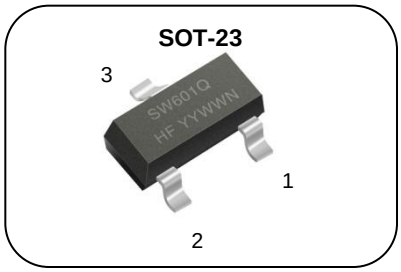
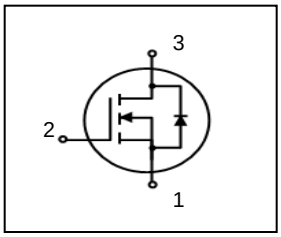
N-channel SOT-23 MOSFET



1. Source 2. Gate 3. Drain

BV_{DSS} : 600V
I_D : 0.185A
$R_{DS(ON)}$: 700Ω



Features

■ $R_{DS(ON)}$ (Max 700Ω)@V_{GS}=0V,ID=3mA
■ High Switching Speed

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=25ºC)	0.185	A
I_{DM}	Drain current pulsed	0.740	A
V_{GSS}	Gate to Source Voltage	±20	V
P_D	Total power dissipation (@T_C=25ºC)	0.5	W
T_J	Junction Temperature	+ 150	ºC
T_{STG},	Storage Temperature	-55 ~ + 150	ºC

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thja}	Thermal resistance, Junction to ambient	250	ºC/W

Notes: 1. Absolute maximum ratings are those valuesbeyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. TJ=+25˚C~+150˚C

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=-5V, I_D=250uA	600			V
$I_{D(OFF)}$	Drain to source leakage current	V_{DS}=600V, V_{GS}=-5V			0.1	uA
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
On characteristics						
$V_{GS(OFF)}$	Gate to Source Cut Off Voltage	V_{DS}=3V, I_D=8uA	-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	Ω
Dynamic characteristics						
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}=-5~5V, V_{DD}=30V, I_D=5mA, R_G=20Ω		40		ns
tr	Rising time			20		
$t_{d(off)}$	Turn off delay time			45		
t_f	Fall time			280		
Q_g	Total gate charge	V_{GS}=-5~5V, 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≤380μs; duty cycle≤2%.

Fig. 1. On-state characteristics

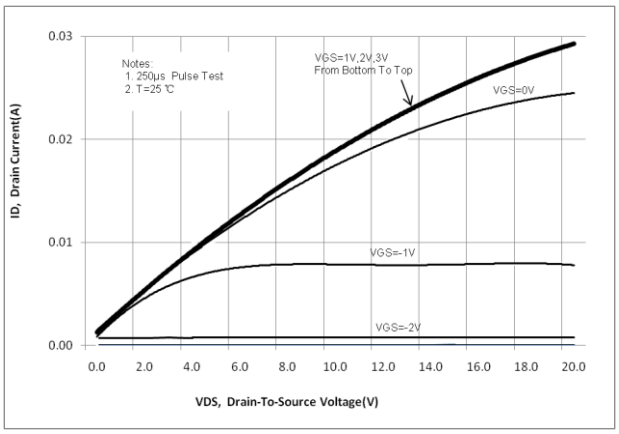


Fig. 2. transfer characteristics

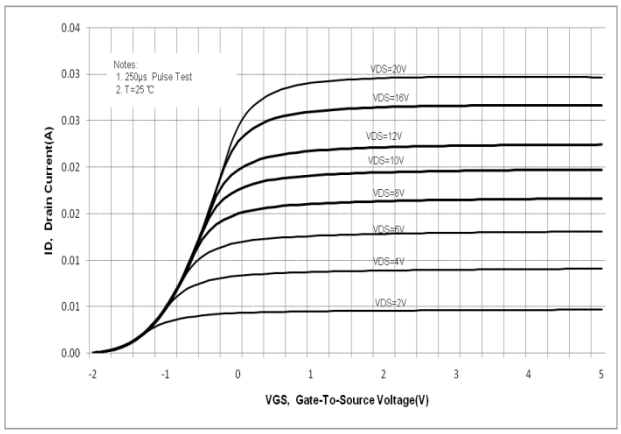


Fig 3. Breakdown Voltage Variation vs. Junction Temperature

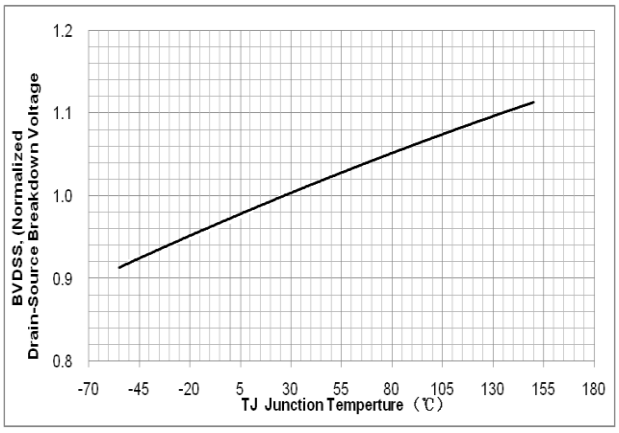


Fig. 4. On resistance variation vs. junction temperature

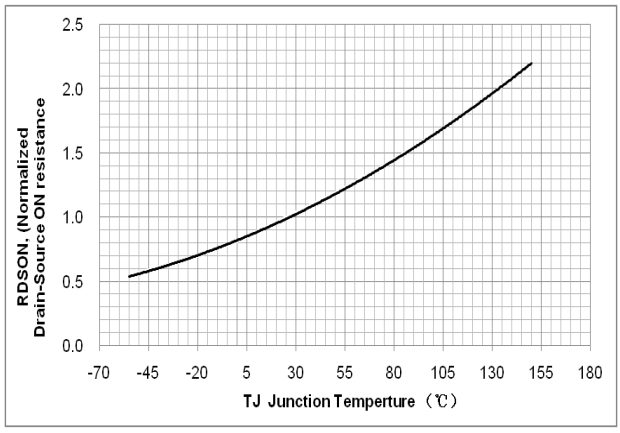


Fig. 10. Gate charge test circuit & waveform

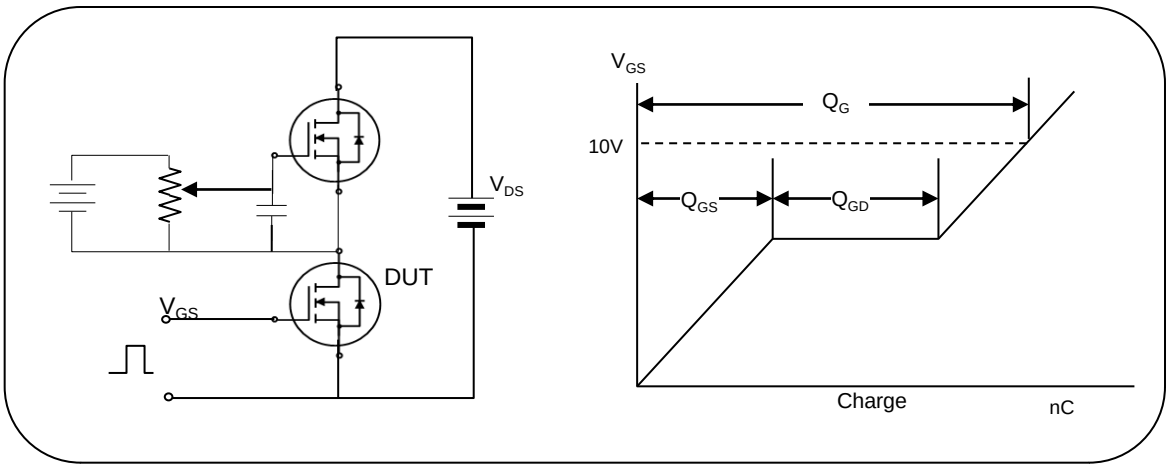


Fig. 11. Switching time test circuit & waveform

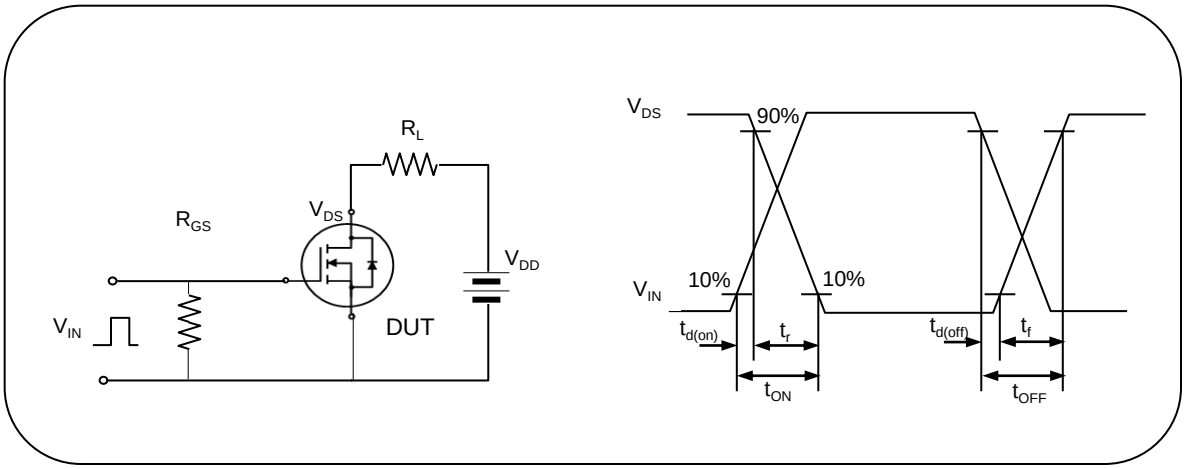


Fig. 13. Peak diode recovery dv/dt test circuit & waveform