SUF1002

Dual N-channel Trench MOSFET

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

Features

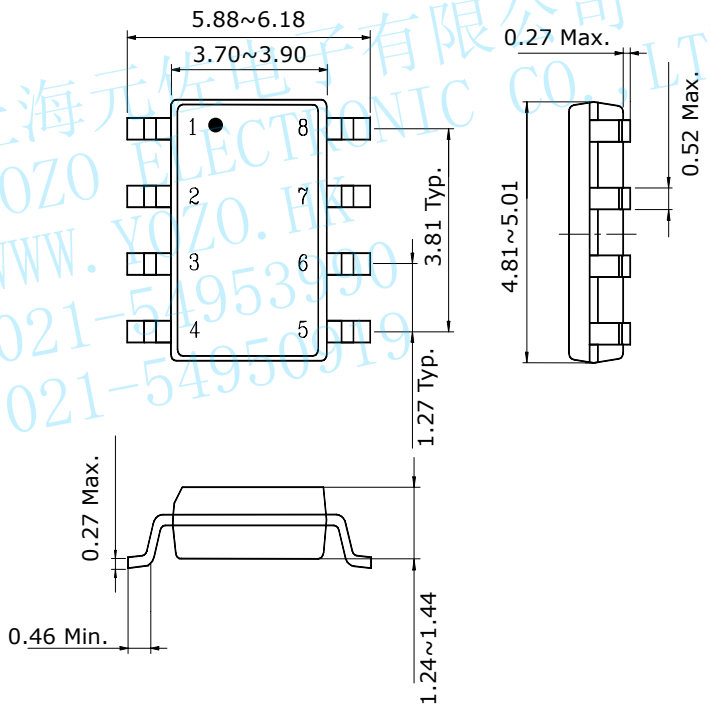
- Low C_{rss} : C_{rss}=36pF(Typ.)
- Low gate charge : Qg=4.2nC(Typ.)
- Low $R_{DS(on)}$:$R_{DS(on)}$=24mΩ(Typ.)
- Low $V_{GS(th)}$: $V_{GS(th)}$=1.0~3.0V

Ordering Information

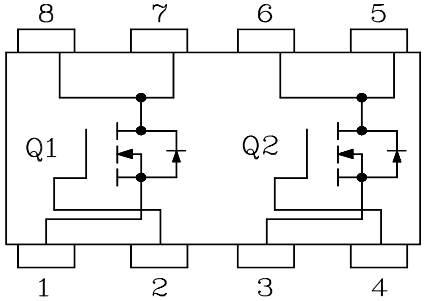
Type NO.	Marking	Package Code
SUF1002	SUF1002	SOP-8

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 2
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 moonted on a glass-epoxy board

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

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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	30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250μA, 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}=±20V	-	-	±100	nA
Drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.9A	-	24	30	mΩ
		V_{GS}=5.0V, I_D=2.9A	-	28	34	mΩ
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=10Ω 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_{DS}=15V, V_{GS}=5V I_D=5.8A ③④	-	4.2	6.3	nC
Gate-source charge	Q_{gs}		-	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	-	uC

Note ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② L=3.4mH, I_{AS}=5.8A, V_{DD}=15V, R_G=25Ω

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

④ Essentially independent of operating temperature

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Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

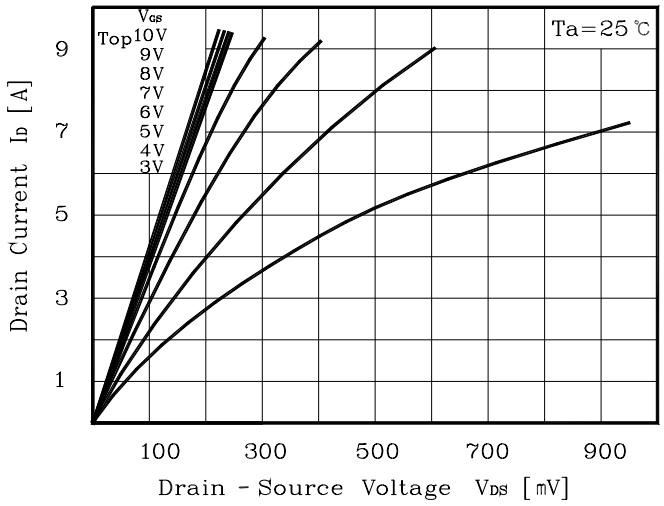

Fig. 2 I_D - V_{GS}

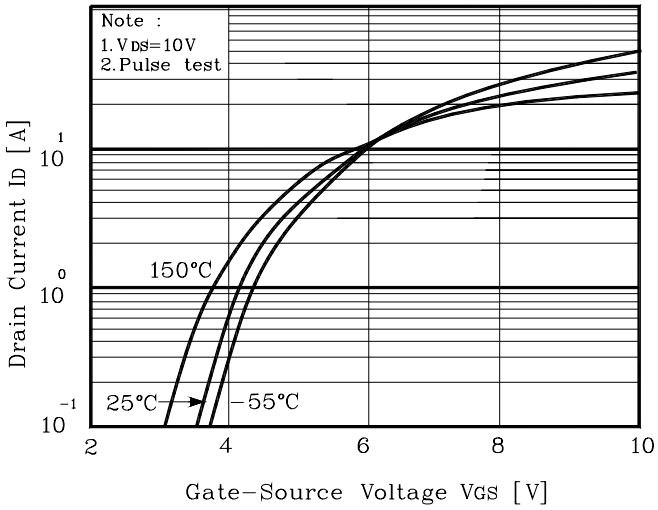

Fig. 3 $R_{DS(on)}$ - I_D

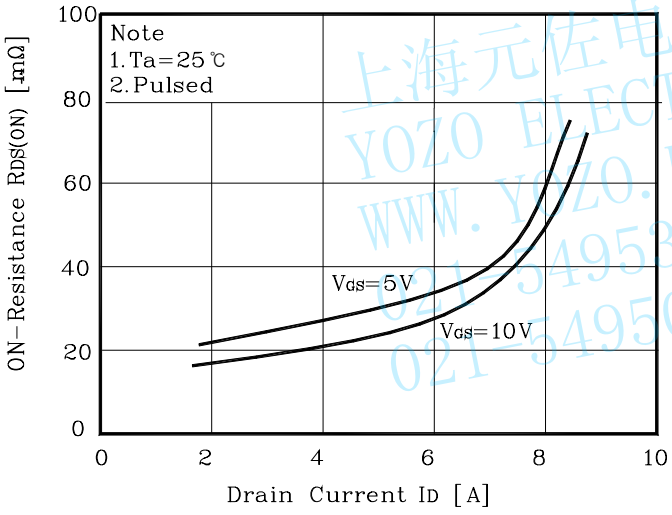

Fig. 4 I_S - V_{SD}

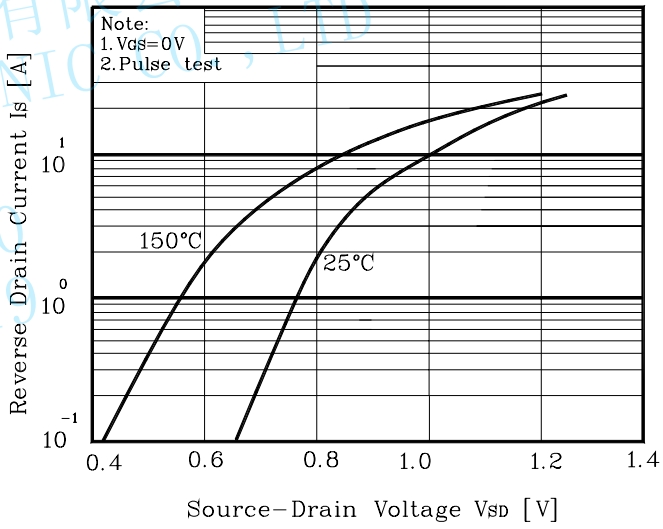

Fig. 5 Capacitance - V_{DS}

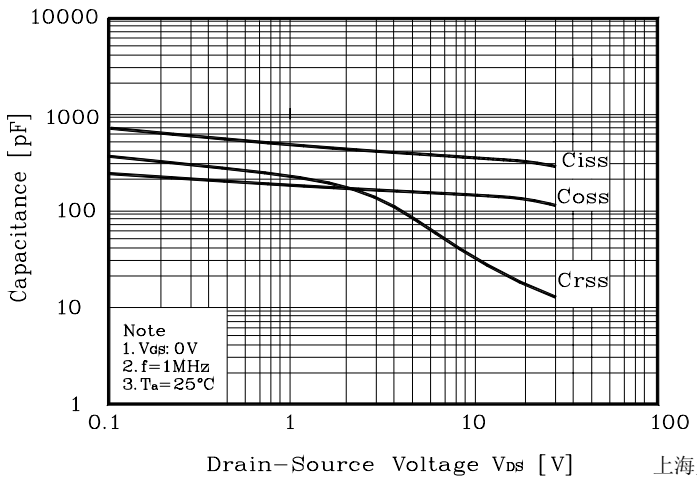

Fig. 6 V_{GS} - Q_G

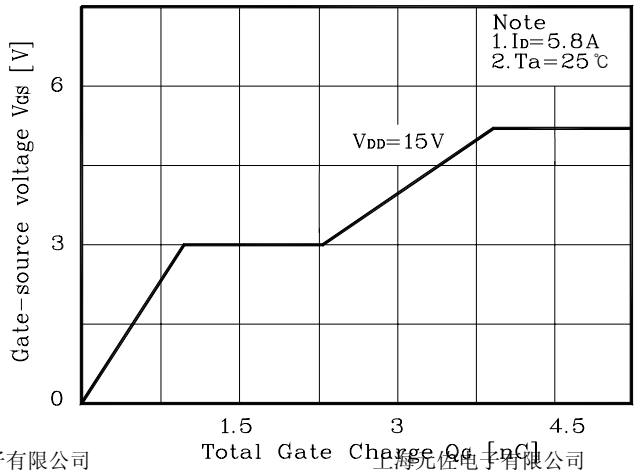

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Fig. 7 V_{DSS} - T_J

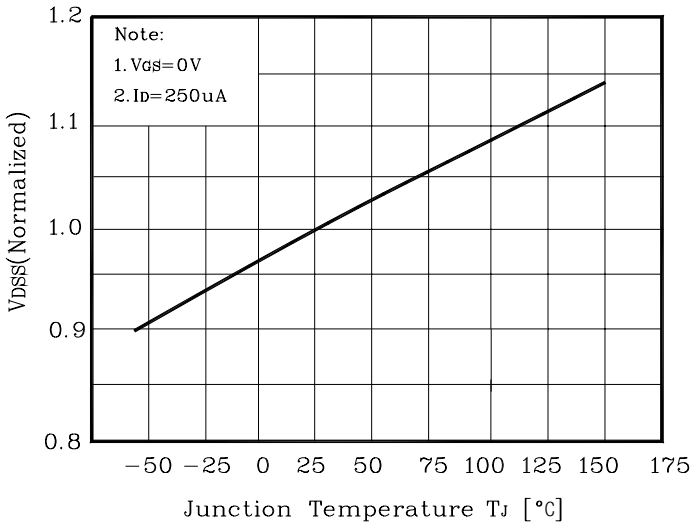

Fig. 8 $R_{DS(on)}$ - T_J

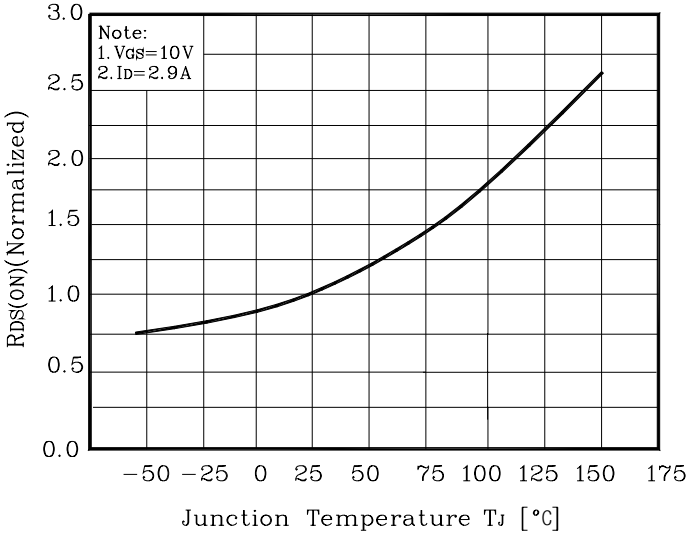

Fig. 9 I_D - T_a

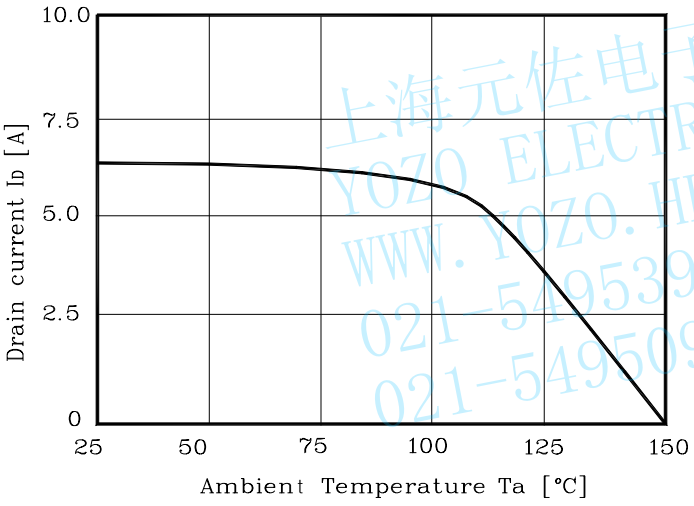

Fig. 10 Safe Operating Area

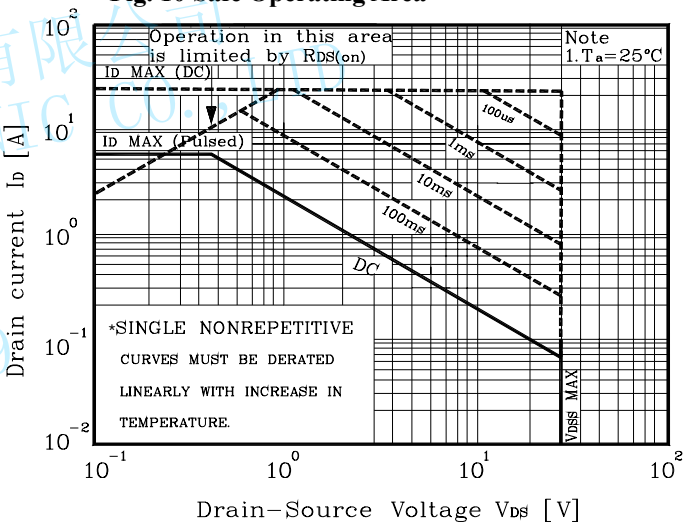

Fig. 11 Gate Charge Test Circuit & Waveform

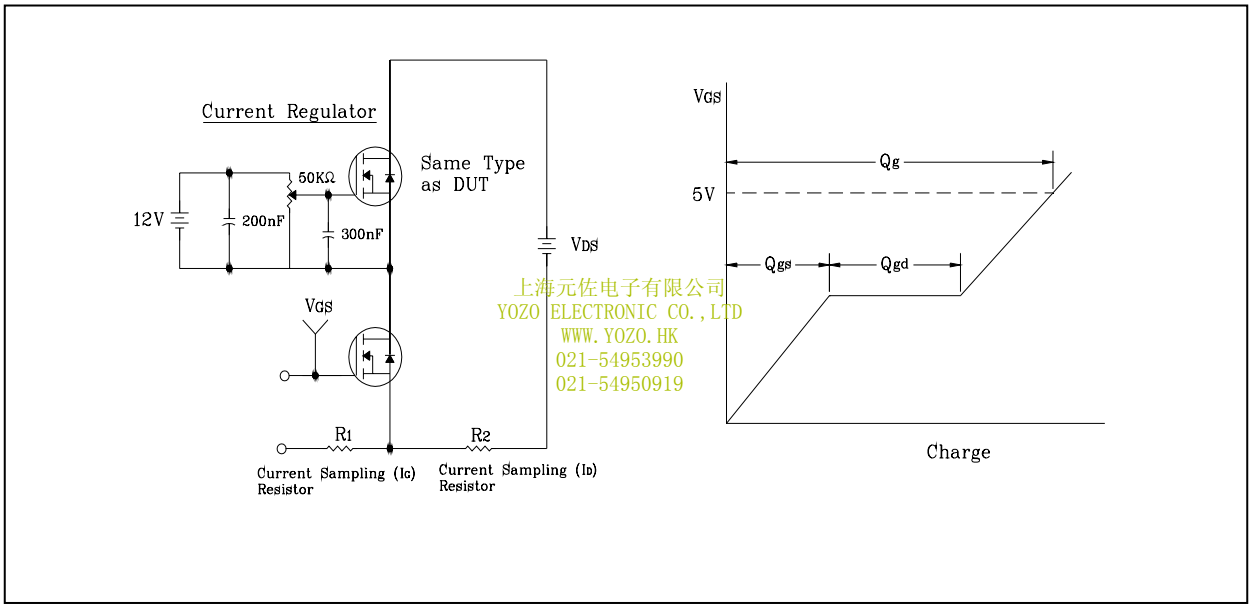

Fig. 12 Resistive Switching Test Circuit & Waveform

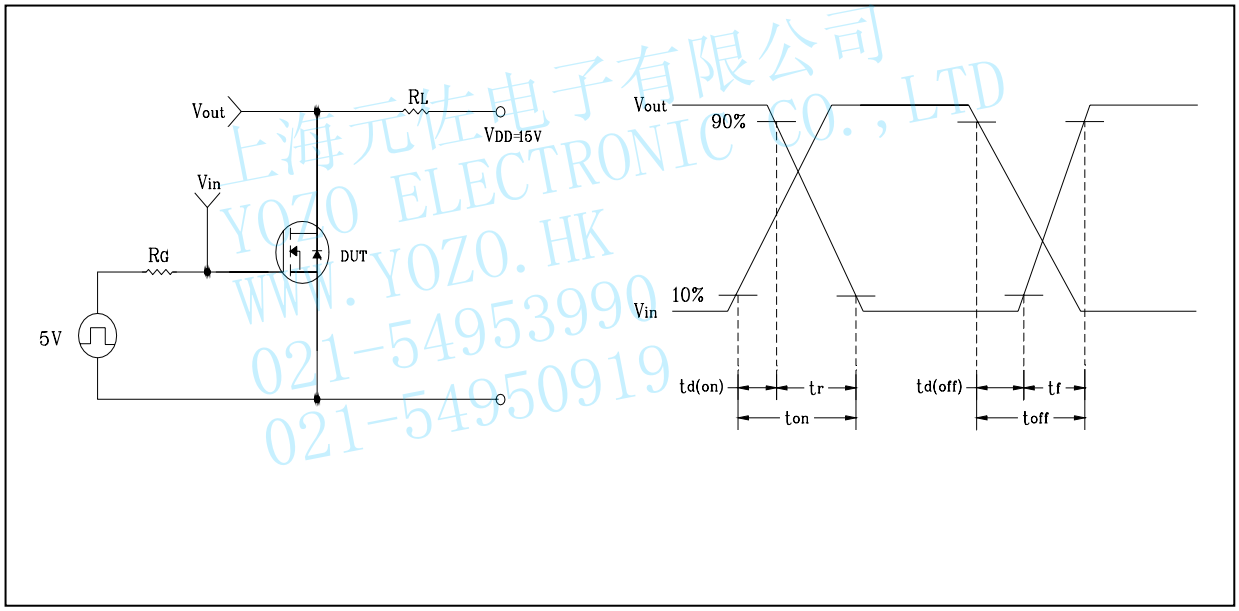

Fig. 13 E_{AS} Test Circuit & Waveform

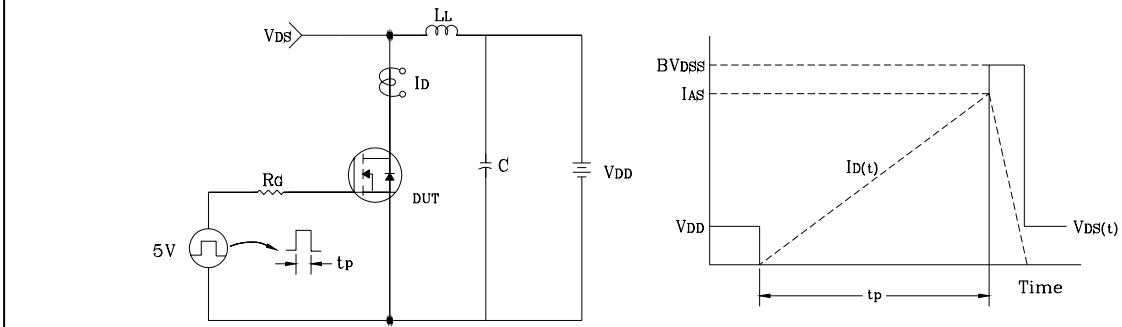

Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform