

2.5V Drive Nch MOSFET

QS8K2

● Structure

Silicon N-channel MOSFET

● Features

- 1) Low On-resistance.
- 2) High power package.
- 3) 2.5V drive.

● Application

Switching

● Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
QS8K2		○

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GS}	± 12	V
Drain current	Continuous	I_D	± 3.5	A
	Pulsed	I_{DP}^{*1}	± 12	A
Source current (Body Diode)	Continuous	I_S	1	A
	Pulsed	I_{sp}^{*1}	12	A
Power dissipation		P_D^{*2}	1.5	W / TOTAL
			1.25	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 $\leq 1\%$

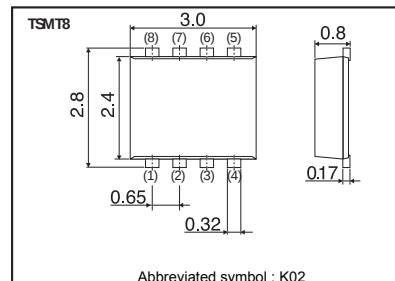
*2 Mounted on a ceramic board.

● Thermal resistance

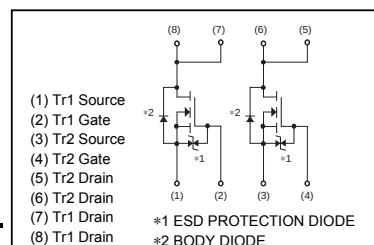
Parameter	Symbol	Limits	Unit
Channel to Ambient	$R_{th}(ch-a)^*$	83.3	°C / W / TOTAL
		100	°C / W / ELEMENT

* Mounted on a ceramic board.

● Dimensions (Unit : mm)



● Inner circuit



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

<It is the same ratings for 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	$R_{DS(on)}^*$	-	38	54	mΩ	$I_D=3.5A$, $V_{GS}=4.5V$
		-	40	56		$I_D=3.5A$, $V_{GS}=4V$
		-	55	77		$I_D=3.5A$, $V_{GS}=2.5V$
Forward transfer admittance	$ Y_{fs} ^*$	3.0	-	-	S	$I_D=3.5A$, $V_{DS}=10V$
Input capacitance	C_{iss}	-	285	-	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	-	90	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	-	55	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	8	-	ns	$I_D=1.7A$, $V_{DD}=15V$
Rise time	t_r^*	-	12	-	ns	$V_{GS}=4.5V$
Turn-off delay time	$t_{d(off)}^*$	-	29	-	ns	$R_L=8.8Ω$
Fall time	t_f^*	-	13	-	ns	$R_G=10Ω$
Total gate charge	Q_g^*	-	4.6	-	nC	$I_D=3.5A$, $V_{DD}=15V$
Gate-source charge	Q_{gs}^*	-	0.7	-	nC	$V_{GS}=4.5V$ $R_L=4.3Ω$
Gate-drain charge	Q_{gd}^*	-	1.5	-	nC	$R_G=10Ω$

*Pulsed

● **Body diode characteristics** (Source-Drain) (Ta = 25°C)

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	V_{SD}^*	-	-	1.2	V	$I_S=3.5A$, $V_{GS}=0V$

*Pulsed

● Electrical characteristic curves

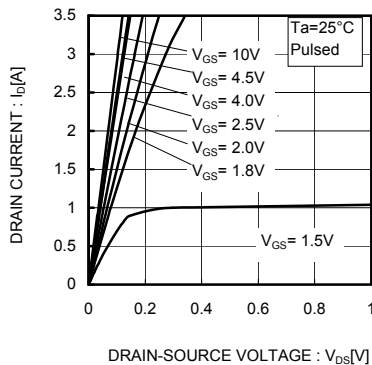


Fig.1 Typical Output Characteristics(I)

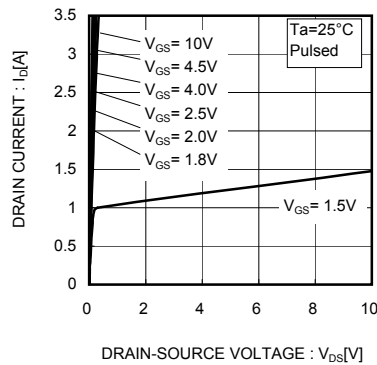


Fig.2 Typical Output Characteristics(II)

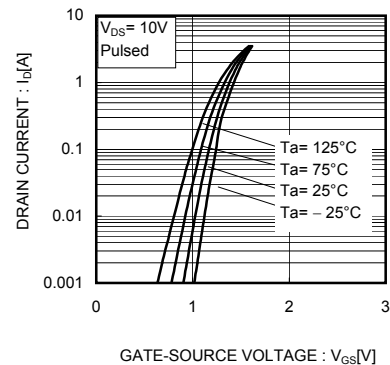


Fig.3 Typical Transfer Characteristics

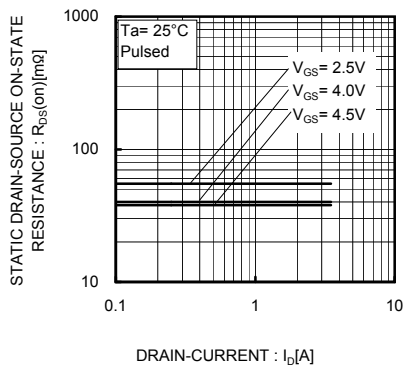


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(I)

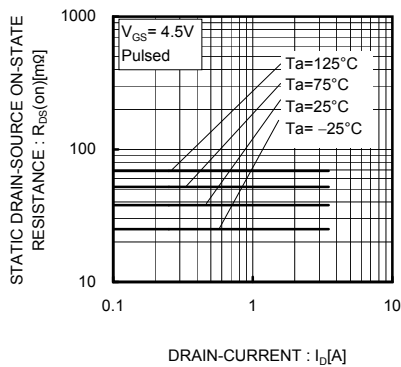


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(II)

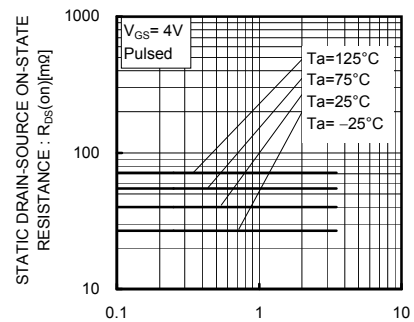


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(III)

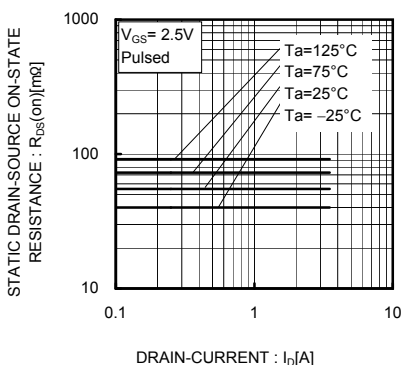


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(IV)

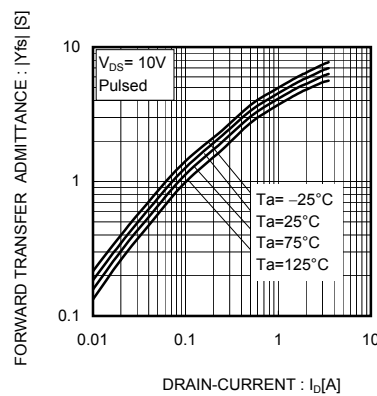


Fig.8 Forward Transfer Admittance vs. Drain Current

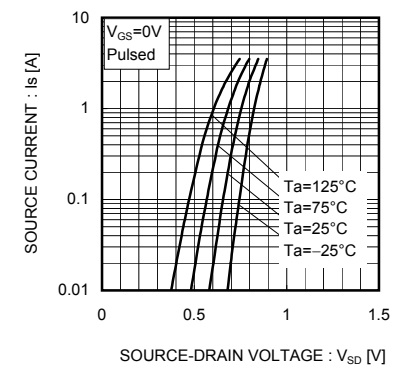
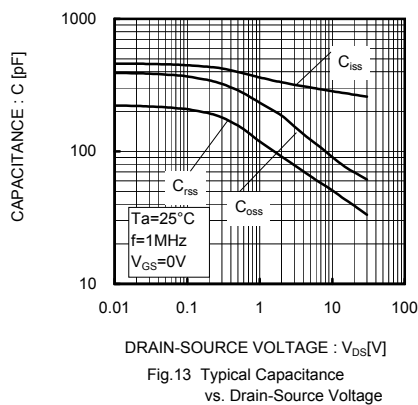
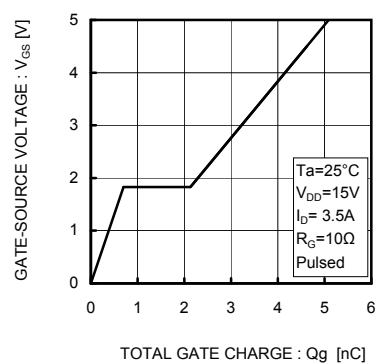
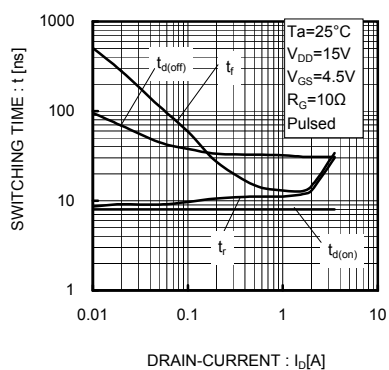
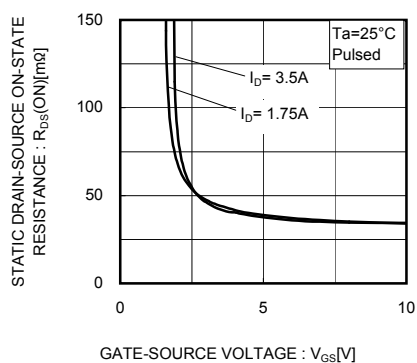


Fig.9 Reverse Drain Current vs. Source-Drain Voltage



● Measurement circuits

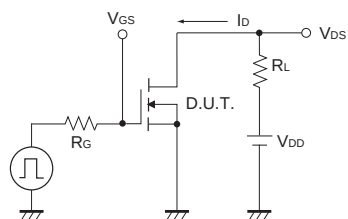


Fig.1-1 Switching time measurement circuit

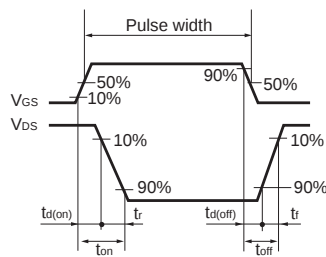


Fig.1-2 Switching waveforms

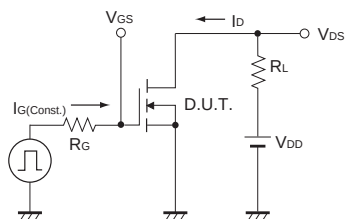


Fig.2-1 Gate charge measurement circuit

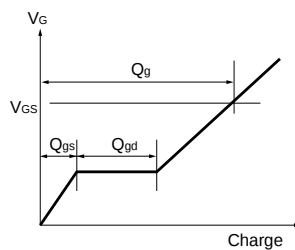


Fig.2-2 Gate Charge Waveform

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