

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 (TSMT5).

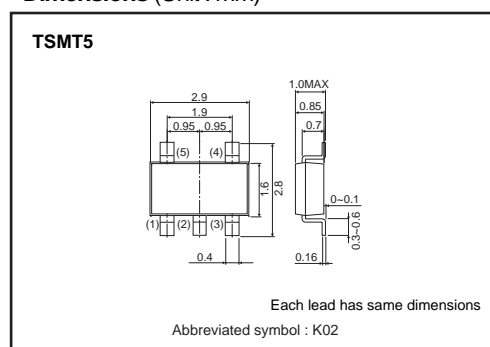
●Applications

Switching

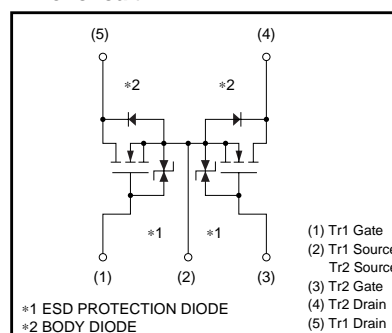
●Packaging specifications

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 <sub>GSS</sub>	–	–	10	μA	V <sub>GS</sub> =12V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	30	–	–	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	1	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	0.5	–	1.5	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA
Static drain-source on-state resistance	R <sub>DS(on)*</sub>	–	71	100	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 4.5V
		–	76	107	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 4.0V
		–	110	154	mΩ	I <sub>D</sub> = 2A, V <sub>GS</sub> = 2.5V
Forward transfer admittance	Y <sub>fs</sub>   *	1.5	–	–	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 2A
Input capacitance	C <sub>iss</sub>	–	175	–	pF	V <sub>DS</sub> = 10V
Output capacitance	C <sub>oss</sub>	–	50	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	25	–	pF	f=1MHz
Turn-on delay time	t <sub>d(on)*</sub>	–	8	–	ns	V <sub>DD</sub> ≐ 15V I <sub>D</sub> = 1A
Rise time	t <sub>r</sub> *	–	10	–	ns	V <sub>GS</sub> = 4.5V
Turn-off delay time	t <sub>d(off)*</sub>	–	21	–	ns	R <sub>L</sub> = 15Ω
Fall time	t <sub>f</sub> *	–	8	–	ns	R <sub>G</sub> =10Ω
Total gate charge	Q <sub>g</sub> *	–	2.8	3.9	nC	V <sub>DD</sub> ≐ 15V
Gate-source charge	Q <sub>gs</sub> *	–	0.6	–	nC	V <sub>GS</sub> = 4.5V
Gate-drain charge	Q <sub>gd</sub> *	–	0.8	–	nC	I <sub>D</sub> = 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 <sub>SD</sub> *	–	–	1.2	V	I <sub>S</sub> = 3.2A, V <sub>GS</sub> =0V

\* Pulsed

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●Electrical characteristics curves

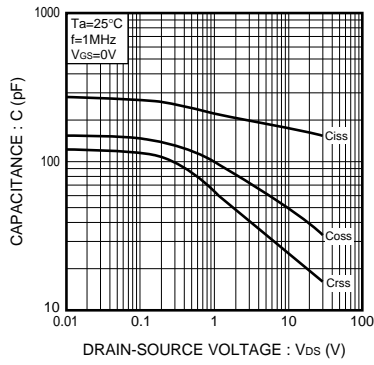


Fig.1 Typical Capacitance vs. Drain-Source Voltage

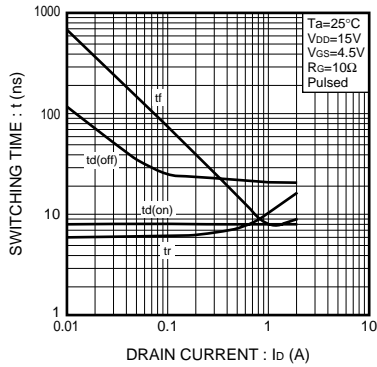


Fig.2 Switching Characteristics

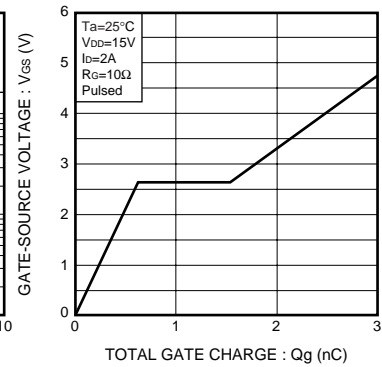


Fig.3 Dynamic Input Characteristics

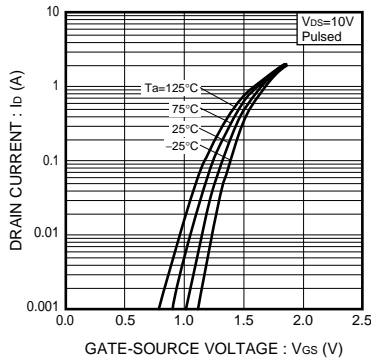


Fig.4 Typical Transfer Characteristics

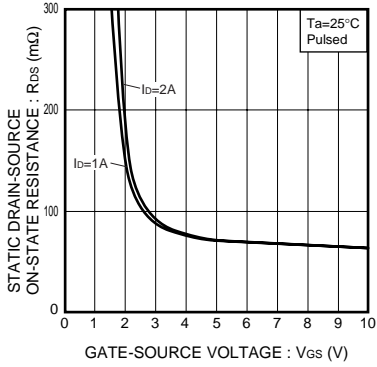


Fig.5 Static Drain-Source On-State Resistance vs. Gate source Voltage

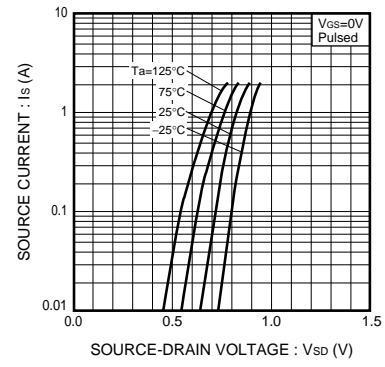


Fig.6 Source Current vs. Source-Drain Voltage

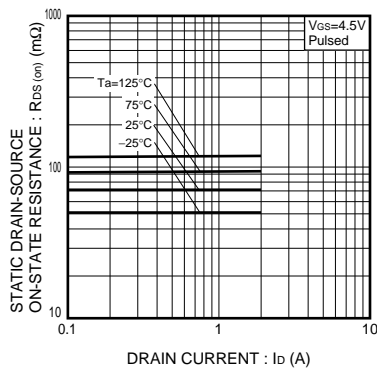


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current ( I )

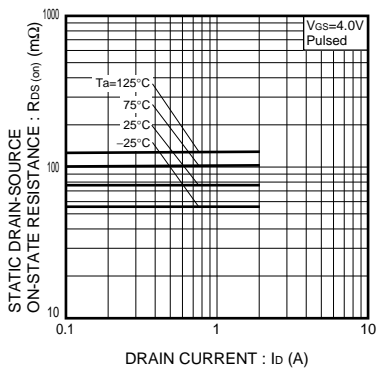


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current ( II )

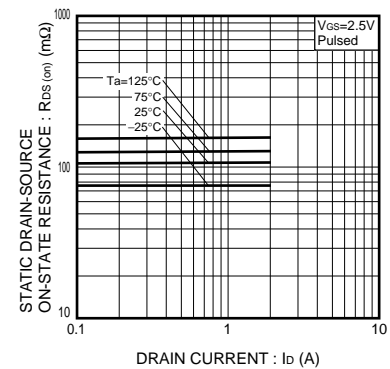


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current ( III )

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