

To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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3SK186

Silicon N-Channel Dual Gate MOS FET

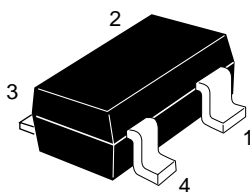
RENESAS

Application

UHF TV tuner RF amplifier

Outline

MPAK-4



- 1. Source
- 2. Gate1
- 3. Gate2
- 4. Drain

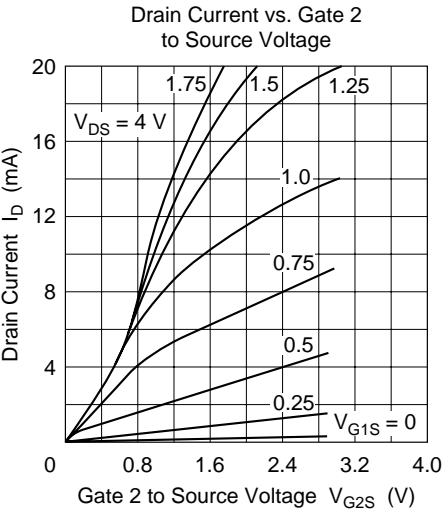
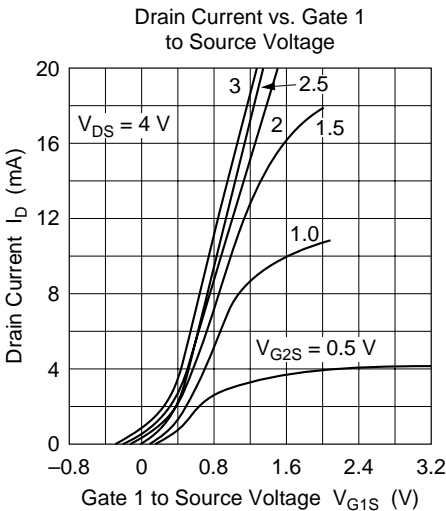
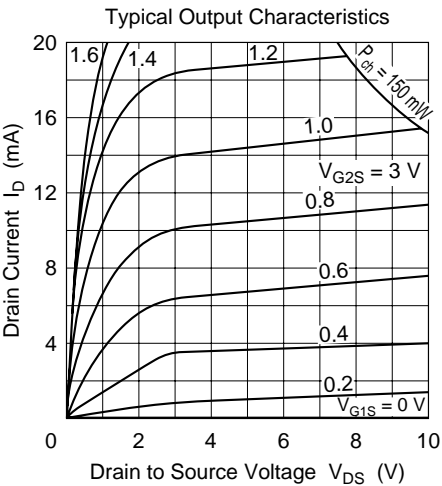
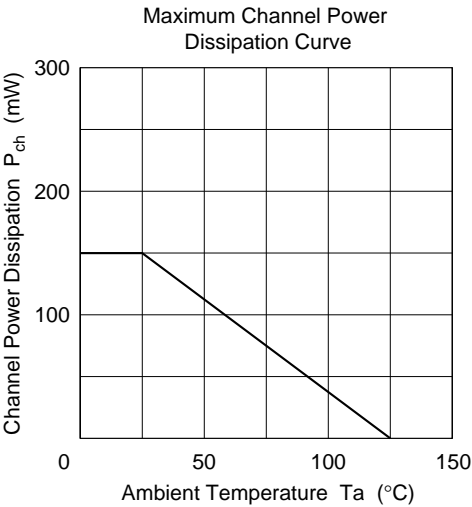
Absolute Maximum Ratings (Ta = 25°C)

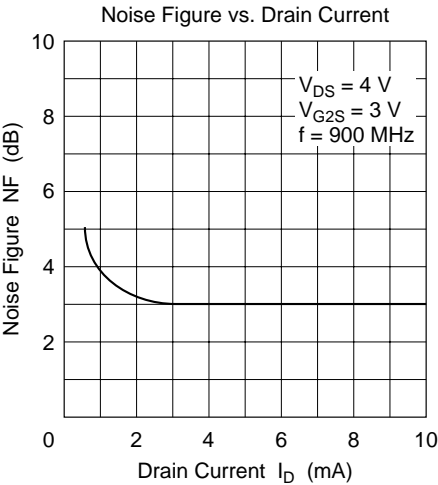
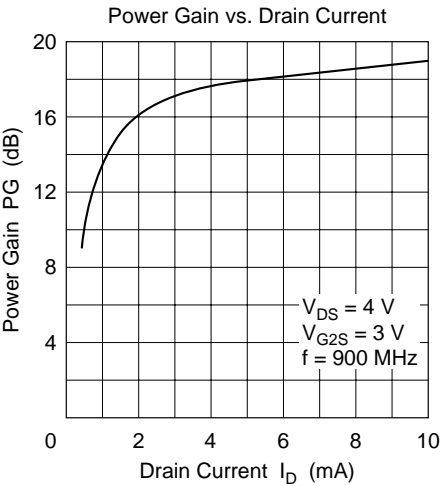
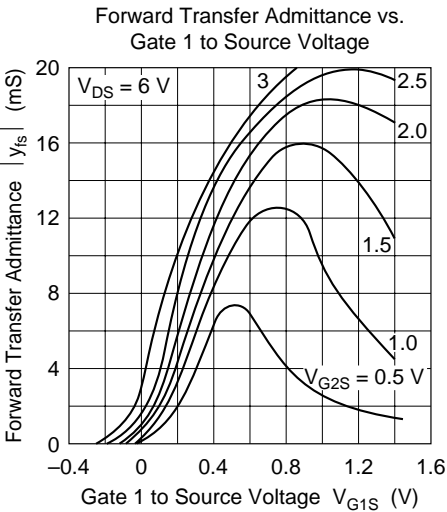
| Item | Symbol | Ratings | Unit |
|---------------------------|-----------|-------------|------|
| Drain to source voltage | V_{DS} | 12 | V |
| Gate 1 to source voltage | V_{G1S} | ± 10 | V |
| Gate 2 to source voltage | V_{G2S} | ± 10 | V |
| Drain current | I_D | 35 | mA |
| Channel power dissipation | Pch | 150 | mW |
| Channel temperature | Tch | 125 | °C |
| Storage temperature | Tstg | -55 to +125 | °C |

Electrical Characteristics (Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|------------------------------------|----------------|----------|-------|-----------|------|---|
| Drain to source breakdown voltage | $V_{(BR)DSX}$ | 12 | — | — | V | $V_{G1S} = V_{G2S} = -5\text{ V}$, $I_D = 200\text{ }\mu\text{A}$ |
| Gate 1 to source breakdown voltage | $V_{(BR)G1SS}$ | ± 10 | — | — | V | $I_{G1} = \pm 10\text{ }\mu\text{A}$, $V_{G2S} = V_{DS} = 0$ |
| Gate 2 to source breakdown voltage | $V_{(BR)G2SS}$ | ± 10 | — | — | V | $I_{G2} = \pm 10\text{ }\mu\text{A}$, $V_{G1S} = V_{DS} = 0$ |
| Gate 1 cutoff current | I_{G1SS} | — | — | ± 100 | nA | $V_{G1S} = \pm 8\text{ V}$, $V_{G2S} = V_{DS} = 0$ |
| Gate 2 cutoff current | I_{G2SS} | — | — | ± 100 | nA | $V_{G2S} = \pm 8\text{ V}$, $V_{G1S} = V_{DS} = 0$ |
| Gate 1 to source cutoff voltage | $V_{G1S(off)}$ | +0.5 | — | -0.8 | V | $V_{DS} = 6\text{ V}$, $V_{G2S} = 3\text{ V}$, $I_D = 100\text{ }\mu\text{A}$ |
| Gate 2 to source cutoff voltage | $V_{G2S(off)}$ | +0.5 | — | -0.8 | V | $V_{DS} = 6\text{ V}$, $V_{G1S} = 3\text{ V}$, $I_D = 100\text{ }\mu\text{A}$ |
| Drain current | I_{DSS} | 0 | — | 4 | mA | $V_{DS} = 6\text{ V}$, $V_{G2S} = 3\text{ V}$, $V_{G1S} = 0$ |
| Forward transfer admittance | $ y_{fs} $ | 15 | — | — | mS | $V_{DS} = 6\text{ V}$, $V_{G2S} = 3\text{ V}$, $I_D = 10\text{ mA}$, $f = 1\text{ kHz}$ |
| Input capacitance | Ciss | — | 1.7 | 2.2 | pF | $V_{DS} = 6\text{ V}$, $V_{G2S} = 3\text{ V}$, $I_D = 10\text{ mA}$, $f = 1\text{ MHz}$ |
| Output capacitance | Coss | — | 1.0 | 1.4 | pF | |
| Reverse transfer capacitance | Crss | — | 0.017 | 0.03 | pF | |
| Power gain | PG | 16 | 19 | — | dB | $V_{DS} = 4\text{ V}$, $V_{G2S} = 3\text{ V}$, $I_D = 10\text{ mA}$, $f = 900\text{ MHz}$ |
| Noise figure | NF | — | 3.0 | 4.5 | dB | |

Note: Marking is "FI—".





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