# 4V Drive Pch+SBD MOS FET QS6U24

#### Structure

Silicon P-channel MOS FET Schottky Barrier DIODE

#### Features

- The QS6U24 combines Pch MOS FET with a Schottky barrier diode in a TSMT6 package.
- 2) Low on-state resisternce with a fast switching.
- 3) Low voltage drive (4V).
- 4) Built-in schottky barrier diode has low forward voltage.

#### Applications

Load switch, DC/DC conversion

# Packaging specifications

	Package	Taping
Type	Code	TR
	Basic ordering unit (pieces)	3000
QS6U24		0

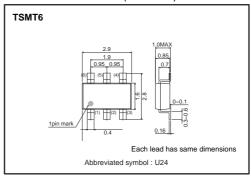
# ● Absolute maximum ratings (Ta=25°C)

# <MOSFET>

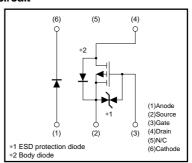
Parameter		Symbol	Limits	Unit			
Drain-source voltage		VDSS	-30	V			
Gate-source voltage		Vgss	±20	V			
Drain current	Continuous	lο	±1.0	Α			
	Pulsed	I <sub>DP</sub> *1	±2.0	Α			
Source current	Continuous	Is	-0.3	Α			
(Body diode)	Pulsed	Isp *1	-1.2	Α			
Channel temperature		Tch	150	°C			
Power dissipation		P <sub>D</sub> *3	0.9	W/ELEMENT			
<di></di>							
Parameter		Symbol	Limits	Unit			
Repetitive peak reverse voltage		V <sub>RM</sub>	25	V			
Reverse voltage		VR	20	V			
Forward current		lF	0.7	Α			
Forward current surge peak		IFSM *2	3.0	Α			
Junction temperature		Tj	150	°C			
Power dissipation		P <sub>D</sub> *3	0.7	W/ELEMENT			
<mosfet and="" di=""></mosfet>							
Parameter		Symbol	Limits	Unit			
Total power dissipatino		P <sub>D</sub> *3	1.25	W/TOTAL			
Range of strage temperature		Tstg	-55 to +150	°C			
4 Post 0 a Potential 40% at 0.00 leading at 0.00 Mountains a constraint and							

#### \*1 Pw≤10μs, Duty cycle≤1% \*2 60Hz-1cyc. \*3 Mounted on a ceramic board

#### ●External dimensions (Unit : mm)



#### •Inner circuit



A protection diode has been buitt in between the gate and
the source to protect against static electricity when the product
is in use. Use the protection circuit when rated voltages are exceeded

# ●Electrical characteristics (Ta=25°C)

## <MOSFET>

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Gate-source leakage	Igss	-	_	±10	μΑ	Vgs=±20V, Vps=0V
Drain-source breakdown voltage	V(BR) DSS	-30	_	_	٧	In=-1mA, Vgs=0V
Zero gate voltage drain current	IDSS	_	_	-1	μΑ	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V
Gate threshold voltage	VGS (th)	-1.0	_	-2.5	٧	V <sub>DS</sub> =-10V, I <sub>D</sub> =-1mA
		_	300	400	$m\Omega$	In=-1A, Vgs=-10V
Static drain-source on-starte resistance	RDS (on)*	_	500	700	$m\Omega$	In=-0.5A, Vgs=-4.5V
resistance		_	600	800	$m\Omega$	In=-0.5A, Vgs=-4V
Forward transfer admittance	Y <sub>fs</sub>   *	0.5	_	_	S	V <sub>DS</sub> =-10V, I <sub>D</sub> =-0.5A
Input capacitance	Ciss	_	90	_	pF	V <sub>DS</sub> =-10V
Output capacitance	Coss	_	25	_	pF	Vgs=0V
Reverse transfer capacitance	Crss	-	16	_	pF	f=1MHz
Turn-on delay time	<b>t</b> d (on) *	-	9	_	ns	ID=-0.5A
Rise time	tr *	_	7	_	ns	V <sub>DD</sub> ≒–15V   V <sub>GS</sub> =–4.5V
Turn-off delay time	td (off) *	_	18	_	ns	VGS=-4.5 V   RL=30Ω
Fall time	t <sub>f</sub> *	_	7	_	ns	R <sub>G</sub> =10Ω
Total gate charge	Qg	_	1.7	_	nC	V <sub>DD</sub> ≒–15V
Gate-source charge	Qgs	-	0.6	_	nC	Vgs=-5V
Gate-drain charge	Qgd	_	0.4	_	nC	ID=-1.0A

<sup>\*</sup> Pulsed

## <Body diode (source-drain)>

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Forward voltage	VsD	_	_	-1.2	V	Is=-0.3A, Vgs=0V

# <Di>

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Forward voltage drop	VF	-	_	0.49	V	I==0.7A
Reverse current	IR	_	_	200	μΑ	V <sub>R</sub> =20V

#### Electrical characteristic curves

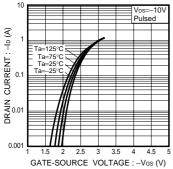


Fig.1 Typical Transfer Characteristics

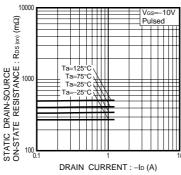


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (I)

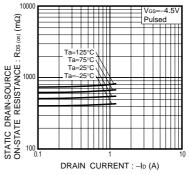


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (II)

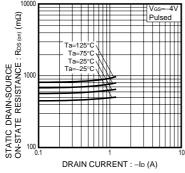


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (III)

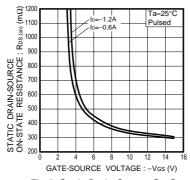


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

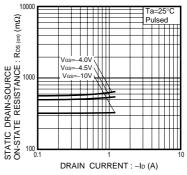


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (IV)

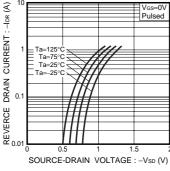
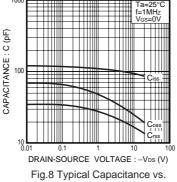


Fig.7 Reverse Drain Current vs. Source-Drain Voltage



Drain-Source Voltage

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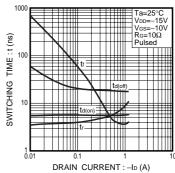
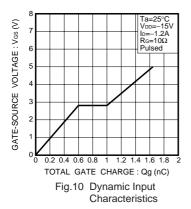


Fig.9 Switching Characteristics



Measurement circuits

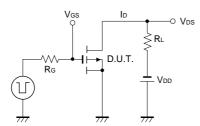


Fig.11 Switching Time Measurement Circuit

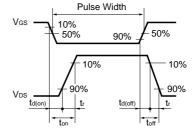


Fig.12 Switching Waveforms

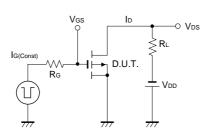


Fig.13 Gate Charge Measurement Circuit

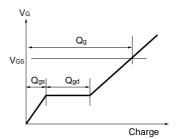


Fig.14 Gate Charge Waveforms

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