	nC	
Gate-source charge	Q _{gs}	V _{GS} =10V,	-	32	-		
Gate-drain("miller") Charge	Q _{gd}	(Note4,5)	-	74	-		

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I _{DR}	-	-	-	109	A
Pulse drain reverse current	I _{DRP}	-	-	-	390	A
Forward voltage(diode)	V _{DSF}	I _{DR} =1A, V _{GS} =0V	-	-	1.2	V
Reverse recovery time	t _{rr}	I _{DR} =55A, T _J =25°C	-	100	170	ns
Reverse recovery charge	Q _{rr}	dI _{DR} / dt =100 A / μs	-	450	680	μC

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

2.L=190uH I_{AS}=55A,,R_G=25Ω, Starting T_J=25°C

3.I_{SD}≤55A, di/dt≤290A/us, V_{DD}<BV_{DSS}, T_J≤150°C

4.Pulse Test:Pulse Width≤400us,Duty Cycles≤2%

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

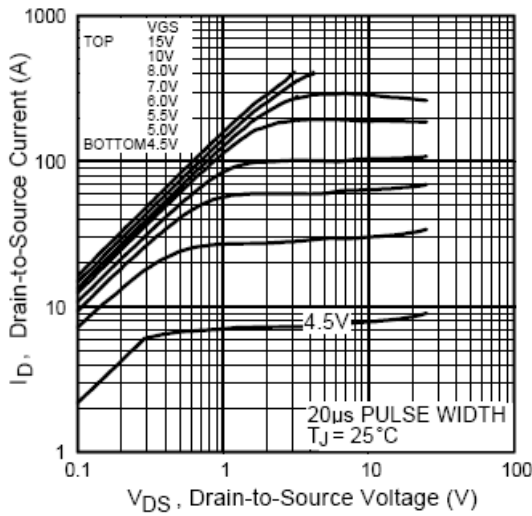


Fig.1 On State Characteristics

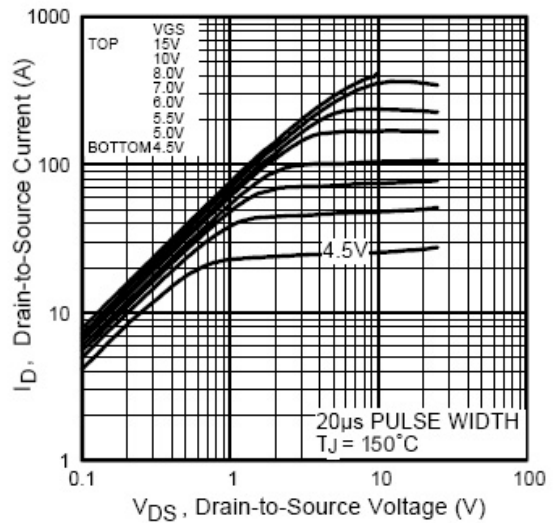


Fig.2 On State Characteristics

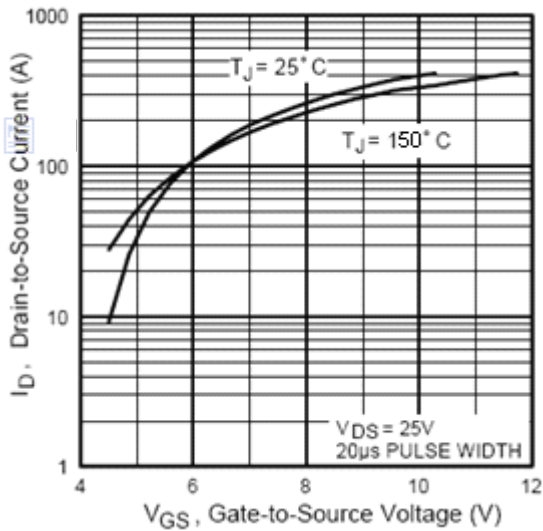


Fig.3 Transfer Characteristics

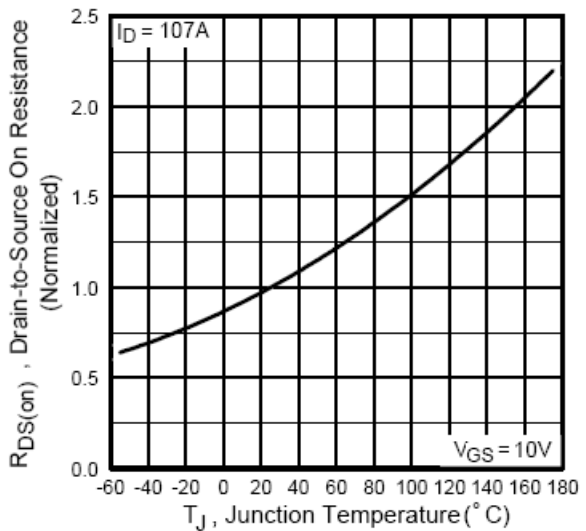


Fig.4 On-Resistance Variation vs Junction temperature

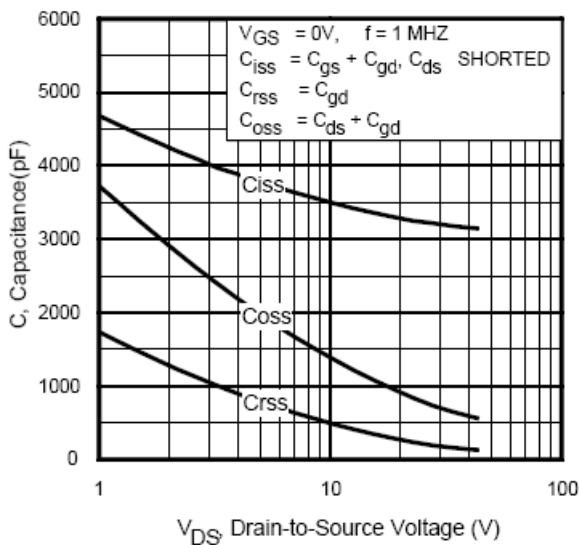


Fig.5 Capacitance Variation vs Drain Voltage

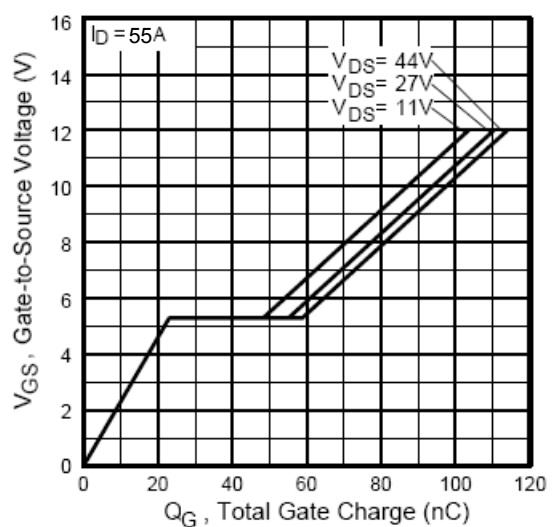


Fig.6 Gate Charge Characteristics



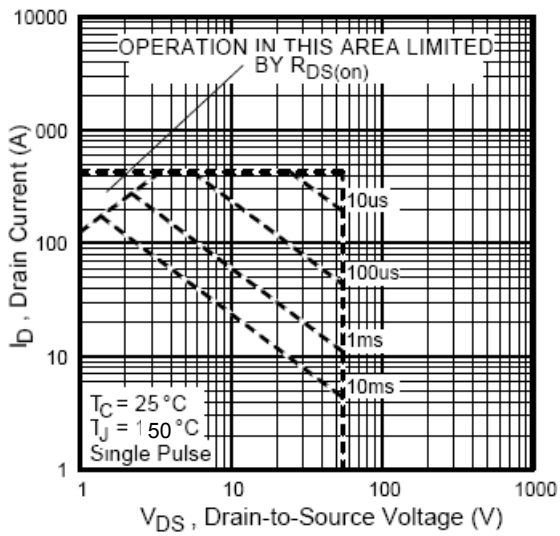


Fig.7 Maximum Safe Operation Area

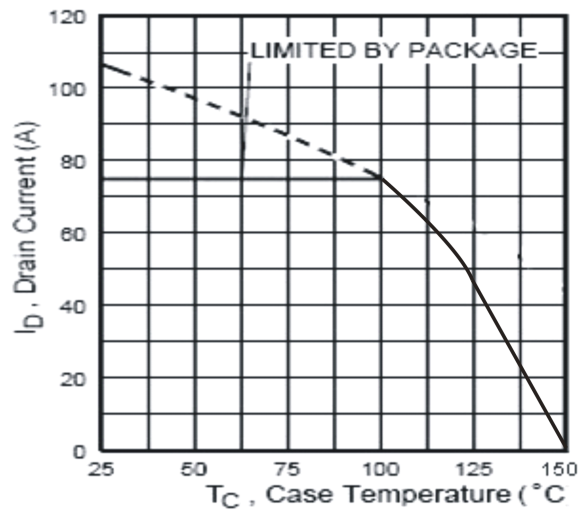


Fig.8 Maximum Drain Current vs Case temperature

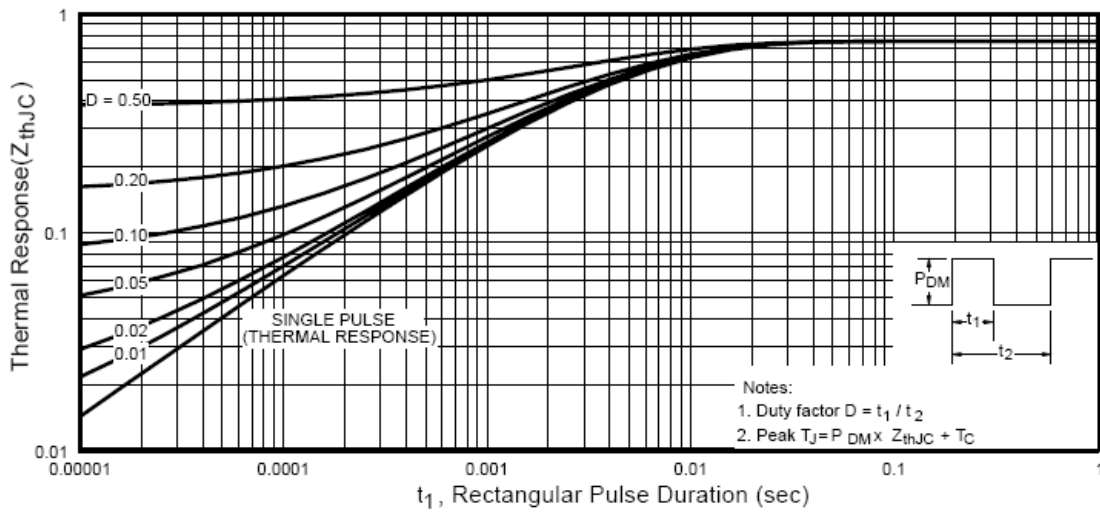


Fig.9 Transient thermal Response Curve

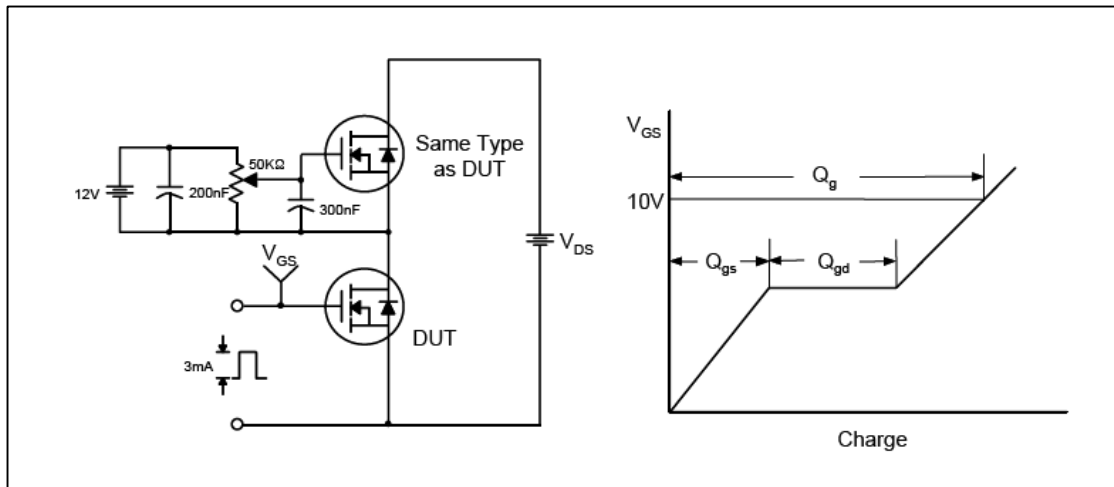


Fig.10 Gate Test circuit & Waveform

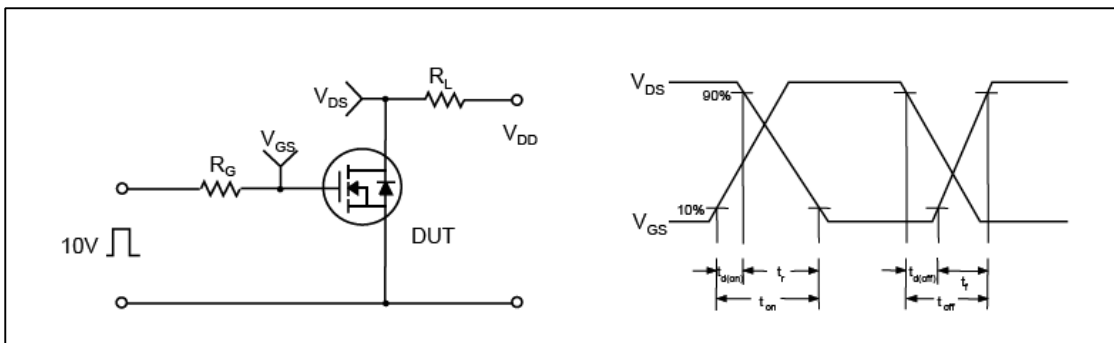


Fig.11 Resistive Switching Test Circuit & Waveform

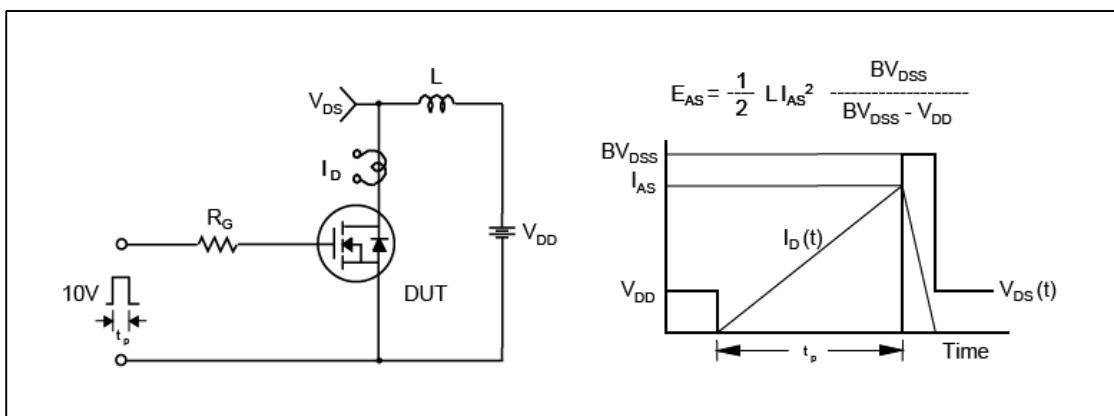


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

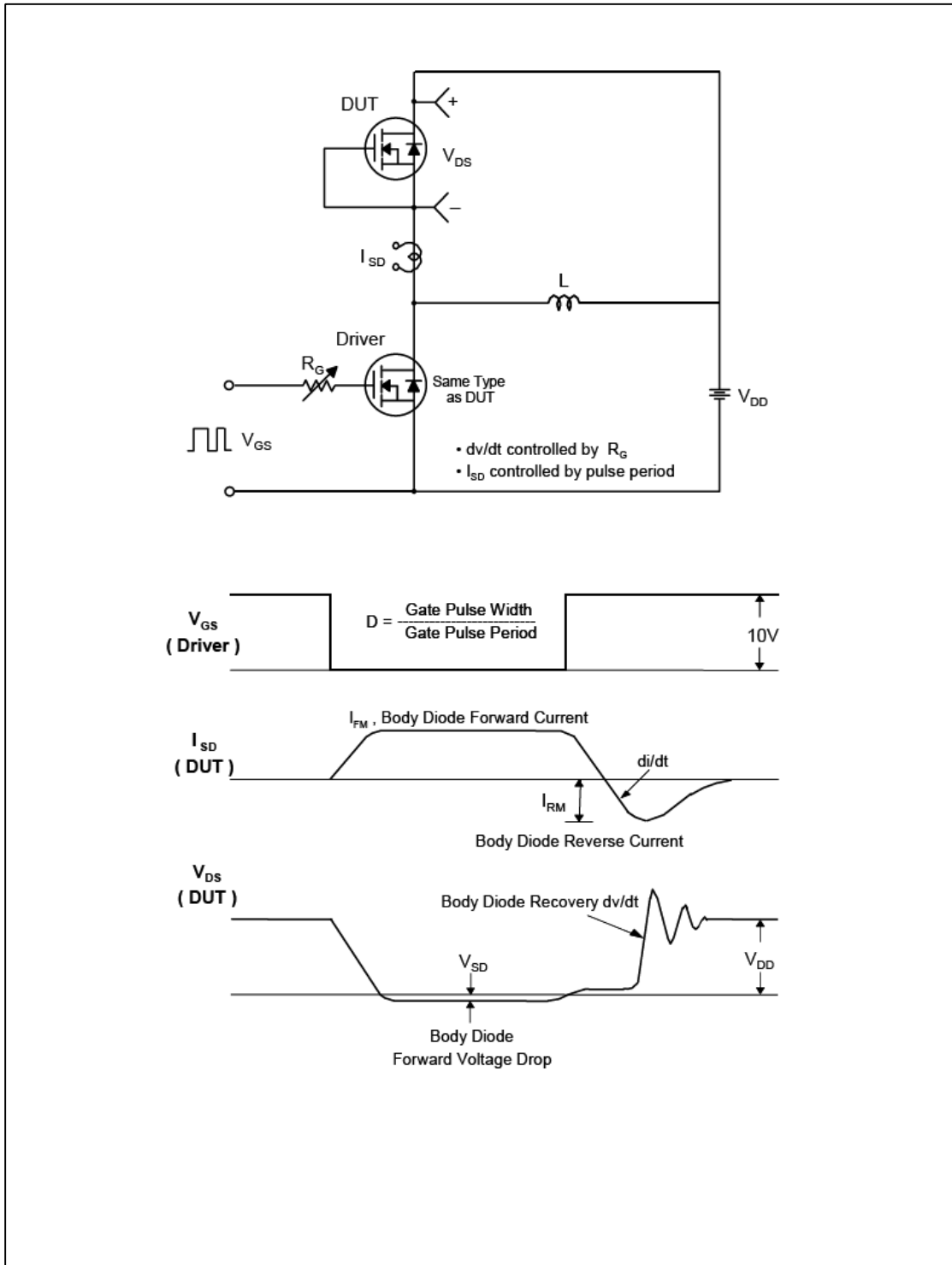


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-247 Package Dimension

