Transistor

Small switching (−20V, −1.5A)

QS5U26

● **Features**

1) The QS5U26 conbines Pch Treueh MOSFET with a Schottky barrier diode in a single TSMT5 package.
2) Pch Treueh MOSFET have a low on-state resisternce with a fast switching.
3) Pch Treueh MOSFET is neucted a low voltage drive (2.5V).
4) The independently connected Schottky barrier diode have a low forward voltage.

● **Applications**

load switch, DC/DC conversion

● **Structure**

•Silicon P-channel MOS FET
•Schottky Barrier DIODE

● **Packaging specifications**

Type	Package		Taping
	Code		TR
	Basic ordering unit (pieces)		3000
QS5U26			○

● **External dimensions** (Units : mm)

TSMT5

(1)Gate
(2)Source
(3)Anode
(4)Cathode
(5)Drain

Each lead has same dimensions

Abbreviated symbol : U26

● **Equivalent circuit**

(1)Gate
(2)Source
(3)Anode
(4)Cathode
(5)Drain

∗1 ESD protection diode
∗2 Body diode
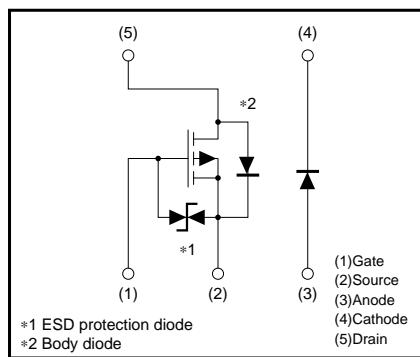
∗ A protection diode has been buitt in between the gate and the source to protect against static electricity when the product is in use. Use the protection circuit when rated voltages are exceeded.

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

<MOSFET>

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	−20	V
Gate-source voltage		V_{GSS}	±12	V
Drain current	Continuous	I_D	±1.5	A
	Pulsed	I_{DP}	±6.0	A [1]
Source current (Body diode)	Continuous	I_S	−0.75	A
	Pulsed	I_{SP}	−3.0	A [1]
Channel temperature		Tch	150	°C

<Di>

Parameter	Symbol	Limits	Unit
Repetitive peak reverse voltage	V_{RM}	30	V
Reverse voltage	V_R	20	V
Forward current	I_F	0.5	A
Forward current surge peak	I_{FSM}	2.0	A [2]
Junction temperature	Tj	125	°C

<MOSFET AND Di>

Parameter	Symbol	Limits	Unit
Total power dissipatino	P_D	1.0	W/TOTAL[3]
Range of strage temperature	Tstg	−40~+125	°C

∗1 Pw≤10μs, Duty cycle≤1% ∗2 60Hz・1cyc. ∗3 Mounted on a ceramic board.

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●**Electrical characteristics** (Ta=25°C)

<MOSFET>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	±10	μA	$V_{GS}=±12V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	−20	–	–	V	$I_D=−1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	–	–	−1	μA	$V_{DS}=−20V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	−0.7	–	−2.0	V	$V_{DS}=−10V$, $I_D=−1mA$
Static drain-source on-starte resistance	$R_{DS(on)}$	–	160	200	mΩ	$I_D=−1.5A$, $V_{GS}=−4.5V$
		–	180	240	mΩ	$I_D=−1.5A$, $V_{GS}=−4V$ *
		–	260	340	mΩ	$I_D=−0.75A$, $V_{GS}=−2.5V$
Forward transfer admittance	$|Y_{fs}|$	1.0	–	–	S	$V_{DS}=−10V$, $I_D=−0.75A$ *
Input capacitance	C_{iss}	–	325	–	pF	$V_{DS}=−10V$
Output capacitance	C_{oss}	–	60	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	40	–	pF	f=1MHz
Tum-on delay time	$t_{d(on)}$	–	10	–	ns	$I_D=−0.75A$ *
Rise time	t_r	–	10	–	ns	$V_{DD}≒−15V$ *
Tum-off delay time	$t_{d(off)}$	–	35	–	ns	$V_{GS}=−4.5V$ $R_L=20Ω$ *
Fall time	t_f	–	10	–	ns	$R_{GS}=10Ω$ *
Total gate charge	Q_g	–	4.2	–	nC	$V_{DD}≒−15V$
Gate-source charge	Q_{gs}	–	1.0	–	nC	$V_{GS}=−4.5V$
Gate-drain charge	Q_{gd}	–	1.1	–	nC	$I_D=−1.5A$

* Pulsed

●**Body diode** (Source-drain)

<MOSFET>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	–	–	−1.2	V	$I_S=−0.75A$, $V_{GS}=0V$

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Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_F	–	–	0.36	V	$I_F=0.1A$
	V_F	–	–	0.47	V	$I_F=0.5A$
Reverse leakage	I_R	–	–	100	μA	$V_R=20V$

●**Electrical characteristic curves**
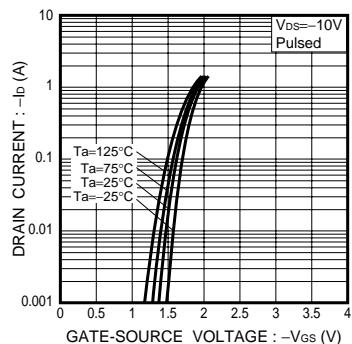
Fig.1 Typical Transfer Characteristics
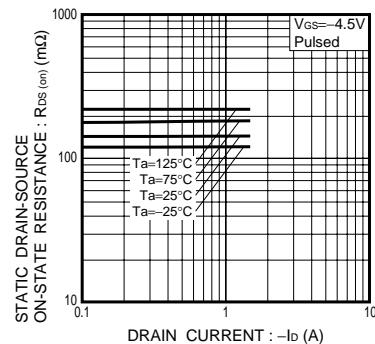
Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (I)
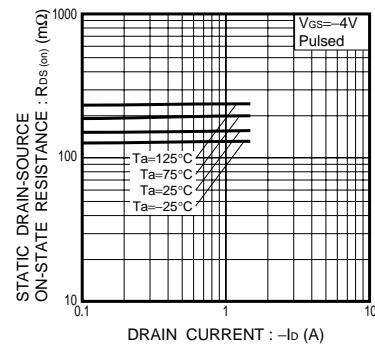
Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (II)
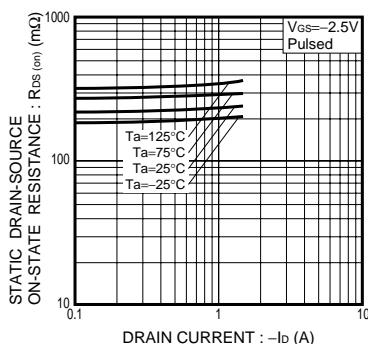

Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (III)
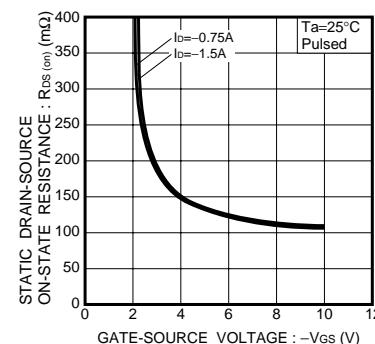
Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage
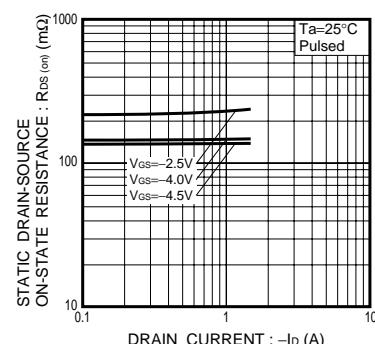
Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (IV)

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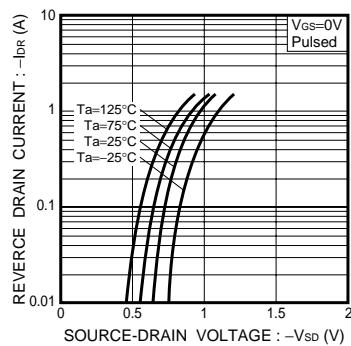
Fig.7 Reverse Drain Current vs.
Source-Drain Current
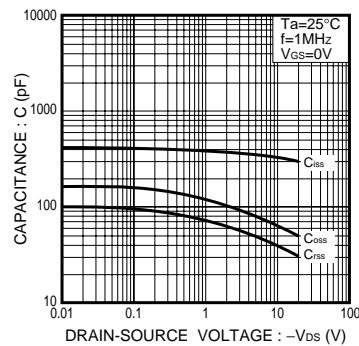
Fig.8 Typical Capacitance vs.
Drain-Source Voltage
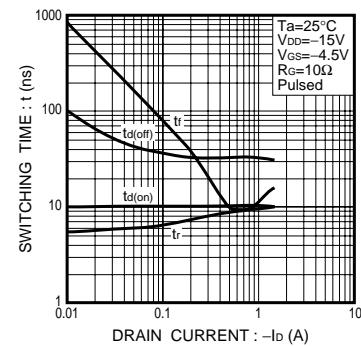

Fig.9 Switching Characteristics
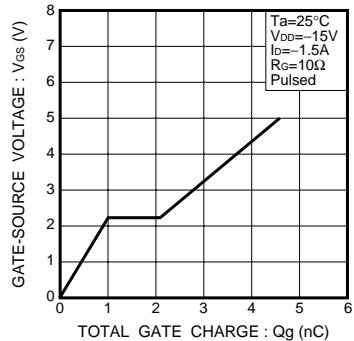
Fig.10 Dynamic Input
Characteristics

●**Measurement circuits**
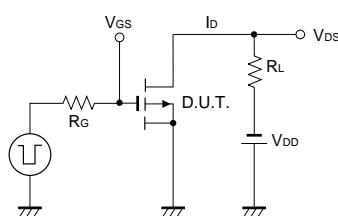
Fig.11 Switching Time Measurement Circuit
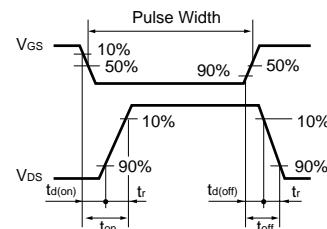
Fig.12 Switching Waveforms
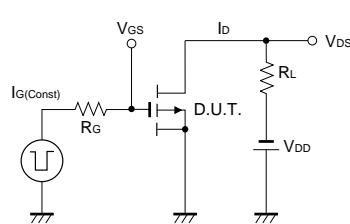
Fig.13 Gate Charge Measurement Circuit
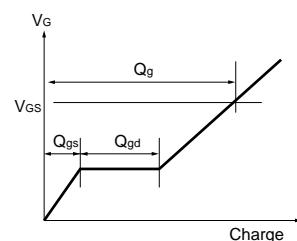
Fig.14 Gate Charge Waveforms

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