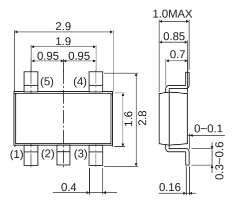
Transistors

2.5V Drive Nch+Nch MOSFET

QS5K2

●Structure
Silicon N-channel MOSFET

●Dimensions (Unit : mm)



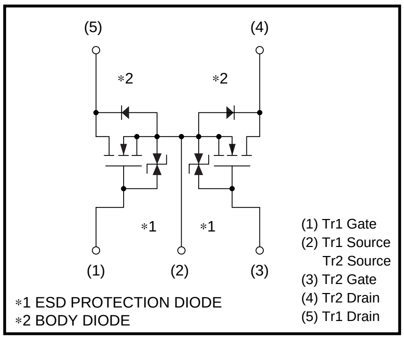
●Features
1) Low On-resistance.
3) Space saving, small surface mount package (TSMT5).

●Applications
Switching

●Packaging specifications

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

●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	±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		Tch	150	°C
Range of 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
		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	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	mΩ	I_D= 2A, V_{GS}= 4.5V
		–	76	107	mΩ	I_D= 2A, V_{GS}= 4.0V
		–	110	154	mΩ	I_D= 2A, V_{GS}= 2.5V
Forward transfer admittance	$\lvert Y_{fs} \rvert$ *	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}≒ 15V
Rise time	t_r *	–	10	–	ns	I_D= 1A
Turn-off delay time	$t_{d\ (off)}$ *	–	21	–	ns	V_{GS}= 4.5V R_L= 15Ω
Fall time	t_f *	–	8	–	ns	R_G=10Ω
Total gate charge	Q_g *	–	2.8	3.9	nC	V_{DD}≒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

●Electrical characteristics curves

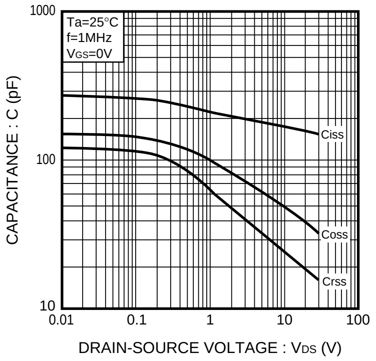

Fig.1 Typical Capacitance vs. Drain-Source Voltage

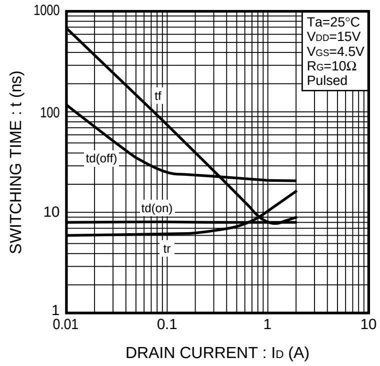

Fig.2 Switching Characteristics

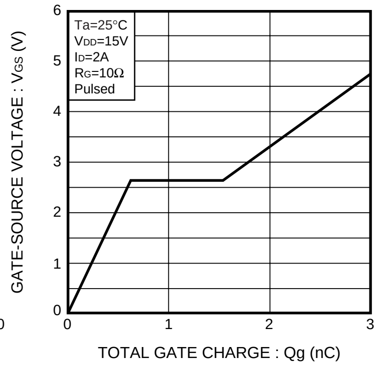

Fig.3 Dynamic Input Characteristics

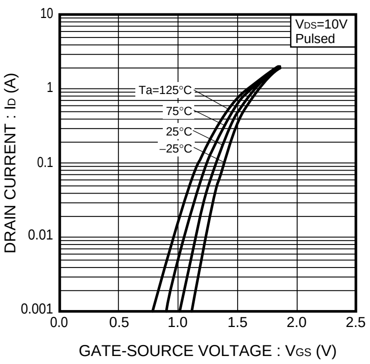

Fig.4 Typical Transfer Characteristics

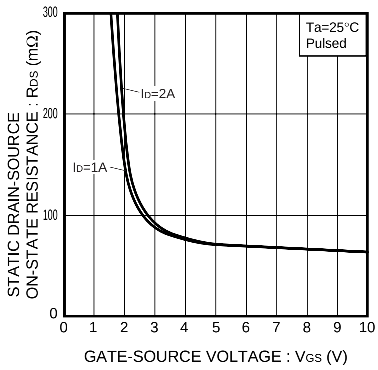

Fig.5 Static Drain-Source On-State Resistance vs. Gate source Voltage

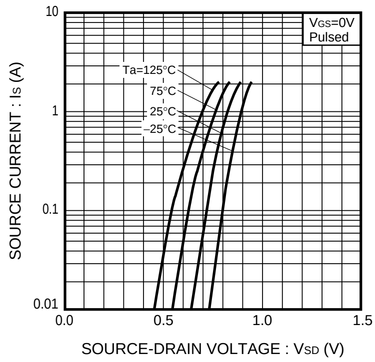

Fig.6 Source Current vs. Source-Drain Voltage

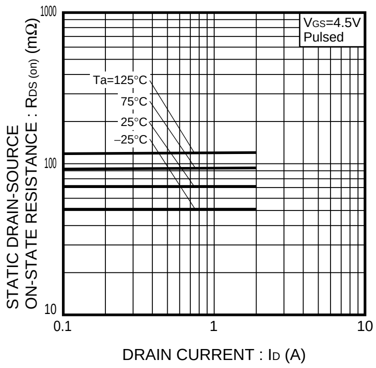

Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

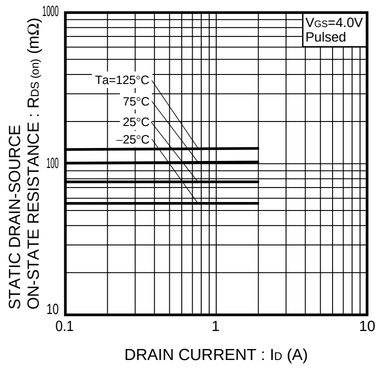

Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

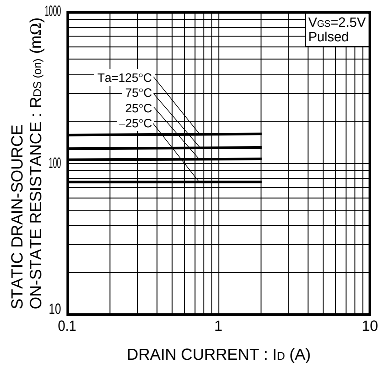

Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

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