4V Drive Nch+Nch MOSFET

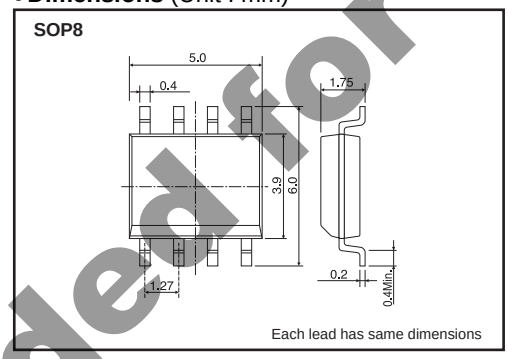
SH8K22

●Structure
Silicon N-channel MOSFET

●Features
1) Built-in G-S Protection Diode.
2) Small surface Mount Package (SOP8).

●Application
Power switching, DC / DC converter, Inverter

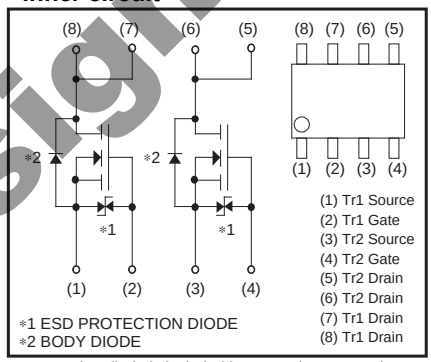
●Dimensions (Unit : mm)



●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SH8K22		◯

●Inner circuit



*A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use the protection circuit when the fixed voltages are exceeded.

●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}	45	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±4.5	A
	Pulsed	I_{DP} *1	±18	A
Source current (Body diode)	Continuous	I_S	1	A
	Pulsed	I_{SP} *1	18	A
Total power dissipation		P_D *2	2	W / TOTAL
			1.4	W / ELEMENT
Chanel temperature		T_{ch}	150	°C
Range of Storage temperature		T_{stg}	-55 to +150	°C

*1 PW ≤ 10μs、Duty cycle ≤ 1%
*2 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}=±20V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	45	–	–	V	I_D= 1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	V_{DS}= 45V, V_{GS}=0V
Gate threshold voltage	$V_{GS\ (th)}$	1.0	–	2.5	V	V_{DS}= 10V, I_D= 1mA
Static drain-source on-state resistance	$R_{DS\ (on)}$*	–	33	46	mΩ	I_D= 4.5A, V_{GS}= 10V
		–	41	57	mΩ	I_D= 4.5A, V_{GS}= 4.5V
		–	46	64	mΩ	I_D= 4.5A, V_{GS}= 4.0V
Forward transfer admittance	$\|Y_{fs}\|$ *	3.5	–	–	S	V_{DS}= 10V, I_D= 4.5A
Input capacitance	C_{iss}	–	550	–	pF	V_{DS}= 10V
Output capacitance	C_{oss}	–	140	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	70	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$ *	–	12	–	ns	V_{DD}≒ 25V
Rise time	t_r *	–	18	–	ns	I_D= 2.5A
Turn-off delay time	$t_{d\ (off)}$ *	–	42	–	ns	V_{GS}= 10V
Fall time	t_f *	–	12	–	ns	R_L= 10Ω R_G=10Ω
Total gate charge	Q_g *	–	6.8	9.6	nC	V_{DD}≒25V, V_{GS}= 5V
Gate-source charge	Q_{gs} *	–	2.0	–	nC	I_D= 4.5A
Gate-drain charge	Q_{gd} *	–	2.9	–	nC	R_L= 5.6Ω, R_G= 10Ω

*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	Condition
Forward voltage	V_{SD} *	–	–	1.2	V	I_S=4.5A/V_{GS}=0V

* pulsed

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●Electrical characteristic curves

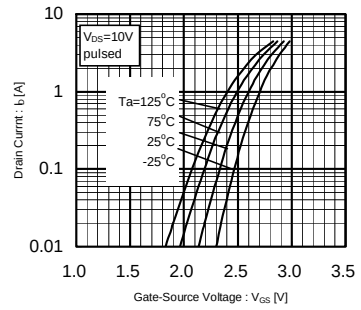


Fig.1 Typical Transfer Characteristics

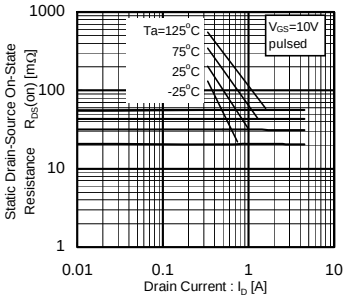


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current (1)

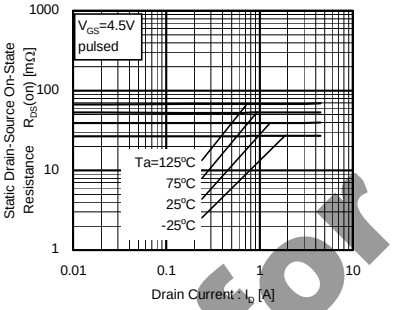


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (2)

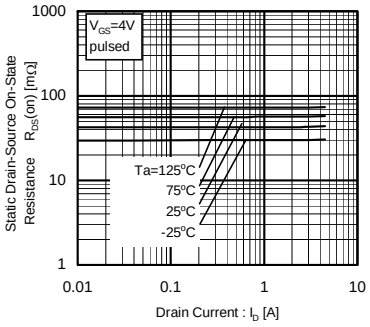


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (3)

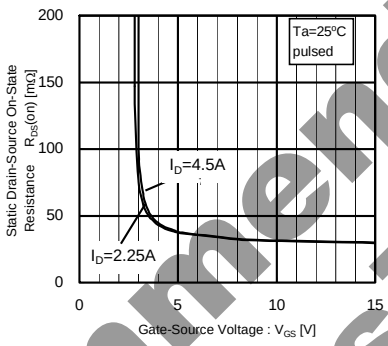


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

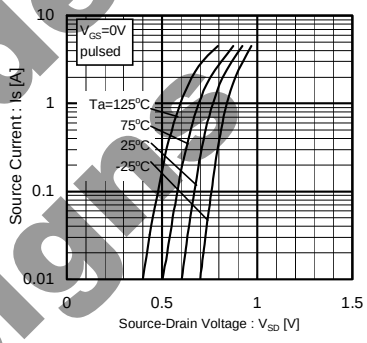


Fig.6 Source-Current vs. Source-Drain Voltage

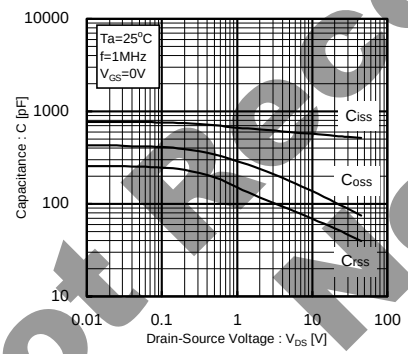


Fig.7 Typical capacitance vs. Source-Drain Voltage

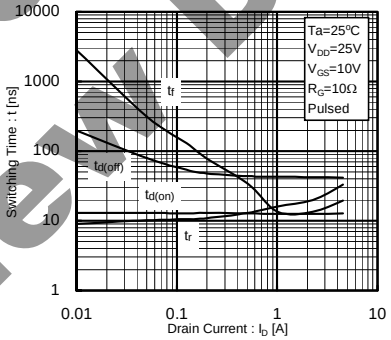


Fig.8 Switching Characteristics

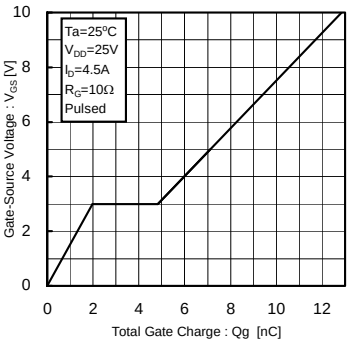


Fig.9 Dynamic Input Characteristics

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●Measurement circuits

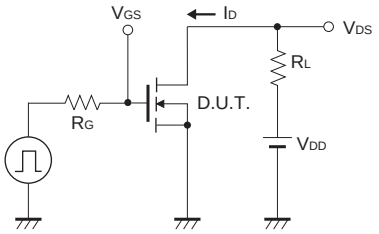


Fig.10 Switching Time Test Circuit

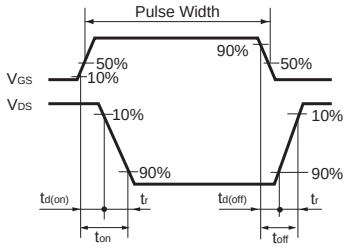


Fig.11 Switching Time Waveforms

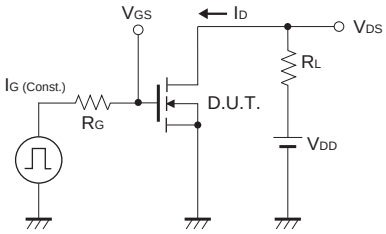


Fig.12 Gate Charge Test Circuit

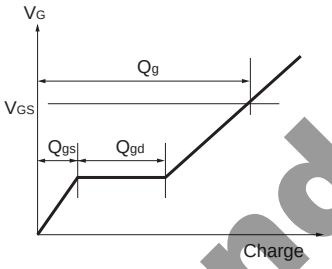


Fig.13 Gate Charge Waveform

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