

**Portable Equipment Application.**

**Notebook Application.**

### Features

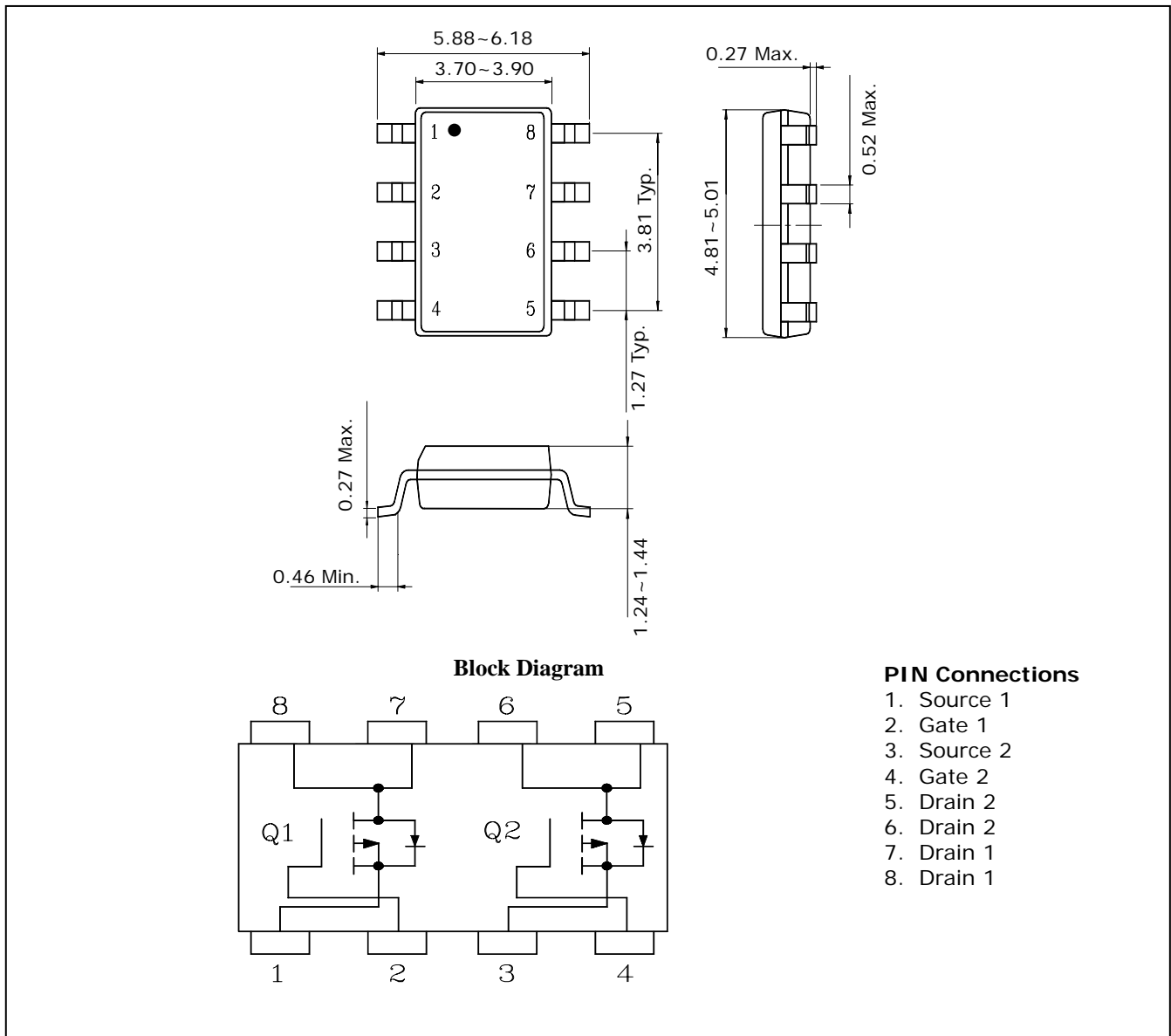
- Low  $V_{GS(th)}$  :  $V_{GS(th)} = 1.0 \sim 3.0V$
- Small footprint due to small package
- Low  $R_{DS(ON)}$  :  $R_{DS(ON)} = 66m\Omega$

### Ordering Information

Type NO.	Marking	Package Code
SUF3001	SUF3001	SOP-8

### Outline Dimensions

unit : mm



## Absolute maximum ratings

(Ta=25°C)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	$V_{DSS}$	-30	V
Gate-source voltage	$V_{GSS}$	$\pm 20$	V
Drain current (DC)	$I_D$	-5.3	A
Drain current (Pulsed) *	$I_{DP}$	-21.2	A
Total Power dissipation **	$P_D$	2.0	W
Avalanche current (Single) ②	$I_{AS}$	-5.3	A
Single pulsed avalanche energy ②	$E_{AS}$	33	mJ
Avalanche current (Repetitive) ①	$I_{AR}$	-5.3	A
Repetitive avalanche energy ①	$E_{AR}$	1.6	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	$\mu A$
Gate leakage current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-2.7A$	-	66	72	m $\Omega$
		$V_{GS}=-5.0V, I_D=-2.7A$	-	77	83	m $\Omega$
Forward transfer conductance	$g_{fs}$	$V_{DS}=-5V, I_D=-5.3A$ ④	-	11	-	S
Input capacitance	$C_{iss}$	$V_{GS}=0V, V_{DD}=-10V,$ $f=1MHz$	-	390	590	pF
Output capacitance	$C_{oss}$		-	97	150	
Reverse transfer capacitance	$C_{rss}$		-	37	60	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-5.3A$ $R_G=10\Omega$ ③④	-	1.2	-	ns
Rise time	$t_r$		-	1.1	-	
Turn-off delay time	$t_{d(off)}$		-	2.5	-	
Fall time	$t_f$		-	1.1	-	
Total gate charge	$Q_g$	$V_{DD}=-15V, V_{GS}=-5V$ $I_D=-5.3A$ ③④	-	4.7	7.0	nC
Gate-source charge	$Q_{gs}$		-	1.4	2.1	
Gate-drain charge	$Q_{gd}$		-	1.7	2.5	

## 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	-	$\mu C$

Note ;

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ②  $L=2.0mH, I_{AS}=-5.0A, V_{DD}=-15V, R_G=25\Omega$
- ③ Pulse Test : Pulse Width < 300us, Duty cycle  $\leq 2\%$
- ④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1  $I_D - V_{DS}$

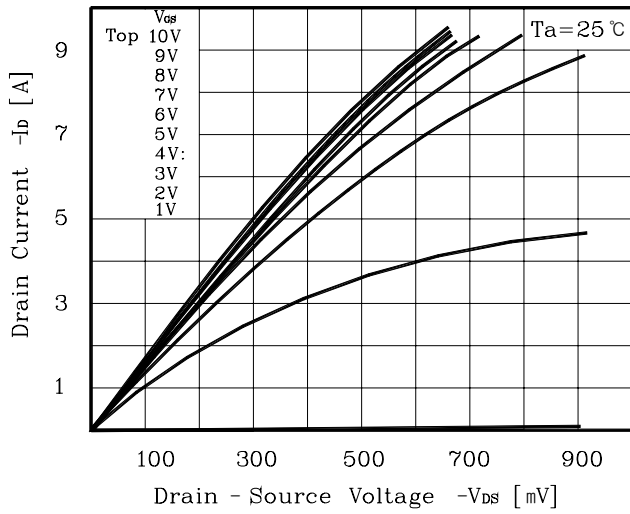


Fig. 2  $I_D - V_{GS}$

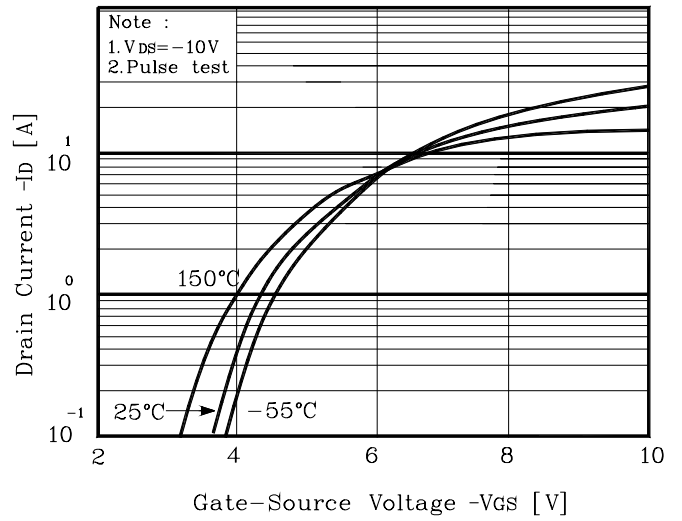


Fig. 3  $R_{DS(on)} - I_D$

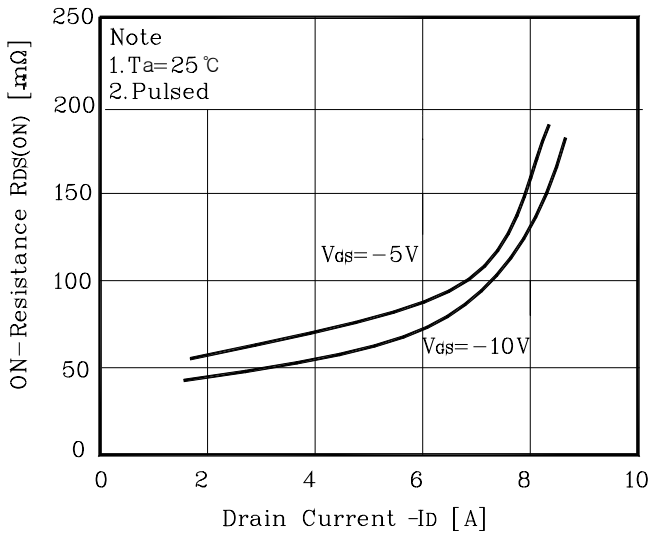


Fig. 4  $I_S - V_{SD}$

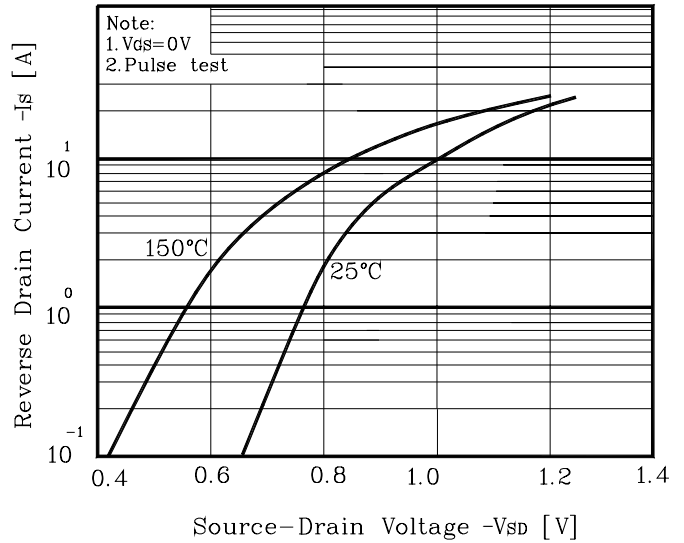


Fig. 5 Capacitance -  $V_{DS}$

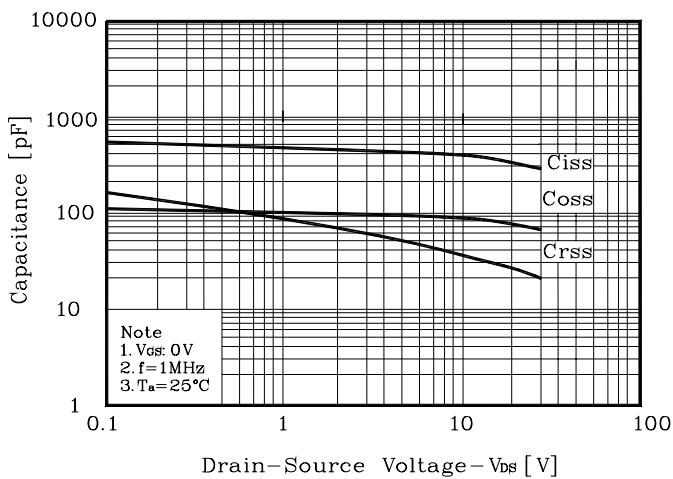
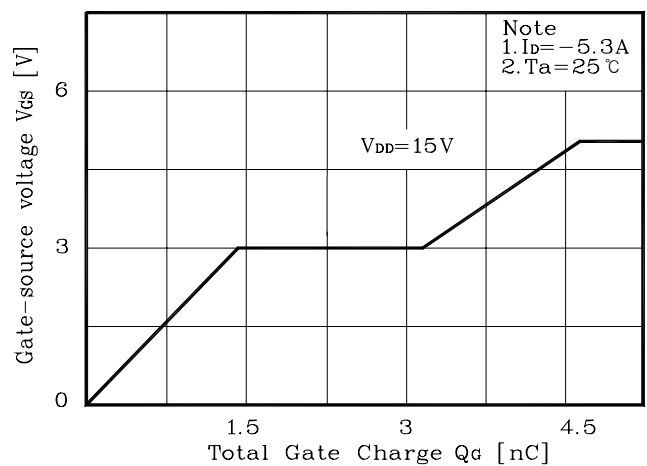
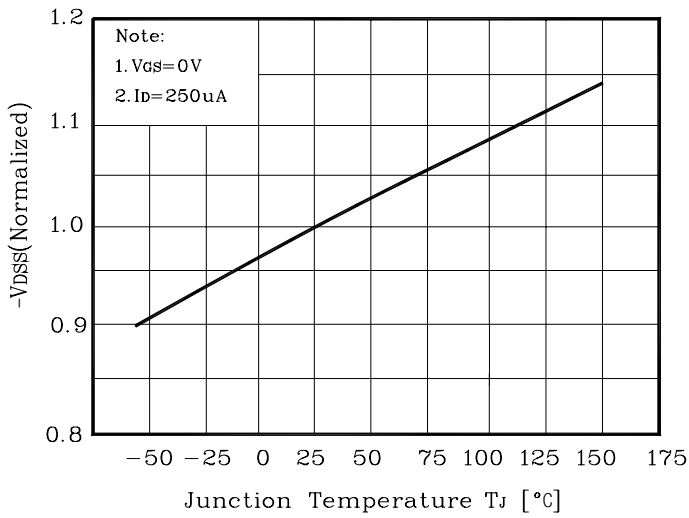


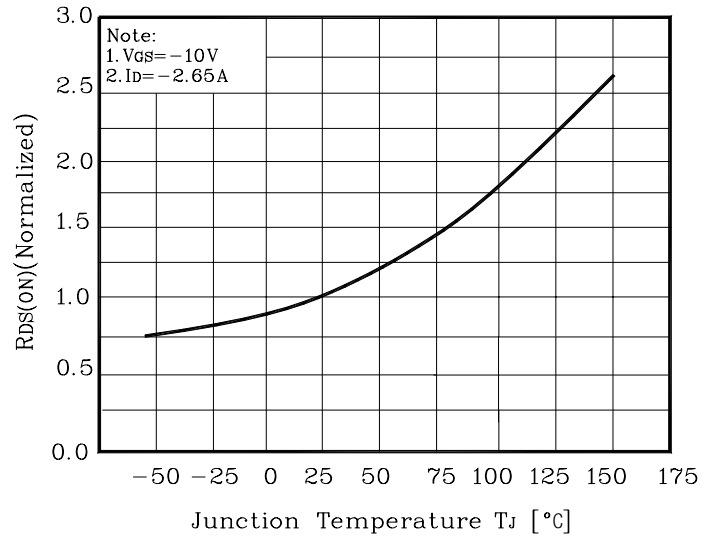
Fig. 6  $V_{GS} - Q_G$



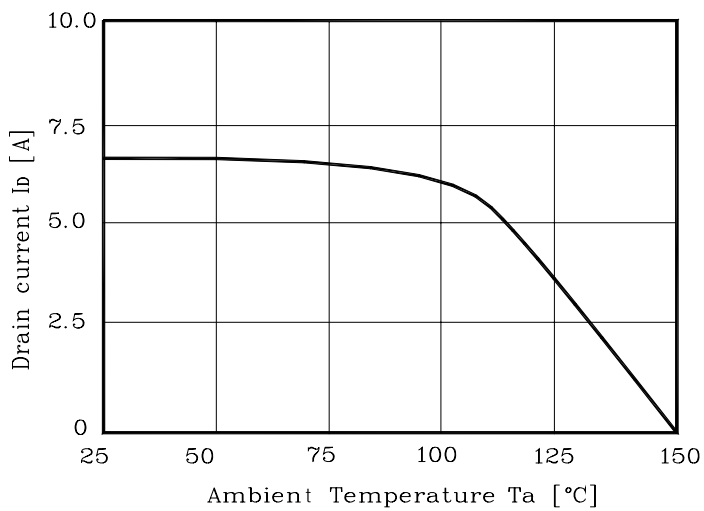
**Fig. 7  $V_{DSS} - T_J$**



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



**Fig. 9  $I_D - T_a$**



**Fig. 10 Safe Operating Area**

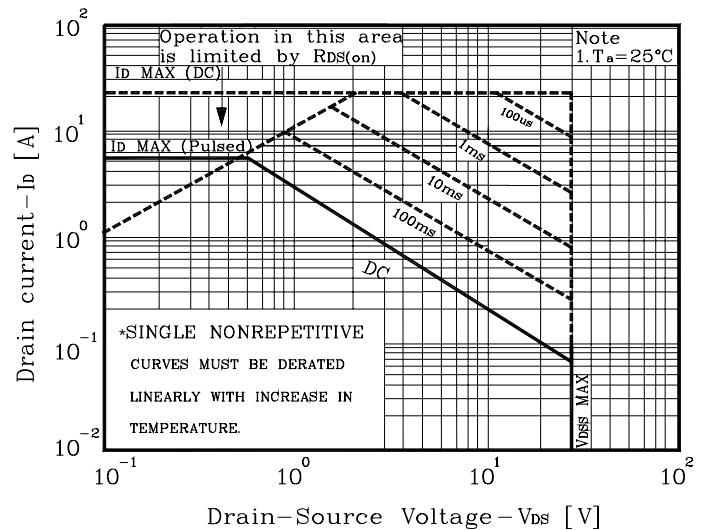


Fig. 11 Gate Charge Test Circuit & Waveform

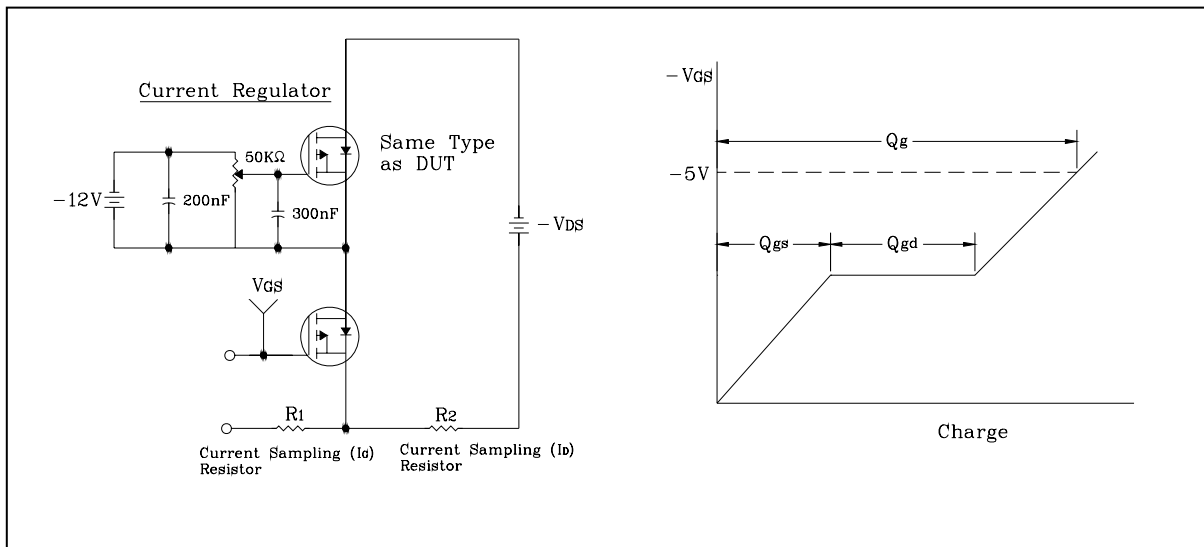


Fig. 12 Resistive Switching Test Circuit & Waveform

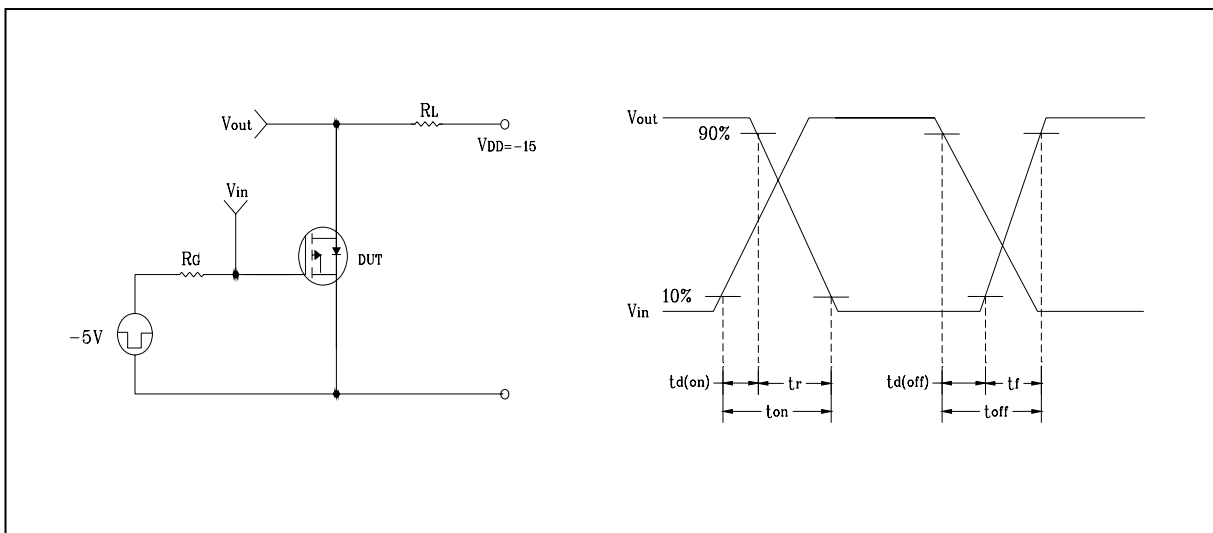


Fig. 13 EAS Test Circuit & Waveform

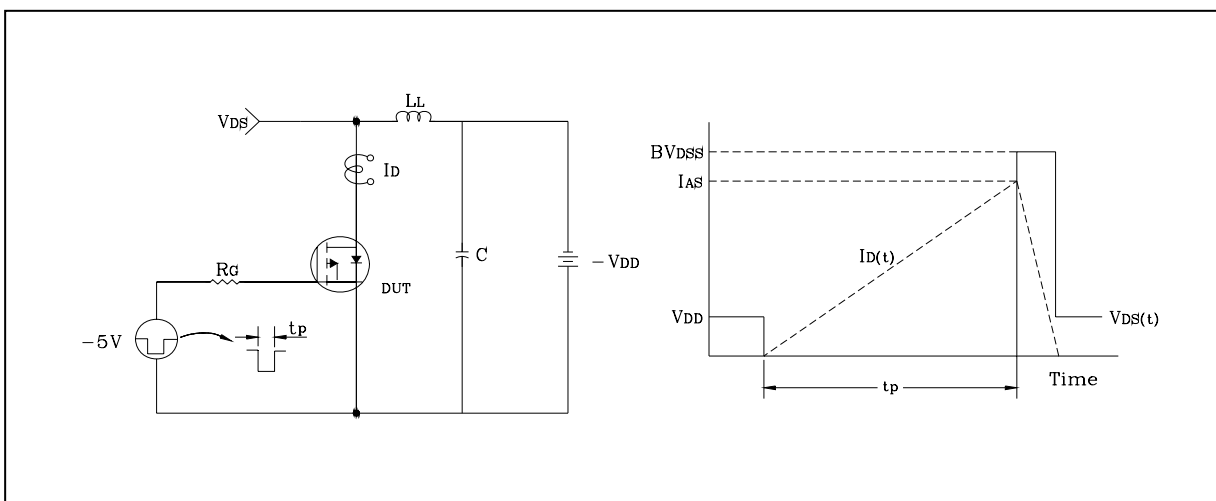
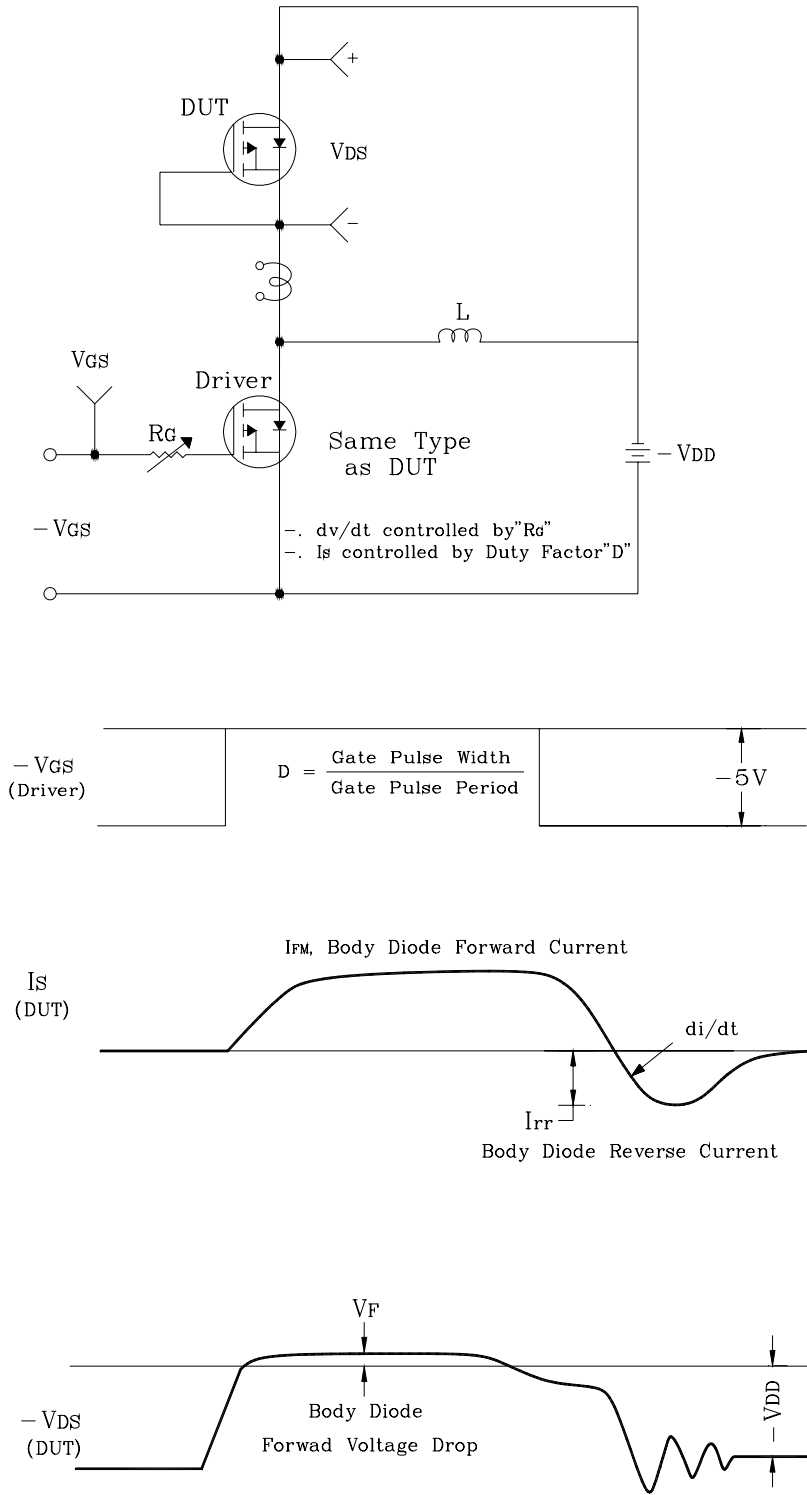


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



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