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

Transistors

2.5V Drive Nch+Pch MOSFET
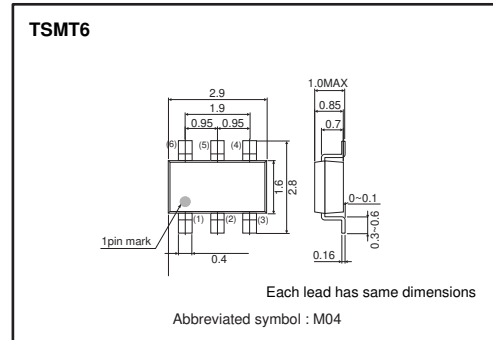
QS6M4

●**Structure**

Silicon P-channel MOSFET

Silicon N-channel MOSFET

●**Features**

1) The QS6M4 combines Pch MOSFET with a Nch MOSFET in a single TSMT6 package.
2) Low on-state resistance with a fast switching.
3) Low voltage drive (2.5V).

●**Applications**

Load switch, inverter

●**Dimensions** (Unit : mm)

TSMT6

2.9 / 1.9 / 0.95 / 0.95 / 1.0MAX / 0.85 / 0.7 / 2.8 / 1.6 / 0~0.1 / 0.3~0.6 / 0.4 / 0.16

1pin mark

Each lead has same dimensions

Abbreviated symbol : M04

●**Packaging specifications**

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
QS6M4		○

●**Equivalent circuit**

(1) Tr1 (Nch) Source
(2) Tr1 (Nch) Gate
(3) Tr2 (Pch) Drain
(4) Tr2 (Pch) Source
(5) Tr2 (Pch) Gate
(6) Tr1 (Nch) Drain

∗1 ESD PROTECTION DIODE
∗2 BODY DIODE

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

Parameter		Symbol	Limits		Unit
			Nchannel	Pchannel	
Drain-source voltage		V_{DSS}	30	−20	V
Gate-source voltage		V_{GSS}	±12	±12	V
Drain current	Continuous	I_D	±1.5	±1.5	A
	Pulsed	I_{DP} ∗1	±6.0	±6.0	A
Source current (Body diode)	Continuous	I_S	0.8	−0.75	A
	Pulsed	I_{SP} ∗1	6.0	−6.0	A
Total power dissipation		P_D ∗2	1.25		W / TOTAL
			0.9		W / ELEMENT
Channel temperature		Tch	150		°C
Storage temperature		Tstg	−55 to +150		°C

∗1 Pw≤10μs, Duty cycle≤1%
∗2 Mounted on a ceramic board
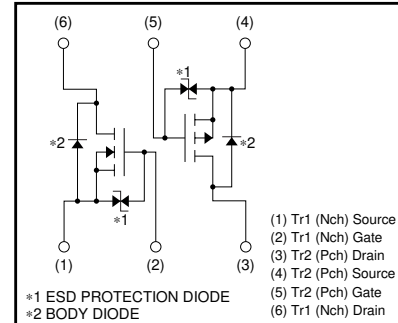
●**Thermal resistance**

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth (ch-a)∗	100	°C / W / TOTAL
		139	°C / W / ELEMENT

∗ Mounted on a ceramic board

ROHM

Transistors

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

<Tr1. N-ch MOSFET>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	±10	μA	$V_{GS}=\pm12V$ / $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)\,DSS}$	30	–	–	V	$I_D=1mA$ / $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	$V_{DS}=30V$ / $V_{GS}=0V$
Gate threshold voltage	$V_{GS\,(th)}$	0.5	–	1.5	V	$V_{DS}=10V$ / $I_D=1mA$
Static drain-source on-state resistance	$R_{DS\,(on)}$ *	–	170	230	mΩ	$I_D=1.5A$ / $V_{GS}=4.5V$
		–	180	245		$I_D=1.5A$ / $V_{GS}=4.0V$
		–	260	360		$I_D=1.0A$ / $V_{GS}=2.5V$
Forward transfer admittance	$|Y_{fs}|$ *	1.0	–	–	S	$V_{DS}=10V$ / $I_D=1.0A$
Input capacitance	C_{iss}	–	80	–	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	–	25	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	–	15	–	pF	f=1MHz
Turn-on delay time	$t_{d\,(on)}$ *	–	7	–	ns	$I_D=1A$, $V_{DD}≒15V$
Rise time	t_r *	–	18	–	ns	$V_{GS}=4.5V$
Turn-off delay time	$t_{d\,(off)}$ *	–	15	–	ns	$R_L=15Ω$ / $R_G=10Ω$
Fall time	t_f *	–	15	–	ns	
Total gate charge	Q_g *	–	1.6	–	nC	$V_{DD}≒15V$ $R_L=10Ω$
Gate-source charge	Q_{gs} *	–	0.5	–	nC	$V_{GS}=4.5V$ $R_G=10Ω$
Gate-drain charge	Q_{gd} *	–	0.9	–	nC	$I_D=1.5A$

∗Pulsed

● **Body diode characteristics** (Source-Drain)

<Tr1. N-ch MOSFET>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD} *	–	–	1.2	V	$I_S=3.2A$ / $V_{GS}=0V$

∗Pulsed

ROHM

Transistors

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

<Tr2. P-ch 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-state resistance	$R_{DS\,(on)}$ *	–	155	215	mΩ	I_D= −1.5A / V_{GS}= −4.5V
		–	170	235		I_D= −1.5A / V_{GS}= −4.0V
		–	310	430		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}	–	270	–	pF	V_{DS}= −10V
Output capacitance	C_{oss}	–	40	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	35	–	pF	f=1MHz
Turn-on delay time	$t_{d\,(on)}$ *	–	10	–	ns	I_D= −0.75A, V_{DD}≒ −15V
Rise time	t_r *	–	12	–	ns	V_{GS}= −4.5V
Turn-off delay time	$t_{d\,(off)}$ *	–	45	–	ns	R_L=20Ω / R_G=10Ω
Fall time	t_f *	–	20	–	ns	
Total gate charge	Q_g *	–	3.0	–	nC	V_{DD}≒ −15V R_L=10Ω
Gate-source charge	Q_{gs} *	–	0.8	–	nC	V_{GS}= −4.5V R_G=10Ω
Gate-drain charge	Q_{gd} *	–	0.85	–	nC	I_D= −1.5A

∗Pulsed

●**Body diode characteristics** (Source-Drain)

<Tr2. P-ch MOSFET>

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

ROHM

Transistors

N-ch

●**Electrical characteristic curves**

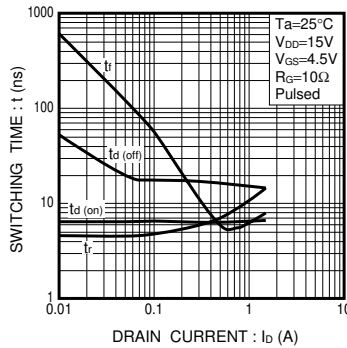Fig.1 Typical Capacitance
vs. Drain-Source Voltage

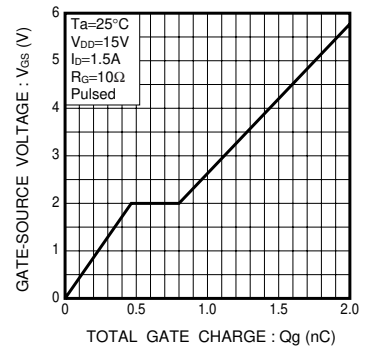Fig.2 Switching Characteristics

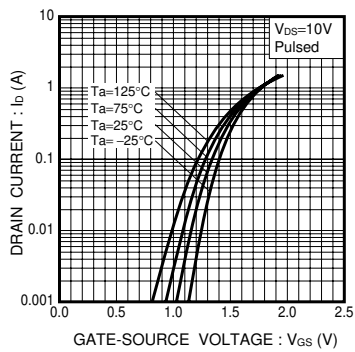Fig.3 Dynamic Input Characteristics
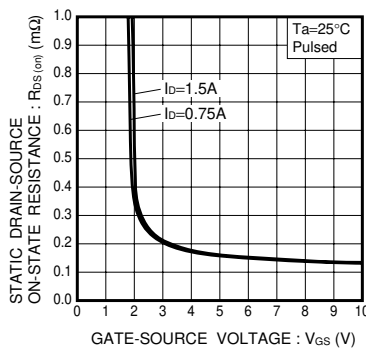

Fig.4 Typical Transfer Characteristics

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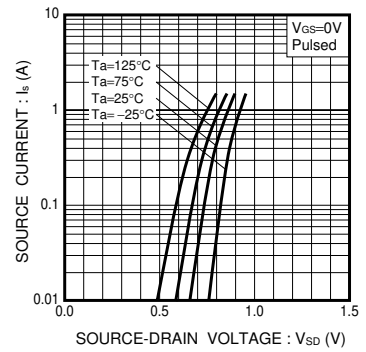On-State Resistance vs.
Gate-Source Voltage

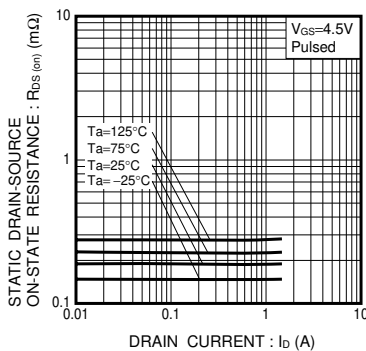Fig.6 Source Current vs.
Source-Drain Voltage

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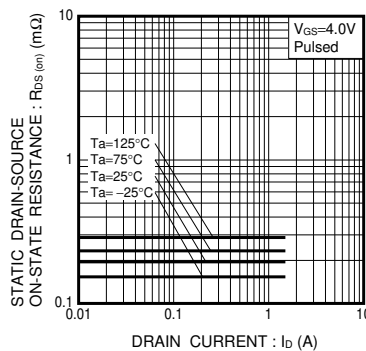On-State Resistance
vs. Drain Current (I)

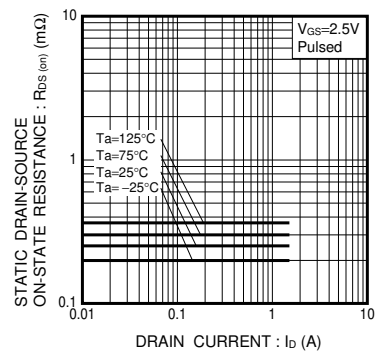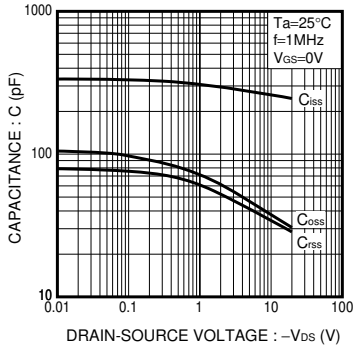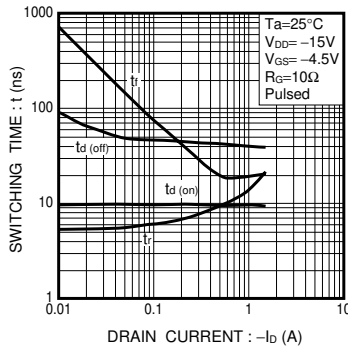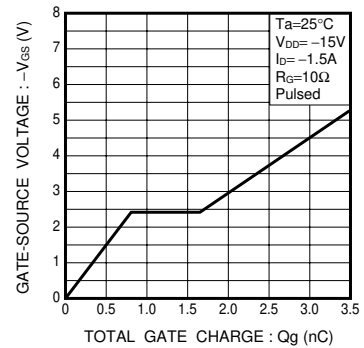Fig.8 Static Drain-Source
On-State Resistance
vs. Drain Current (II)

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

ROHM

P-ch

●**Electrical characteristic curves**

Fig.1 Typical Capacitance
vs. Drain-Source Voltage

Fig.2 Switching Characteristics
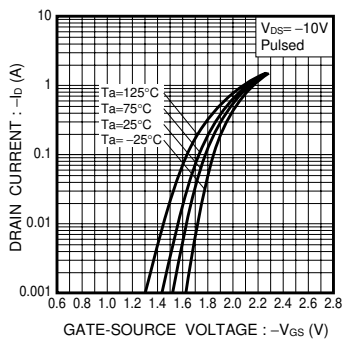

Fig.3 Dynamic Input Characteristics
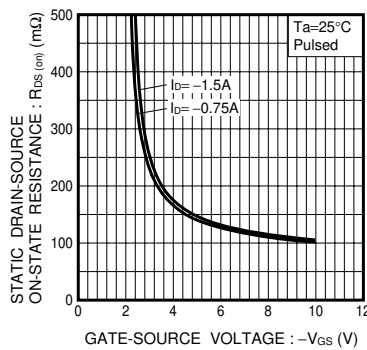

Fig.4 Typical Transfer Characteristics

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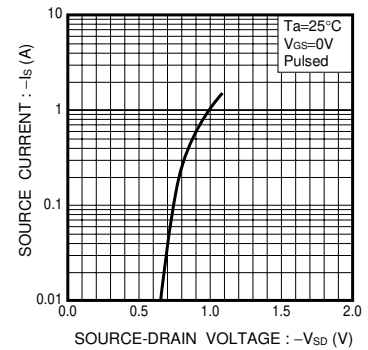Gate-Source Voltage
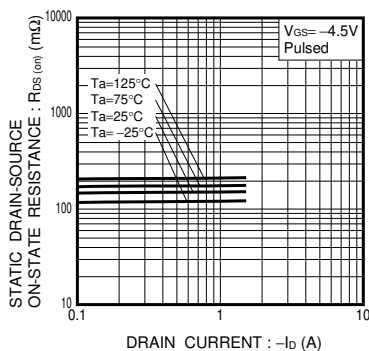

Fig.6 Source Current vs.
Source-Drain Voltage

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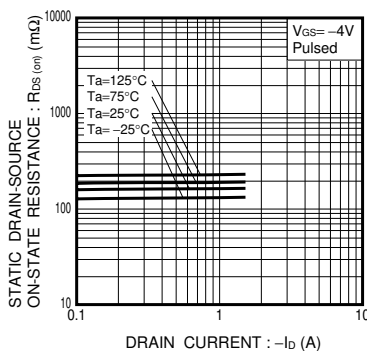On-State Resistance
vs. Drain Current (I)

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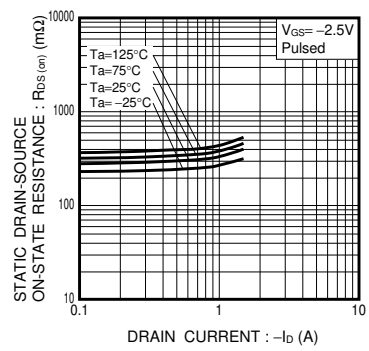On-State Resistance
vs. Drain Current (II)

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

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