

Transistors

4V Drive Nch+Pch MOS FET

SP8M24

●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).

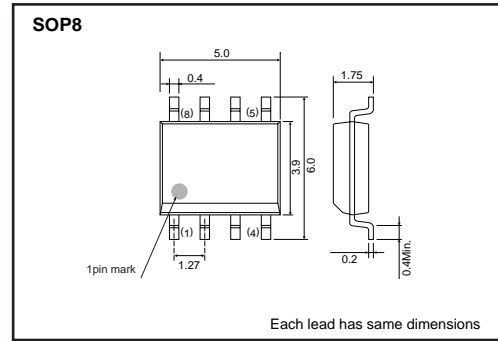
●Applications

Switching

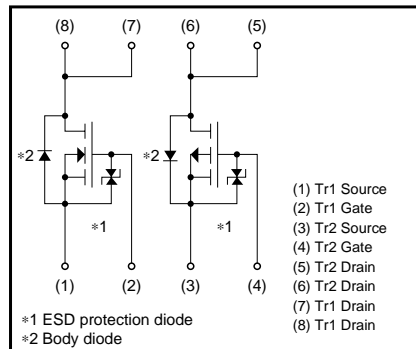
●Packaging specifications

Type	Package	Taping
	Code	TB
	Basic ordering unit (pieces)	2500
SP8M24		○

●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}	45	-45	V	
Gate-source voltage	V _{GSS}	20	-20	V	
Drain current	Continuous	I _D	±4.5	±3.5	A
	Pulsed	I _{DP} *1	±18	±14	A
Source current (Body diode)	Continuous	I _S	1.0	-1.0	A
	Pulsed	I _{SP} *1	18	-14	A
Total power dissipation	P _D *2	2.0		W / TOTAL	
		1.4		W / ELEMENT	
Channel temperature	T _{ch}	150		°C	
Storage temperature	T _{stg}	-55 to +150		°C	

*1 Pw≤10μs, Duty cycle≤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}	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} = 4V
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
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)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V _{SD} *	–	–	1.2	V	I _S = 4.5A, 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}	–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)} *	–	45	63	mΩ	I _D = –3.5A, V _{GS} = –10V
		–	60	84	mΩ	I _D = –3.5A, V _{GS} = –4.5V
		–	66	92	mΩ	I _D = –3.5A, V _{GS} = –4V
Forward transfer admittance	Y _{fs} *	4.5	–	–	S	V _{DS} = –10V, I _D = –3.5A
Input capacitance	C _{iss}	–	1700	–	pF	V _{DS} = –10V
Output capacitance	C _{oss}	–	200	–	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	–	135	–	pF	f=1MHz
Turn-on delay time	t _{d(on)} *	–	16	–	ns	V _{DD} ≙ –25V
Rise time	t _r *	–	17	–	ns	I _D = –2.0A
Turn-off delay time	t _{d(off)} *	–	70	–	ns	V _{GS} = –10V
Fall time	t _f *	–	14	–	ns	R _L =12.5Ω
Total gate charge	Q _g *	–	13.0	18.2	nC	V _{DD} ≙ –25V, V _{GS} = –5V
Gate-source charge	Q _{gs} *	–	3.6	–	nC	I _D = –3.5A
Gate-drain charge	Q _{gd} *	–	4.7	–	nC	R _L = 7.1Ω, 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 = –3.5A, V _{GS} =0V

* Pulsed

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