

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).

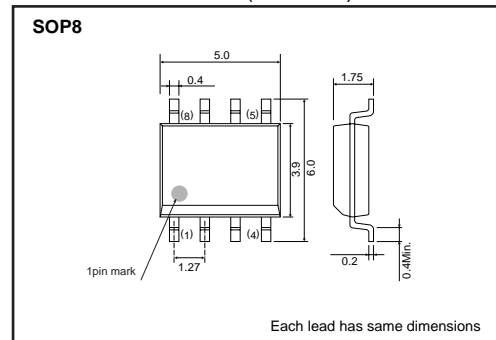
●Applications

Switching

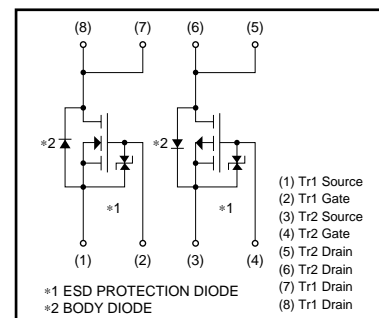
●Package specifications

| 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 | 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} | 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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