

Transistors

# 2.5V Drive Nch+Nch MOSFET

## QS5K2

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 3) Space saving, small surface mount package (TSM5).

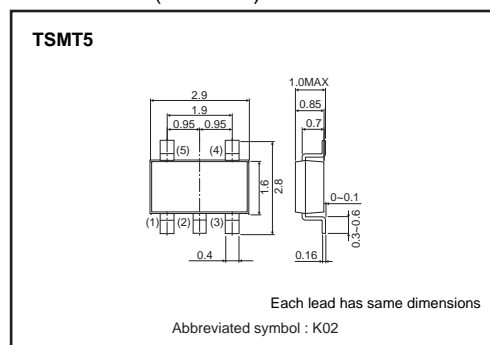
●Applications

Switching

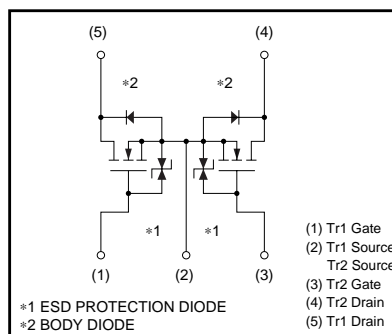
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
QS5K2		○

●Dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

<It is the same ratings for the Tr1 and Tr2>

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DSS}$	30	V
Gate-source voltage	$V_{GSS}$	12	V
Drain current	Continuous	$I_D$	$\pm 2.0$ A
	Pulsed	$I_{DP}$ *1	$\pm 8.0$ A
Source current (Body diode)	Continuous	$I_S$	0.8 A
	Pulsed	$I_{SP}$ *1	3.2 A
Total power dissipation	$P_D$ *2	1.25	W / TOTAL
		0.9	W / ELEMENT
Channel temperature	$T_{ch}$	150	°C
Range of storage temperature	$T_{stg}$	-55 to +150	°C

\*1  $P_w \leq 10\mu s$ , Duty cycle  $\leq 1\%$   
 \*2 Mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}$ *	100	°C/W
		139	°C/W

\* Mounted on a ceramic board

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

<It is the same characteristics for the Tr1 and Tr2>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	–	–	10	$\mu A$	$V_{GS}=12V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR) DSS}$	30	–	–	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	$I_{DSS}$	–	–	1	$\mu A$	$V_{DS}=30V, V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	0.5	–	1.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	–	71	100	$m\Omega$	$I_D=2A, V_{GS}=4.5V$
		–	76	107	$m\Omega$	$I_D=2A, V_{GS}=4.0V$
		–	110	154	$m\Omega$	$I_D=2A, V_{GS}=2.5V$
Forward transfer admittance	$ Y_{fs} ^*$	1.5	–	–	S	$V_{DS}=10V, I_D=2A$
Input capacitance	$C_{iss}$	–	175	–	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	–	50	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	–	25	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	–	8	–	ns	$V_{DD} \doteq 15V$ $I_D=1A$
Rise time	$t_r^*$	–	10	–	ns	$V_{GS}=4.5V$
Turn-off delay time	$t_{d(off)}^*$	–	21	–	ns	$R_L=15\Omega$
Fall time	$t_f^*$	–	8	–	ns	$R_G=10\Omega$
Total gate charge	$Q_g^*$	–	2.8	3.9	nC	$V_{DD} \doteq 15V$
Gate-source charge	$Q_{gs}^*$	–	0.6	–	nC	$V_{GS}=4.5V$
Gate-drain charge	$Q_{gd}^*$	–	0.8	–	nC	$I_D=2A$

\*Pulsed

### ●Body diode characteristics (Source-drain) (Ta=25°C)

<It is the same characteristics for the Tr1 and Tr2>

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

\* Pulsed

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●Electrical characteristics curves

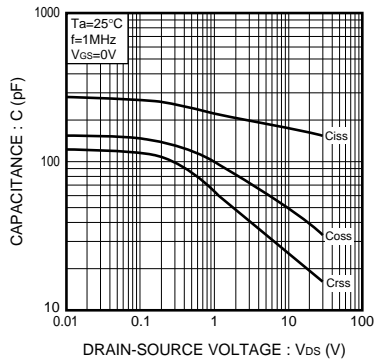


Fig.1 Typical Capacitance vs. Drain-Source Voltage

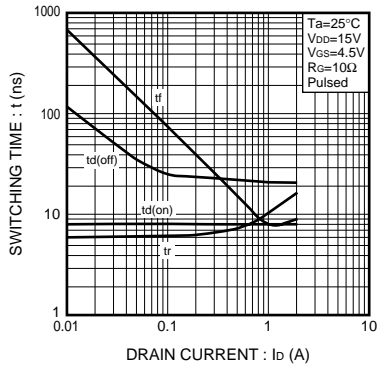


Fig.2 Switching Characteristics

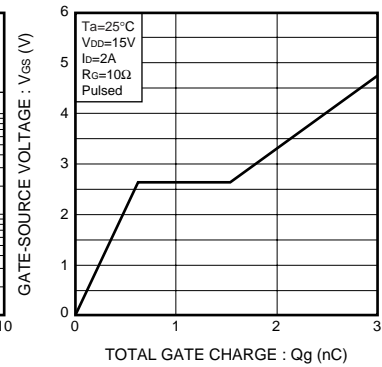


Fig.3 Dynamic Input Characteristics

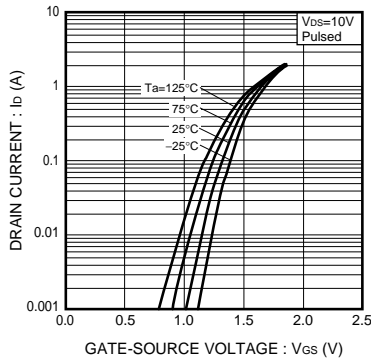


Fig.4 Typical Transfer Characteristics

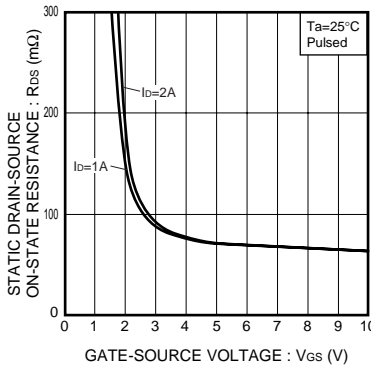


Fig.5 Static Drain-Source On-State Resistance vs. Gate source Voltage

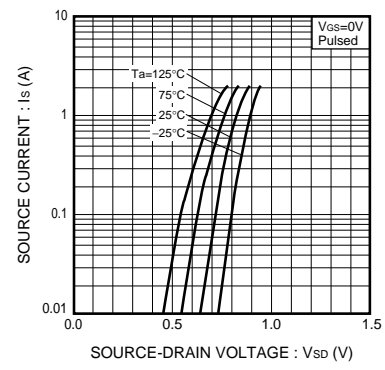


Fig.6 Source Current vs. Source-Drain Voltage

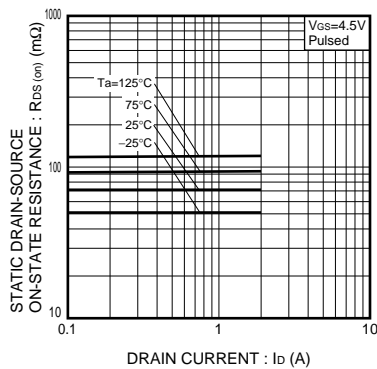


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current ( I )

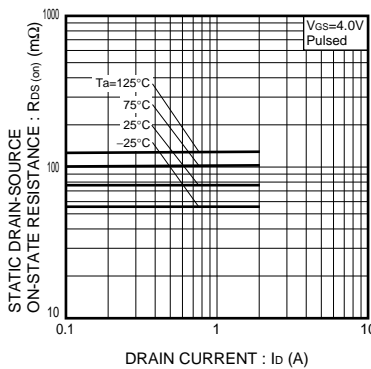


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current ( II )

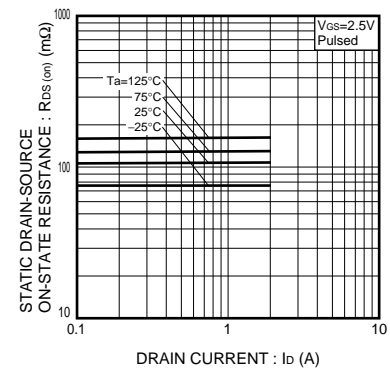


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current ( III )

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