

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).

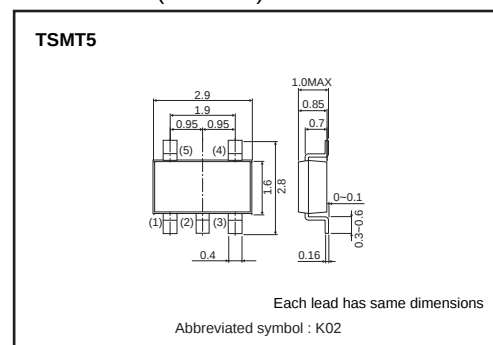
●Applications

Switching

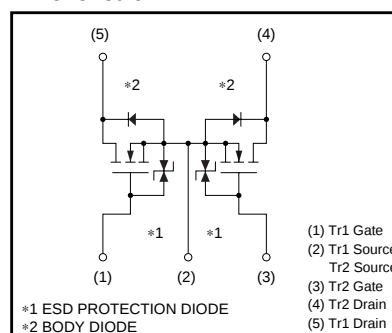
●Packaging specifications

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_{DS}	30	V
Gate-source voltage	V_{GS}	12	V
Drain current	Continuous	I_D	± 2.0 A
	Pulsed	I_{DP} *1	± 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

Transistors

●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	μA	$V_{GS}=12V, V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR) DSS}$	30	—	—	V	$I_D=1mA, V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	—	—	1	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	$R_{DS(on)}^*$	—	71	100	m Ω	$I_D=2A, V_{GS}=4.5V$
		—	76	107	m Ω	$I_D=2A, V_{GS}=4.0V$
		—	110	154	m Ω	$I_D=2A, V_{GS}=2.5V$
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	$V_{DD} \doteq 15V$
Rise time	t_r^*	—	10	—	ns	$I_D=1A$
Turn-off delay time	$t_{d(off)}^*$	—	21	—	ns	$V_{GS}=4.5V$
Fall time	t_f^*	—	8	—	ns	$R_L=15\Omega$
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

Transistors

●Electrical characteristics curves

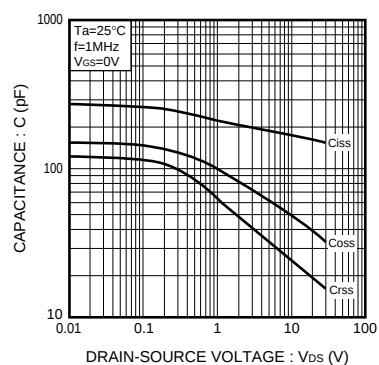


Fig.1 Typical Capacitance vs. Drain-Source Voltage

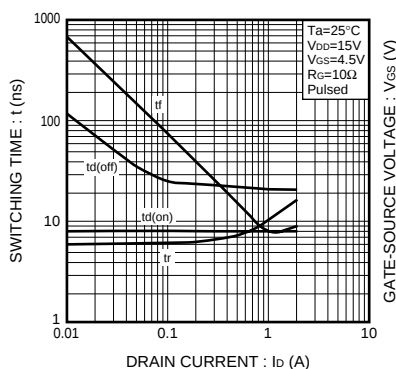


Fig.2 Switching Characteristics

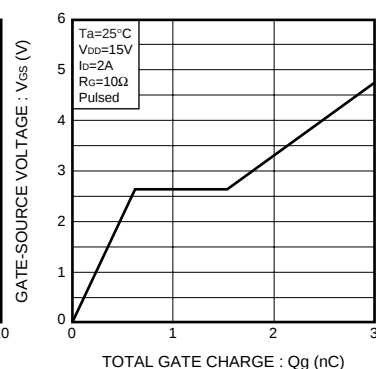


Fig.3 Dynamic Input Characteristics

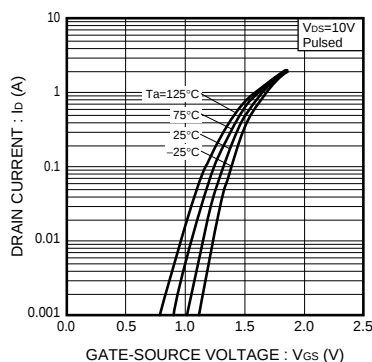


Fig.4 Typical Transfer Characteristics

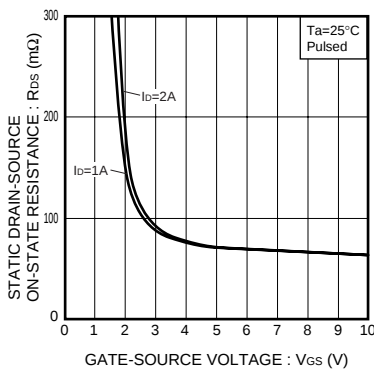


Fig.5 Static Drain-Source On-State Resistance vs. Gate source Voltage

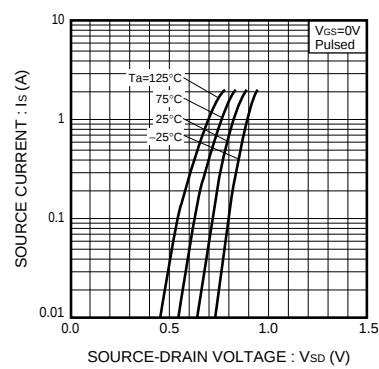


Fig.6 Source Current vs. Source-Drain Voltage

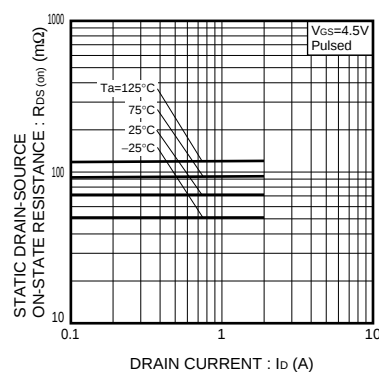


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

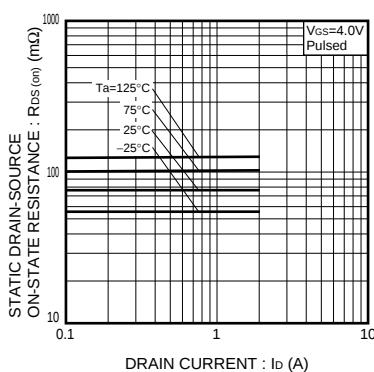


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

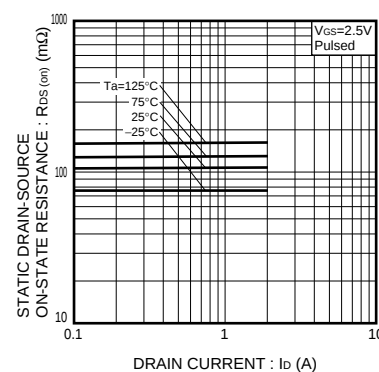


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

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