Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

# 1.8V Drive Nch+SBD MOSFET

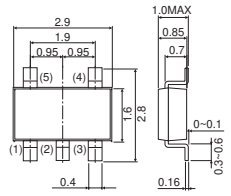
## QS5U34

### ●Structure
Silicon N-channel MOSFET
Schottky Barrier DIODE

### ●Features
1) The QS5U34 combines Nch MOSFET with a Schottky barrier diode in a single TSMT5 package.
2) Low on-state resistance with fast switching.
3) Low voltage drive (1.8V).
4) The Independently connected Schottky barrier diode has low forward voltage.

### ●Dimensions (Unit : mm)

**TSMT5**



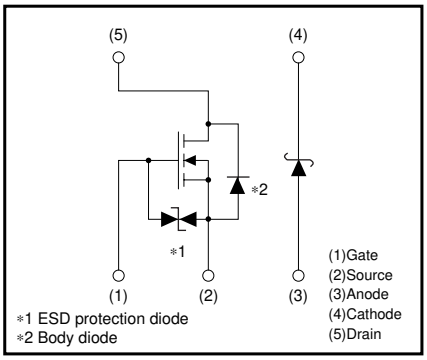

Each lead has same dimensions
Abbreviated symbol : U34

### ●Applications
Load switch, DC / DC conversion

### ●Packaging specifications

| | | |
|---|---|---|
| Type | Package | Taping |
| | Code | TR |
| | Basic ordering unit (pieces) | 3000 |
| QS5U34 | | ○ |

### ●Equivalent circuit




*1 ESD protection diode
*2 Body diode

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

<MOSFET>

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DSS}$ | 20 | V |
| Gate-source voltage | | $V_{GSS}$ | 10 | V |
| Drain current | Continuous | $I_D$ | ±1.5 | A |
| | Pulsed | $I_{DP}$ *1 | ±3.0 | A |
| Source current (Body diode) | Continuous | $I_S$ | 0.6 | A |
| | Pulsed | $I_{SP}$ *1 | 2.4 | A |
| Channel temperature | | Tch | 150 | °C |
| Power dissipation | | $P_D$ *3 | 0.9 | W/ELEMENT |

<Di>

| | | | |
|---|---|---|---|
| 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 | 2.0 | A |
| Junction temperature | Tj | 150 | °C |
| Power dissipation | $P_D$ *3 | 0.7 | W/ELEMENT |

<MOSFET AND Di>

| | | | |
|---|---|---|---|
| Total power dissipation | $P_D$ *3 | 1.25 | W / TOTAL |
| Range of Storage temperature | Tstg | −55 to +150 | °C |

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

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

<MOSFET>

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Gate-source leakage | $I_{GSS}$ | – | – | 10 | µA | $V_{GS}$=10V / $V_{DS}$=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 | $V_{GS\ (th)}$ | 0.3 | – | 1.3 | V | $V_{DS}$=10V / $I_D$=1mA |
| Static drain-source on-state resistance | $R_{DS\ (on)}$* | – | 130 | 180 | mΩ | $I_D$=1.5A, $V_{GS}$=4.5V |
| | | – | 170 | 240 | mΩ | $I_D$=1.5A, $V_{GS}$=2.5V |
| | | – | 220 | 310 | mΩ | $I_D$=0.8A, $V_{GS}$=1.8V |
| Forward transfer admittance | $\|Y_{fs}\|$ * | 1.6 | – | – | S | $V_{DS}$=10V, $I_D$=1.5A |
| Input capacitance | $C_{iss}$ | – | 110 | – | pF | $V_{DS}$=10V |
| Output capacitance | $C_{oss}$ | – | 18 | – | pF | $V_{GS}$=0V |
| Reverse transfer capacitance | $C_{rss}$ | – | 15 | – | pF | f=1MHz |
| Turn-on delay time | $t_{d\ (on)}$ * | – | 5 | – | ns | $I_D$=1.0A |
| Rise time | $t_r$ * | – | 5 | – | ns | $V_{DD}$ ≒10V |
| Turn-off delay time | $t_{d\ (off)}$ * | – | 20 | – | ns | $V_{GS}$=4.5V |
| Fall time | $t_f$ * | – | 3 | – | ns | $R_L$=10Ω |
| | | | | | | $R_G$=10Ω |
| Total gate charge | $Q_g$ * | – | 1.8 | 2.5 | nC | $V_{DD}$ ≒10V |
| Gate-source charge | $Q_{gs}$ * | – | 0.3 | – | nC | $V_{GS}$=4.5V |
| Gate-drain charge | $Q_{gd}$ * | – | 0.3 | – | nC | $I_D$=1.5A |

*Pulsed

<MOSFET>Body diode (source-drain)

| | | | | | | |
|---|---|---|---|---|---|---|
| Forward voltage | $V_{SD}$ | – | – | 1.2 | V | $I_S$=0.6A / $V_{GS}$=0V |

<Di>

| | | | | | | |
|---|---|---|---|---|---|---|
| Forward voltage | $V_F$ | – | – | 0.36 | V | $I_F$=0.1A |
| | | – | – | 0.47 | V | $I_F$=0.5A |
| Reverse current | $I_R$ | – | – | 100 | µA | $V_R$=20V |

**●Electrical characteristic curves**

<MOSFET>

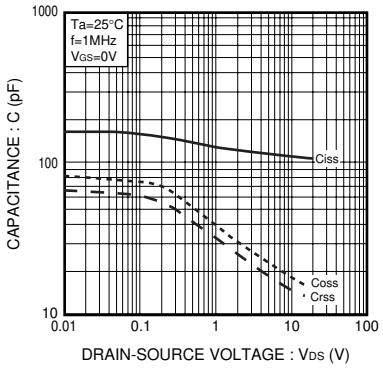



Fig.1 Typical Capacitance vs. Drain-Source Voltage

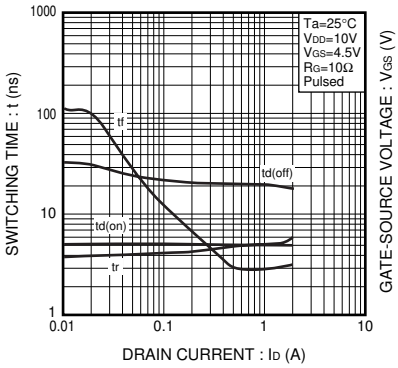



Fig.2 Switching Characteristics

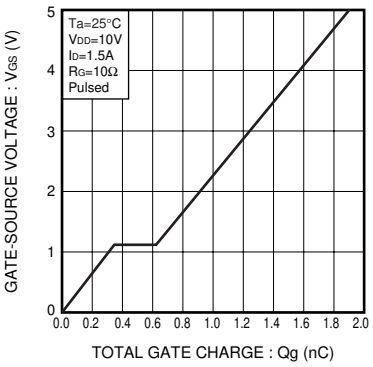



Fig.3 Dynamic Input Characteristics

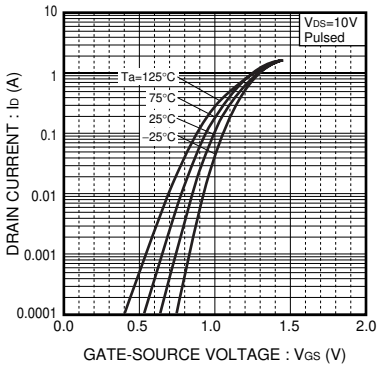



Fig.4 Typical Transfer Characteristics

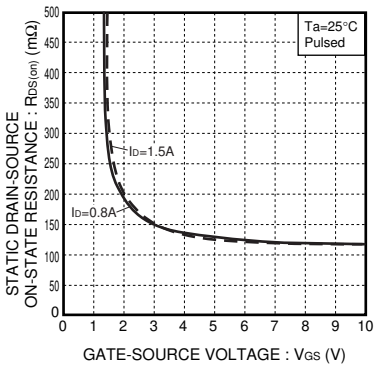



Fig.5 Static Drain-Source On-State Resistance vs. Gate-source Voltage

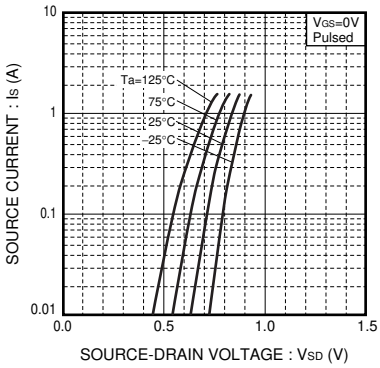



Fig.6 Source Current vs. Source-Drain Voltage

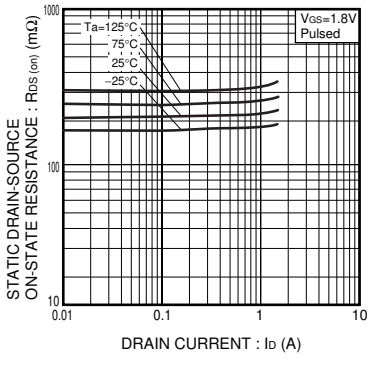



Fig.7 Static Drain-Source On-State Resistance vs. Drain Current ( I )

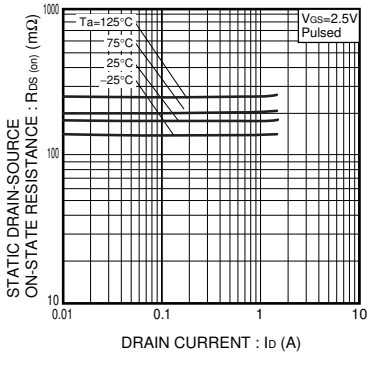



Fig.8 Static Drain-Source On-State Resistance vs. Drain Current ( II )

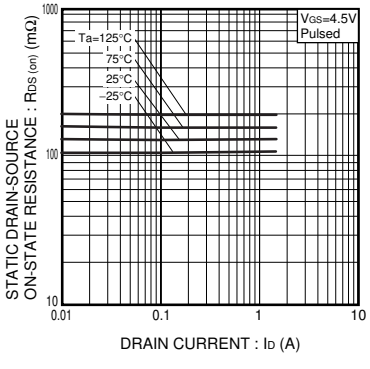



Fig.9 Static Drain-Source On-State Resistance vs. Drain Current ( III )

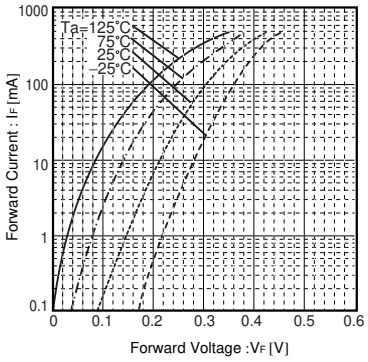



Fig.10 Forward Temperature Characteristics

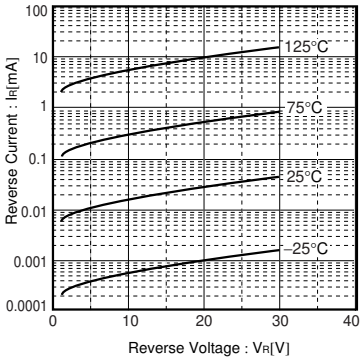



Fig.11 Reverse Temperature Characteristics

**●Notice**

1. SBD has a large reverse leak current compared to other type of diode. Therefore; it would raise a junction temperature, and increase a reverse power loss. Further rise of inside temperature would cause a thermal runaway.
   This built-in SBD has low $V_F$ characteristics and therefore, higher leak current. Please consider enough the surrounding temperature, generating heat of MOSFET and the reverse current.

2. This product might cause chip aging and breakdown under the large electrified environment.
   Please consider to design ESD protection circuit.

## Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).
Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.
It is our top priority to supply products with the utmost quality and reliability. However, there is always a chance of failure due to unexpected factors. Therefore, please take into account the derating characteristics and allow for sufficient safety features, such as extra margin, anti-flammability, and fail-safe measures when designing in order to prevent possible accidents that may result in bodily harm or fire caused by component failure. ROHM cannot be held responsible for any damages arising from the use of the products under conditions out of the range of the specifications or due to non-compliance with the NOTES specified in this catalog.

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact your nearest sales office.

**ROHM** Customer Support System **THE AMERICAS** / **EUPOPE** / **ASIA** / **JAPAN**

www.rohm.com **Contact us** : webmaster@ rohm.co.jp


ROHM CO., LTD. 21, Saiin Mizosaki-cho, Ukyo-ku, Kyoto 615-8585, Japan
TEL : +81-75-311-2121
FAX : +81-75-315-0172