AUK Semiconductor

STJ001SF

P-channel Trench MOSFET

Portable Equipment Application.
Notebook Application.

Features

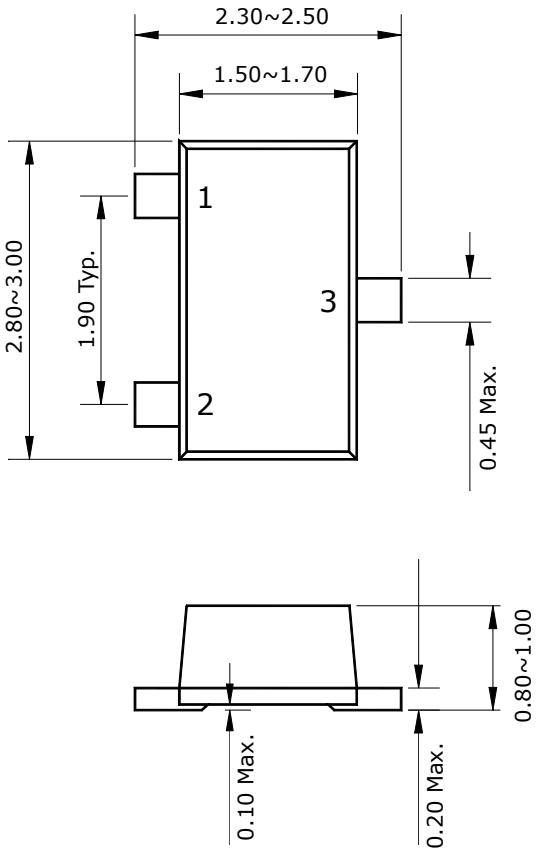
- Low $V_{GS(th)}$: $V_{GS(th)}$=-0.6~-1.4V
- Small footprint due to small package
- Low $R_{DS\ (ON)}$: $R_{DS\ (ON)}$= 68mΩ (Typ.)

Ordering Information

Type NO.	Marking	Package Code
STJ001SF	J01	SOT-23F

Outline Dimensions

unit : mm



PIN Connections

1. Gate
2. Source
3. Drain

Absolute maximum ratings (Ta=25°C)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	-20	V
Gate-source voltage	V_{GSS}	±12	V
Drain current (DC) **	I_D	-2.8	A
Drain current (Pulsed) *	I_{DP}	-11.2	A
Total Power dissipation **	P_D	0.5	W
Avalanche current (Single) ②	I_{AS}	-2.8	A
Single pulsed avalanche energy ②	E_{AS}	28	mJ
Avalanche current (Repetitive) ①	I_{AR}	-2.8	A
Repetitive avalanche energy ①	E_{AR}	1.3	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	$R_{th(J-a)}$ **	-	250	℃/W

P-CH Electrical Characteristics

(Ta=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0	-20	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=-250μA, V_{DS}=V_{GS}	-0.6	-	-1.4	V
Drain-source cut-off current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	1	μA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
Drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=-5.0V, I_D=-1.4A	-	68	88	mΩ
		V_{GS}=-2.5V, I_D=-1.4A	-	72	93	mΩ
Forward transfer conductance ④	g_{fs}	V_{DS}=-5V, I_D=-2.8A	-	15	-	S
Input capacitance	Ciss	V_{GS}=0V, V_{DD}=-10V, f=1MHz	-	880	1320	pF
Output capacitance	Coss		-	210	320	
Reverse transfer capacitance	Crss		-	110	170	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V, I_D=-2.8A R_G=10Ω ③④	-	5.2	-	ns
Rise time	t_r		-	10	-	
Turn-off delay time	$t_{d(off)}$		-	17.6	-	
Fall time	t_f		-	10	-	
Total gate charge	Q_g	V_{DD}=-10V, V_{GS}=-5V I_D=-2.8A ③④	-	8.0	12	nC
Gate-source charge	Q_{gs}		-	1.3	2.0	
Gate-drain charge	Q_{gd}		-	2.3	3.5	

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	-	-	-0.5	A
Sourcecurrent(Plused) ①	I_{SM}		-	-	-2.8	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=-0.5A	-	-0.9	-1.3	V
Reverse recovery time	t_{rr}	I_s=-0.5A di_S/dt=100A/us	-	73	-	ns
Reverse recovery charge	Q_{rr}		-	250	-	uC

Note ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② L=2.0mH, I_{AS}=-2.8A, V_{DD}=-10V, R_G=25Ω

③ Pulse Test : Pulse Width < 300us, Duty cycle≤ 2%

④ Essentially independent of operating temperature

P-CH Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

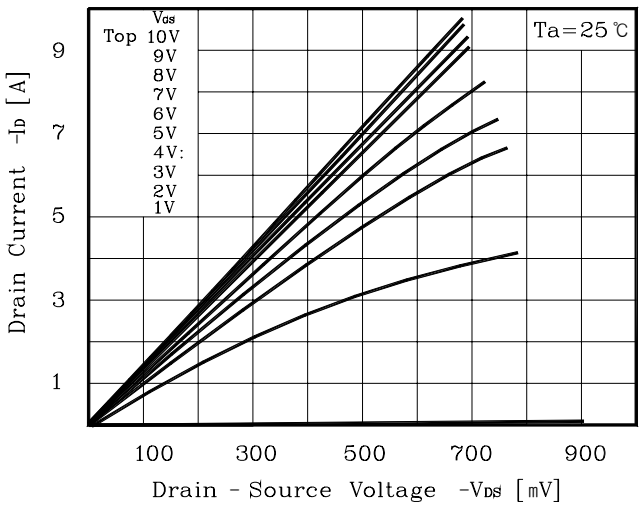


Fig. 2 I_D - V_{GS}

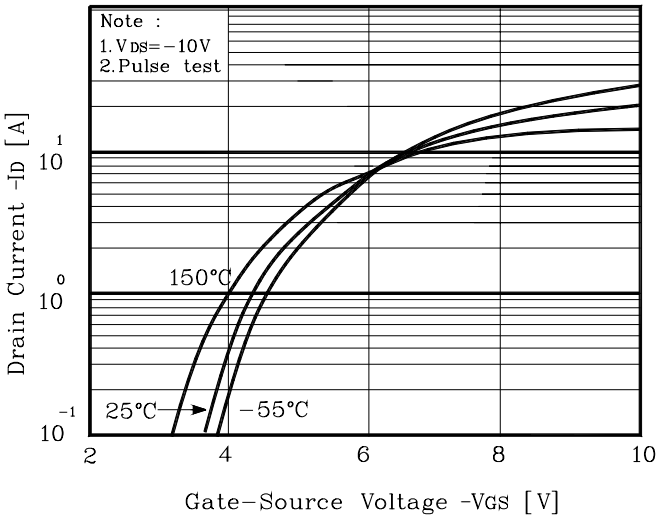


Fig. 3 $R_{DS(on)}$ - I_D

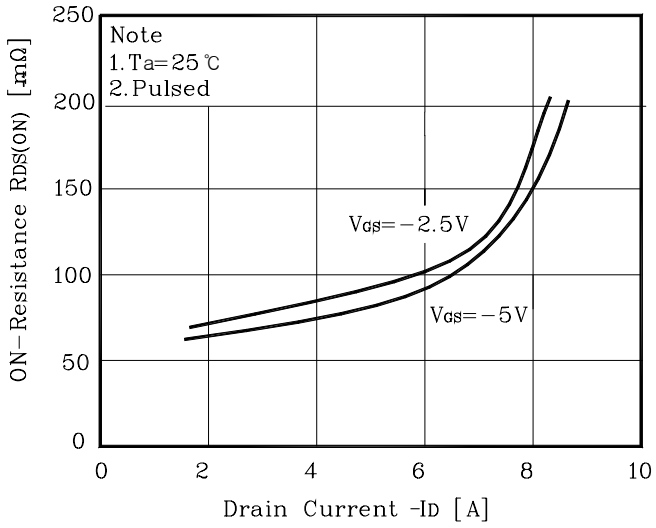


Fig. 4 I_S - V_{SD}

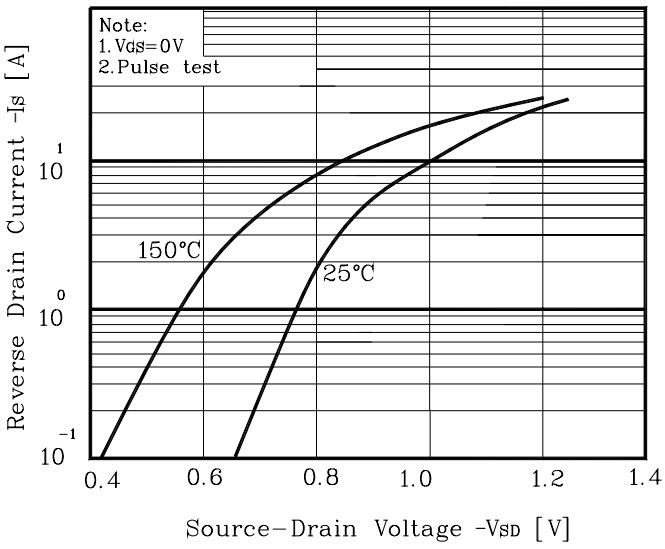


Fig. 5 Capacitance - V_{DS}

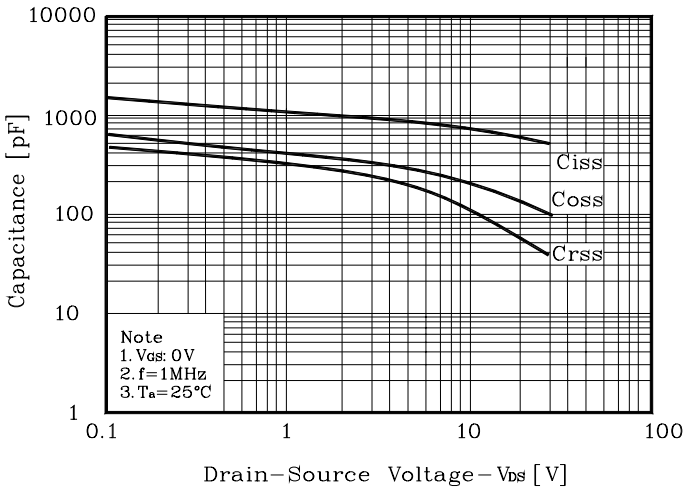


Fig. 6 V_{GS} - Q_G

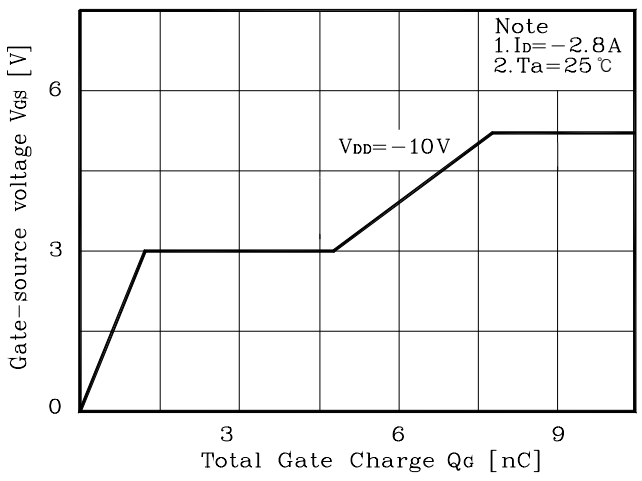


Fig. 7 V_{DSS} - T_J

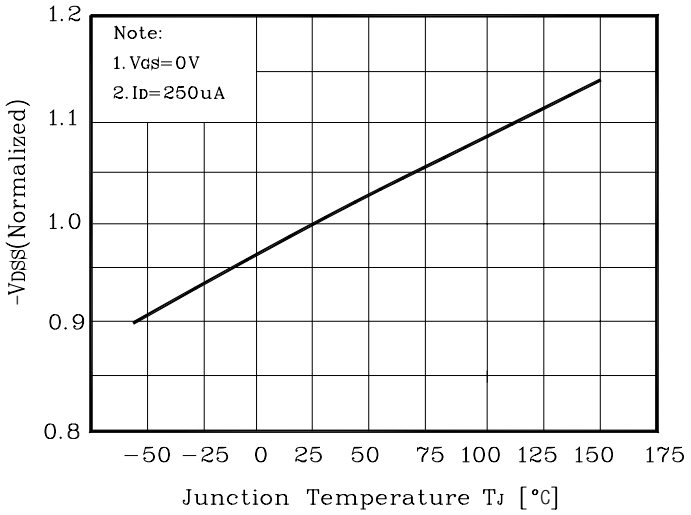


Fig. 8 $R_{DS(on)}$ - T_J

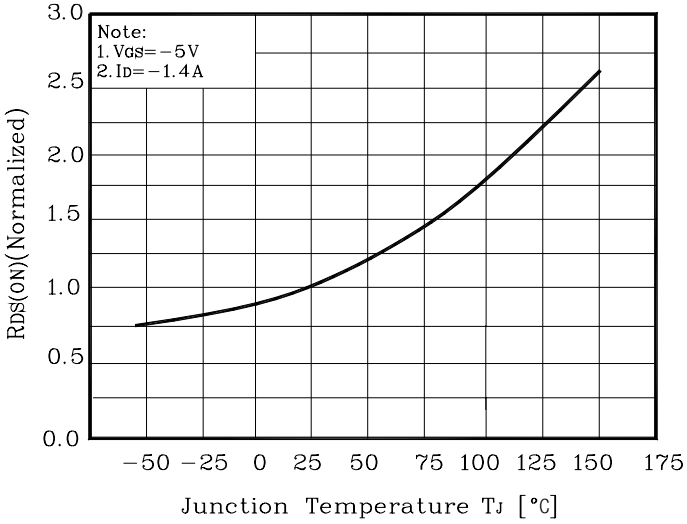


Fig. 9 I_D - T_a

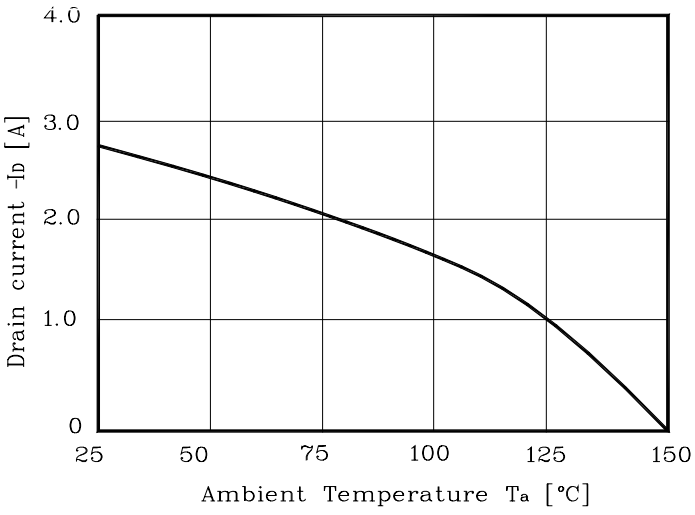


Fig. 10 Safe Operating Area

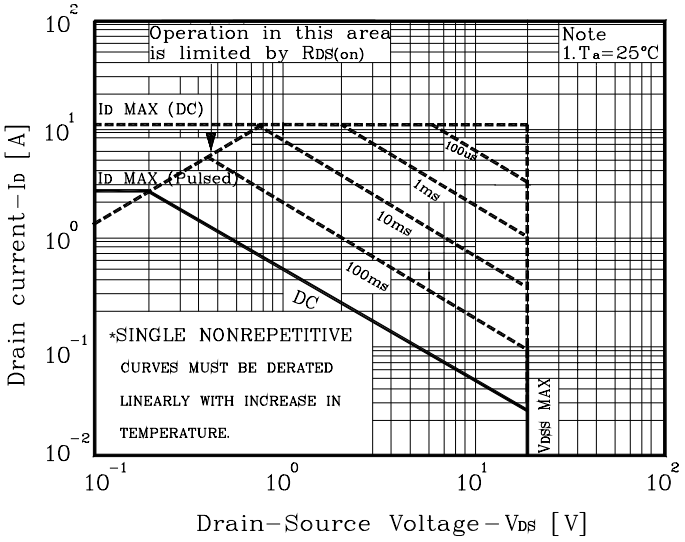


Fig. 11 Gate Charge Test Circuit & Waveform

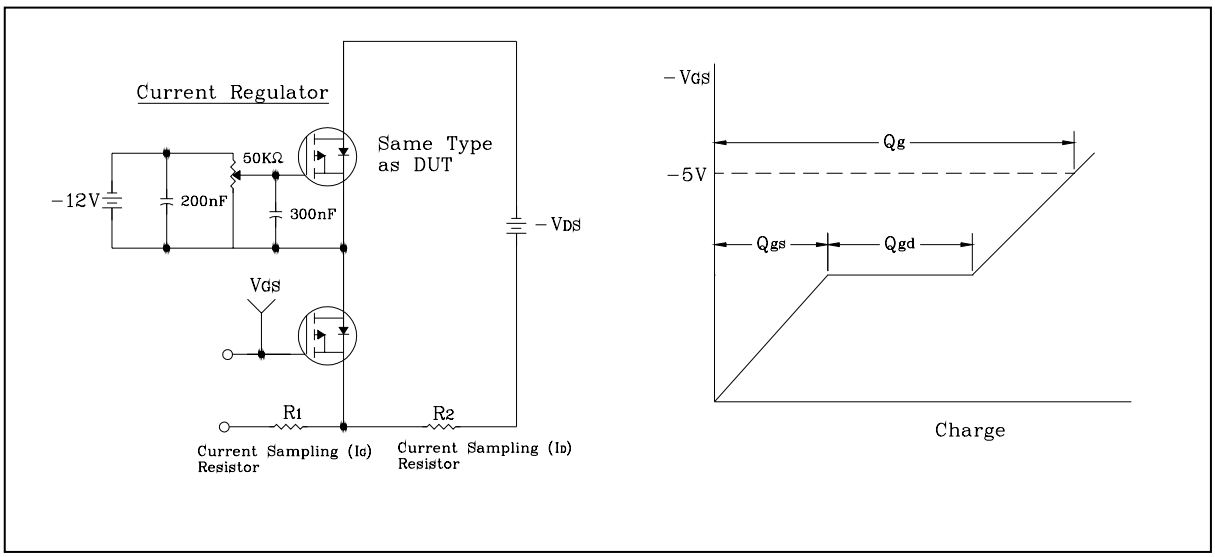


Fig. 12 Resistive Switching Test Circuit & Waveform

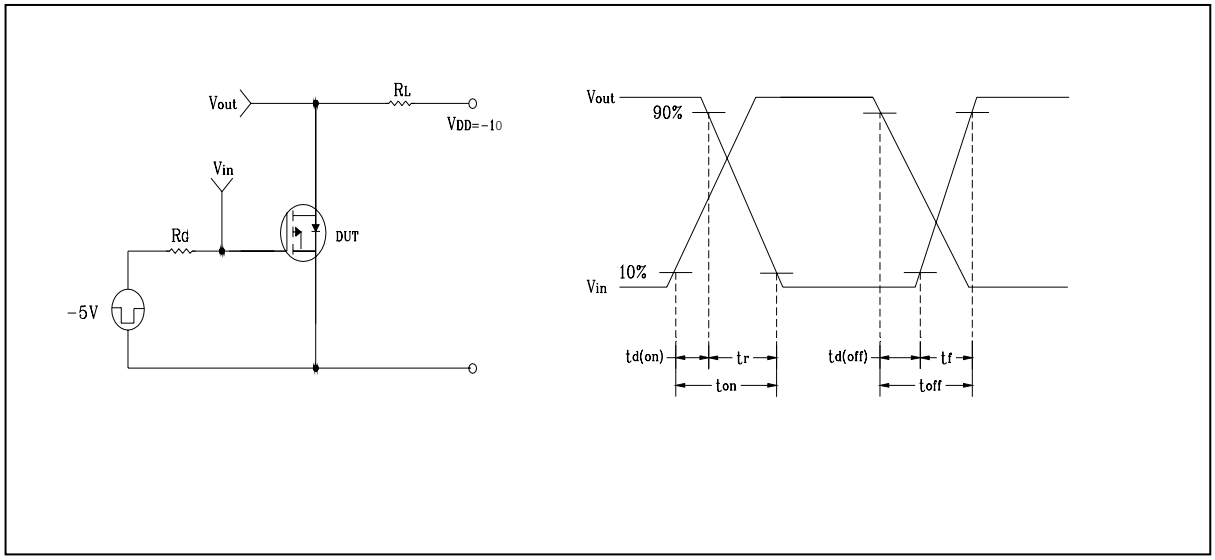


Fig. 13 E_{AS} Test Circuit & Waveform

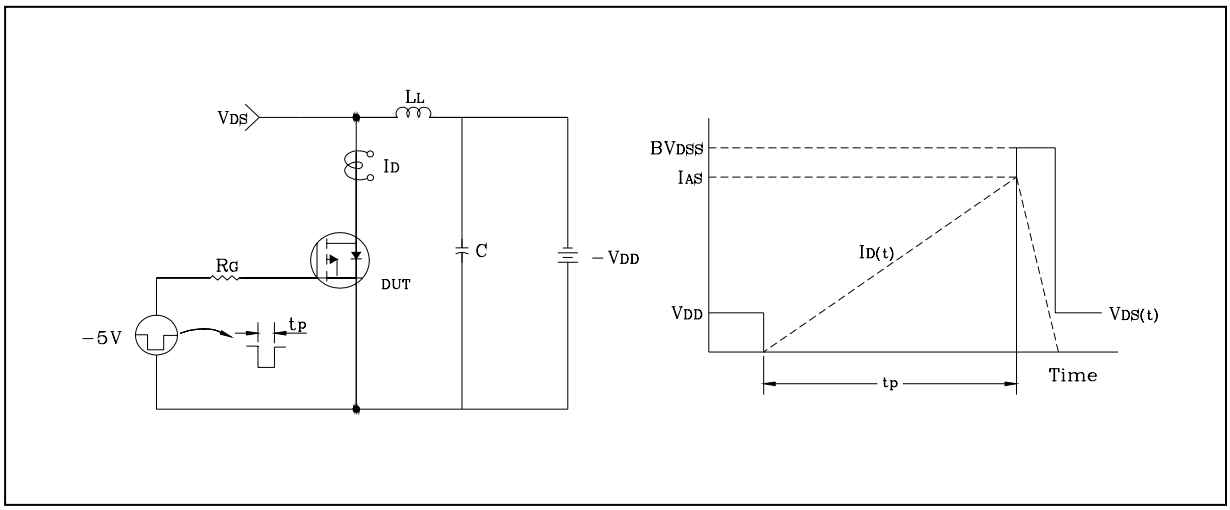
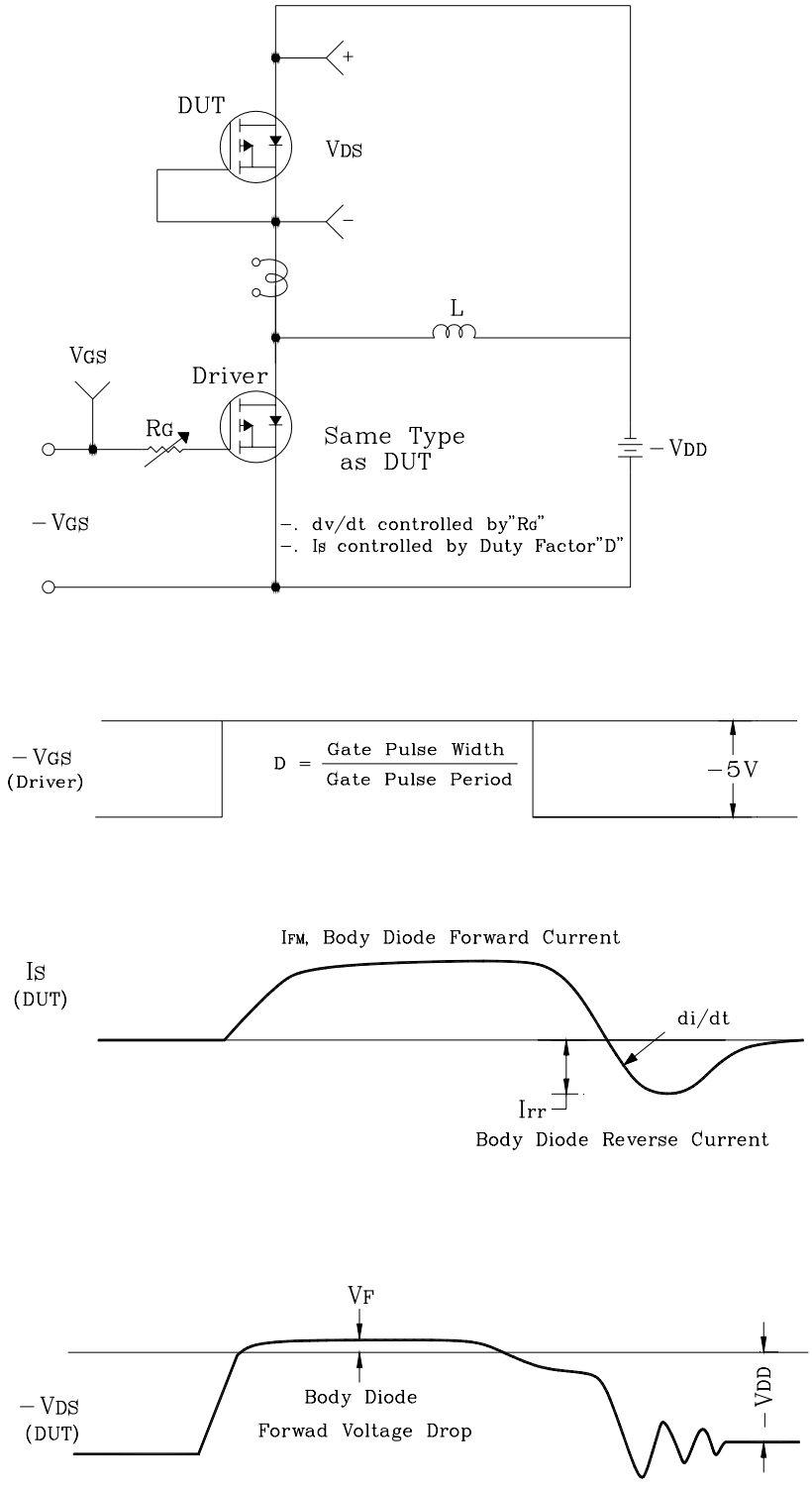


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



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