

Portable Equipment Application.

Notebook Application.

Features

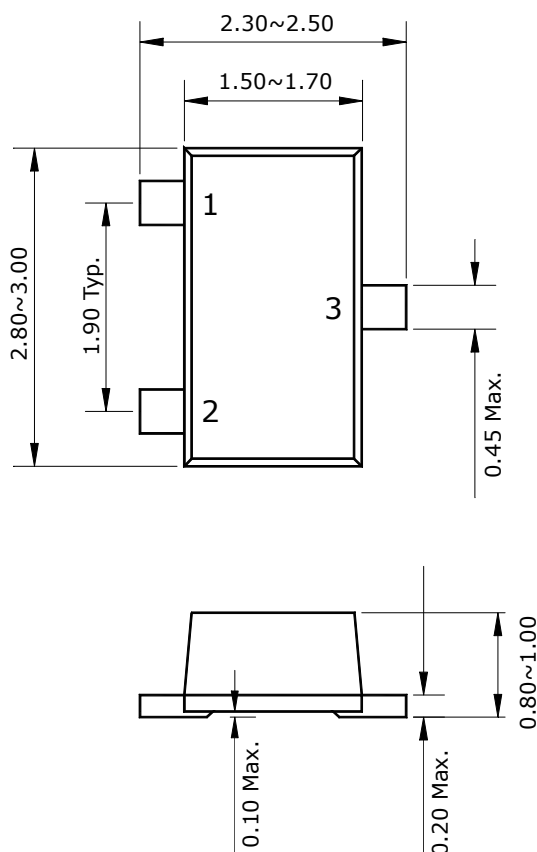
- Low $V_{GS(th)}$: $V_{GS(th)} = -0.6 \sim -1.4V$
- Small footprint due to small package
- Low $R_{DS(ON)}$: $R_{DS(ON)} = 68m\Omega$ (Typ.)

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	°C/W

P-CH Electrical Characteristics

(Ta=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	$I_D = -250\mu A, V_{GS} = 0$	-20	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D = -250\mu A, V_{DS} = V_{GS}$	-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}	$V_{DS} = 0V, V_{GS} = \pm 12V$	-	-	± 100	nA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = -5.0V, I_D = -1.4A$	-	68	88	m Ω
		$V_{GS} = -2.5V, I_D = -1.4A$	-	72	93	m Ω
Forward transfer conductance ④	g_{fs}	$V_{DS} = -5V, I_D = -2.8A$	-	15	-	S
Input capacitance	C_{iss}	$V_{GS} = 0V, V_{DD} = -10V, f = 1MHz$	-	880	1320	pF
Output capacitance	C_{oss}		-	210	320	
Reverse transfer capacitance	C_{rss}		-	110	170	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -10V, I_D = -2.8A, R_G = 10\Omega$ 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 $L = 2.0mH, I_{AS} = -2.8A, V_{DD} = -10V, R_G = 25\Omega$
- ③ Pulse Test : Pulse Width < 300us, Duty cycle $\leq 2\%$
- ④ Essentially independent of operating temperature

P-CH Electrical Characteristic Curves

Fig. 1 $I_D - V_{DS}$

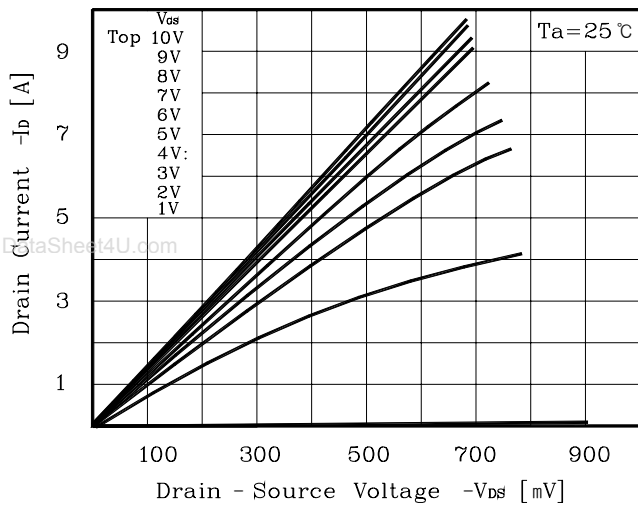


Fig. 2 $I_D - V_{GS}$

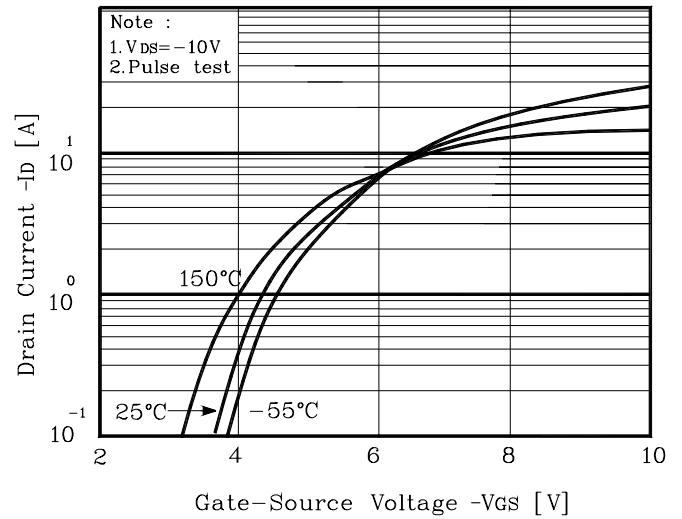


Fig. 3 $R_{DS(on)} - I_D$

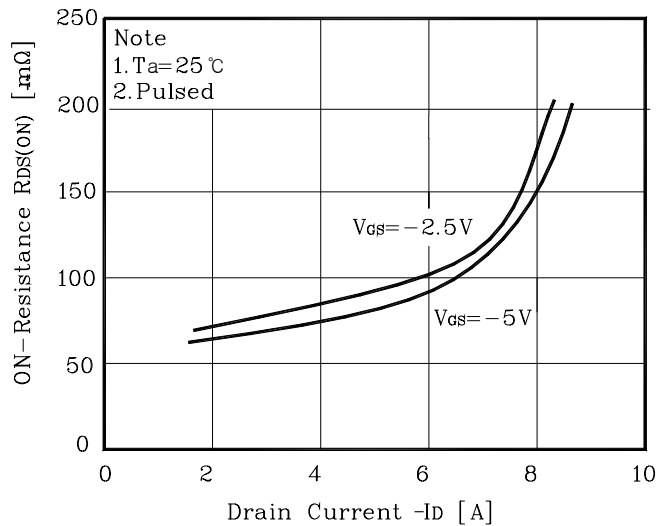


Fig. 4 $I_S - V_{SD}$

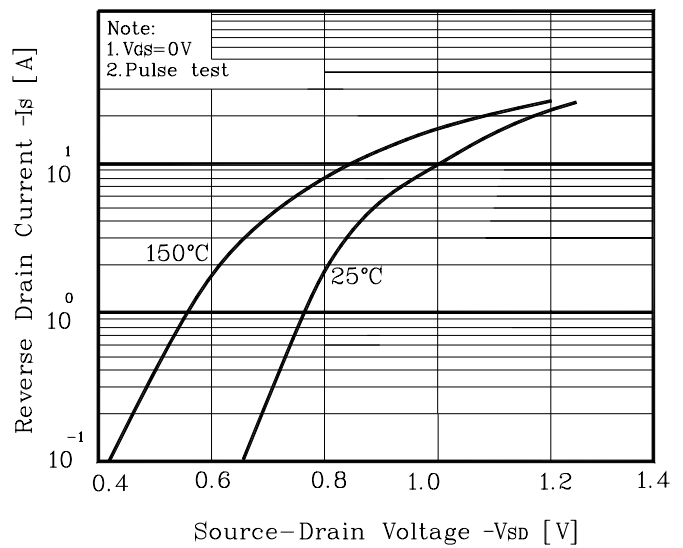


Fig. 5 Capacitance - V_{DS}

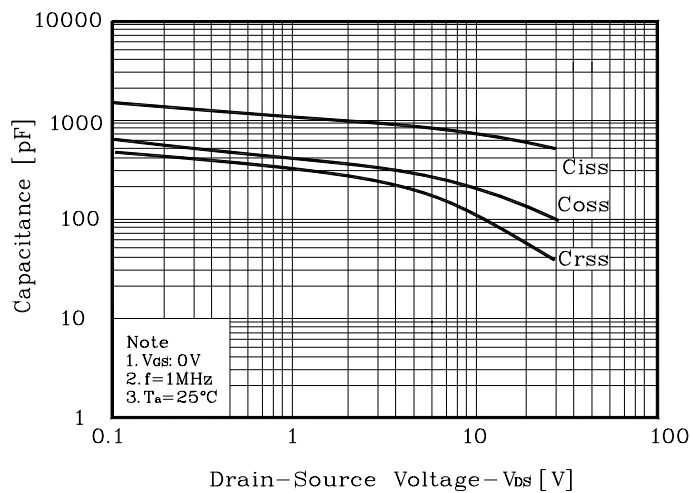


Fig. 6 $V_{GS} - Q_G$

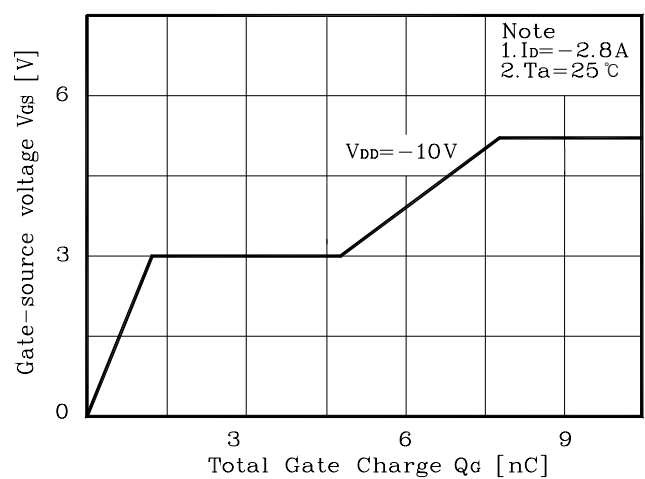


Fig. 7 $V_{DSS} - T_J$

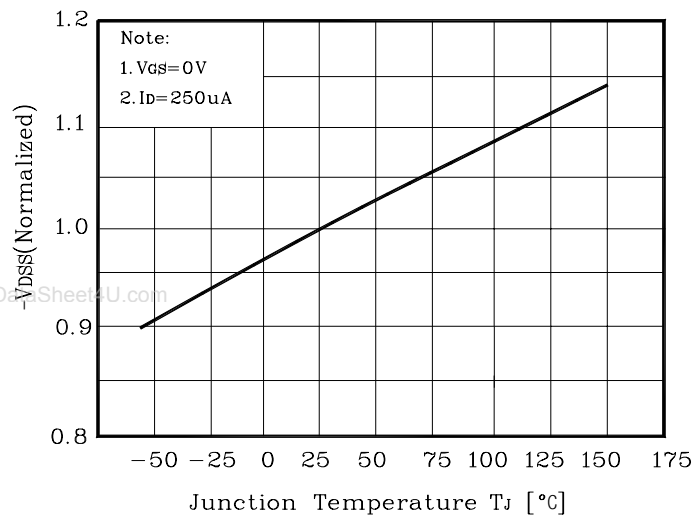


Fig. 8 $R_{DS(on)} - T_J$

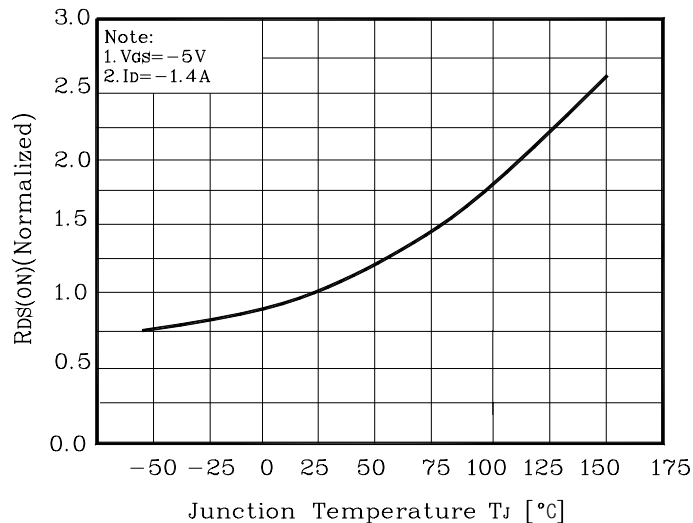


Fig. 9 $I_D - T_a$

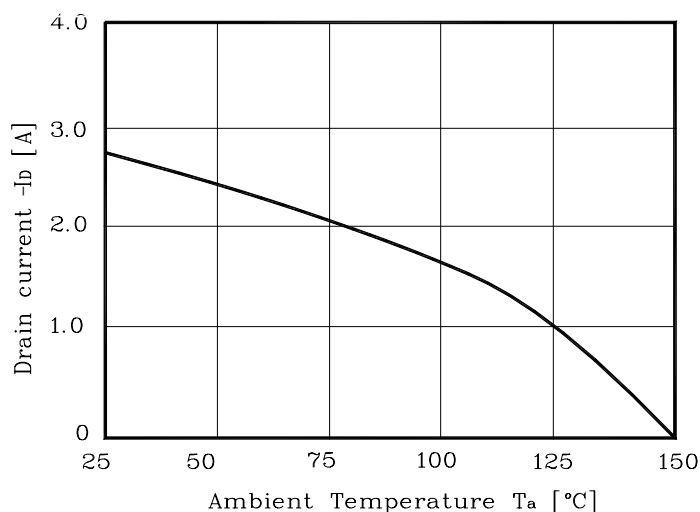


Fig. 10 Safe Operating Area

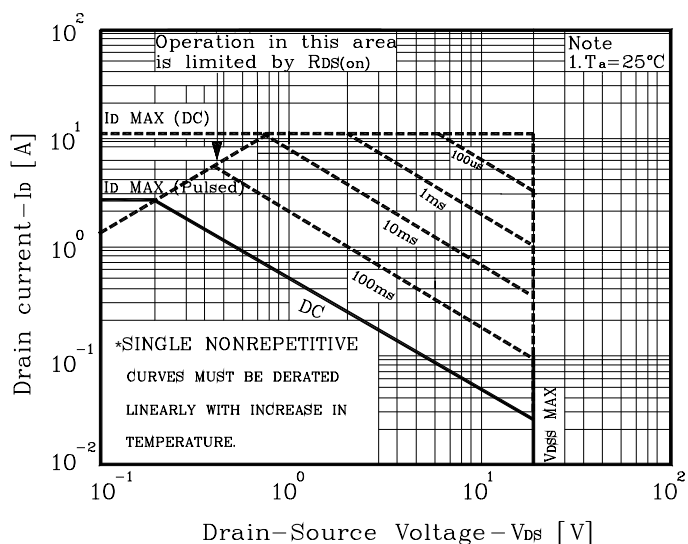


Fig. 11 Gate Charge Test Circuit & Waveform

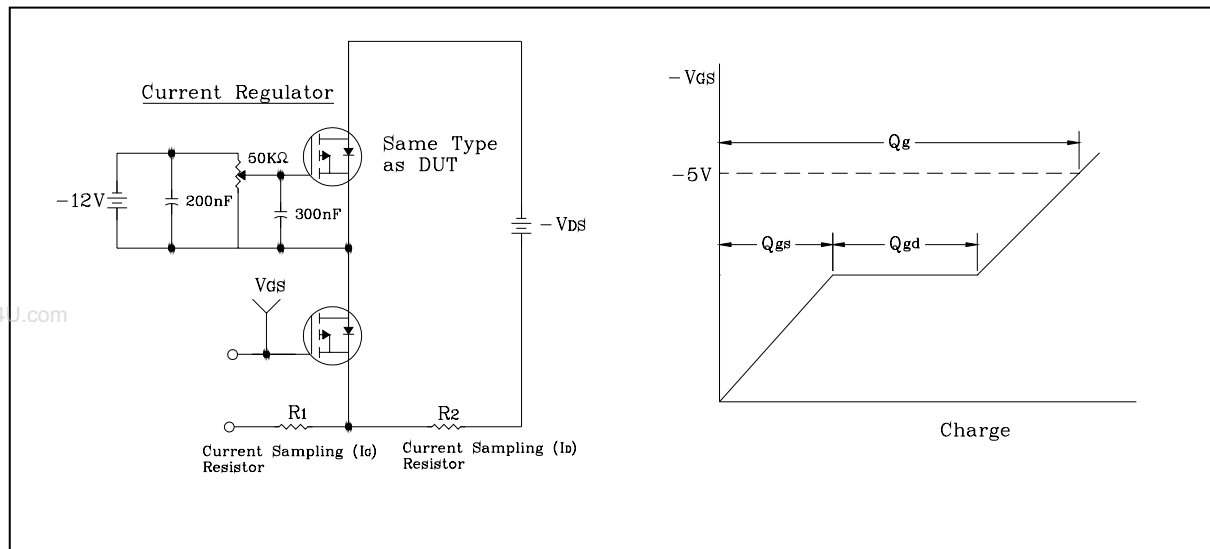


Fig. 12 Resistive Switching Test Circuit & Waveform

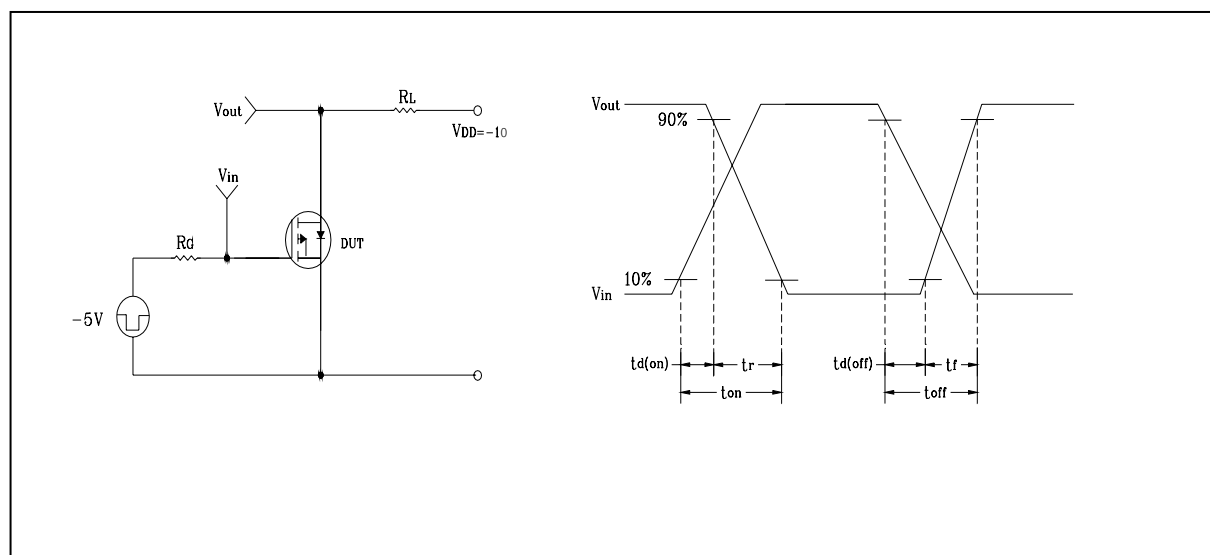


Fig. 13 E_{AS} Test Circuit & Waveform

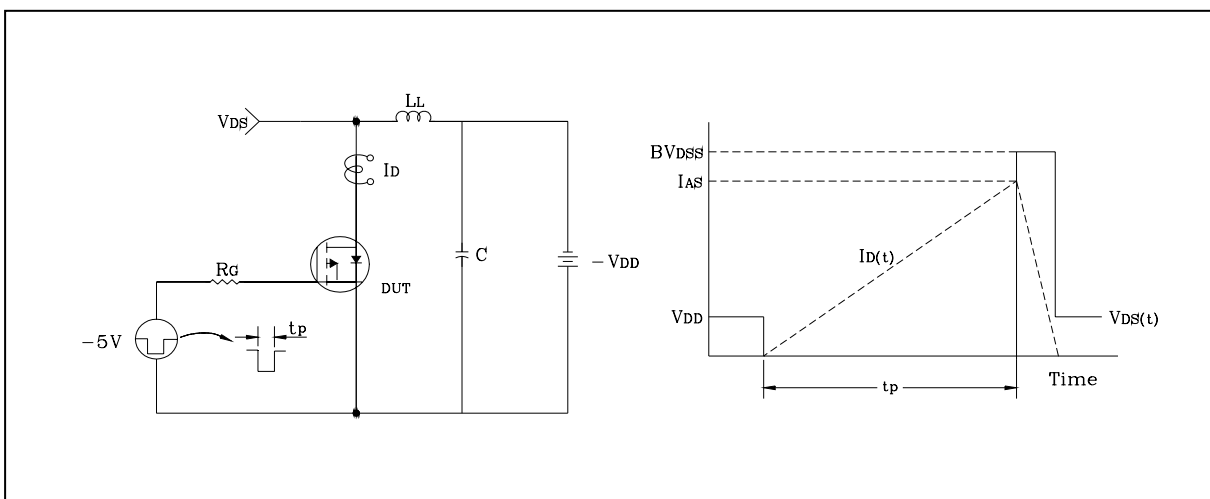
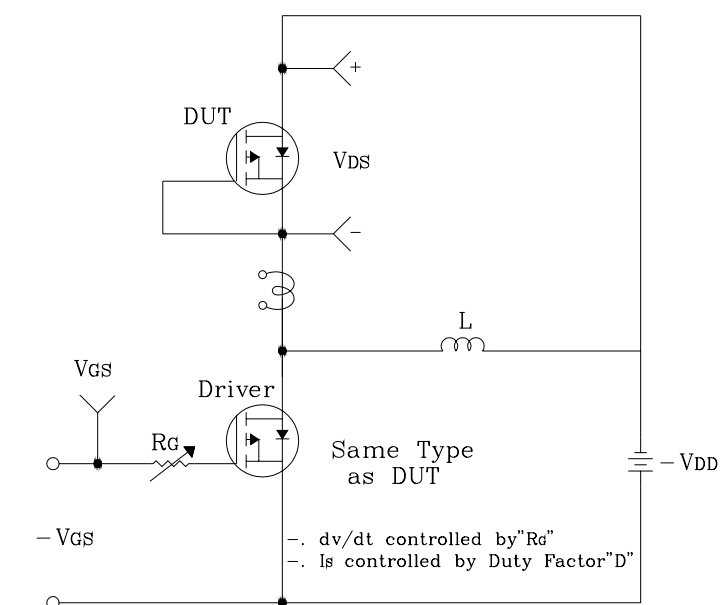


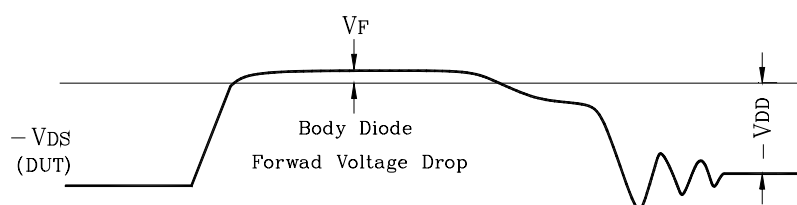
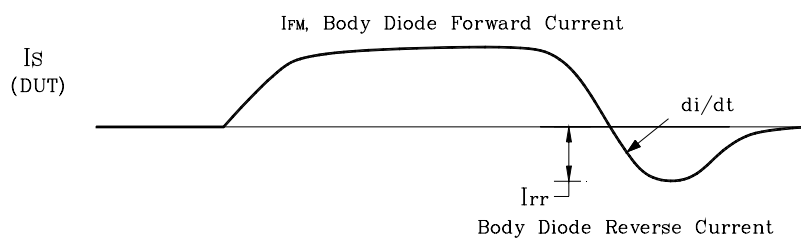
Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



$-V_{GS}$ (Driver)

$$D = \frac{\text{Gate Pulse Width}}{\text{Gate Pulse Period}}$$

$-5V$



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