

Lithium Ion Battery Application.
Notebook PC , Motor drive Application.

Features

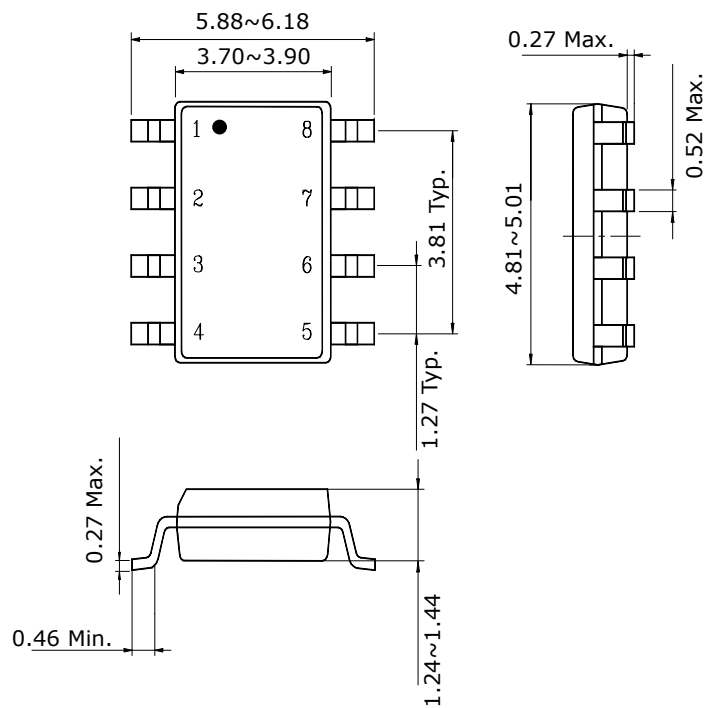
- Low C_{rss} : $C_{rss}=36\text{pF(Typ.)}$
- Low gate charge : $Q_g=4.2\text{nC(Typ.)}$
- Low $R_{DS(on)}$: $R_{DS(on)}=24\text{m}\Omega\text{(Typ.)}$
- Low $V_{GS(th)}$: $V_{GS(th)}=1.0\sim 3.0\text{V}$

Ordering Information

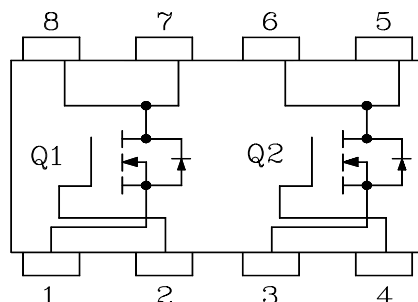
Type NO.	Marking	Package Code
SUF1002	SUF1002	SOP-8

Outline Dimensions

unit : mm



Block Diagram



PIN Connections

1. Source 1
2. Gate 1
3. Source 2
4. Gate 2
5. Drain 2
6. Drain 1
7. Drain 1
8. Drain 1

Absolute maximum ratings

(Ta=25°C)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	30	V
Gate-source voltage	V_{GSS}	±20	V
Drain current (DC)	I_D	5.8	A
Drain current (Pulsed) *	I_{DP}	23.2	A
Total Power dissipation **	P_D	2.0	W
Avalanche current (Single) ②	I_{AS}	5.8	A
Single pulsed avalanche energy ②	E_{AS}	72	mJ
Avalanche current (Repetitive) ①	I_{AR}	5.8	A
Repetitive avalanche energy ①	E_{AR}	3.4	mJ
Junction temperature	T_J	150	°C
Storage temperature range	T_{stg}	-55~150	

* Limited by maximum junction temperature

** Device mounted on a glass-epoxy board

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-ambient	$R_{th(J-a)}$	62.5		°C/W

Electrical Characteristics

(Ta=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0$	30	-	-	V	
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu A, V_{DS}=V_{GS}$	1.0	-	3.0	V	
Drain-source cut-off current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA	
Gate leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA	
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=2.9A$	-	24	30	m Ω	
		$V_{GS}=5.0V, I_D=2.9A$	-	28	34	m Ω	
Forward transfer conductance ④	g_{fs}	$V_{DS}=5V, I_D=5.8A$	-	12	-	S	
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=10V, f=1MHz$	-	370	560	pF	
Output capacitance	C_{oss}		-	60	90		
Reverse transfer capacitance	C_{rss}		-	36	54		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=15V, I_D=5.8A, R_G=10\Omega$	-	1.2	-	ns	
Rise time	t_r		-	1.1	-		
Turn-off delay time	$t_{d(off)}$		③④	-	2.5		-
Fall time	t_f		-	1.1	-		
Total gate charge	Q_g	$V_{DS}=15V, V_{GS}=5V, I_D=5.8A$	-	4.2	6.3	nC	
Gate-source charge	Q_{gs}		③④	-	0.9		1.4
Gate-drain charge	Q_{gd}		-	-	1.4		2.1

Source-Drain Diode Ratings and Characteristics

(Ta=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Source current	I_S	Integral reverse diode in the MOSFET	-	-	1.5	A
Source current(Plused) ①	I_{SM}		-	-	6.0	
Forward voltage ④	V_{SD}	$V_{GS}=0V, I_S=1.5A$	-	-	1.2	V
Reverse recovery time	t_{rr}	$I_S=1.5A, di_s/dt=100A/us$	-	90	-	ns
Reverse recovery charge	Q_{rr}		-	0.5	-	μC

Note ;

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ② $L=3.4mH, I_{AS}=5.8A, V_{DD}=15V, R_G=25\Omega$
- ③ Pulse Test : Pulse Width < 300us, Duty cycle ≤ 2%
- ④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 $I_D - V_{DS}$

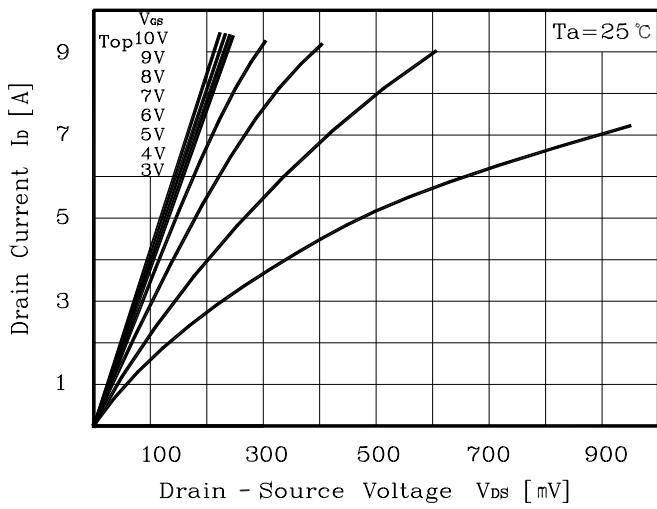


Fig. 2 $I_D - V_{GS}$

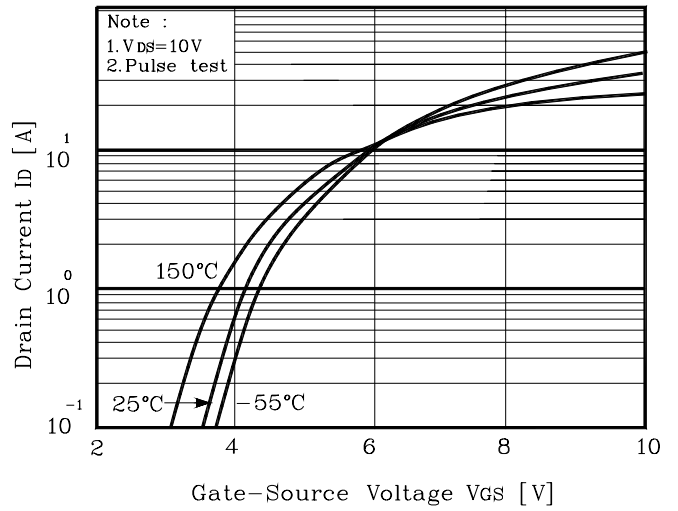


Fig. 3 $R_{DS(on)} - I_D$

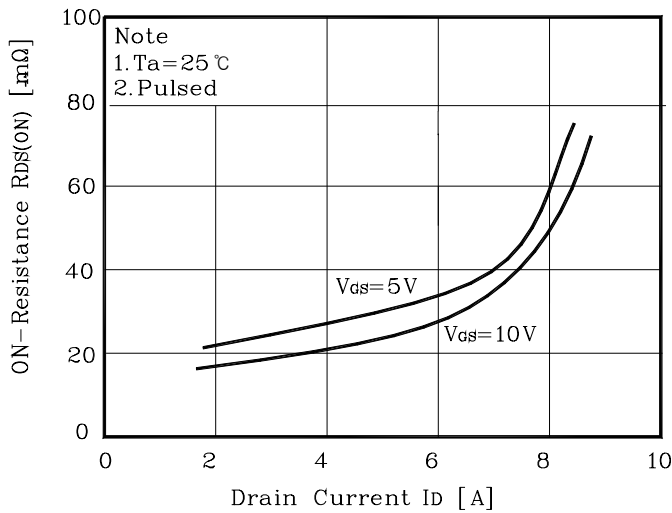


Fig. 4 $I_S - V_{SD}$

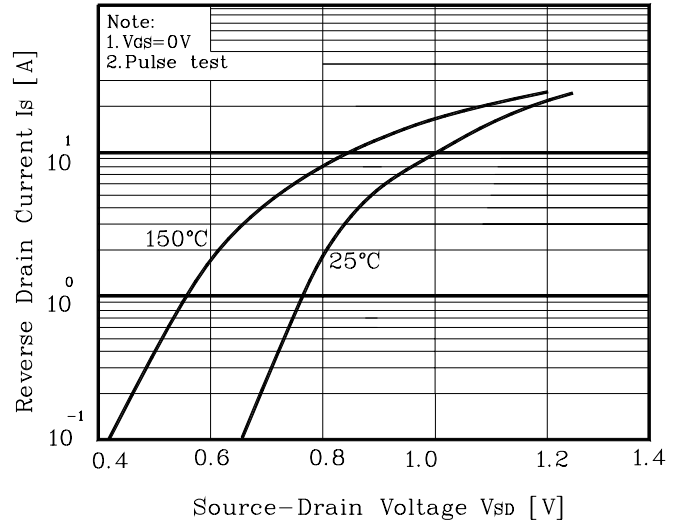


Fig. 5 Capacitance - V_{DS}

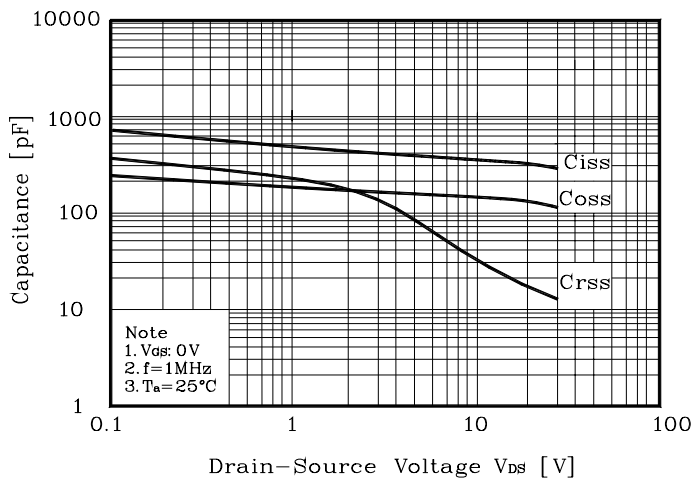


Fig. 6 $V_{GS} - Q_G$

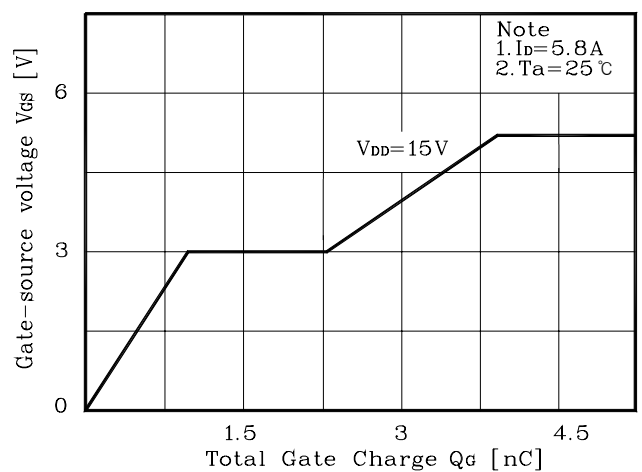


Fig. 7 $V_{DSS} - T_J$

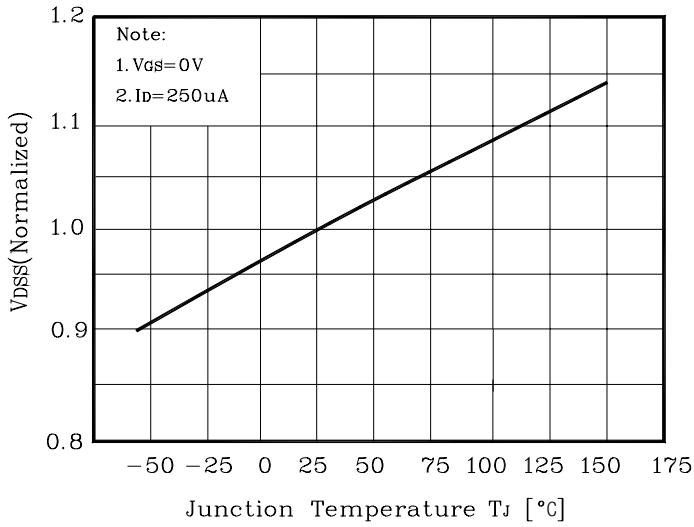


Fig. 8 $R_{DS(on)} - T_J$

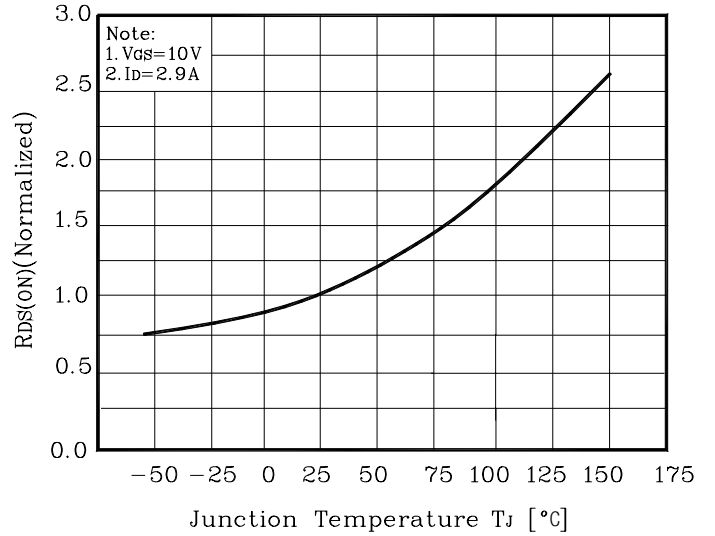


Fig. 9 $I_D - T_a$

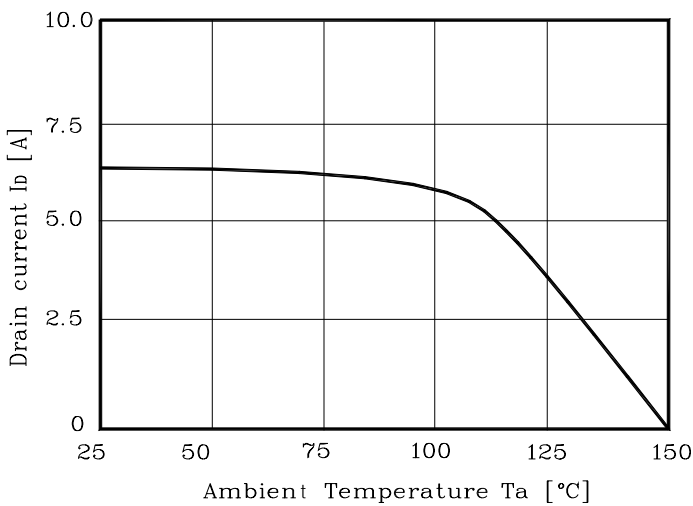


Fig. 10 Safe Operating Area

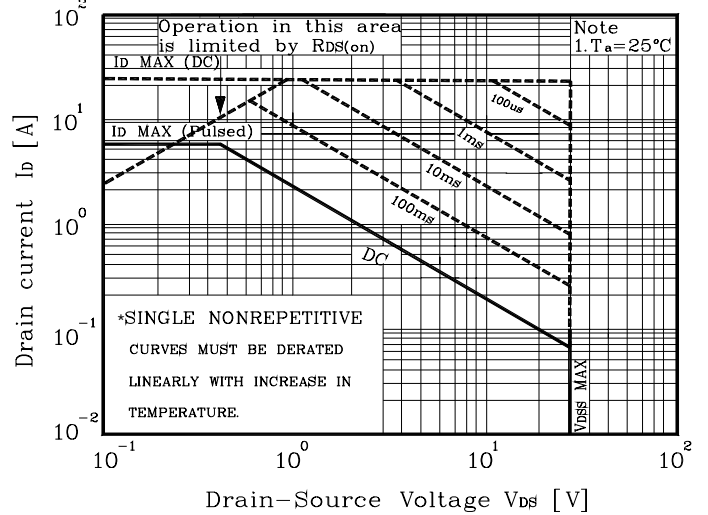


Fig. 11 Gate Charge Test Circuit & Waveform

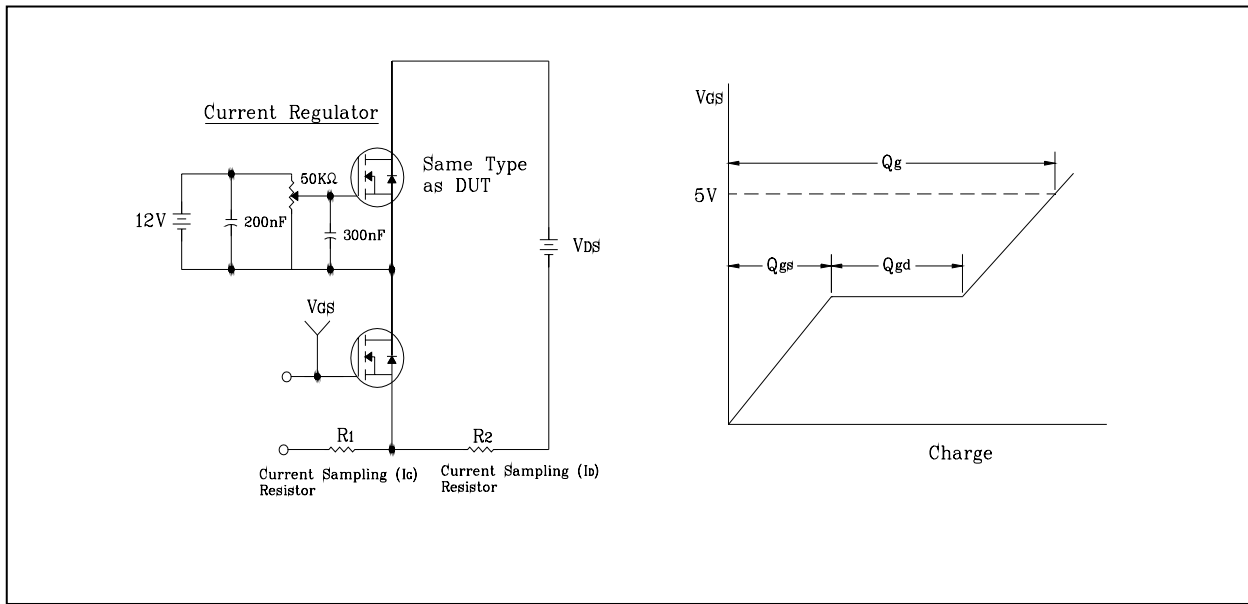


Fig. 12 Resistive Switching Test Circuit & Waveform

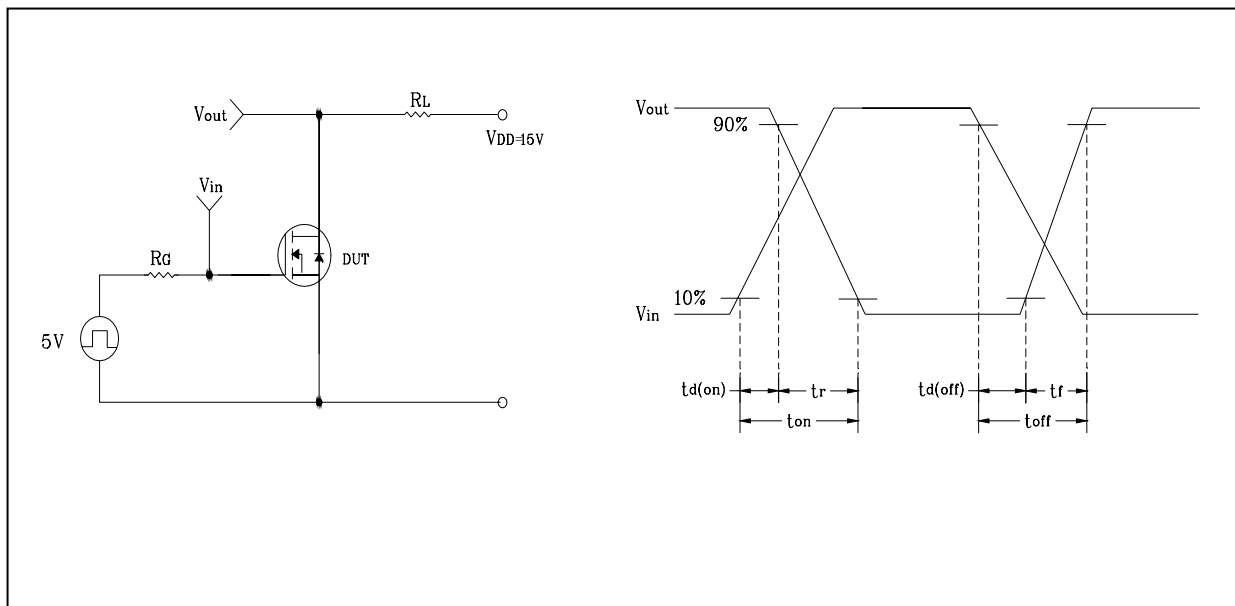


Fig. 13 E_{AS} Test Circuit & Waveform

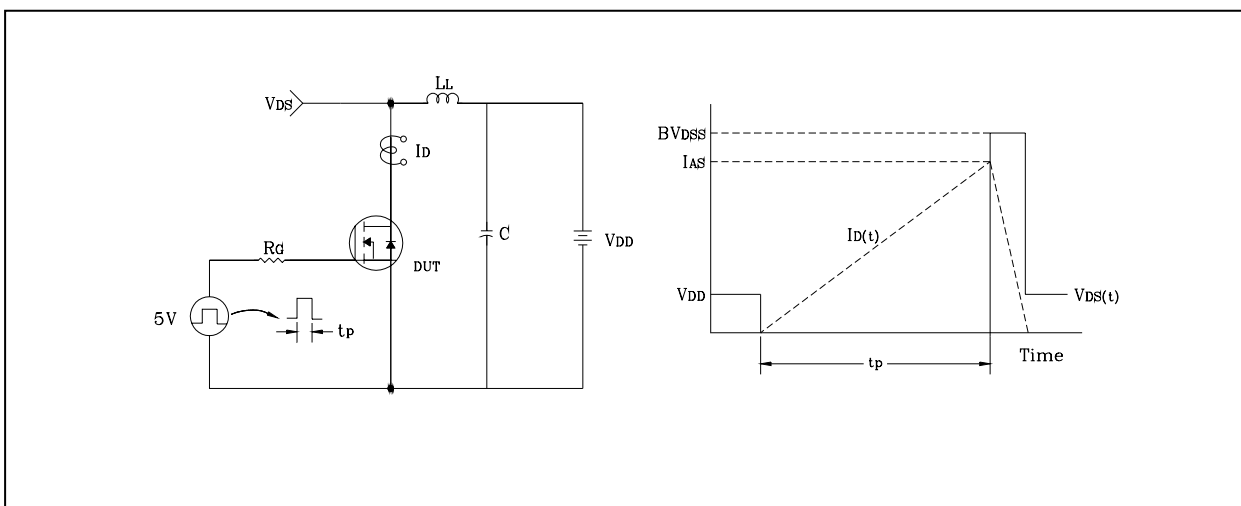
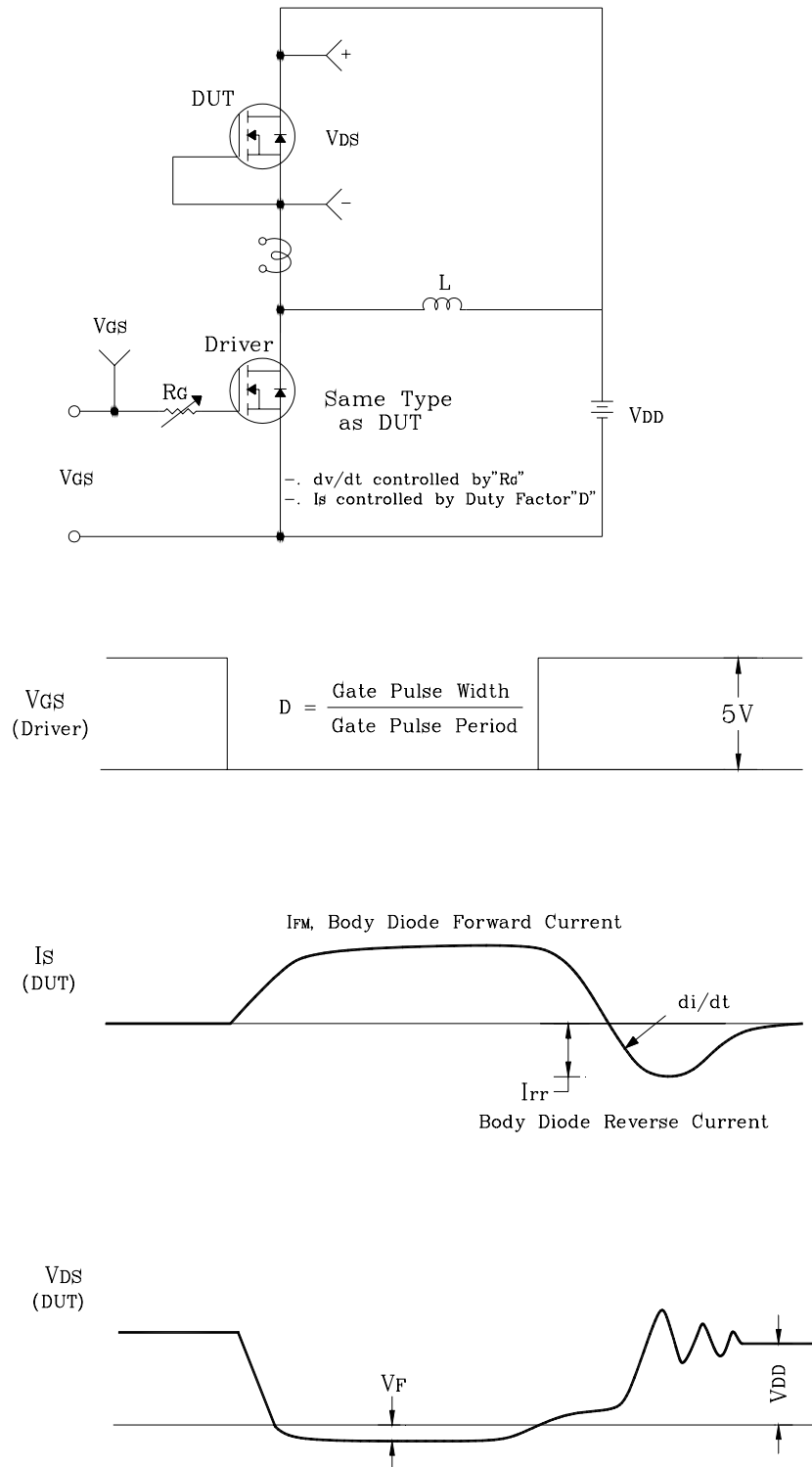


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



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