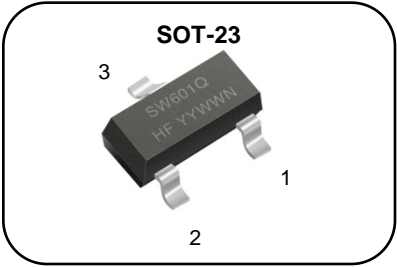


N-channel Depletion mode SOT-23 MOSFET

Features

- Low  $R_{DS(ON)}$  (Typ 330Ω) @  $V_{GS}=0V, I_D=3mA$
- High Switching Speed
- Application:LED,Charger



1. Source 2. Gate 3. Drain

**$BV_{DSS}$  : 600V**  
 **$I_D$  : 0.185A**  
 **$R_{DS(ON)}$  : 330Ω**



General Description

The SW601Q is an N-channel power MOSFET using SAMWIN's Advanced technology to provide the customers with high switching speed.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW E 601Q	SW601Q	SOT-23	REEL

Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{DSS}$	Drain to source voltage (Note 2)	600	V
$V_{DGX}$	Drain to gate voltage (Note 2)	600	V
$I_D$	Continuous drain current (@ $T_C=25^{\circ}C$ )	0.185	A
$I_{DM}$	Drain current pulsed	0.740	A
$V_{GSS}$	Gate to source voltage	$\pm 20$	V
$P_D$	Total power dissipation (@ $T_C=25^{\circ}C$ )	0.5	W
$T_J$	Junction temperature	+ 150	$^{\circ}C$
$T_{STG}$	Storage temperature	-55 ~ + 150	$^{\circ}C$

Thermal characteristics

Symbol	Parameter	Value	Unit
$R_{thja}$	Thermal resistance, Junction to ambient	250	$^{\circ}C/W$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.  
2.  $T_J=+25^{\circ}C\sim+150^{\circ}C$

Electrical characteristic (  $T_C = 25^{\circ}\text{C}$  unless otherwise specified )

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
<b>Off characteristics</b>						
$BV_{DSS}$	Drain to source breakdown voltage	$V_{GS}=-5V, I_D=250\mu A$	600			V
$I_{D(OFF)}$	Drain to source leakage current	$V_{DS}=600V, V_{GS}=-5V$			0.1	$\mu A$
$I_{GSS}$	Gate to source leakage current, forward	$V_{GS}=20V, V_{DS}=0V$			100	nA
	Gate to source leakage current, reverse	$V_{GS}=-20V, V_{DS}=0V$			-100	nA
<b>On characteristics</b>						
$V_{GS(OFF)}$	Gate to Source Cut Off Voltage	$V_{DS}=3V, I_D=8\mu A$	-2.7		-1.5	V
$I_{DSS}$	Drain to source leakage current	$V_{DS}=25V, V_{GS}=0V$	7			mA
$R_{DS(ON)}$	Drain to source on state resistance	$V_{GS}=0V, I_D=3mA$		330	700	$\Omega$
<b>Dynamic characteristics</b>						
$C_{iss}$	Input capacitance	$V_{GS}=0V, V_{DS}=25V, f=1MHz$		15		pF
$C_{oss}$	Output capacitance			145		
$C_{rss}$	Reverse transfer capacitance			4		
$t_{d(on)}$	Turn on delay time	$V_{GS}=-5\sim 5V, V_{DD}=30V, I_D=5mA, R_G=20\Omega$		40		ns
$t_r$	Rising time			20		
$t_{d(off)}$	Turn off delay time			45		
$t_f$	Fall time			280		
$Q_g$	Total gate charge	$V_{GS}=-5\sim 5V, V_{DD}=30V, I_D=5mA$		1300		nC
$Q_{gs}$	Gate-source charge			300		
$Q_{gd}$	Gate-drain charge			45		

## Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{SD}$	Diode forward voltage drop.	$I_{SD}=3mA, V_{GS}=-10V$			1.4	V

Notes: 1. Repetitive rating, pulse width limited by maximum junction temperature.  
2. Pulse width $\leq 380\mu s$ ; duty cycle $\leq 2\%$ .

Fig. 1. On-state characteristics

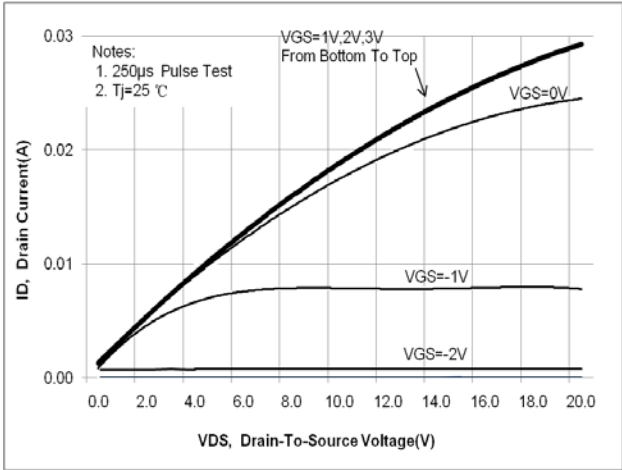


Fig. 2. transfer characteristics

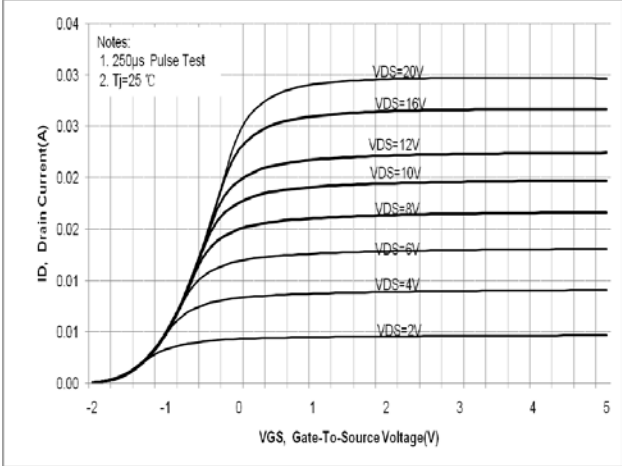


Fig 3. Breakdown Voltage Variation vs. Junction Temperature

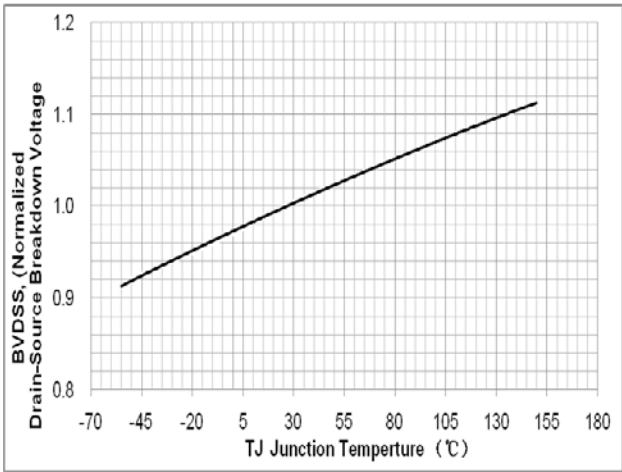


Fig. 4. On resistance variation vs. junction temperature

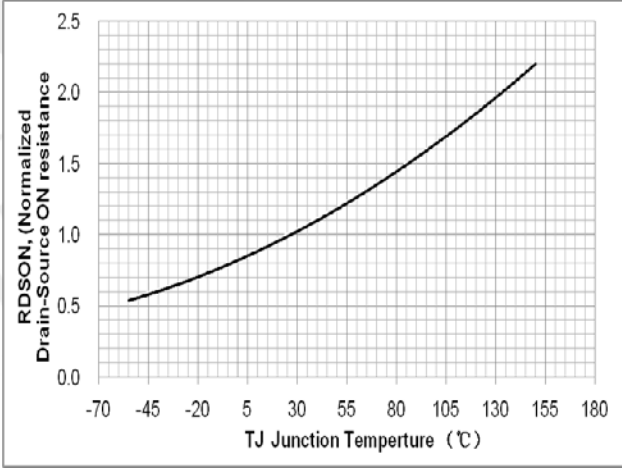


Fig. 5. Gate charge test circuit & waveform

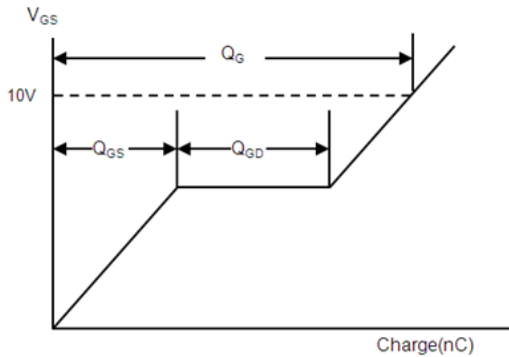
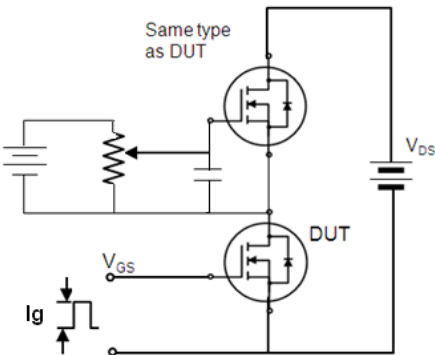


Fig. 6. Switching time test circuit & waveform

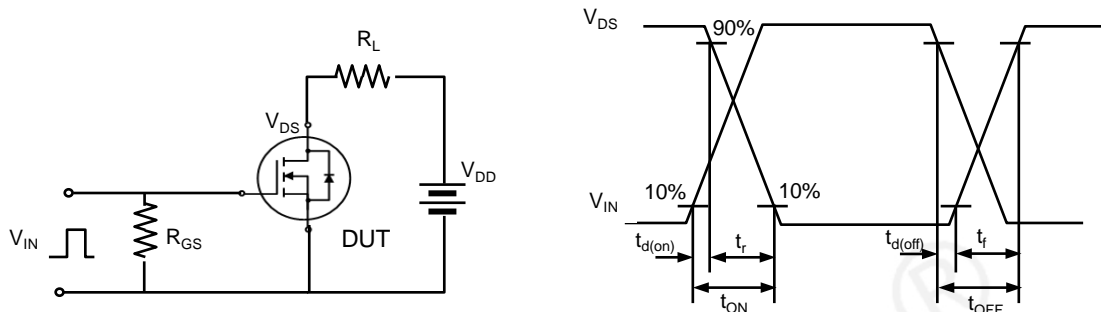
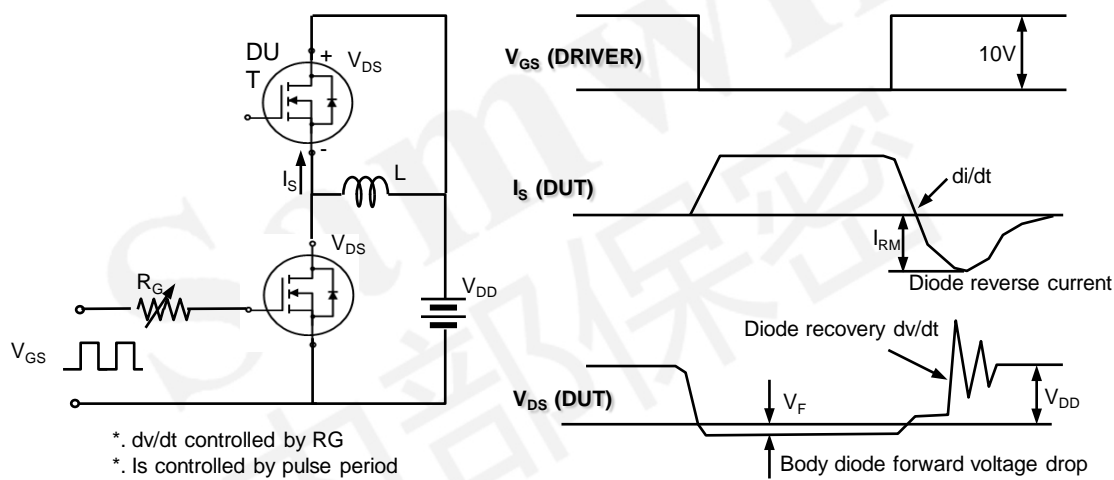



Fig. 7. Peak diode recovery dv/dt test circuit & waveform



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### DISCLAIMER

- \* All the data & curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
- \* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
- \* Qualification standards can also be found on the Web site (<http://www.semipower.com.cn>) 
- \* Suggestions for improvement are appreciated, Please send your suggestions to [samwin@samwinsemi.com](mailto:samwin@samwinsemi.com)