

Transistors

4V Drive Nch+Pch MOS FET

SP8M2

●Structure

Silicon N-channel MOS FET /
Silicon P-channel MOS FET

●Features

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

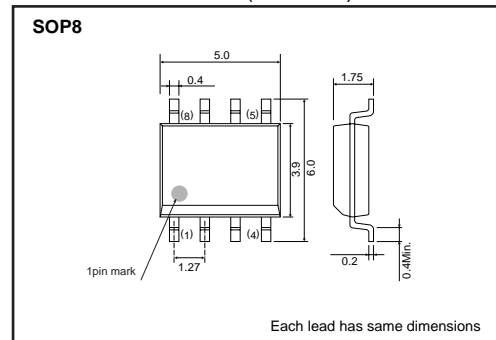
●Applications

Switching

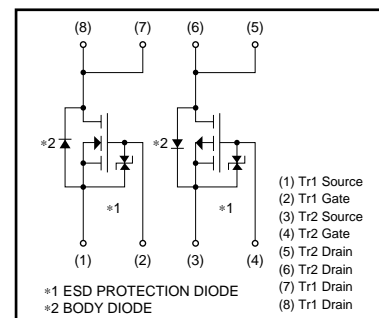
●Package specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SP8M2		○

●External dimensions (Unit : mm)



●Inner circuit



●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	Tch	150		°C
Storage temperature	Tstg	-55 to +150		°C

*1 $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$
*2 Mounted on a ceramic board.

Transistors

N-ch

●Electrical characteristics (Ta=25°C)

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}	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 = 8.57Ω
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 = 4.29Ω, R _G = 10Ω

*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

Transistors

P-ch

●Electrical characteristics (Ta=25°C)

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}	–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)} *	–	65	90	mΩ	I _D = –3.5A, V _{GS} = –10V
		–	100	140	mΩ	I _D = –1.75A, V _{GS} = –4.5V
		–	120	165	mΩ	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
Rise time	t _r *	–	15	–	ns	I _D = –1.75A
Turn-off delay time	t _{d(off)} *	–	35	–	ns	V _{GS} = –10V
Fall time	t _f *	–	10	–	ns	R _L = 8.57Ω
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 = 4.29Ω, R _G = 10Ω

*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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