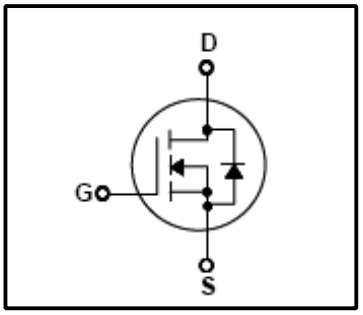
WFP3205

Silicon N-Channel MOSFET

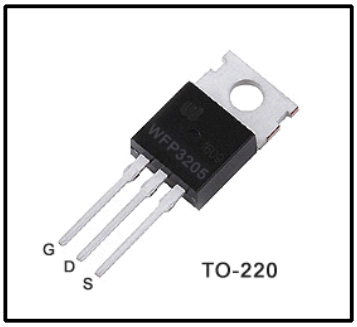
Features

- 110A,50V, $R_{DS(on)}$(Max 8mΩ)@V_{GS}=10V
- Ultra-low Gate charge(Typical133nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150℃)



General Description

This Power MOSFET is produced using Winsemi's advanced planar stripe,DMOS technology. This latest technology has beenespecially 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		50	V
I_D	Continuous Drain Current(@Tc=25℃)		110	A
	Continuous Drain Current(@Tc=100℃)		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(@Tc=25℃)		200	W
	Derating Factor above 25℃		1.3	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	-	-	0.75	℃/W
R_{QCS}	Thermal Resistance , Case-to-Sink	-	0.5	-	℃/W
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62	℃/W

Electrical Characteristics(Tc=25℃)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I_{GSS}	V_{GS} = ±30 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}=50V,V_{GS}=0V	-	-	10	μA
Drain -source breakdown voltage		$V_{(BR)DSS}$	I_D=250 μA,V_{GS}=0V	50	-	-	V
Breakdown voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	I_D=1mA, Referenced to 25℃	-	0.057	-	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=60A	-	-	8.0	mΩ
Forward Transconductance		gfs	V_{DS}=25V,I_D=60A	44	-	-	S
Input capacitance		C_{iss}	V_{DS}=25V,	-	3247	-	pF
Reverse transfer capacitance		C_{rss}	V_{GS}=0V,	-	211	-	
Output capacitance		C_{oss}	f=1MHz	-	781	-	
Switching time	Rise time	tr	V_{DD}=28V,	-	101	-	ns
	Turn-on time	ton	I_D=60A	-	14	-	
	Fall time	tf	R_G=4.5Ω	-	65	-	
	Turn-off time	toff	V_{GS}=10V (Note4,5)	-	50	-	
Total gate charge(gate-source plus gate-drain)		Qg	V_{DS}=44V, V_{GS}=10V,	-	133	146	nC
Gate-source charge		Qgs	I_D=60A	-	-	35	
Gate-drain("miller") Charge		Qgd	(Note4,5)	-	-	54	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	110	A
Pulse drain reverse current	I_{DRP}	-	-	-	390	A
Forward voltage(diode)	V_{DSF}	I_{DR}=60A,V_{GS}=0V	-	-	1.4	V
Reverse recovery time	trr	I_{DR}=60A,V_{GS}=0V,	-	69	104	ns
Reverse recovery charge	Qrr	dI_{DR} / dt =100 A / μs	-	143	215	μC

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

2.L=138uH I_{AS}=60A,,R_G=25Ω,Starting T_J=25℃

3.I_{SD}≤60A,di/dt≤207A/us,V_{DD}<BV_{DSS}, T_J≤150℃

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

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

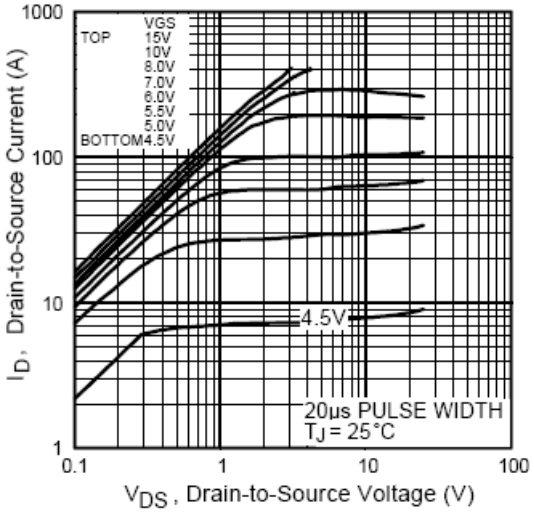


Fig.1 On State Characteristics

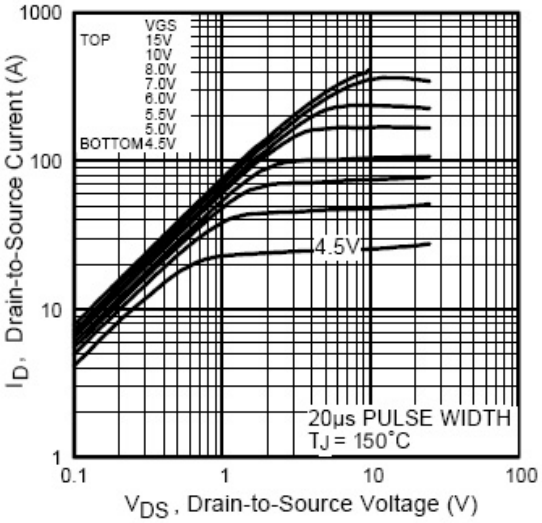


Fig.2 On State Characteristics

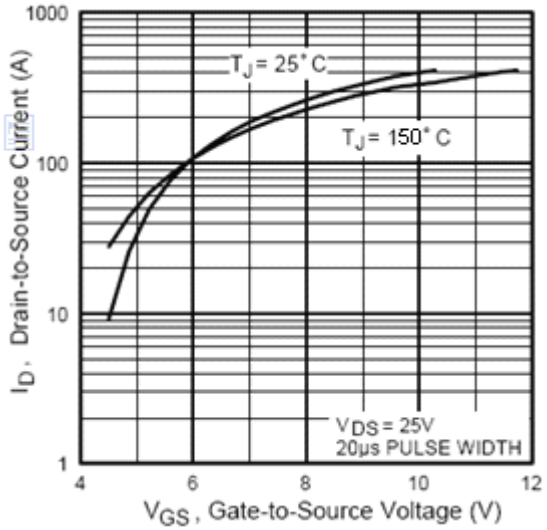


Fig.3 Transfer Characteristics

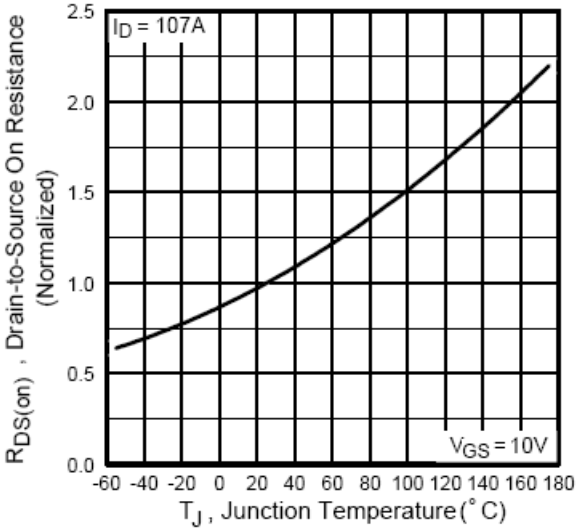


Fig.5 On-Resistance Variation vs Junction temperature

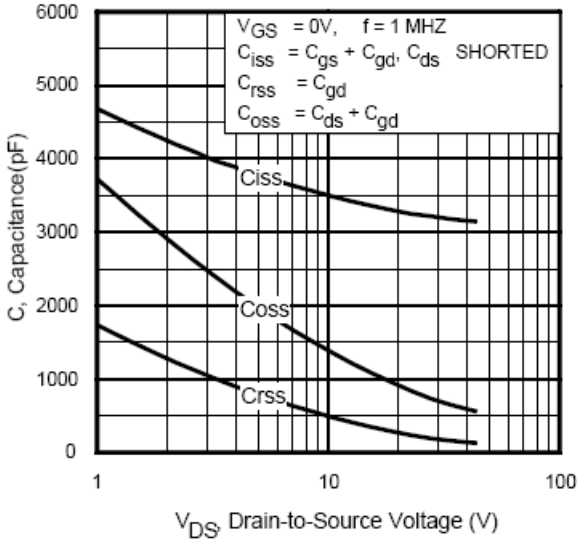


Fig.5 Capacitance Variation vs Drain Voltage

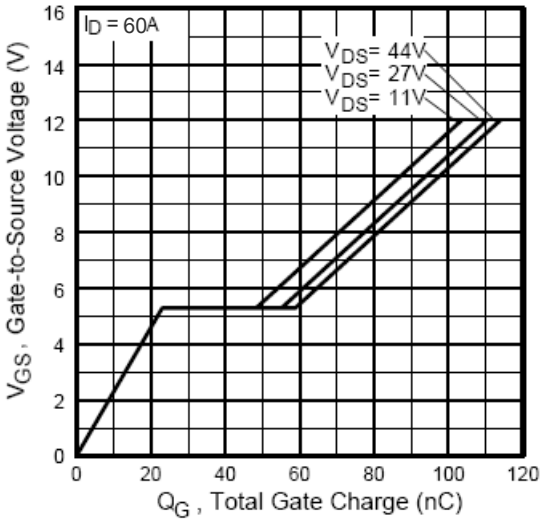


Fig.6 Gate Charge Characteristics

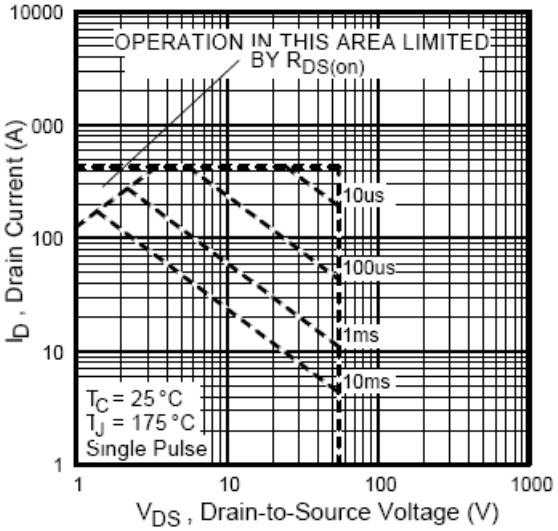


Fig.7 Maximum Safe Operation Area

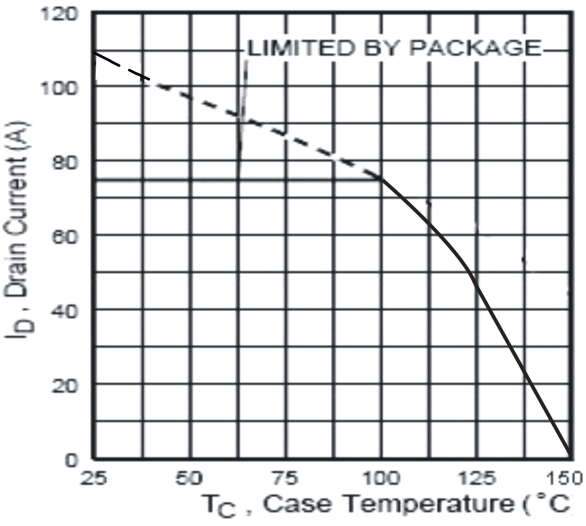


Fig.8 Maximum Drain Current vs Case temperature

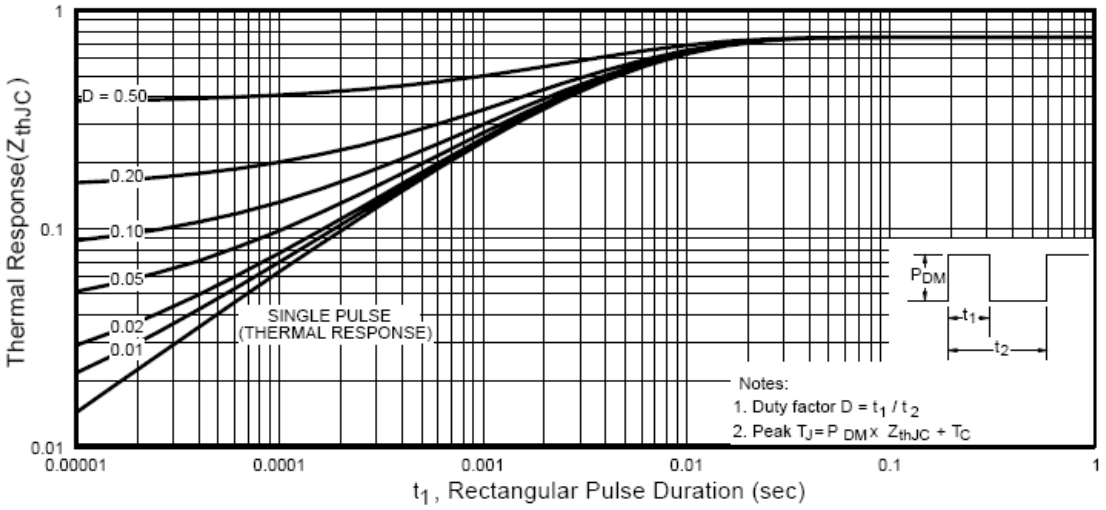


Fig.9 Transient thermal Response Curve

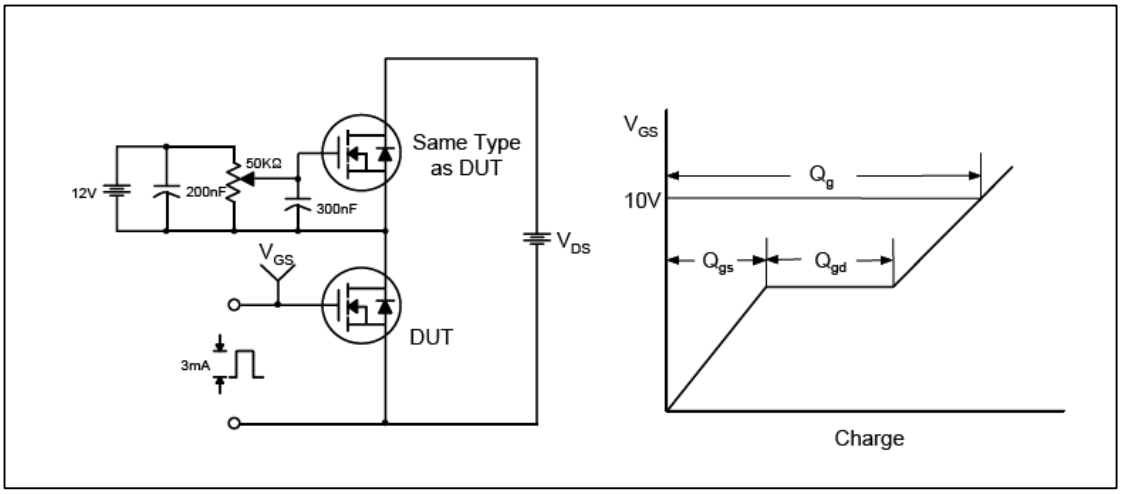


Fig.10 Gate Test circuit & Waveform

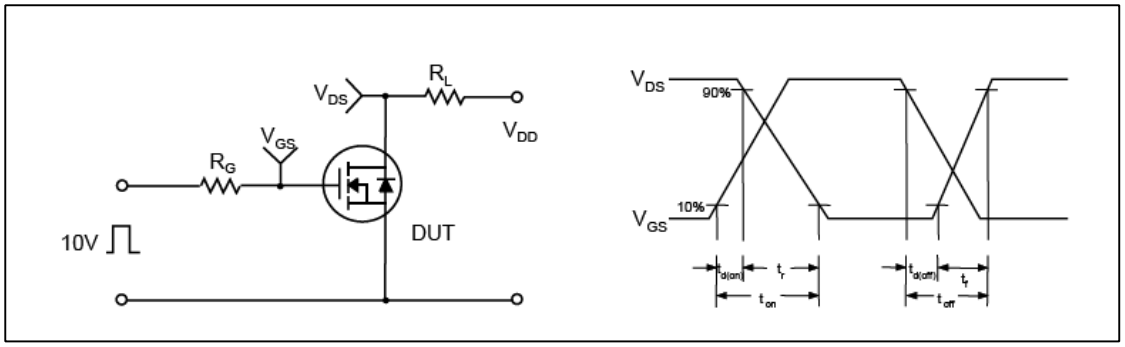


Fig.11 Resistive Switching Test Circuit & Waveform

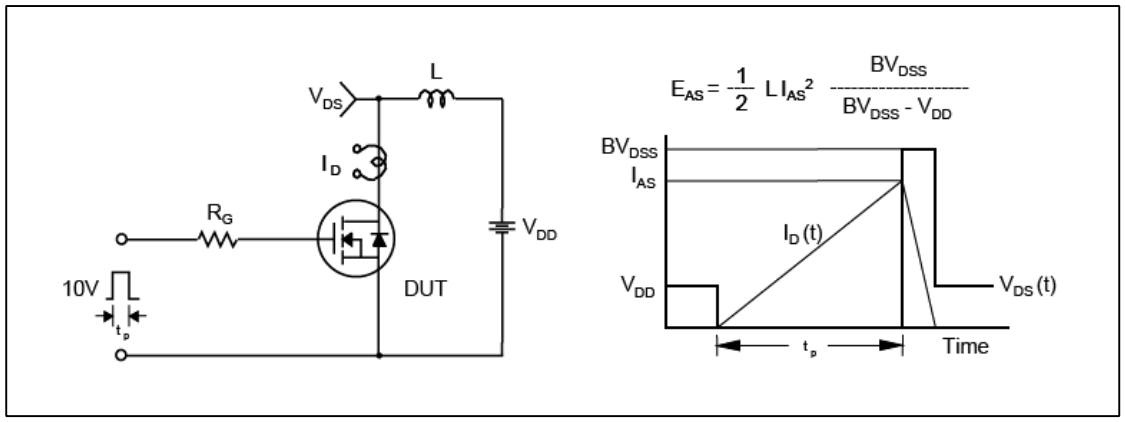


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

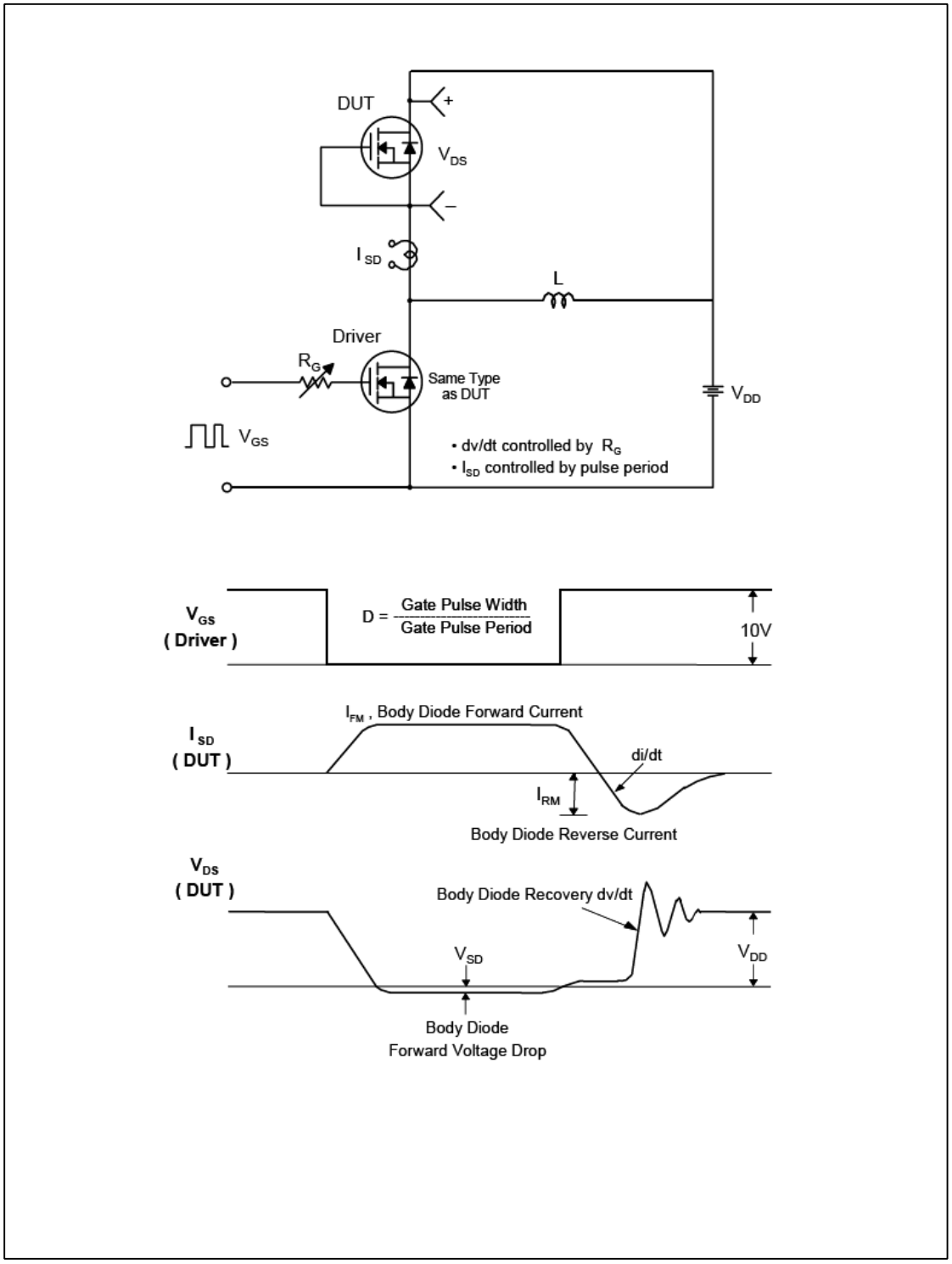


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

Unit:mm