

Portable Equipment Application.

Notebook Application.

Features

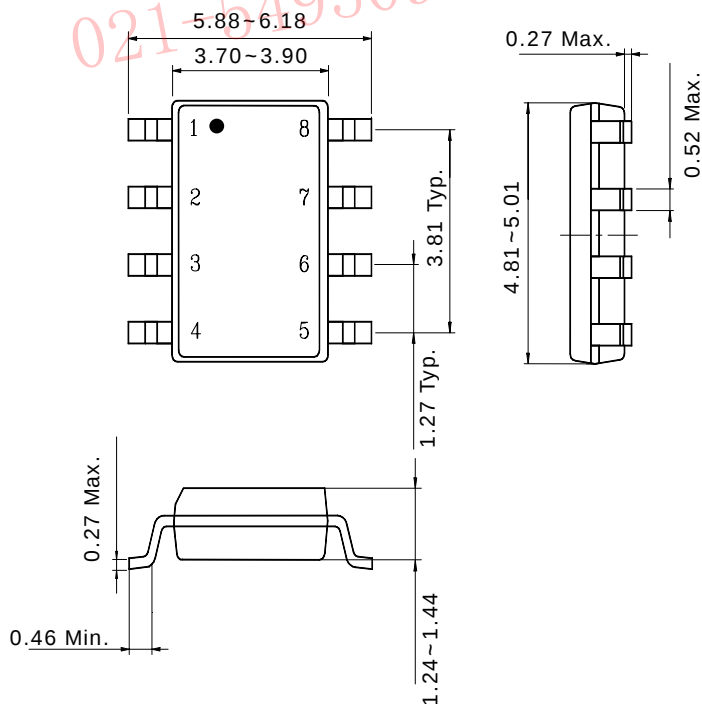
- Low $V_{GS(th)}$: $V_{GS(th)} = 1.0 \sim 3.0V$
- Small footprint due to small package
- Low $R_{DS(ON)}$: $R_{DS(ON)} = 66m\Omega$

Ordering Information

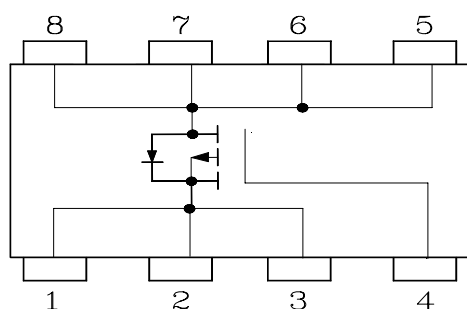
Type NO.	Marking	Package Code
STJ009	STJ009	SOP-8

Outline Dimensions

unit : mm



Block Diagram



PIN Connections

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

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	-5.3	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	μA
Gate leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -2.7A$	-	66	72	m Ω
		$V_{GS} = -5.0V, I_D = -2.7A$	-	77	83	m Ω
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}	$I_S = -1.5A$ $di_S/dt = 100A/\mu s$	-	90	-	ns
Reverse recovery charge	Q_{rr}		-	0.5	-	μC

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 < 300 μs , Duty cycle $\leq 2\%$
- ④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

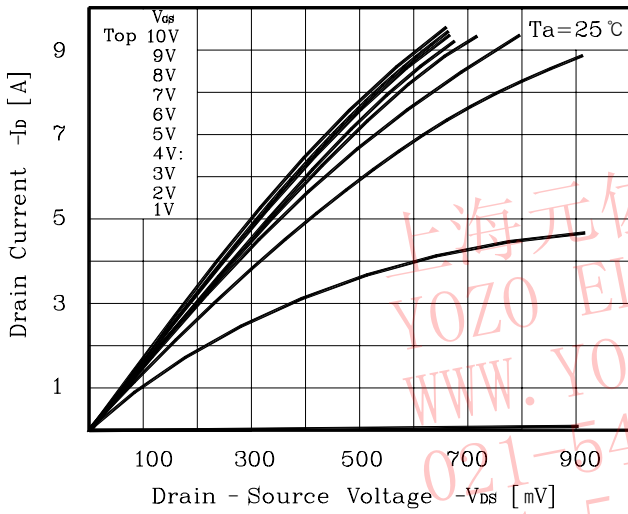


Fig. 2 I_D - V_{GS}

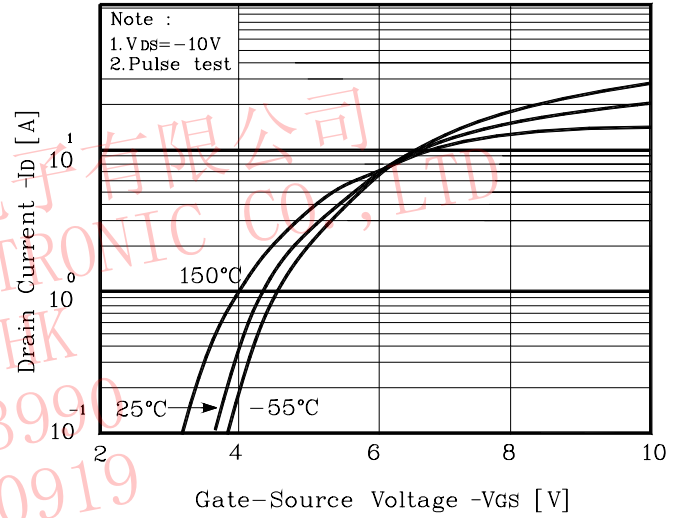


Fig. 3 $R_{DS(on)}$ - I_D

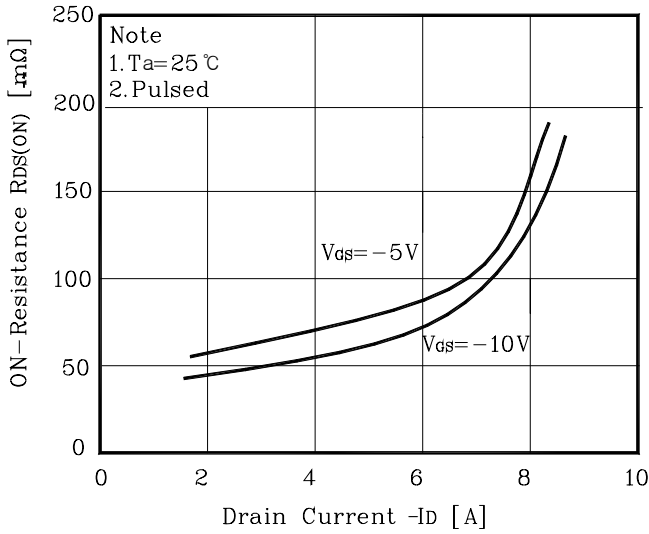


Fig. 4 I_S - V_{SD}

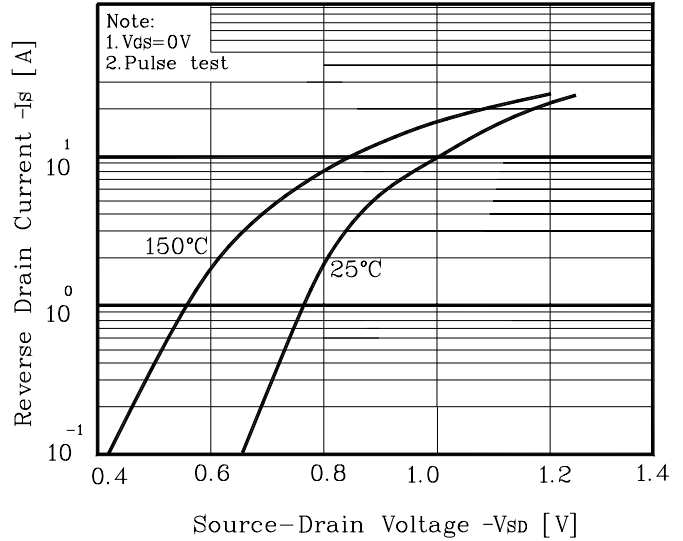


Fig. 5 Capacitance - V_{DS}

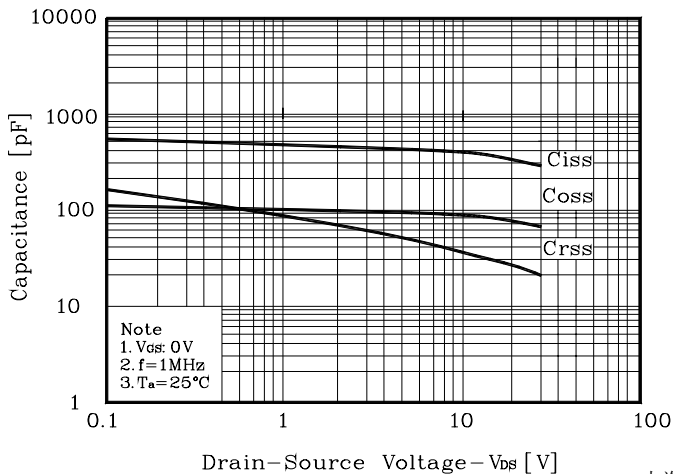
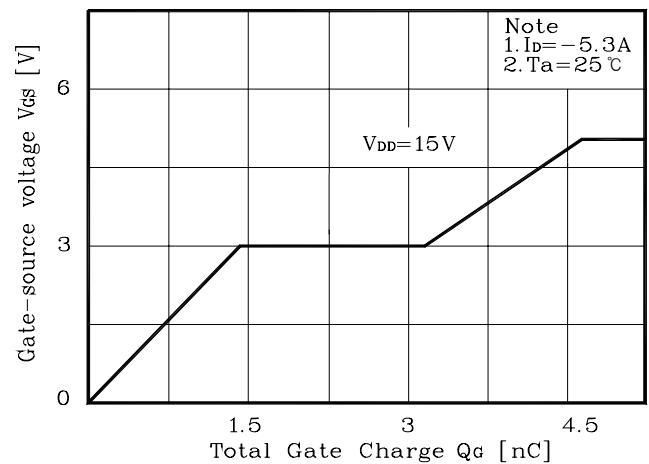


Fig. 6 V_{GS} - Q_G



STJ009

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Fig. 7 $V_{DS} - T_J$

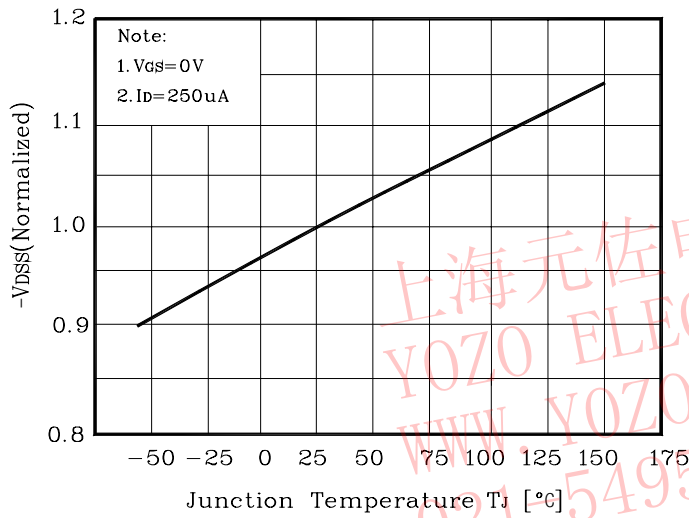


Fig. 8 $R_{DS(on)} - T_J$

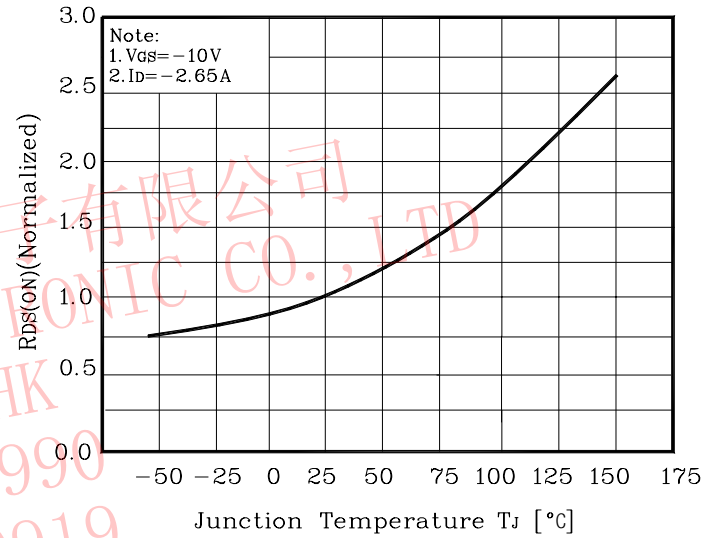


Fig. 9 $I_D - T_a$

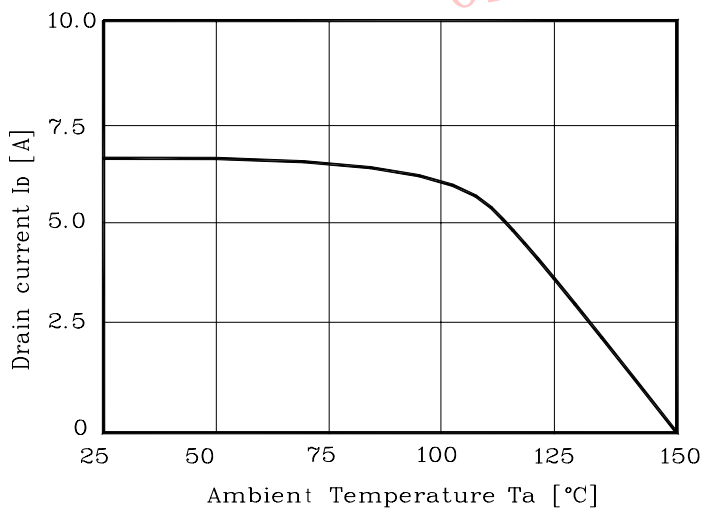


Fig. 10 Safe Operating Area

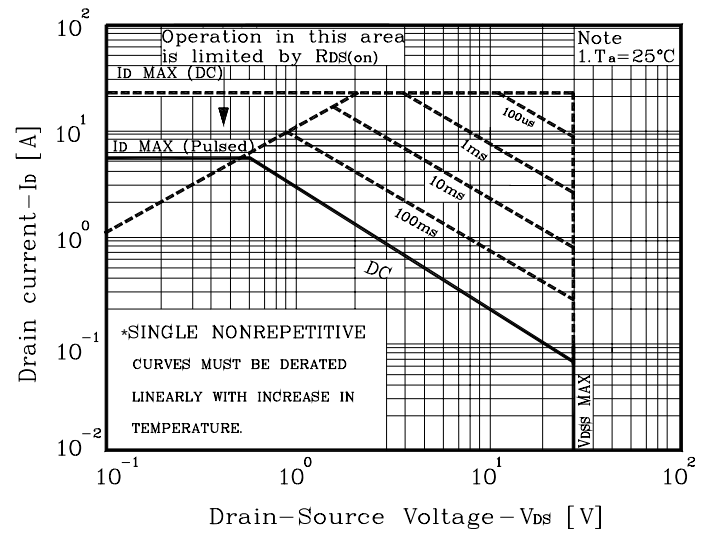


Fig. 11 Gate Charge Test Circuit & Waveform

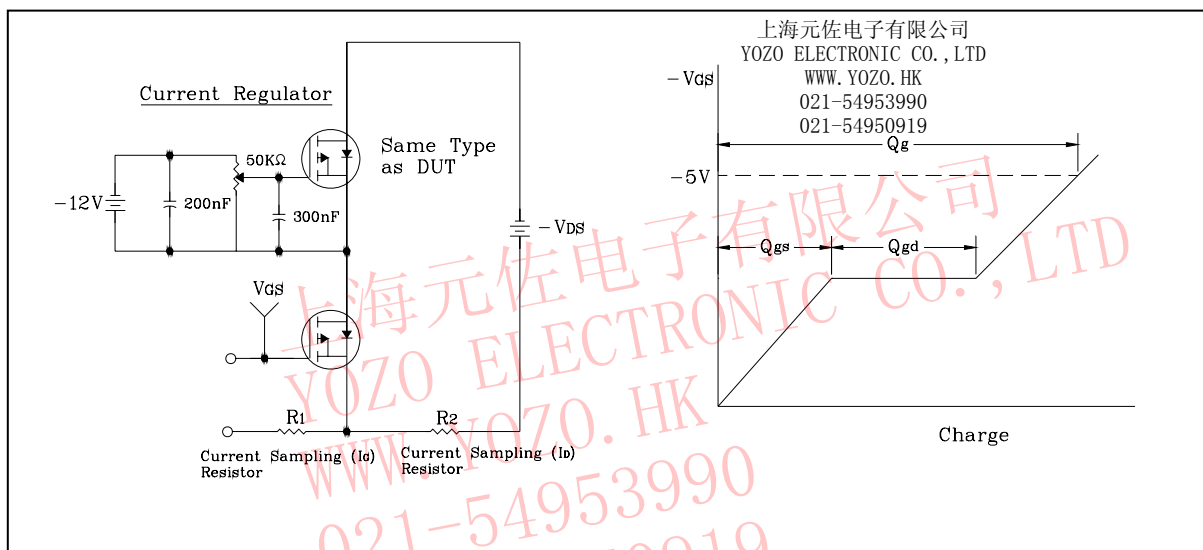


Fig. 12 Resistive Switching Test Circuit & Waveform

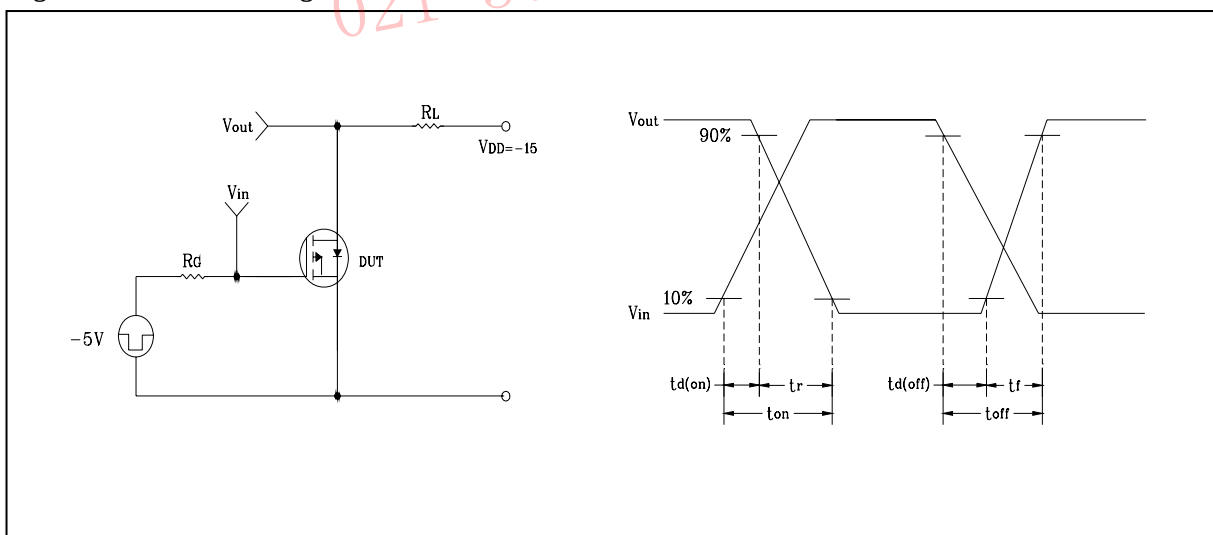


Fig. 13 E_{AS} Test Circuit & Waveform

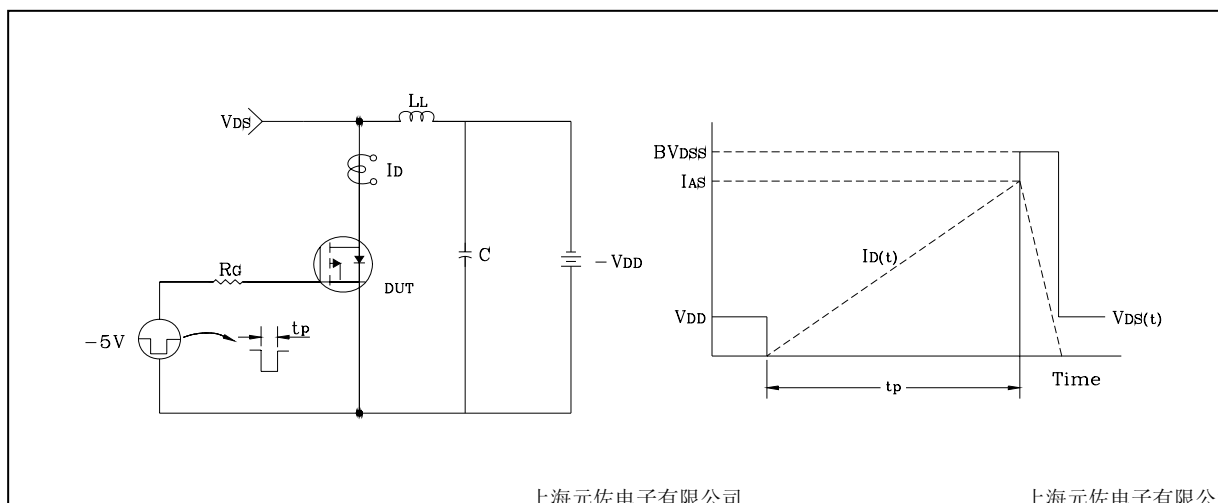


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform

