

# 4V Drive Nch+Pch MOSFET

## SH8M2

### ●Structure

Silicon N-channel / P-channel MOSFET

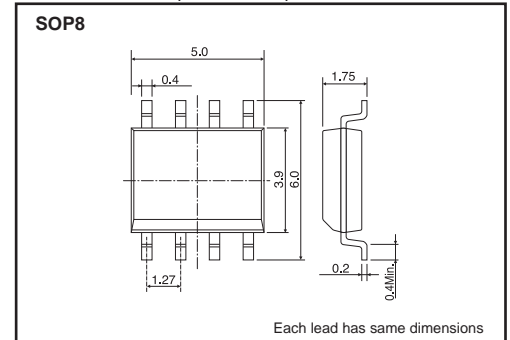
### ●Features

- 1) Low on-resistance.
- 2) Built-in G-S protection diode.
- 3) Small surface mount package (SOP8).

### ●Application

Power switching, DC / DC converter.

### ●Dimensions (Unit : mm)



### ●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SH8M2		○

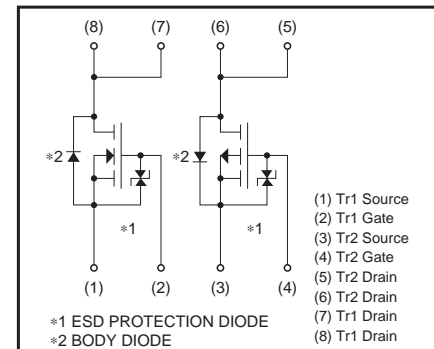
### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits		Unit
		Tr1 : N-ch	Tr2 : P-ch	
Drain-source voltage	$V_{DSS}$	30	-30	V
Gate-source voltage	$V_{GSS}$	±20	±20	V
Drain current	Continuous	$I_D$	±3.5	A
	Pulsed	$I_{DP}^{*1}$	±14	A
Source current (Body diode)	Continuous	$I_S$	1.6	A
	Pulsed	$I_{SP}^{*1}$	14	A
Total power dissipation	$P_D^{*2}$	2.0		W / TOTAL
Channel temperature	$T_{ch}$	150		°C
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.

### ●Inner circuit



## N-ch

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	–	–	±10	μA	$V_{GS}=\pm 20V, V_{DS}=0V$
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	$V_{GS(th)}$	1.0	–	2.5	V	$V_{DS}=10V, I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$ *	–	59	83	mΩ	$I_D=3.5A, V_{GS}=10V$
		–	93	130	mΩ	$I_D=3.5A, V_{GS}=4.5V$
		–	107	150	mΩ	$I_D=3.5A, V_{GS}=4V$
Forward transfer admittance	$ Y_{fs} $ *	2.0	–	–	S	$V_{DS}=10V, I_D=3.5A$
Input capacitance	$C_{iss}$	–	140	–	pF	$V_{DS}=10V$
Output capacitance	$C_{oss}$	–	45	–	pF	$V_{GS}=0V$
Reverse transfer capacitance	$C_{rss}$	–	30	–	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$ *	–	6	–	ns	$V_{DD}=15V$
Rise time	$t_r$ *	–	6	–	ns	$I_D=1.75A$
Turn-off delay time	$t_{d(off)}$ *	–	17	–	ns	$V_{GS}=10V$
Fall time	$t_f$ *	–	4	–	ns	$R_L=8.57\Omega$
Total gate charge	$Q_g$ *	–	2.5	3.5	nC	$V_{DD}=15V, V_{GS}=5V$
Gate-source charge	$Q_{gs}$ *	–	0.8	–	nC	$I_D=3.5A$
Gate-drain charge	$Q_{gd}$ *	–	0.8	–	nC	$R_L=4.29\Omega, R_G=10\Omega$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}$ *	–	–	1.2	V	$I_S=6.4A, V_{GS}=0V$

\*Pulsed

## P-ch

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	-	-	$\pm 10$	$\mu A$	$V_{GS} = \pm 20V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	-30	-	-	V	$I_D = -1mA, V_{GS} = 0V$
Zero gate voltage drain current	$I_{DSS}$	-	-	-1	$\mu A$	$V_{DS} = -30V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	-1.0	-	-2.5	V	$V_{DS} = -10V, I_D = -1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	65	90	$m\Omega$	$I_D = -3.5A, V_{GS} = -10V$
		-	100	140	$m\Omega$	$I_D = -1.75A, V_{GS} = -4.5V$
		-	120	165	$m\Omega$	$I_D = -1.75A, V_{GS} = -4V$
Forward transfer admittance	$ Y_{fs} ^*$	1.8	-	-	S	$V_{DS} = -10V, I_D = -1.75A$
Input capacitance	$C_{iss}$	-	490	-	pF	$V_{DS} = -10V$
Output capacitance	$C_{oss}$	-	110	-	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	-	75	-	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	10	-	ns	$V_{DD} = -15V$ $I_D = -1.75A$
Rise time	$t_r^*$	-	15	-	ns	$V_{GS} = -10V$
Turn-off delay time	$t_{d(off)}^*$	-	35	-	ns	$R_L = 8.57\Omega$
Fall time	$t_f^*$	-	10	-	ns	$R_G = 10\Omega$
Total gate charge	$Q_g^*$	-	5.5	7.7	nC	$V_{DD} = -15V, V_{GS} = -5V$
Gate-source charge	$Q_{gs}^*$	-	1.5	-	nC	$I_D = -3.5A$
Gate-drain charge	$Q_{gd}^*$	-	2.0	-	nC	$R_L = 4.29\Omega, R_G = 10\Omega$

\*Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}^*$	-	-	-1.2	V	$I_S = -1.6A, V_{GS} = 0V$

\*Pulsed

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