

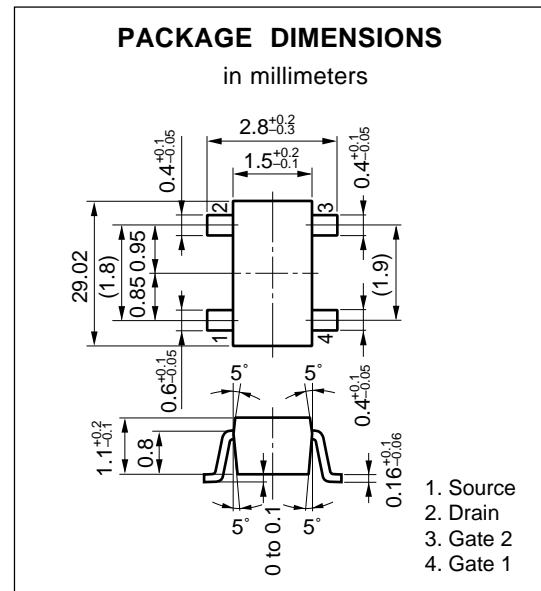
RF AMP. FOR UHF TV TUNER
 N-CHANNEL GaAs DUAL-GATE MES FIELD-EFFECT TRANSISTOR
 4 PIN MINI MOLD

FEATURES

- Suitable for use as RF amplifier in UHF TV tuner.
- Low C_{rss} : 0.02 pF TYP.
- High G_{ps} : 20 dB TYP.
- Low NF : 1.1 dB TYP.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^\circ\text{C}$)

| | | | |
|--------------------------|-----------|-------------|------------------|
| Drain to Source Voltage | V_{DSX} | 13 | V |
| Gate 1 to Source Voltage | V_{G1S} | -4.5 | V |
| Gate2 to Source Voltage | V_{G2S} | -4.5 | V |
| Drain Current | I_D | 40 | mA |
| Total Power Dissipation | P_T | 200 | mW |
| Channel Temperature | T_{ch} | 125 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to +125 | $^\circ\text{C}$ |



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|-----------------------------------|----------------|------|------|------|---------------|---|
| Drain to Source Breakdown Voltage | BV_{DSX} | 13 | | | V | $V_{G1S} = -4\text{ V}, V_{G2S} = 0, I_D = 10\text{ }\mu\text{A}$ |
| Drain Current | I_{DSS} | 5 | 20 | 40 | mA | $V_{DS} = 5\text{ V}, V_{G2S} = 0, V_{G1S} = 0$ |
| Gate1 to Source Cutoff Voltage | $V_{G1S(off)}$ | | | -3.5 | V | $V_{DS} = 5\text{ V}, V_{G2S} = 0, I_D = 100\text{ }\mu\text{A}$ |
| Gate2 TO Source Cutoff Voltage | $V_{G2S(off)}$ | | | -3.5 | V | $V_{DS} = 5\text{ V}, V_{G1S} = 0, I_D = 100\text{ }\mu\text{A}$ |
| Gate1 Reverse Current | I_{G1SS} | | | 10 | μA | $V_{DS} = 0, V_{G1S} = -4\text{ V}, V_{G2S} = 0$ |
| Gate2 Reverse Current | I_{G2SS} | | | 10 | μA | $V_{DS} = 0, V_{G2S} = -4\text{ V}, V_{G1S} = 0$ |
| Forward Transter Admittance | $ y_{fs} $ | 18 | 25 | 35 | ms | $V_{DS} = 5\text{ V}, V_{G2S} = 1\text{ V}, I_D = 10\text{ mA}, f = 1.0\text{ kHz}$ |
| Input Capacitance | C_{iss} | 0.5 | 1.0 | 1.5 | pF | $V_{DS} = 5\text{ V}, V_{G2S} = 1\text{ V}, I_D = 10\text{ mA}, f = 1\text{ MHz}$ |
| Reverse Transfer Capacitance | C_{rss} | | 0.02 | 0.03 | pF | |
| Power Gain | G_{PS} | 16.0 | 20.0 | | dB | $V_{DS} = 5\text{ V}, V_{G2S} = 1\text{ V}, I_D = 10\text{ mA}, f = 900\text{ MHz}$ |
| Noise Figure | NF | | 1.1 | 2.5 | dB | |

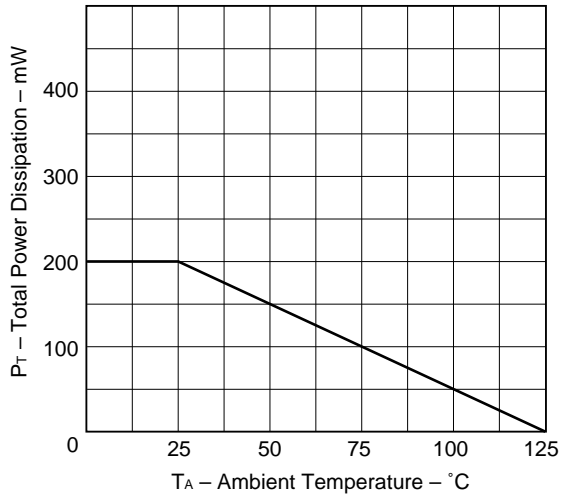
I_{DSS} Classification

Unit: mA

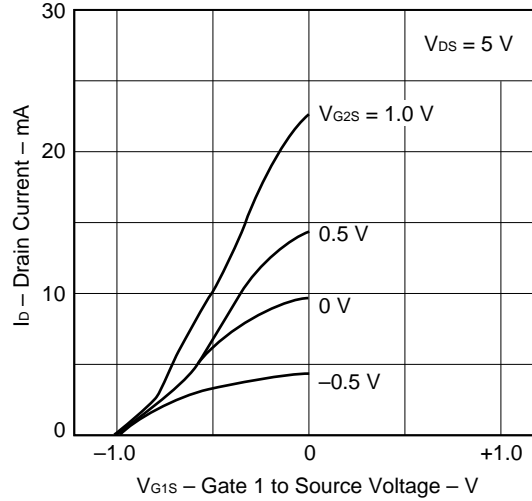
| | | | | |
|-----------|---------|----------|----------|----------|
| Class | U71 | U72 | U73 | U74 |
| Marking | U71 | U72 | U73 | U74 |
| I_{DSS} | 5 to 15 | 10 to 25 | 20 to 35 | 30 to 40 |

TYPICAL CHARACTERISTICS (T_A = 25 °C)

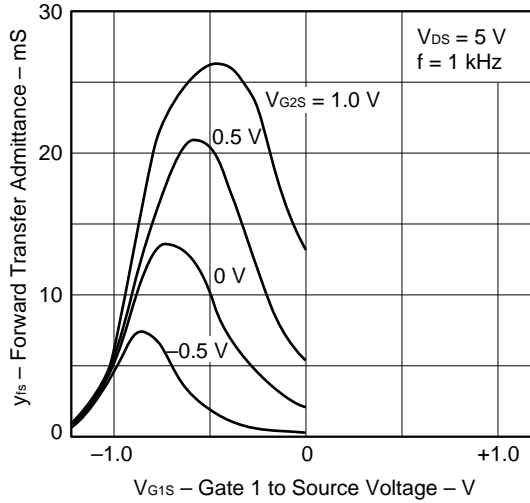
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



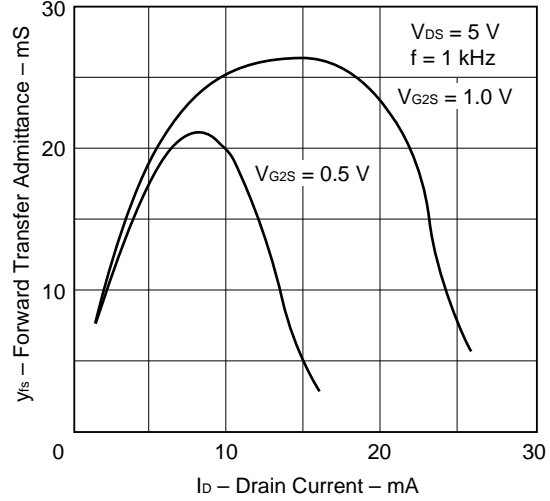
DRAIN CURRENT vs. GATE1 TO SOURCE VOLTAGE



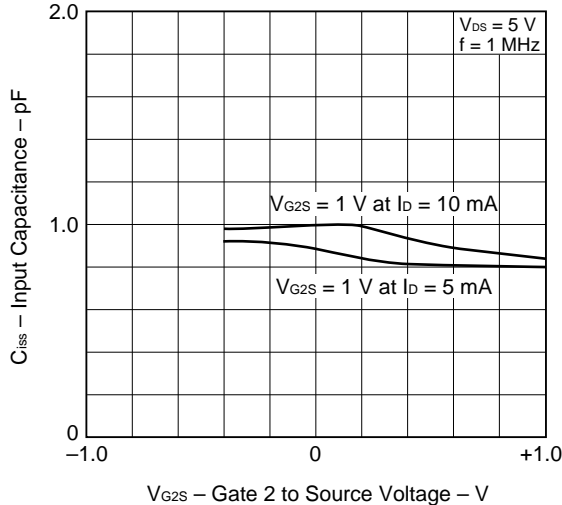
FORWARD TRANSFER ADMITTANCE vs. GATE1 TO SOURCE VOLTAGE



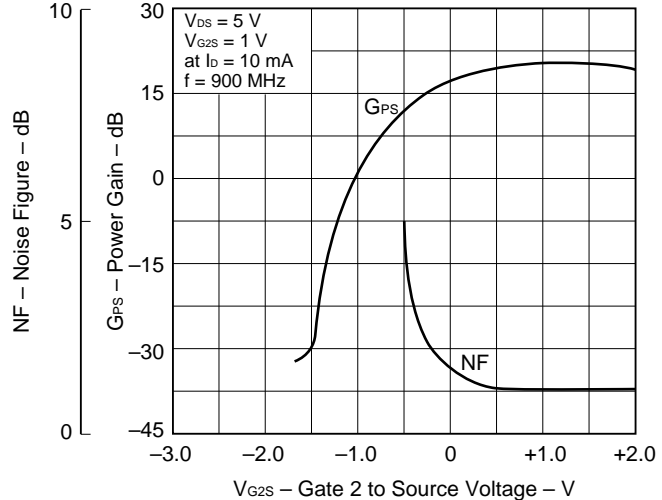
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT

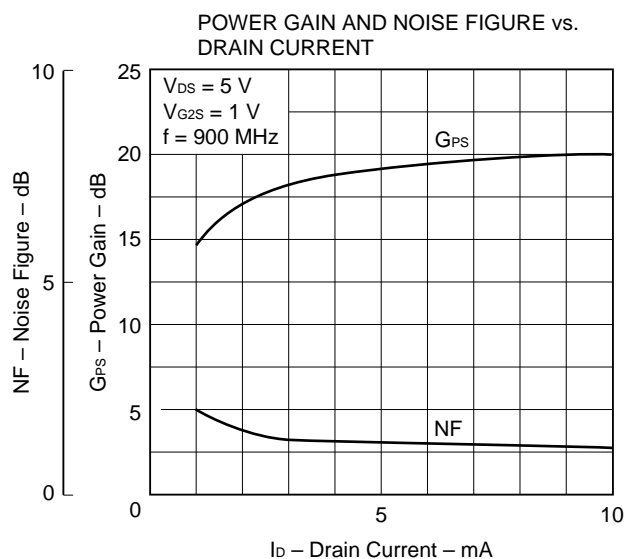
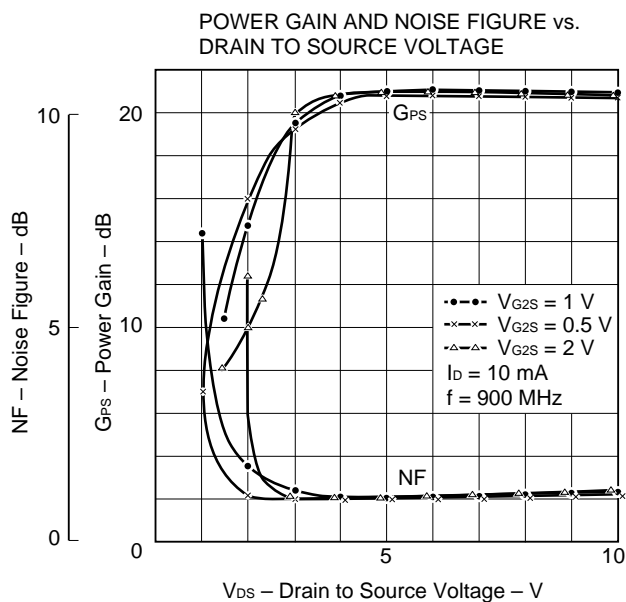


INPUT CAPACITANCE vs. GATE2 TO SOURCE VOLTAGE



POWER GAIN AND NOISE FIGURE vs. GATE2 TO SOURCE VOLTAGE

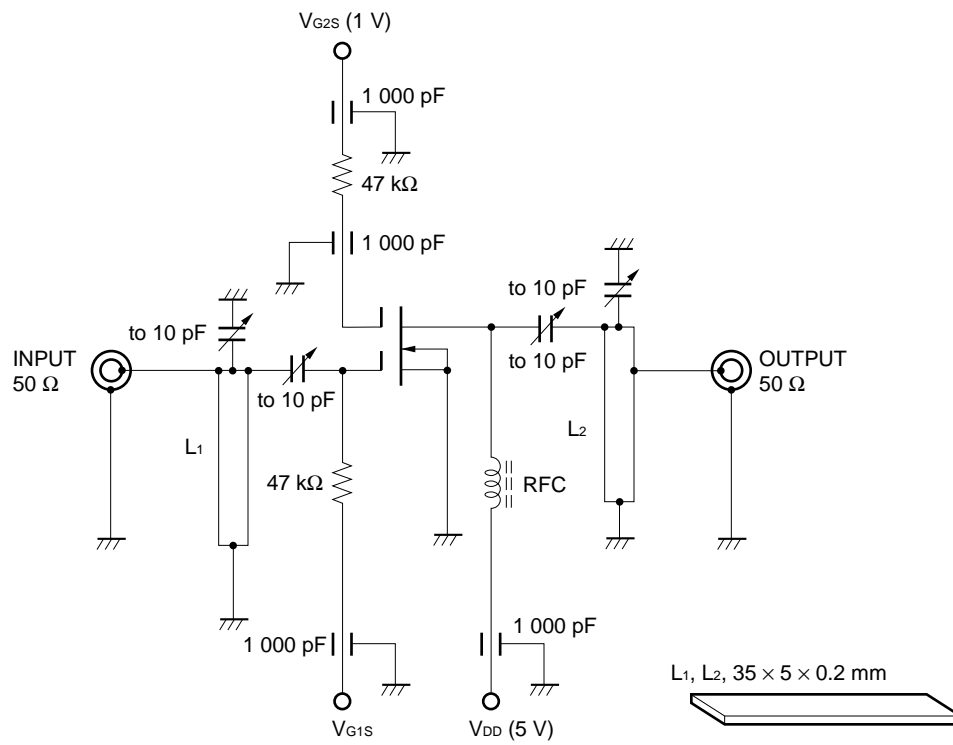




S-PARAMETER (V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA)

| FREQUENCY MHz | S11 | | S21 | | S12 | | S22 | |
|------------------|-------|-------|-------|-------|-------|--------|-------|-------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 100.0000 | 0.999 | -3.3 | 2.359 | 177.2 | 0.006 | -122.3 | 0.969 | -1.3 |
| 200.0000 | 1.000 | -7.2 | 2.389 | 169.3 | 0.004 | 123.0 | 0.981 | -2.9 |
| 300.0000 | 0.998 | -9.3 | 2.313 | 164.4 | 0.000 | -145.0 | 0.979 | -3.3 |
| 400.0000 | 0.974 | -13.4 | 2.233 | 160.0 | 0.004 | 79.2 | 0.967 | -5.6 |
| 500.0000 | 1.005 | -15.7 | 2.420 | 158.4 | 0.007 | 29.7 | 0.999 | -5.8 |
| 600.0000 | 0.942 | -19.1 | 2.300 | 150.0 | 0.003 | 65.0 | 0.958 | -7.7 |
| 700.0000 | 0.968 | -22.2 | 2.332 | 145.5 | 0.004 | 45.5 | 0.997 | -8.5 |
| 800.0000 | 0.920 | -25.2 | 2.229 | 141.5 | 0.008 | 80.1 | 0.957 | -9.4 |
| 900.0000 | 0.952 | -28.9 | 2.447 | 136.8 | 0.004 | 8.3 | 0.999 | -12.5 |
| 1000.0000 | 0.898 | -29.4 | 2.303 | 131.1 | 0.001 | 50.9 | 0.968 | -11.1 |
| 1100.0000 | 0.915 | -35.1 | 2.348 | 125.8 | 0.004 | 71.4 | 0.984 | -14.8 |
| 1200.0000 | 0.879 | -35.2 | 2.367 | 123.5 | 0.000 | 91.1 | 0.989 | -13.0 |

900 MHz GPs AND NF TEST CIRCUIT



$V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 \text{ mA}$

[MEMO]

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