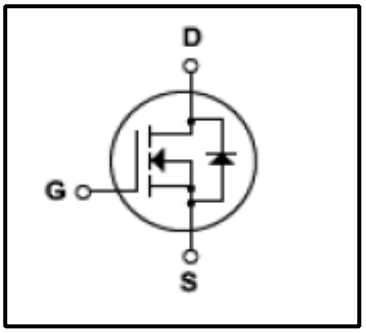
Silicon N-Channel MOSFET

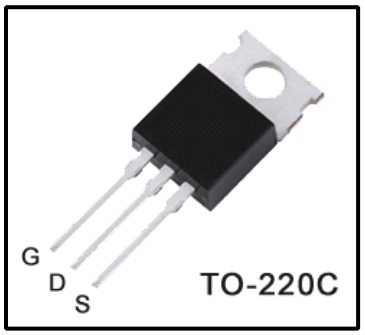
Features

- 4.5A,800V,$R_{DS(on)}$(Max2.5Ω)@V_{GS}=10V
- Ultra-low Gate charge(Typical 14nC)
- 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 devices is specially well suited for half bridge and full bridge resonant topology line a electronic lamp ballast, high efficiency switched mode power supplies, active power factor correction.



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain Source Voltage		800	V
I_D	Continuous Drain Current(@Tc=25℃)		4.5	A
	Continuous Drain Current(@Tc=100℃)		2.5	A
I_{DM}	Drain Current Pulsed	(Note1)	16	A
V_{GS}	Gate to Source Voltage		±30	V
E_{AS}	Single Pulsed Avalanche Energy	(Note2)	230	mJ
I_{AR}	Avalanche Current	(Note1)	4	
E_{AR}	Repetitive Avalanche Energy	(Note1)	11	mJ
dv/dt	Peak Diode Recovery dv /dt	(Note3)	4.5	V/ns
P_D	Total Power Dissipation(@Tc=25℃)		100	W
	Derating Factor above 25℃		1.28	W/℃
T_J	Junction Temperature		150	℃
T_{stg}	Storage Temperature		-55~150	
T_L	Channel Temperature		300	℃

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
$R_{\theta JC}$	Thermal Resistance , Junction -to -Case	-	-	1.25	℃/W
$R_{\theta JA}$	Thermal Resistance , Junction-to -Ambient	-	-	62.5	℃/W

Electrical Characteristics(Tc=25℃)

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}=800V,V_{GS}=0V,Tc=25℃	-	-	10	μA
			V_{DS}=640V,Tc=125℃	-	-	100	μA
Drain -source breakdown voltage		$V_{(BR)DSS}$	I_D=250 μA,V_{GS}=0V	800	-	-	V
Breakdown Voltage Temperature		$\Delta BV_{DSS}/\Delta T_J$	I_D=250μA,referenced to25℃	-	0.65	-	V/℃
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=2.25A	-	2.0	2.5	Ω
Forward Transconductance		gfs	V_{DS}=40V,I_D=2.25A	-	4.6	-	S
Input capacitance		C_{iss}	V_{DS}=25V,	-	1320	1716	pF
Reverse transfer capacitance		C_{rss}	V_{GS}=0V,	-	9	12	
Output capacitance		C_{oss}	f=1MHz	-	105	136	
Switching time	Turn-on Rise time	tr	V_{DD}=400V,	-	85	155	ns
	Turn-on delay time	Td(on)	I_D=4.5A	-	34	75	
	Turn-off Fall time	tf	R_G=25Ω	-	59	118	
	Turn-off delay time	Td(off)	(Note4,5)	-	56	113	
Total gate charge(gate-source plus gate-drain)		Qg	V_{DD}=640V, V_{GS}=10V,	-	14	19	nC
Gate-source charge		Qgs	I_D=4.5A	-	5	-	
Gate-drain("miller") Charge		Qgd	(Note,5)	-	6	-	

Source-Drain Ratings and Characteristics(Ta=25℃)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	4.5	A
Pulse drain reverse current	I_{DRP}	-	-	-	16	A
Forward voltage(diode)	V_{DSF}	I_{DR}=4.5A,V_{GS}=0V	-	-	1.4	V
Reverse recovery time	trr	I_{DR}=4.5A,V_{GS}=0V,	-	625	-	ns
Reverse recovery charge	Qrr	dI_{DR} /dt =100 A /μs	-	6.71	-	μC

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

2.L=40mH I_{AS}=4.5A,V_{DD}=50V,R_G=25Ω,Starting T_J=25℃

3.I_{SD}≤4.5A,di/dt≤200A/us,V_{DD}<BV_{DSS},STARTING T_J=25℃

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

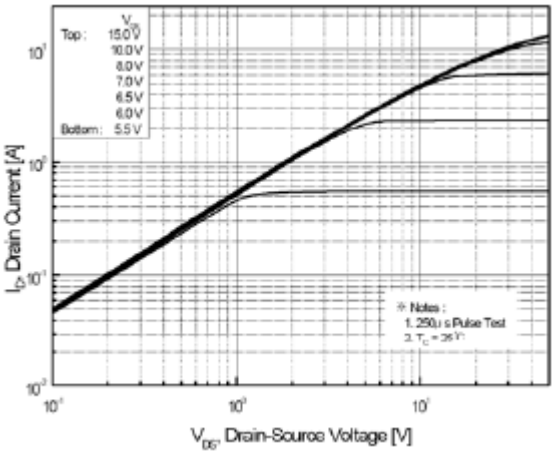


Fig.1 On-State characteristics

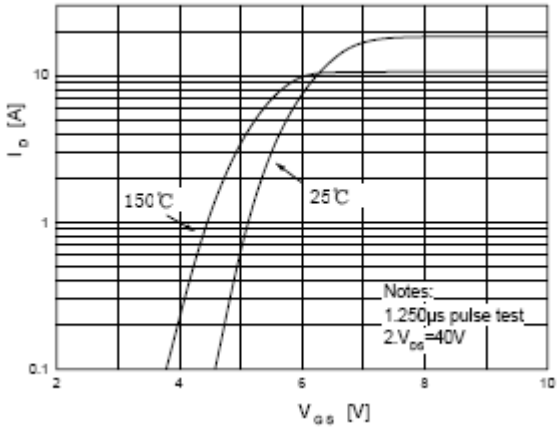


Fig.2 Transfer characteristics

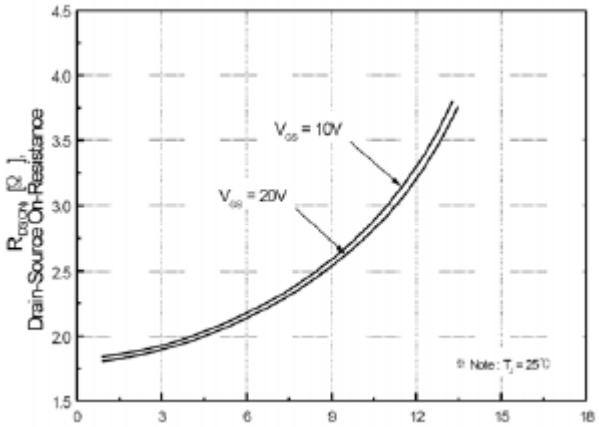


Fig.3 On-Resistance Variation vsDrain Current and Gate Voltage

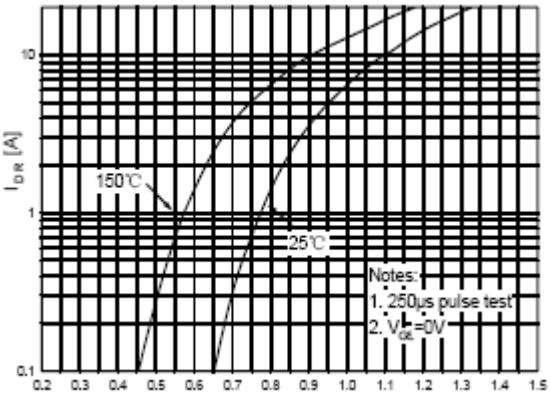


Fig.4 Body Diode Forward Voltage Variation with Source Current and Temperature

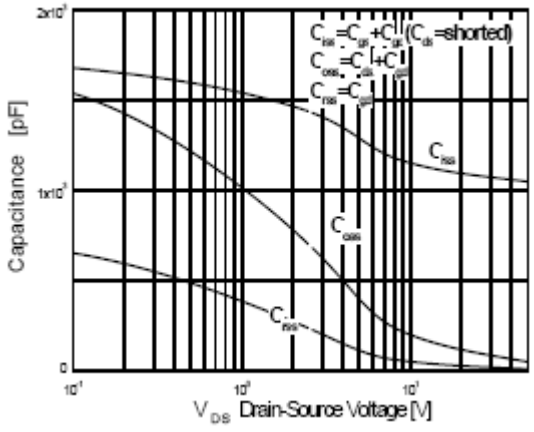


Fig.5 Capacitance Characteristics

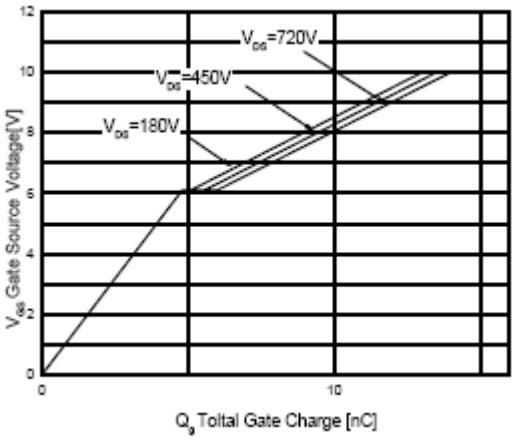


Fig.6 Gate Charge Characteristics

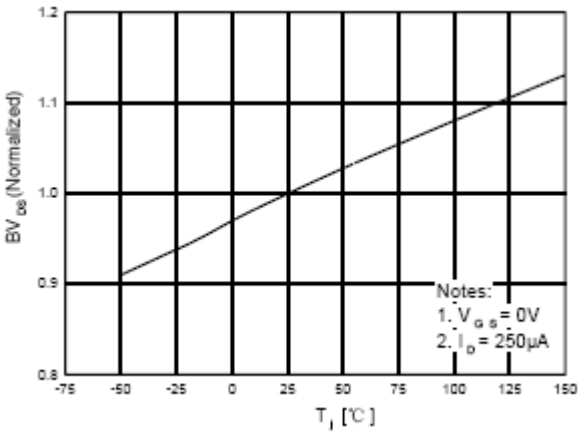


Fig.7 Breakdown Voltage Variation vs.Temperature

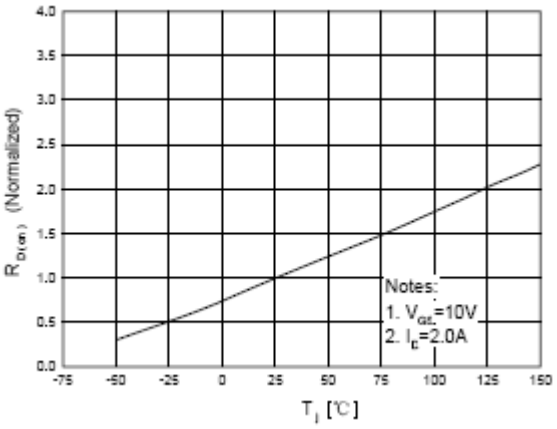


Fig.8 On-Resistance Variation vs. Temperature

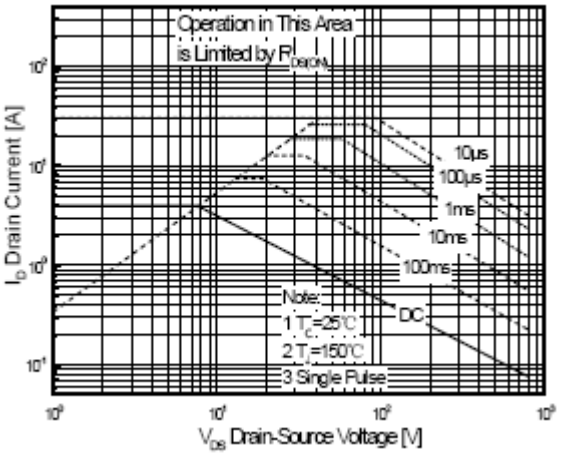


Fig.9 Maximum Safe Operation Area

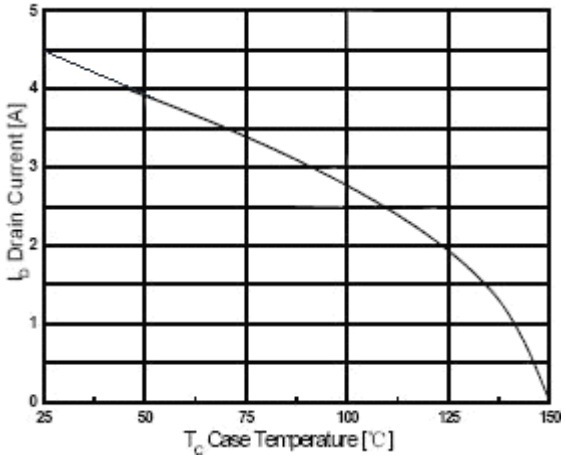


Fig.10 Maximum Drain Current vs Case Temperature

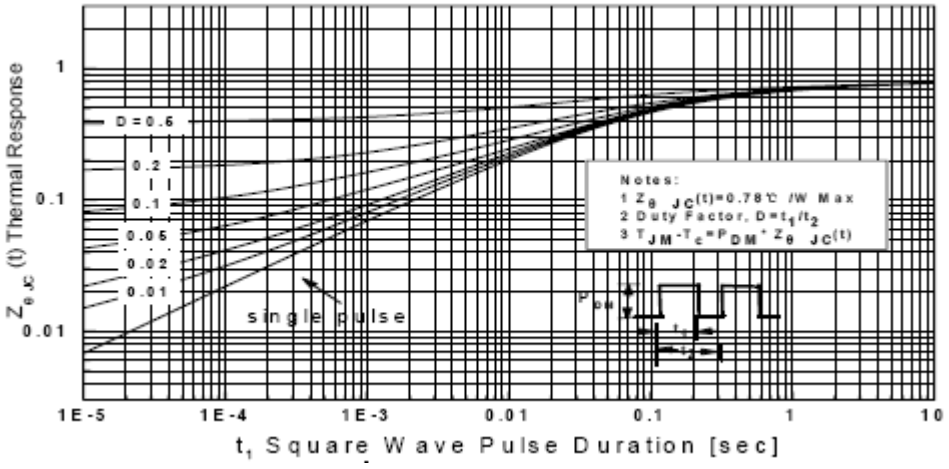


Fig.11 Transient Thermal Response Curve

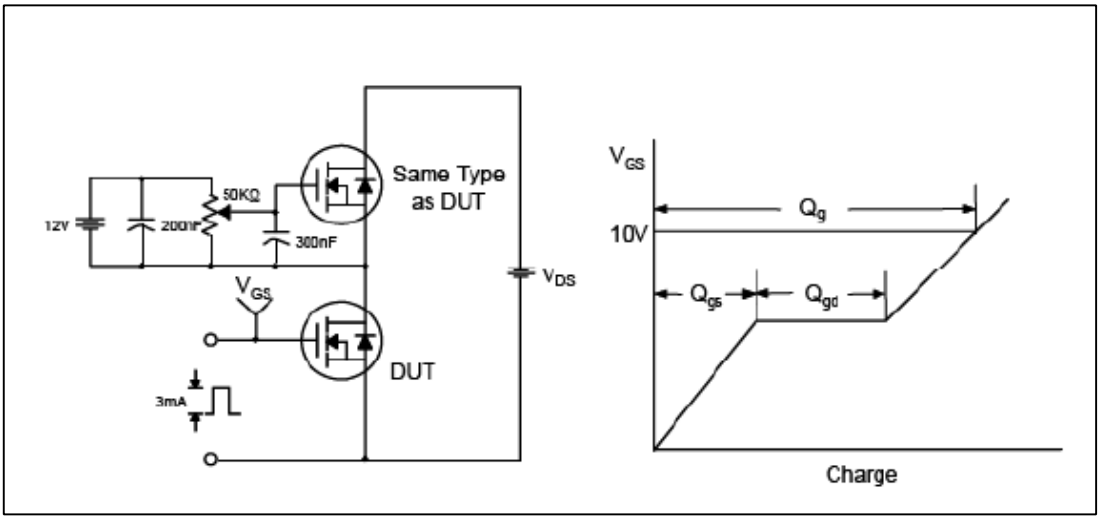


Fig.12 Gate Test Circuit & Waveform

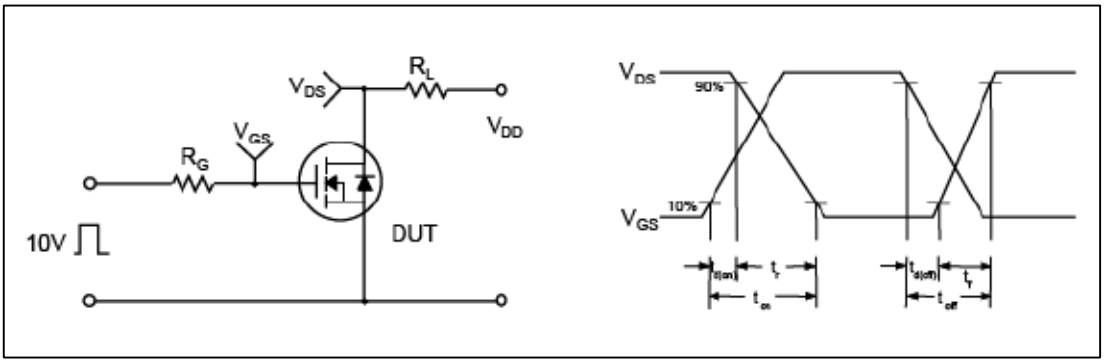


Fig.13 Resistive Switching Test Circuit & Waveform

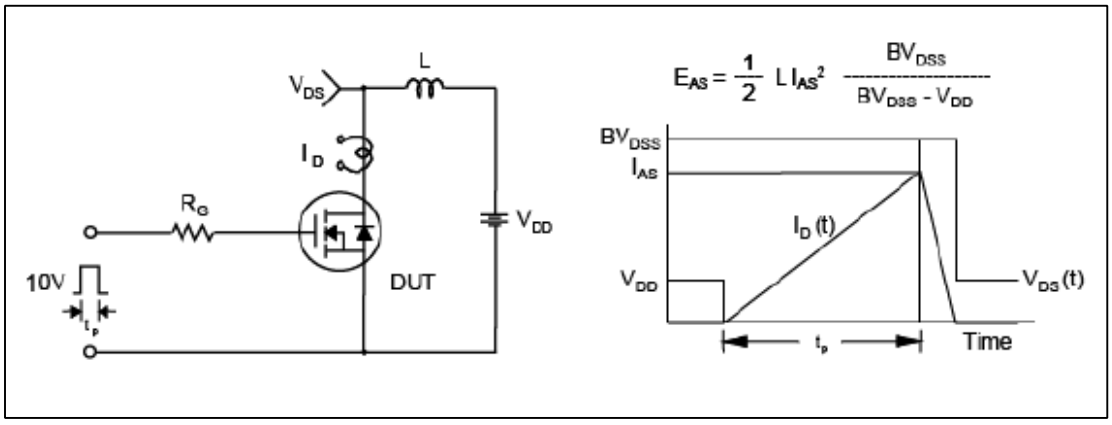


Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

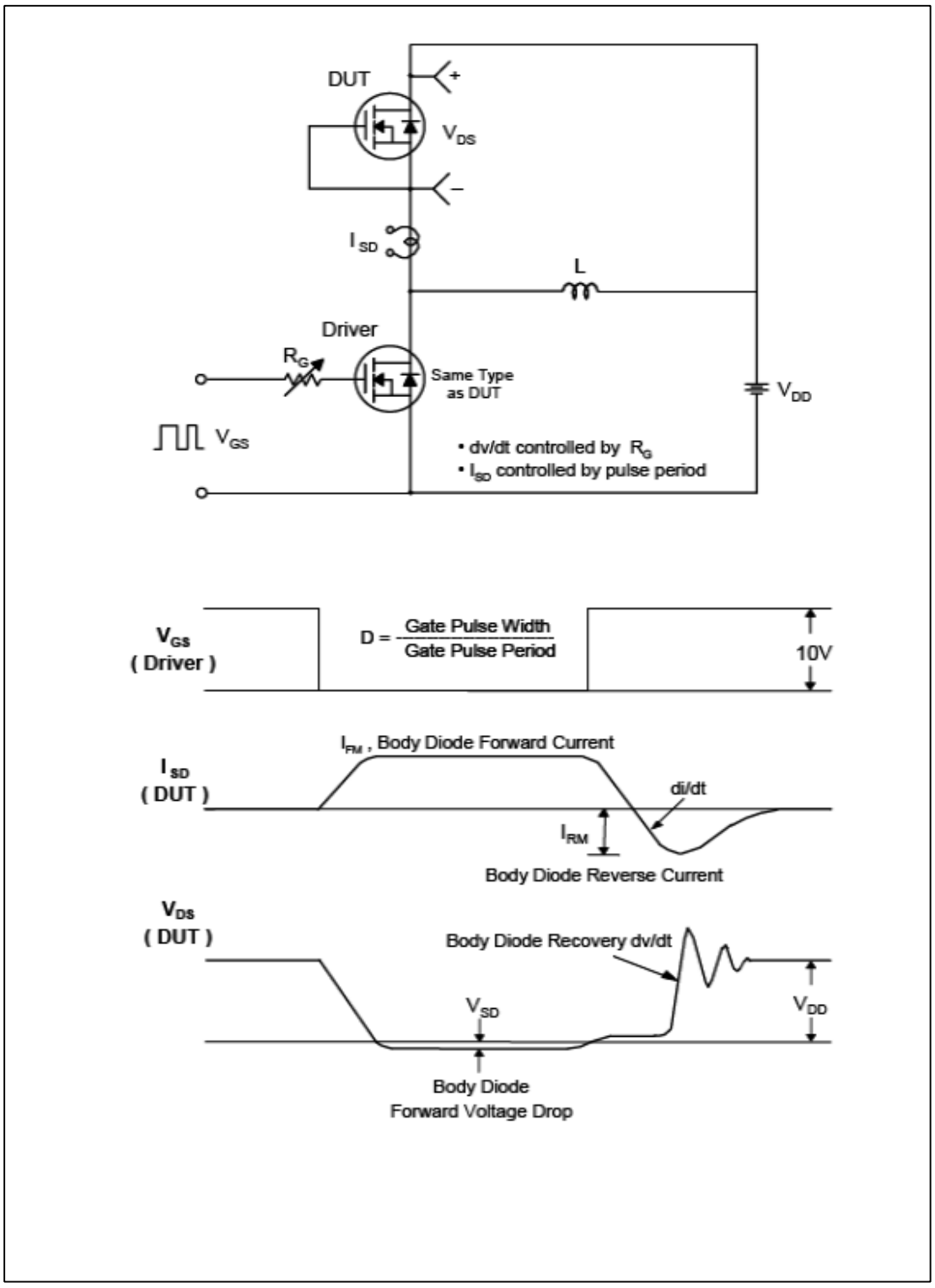


Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220C Package Dimension

Unit:mm