

**RF AMPLIFIER FOR FM TUNER AND VHF TV TUNER  
N-CHANNEL Si DUAL GATE MOS FIELD-EFFECT TRANSISTOR  
4 PINS MINI MOLD**

**FEATURES**

- The Characteristic of Cross-Modulation is good.  
CM = 92 dB $\mu$  TYP. @ f = 200 MHz, G<sub>R</sub> = -30 dB
- Low Noise Figure: NF1 = 1.2 dB TYP. (f = 200 MHz)  
NF2 = 1.0 dB TYP. (f = 55 MHz)
- High Power Gain: G<sub>PS</sub> = 23 dB TYP. (f = 200 MHz)
- Enhancement Type.
- Suitable for use as RF amplifier in FM tuner and VHF TV tuner.
- Automatically Mounting: Embossed Type Taping
- Small Package: 4 Pins Mini Mold

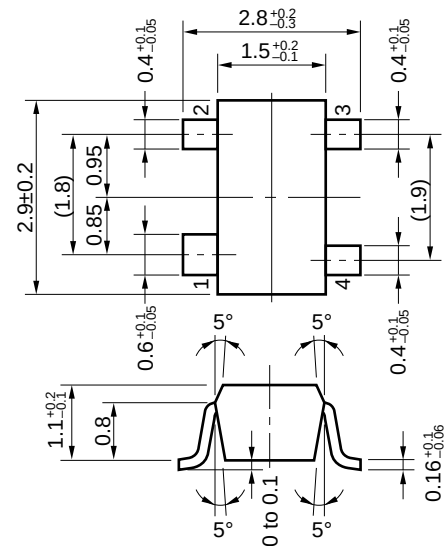
**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C)**

|                         |                  |             |    |
|-------------------------|------------------|-------------|----|
| Drain to Source Voltage | V <sub>DSX</sub> | 18          | V  |
| Gate1 to Source Voltage | V <sub>G1S</sub> | ±8 (±10)*1  | V  |
| Gate2 to Source Voltage | V <sub>G2S</sub> | ±8 (±10)*1  | V  |
| Gate1 to Drain Voltage  | V <sub>G1D</sub> | 18          | V  |
| Gate2 to Drain Voltage  | V <sub>G2D</sub> | 18          | V  |
| Drain Current           | I <sub>D</sub>   | 25          | mA |
| Total Power Dissipation | P <sub>D</sub>   | 200         | mW |
| Channel Temperature     | T <sub>ch</sub>  | 125         | °C |
| Storage Temperature     | T <sub>stg</sub> | -55 to +125 | °C |

\*1 R<sub>L</sub> ≥ 10 k $\Omega$

**PACKAGE DIMENSIONS**

(Unit: mm)



1. Source
2. Drain
3. Gate 2
4. Gate 1

**PRECAUTION**

Avoid high static voltages or electric fields so that this device would not suffer from any damage due to those voltage or fields.

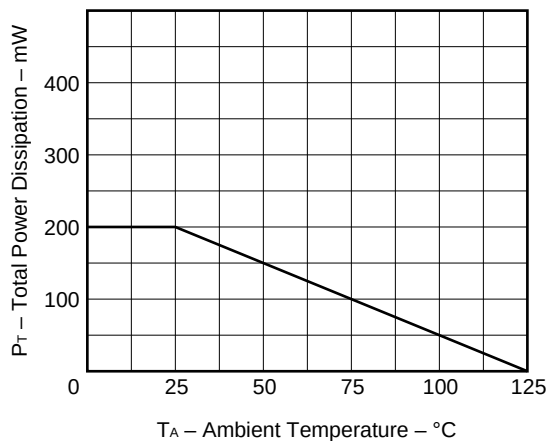
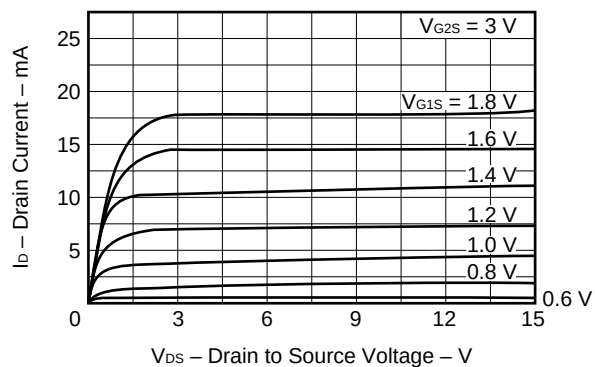
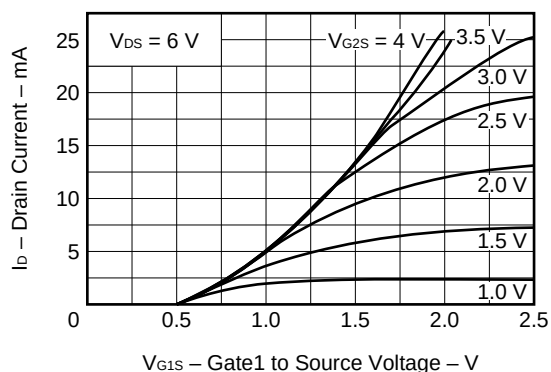
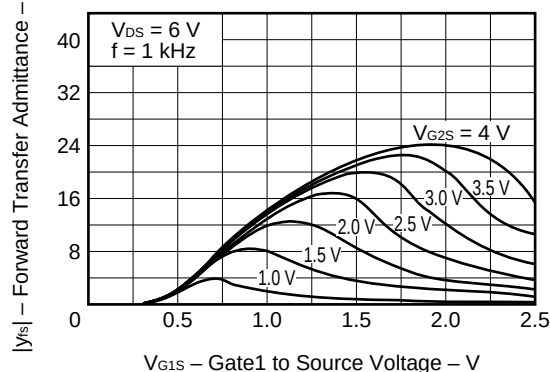
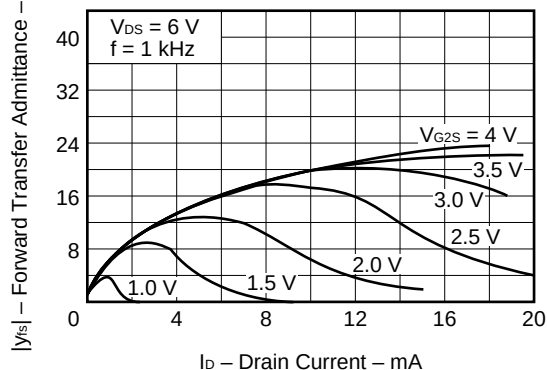
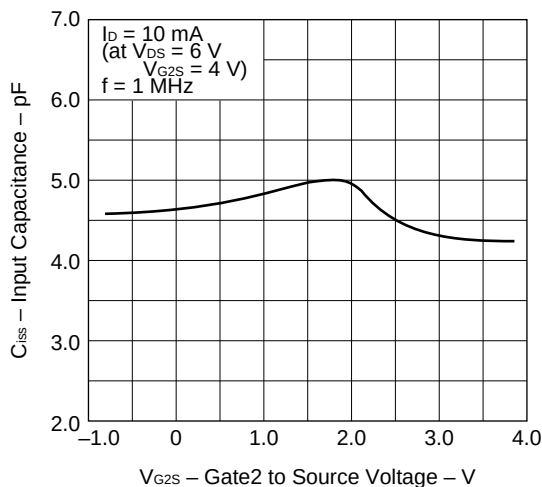
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

| CHARACTERISTIC                    | SYMBOL                | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS                                                                      |
|-----------------------------------|-----------------------|------|------|------|------|--------------------------------------------------------------------------------------|
| Drain to Source Breakdown Voltage | BV <sub>DSX</sub>     | 18   |      |      | V    | V <sub>G1S</sub> = V <sub>G2S</sub> = -2 V, I <sub>D</sub> = 10 μA                   |
| Drain Current                     | I <sub>DSX</sub>      | 0.01 |      | 8.0  | mA   | V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 3 V, V <sub>G1S</sub> = 0.75 V             |
| Gate1 to Source Cutoff Voltage    | V <sub>G1S(off)</sub> | 0    |      | +1.0 | V    | V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 10 μA                |
| Gate2 to Source Cutoff Voltage    | V <sub>G2S(off)</sub> | 0    |      | +1.0 | V    | V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 10 μA                |
| Gate1 Reverse Current             | I <sub>G1SS</sub>     |      |      | ±20  | nA   | V <sub>DS</sub> = 0, V <sub>G2S</sub> = 0, V <sub>G1S</sub> = ±8 V                   |
| Gate2 Reverse Current             | I <sub>G2SS</sub>     |      |      | ±20  | nA   | V <sub>DS</sub> = 0, V <sub>G1S</sub> = 0, V <sub>G2S</sub> = ±8 V                   |
| Forward Transfer Admittance       | y <sub>fs</sub>       | 15   | 19.5 |      | mS   | V <sub>DS</sub> = 5 V, V <sub>G2S</sub> = 4 V, I <sub>D</sub> = 10 mA<br>f = 1 kHz   |
| Input Capacitance                 | C <sub>iss</sub>      | 3.6  | 4.3  | 5.0  | pF   | V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 10 mA<br>f = 1 MHz   |
| Output Capacitance                | C <sub>DSS</sub>      | 1.0  | 1.5  | 2.0  | pF   |                                                                                      |
| Reverse Transfer Capacitance      | C <sub>rss</sub>      |      | 0.02 | 0.03 | pF   |                                                                                      |
| Power Gain                        | G <sub>PS</sub>       | 21.0 | 23.0 |      | dB   | V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 4 V, I <sub>D</sub> = 10 mA<br>f = 200 MHz |
| Noise Figure 1                    | NF1                   |      | 1.2  | 2.0  | dB   | V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 4 V, I <sub>D</sub> = 10 mA<br>f = 55 MHz  |
| Noise Figure 2                    | NF2                   |      | 1.0  | 2.0  | dB   |                                                                                      |

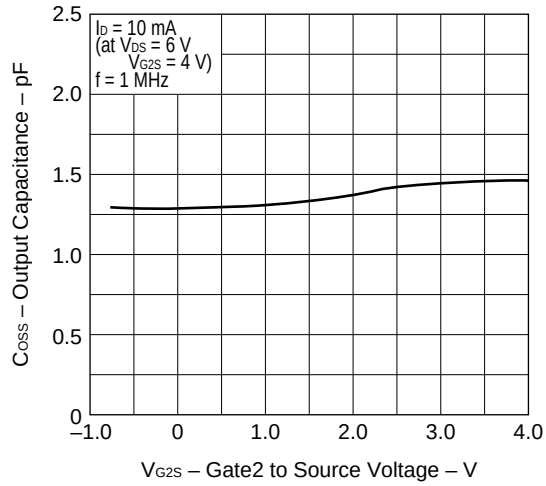
**I<sub>DSX</sub> Classification**

|                       |             |            |
|-----------------------|-------------|------------|
| Class                 | V21/VBA*    | V22/VBB*   |
| Marking               | V21         | V22        |
| I <sub>DSX</sub> (mA) | 0.01 to 3.0 | 1.0 to 8.0 |

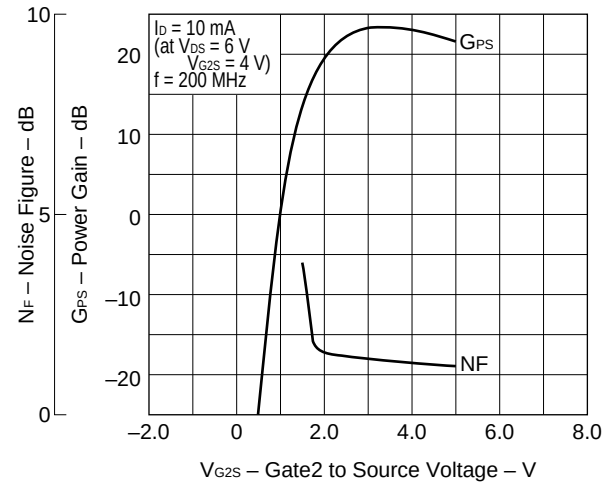
\* Old specification/New specification

TYPICAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ )TOTAL POWER DISSIPATION vs.  
AMBIENT TEMPERATUREDRAIN CURRENT vs.  
DRAIN TO SOURCE VOLTAGEDRAIN CURRENT vs.  
GATE1 TO SOURCE VOLTAGEFORWARD TRANSFER ADMITTANCE vs.  
GATE1 TO SOURCE VOLTAGEFORWARD TRANSFER ADMITTANCE vs.  
DRAIN CURRENTINPUT CAPACITANCE vs.  
GATE2 TO SOURCE VOLTAGE

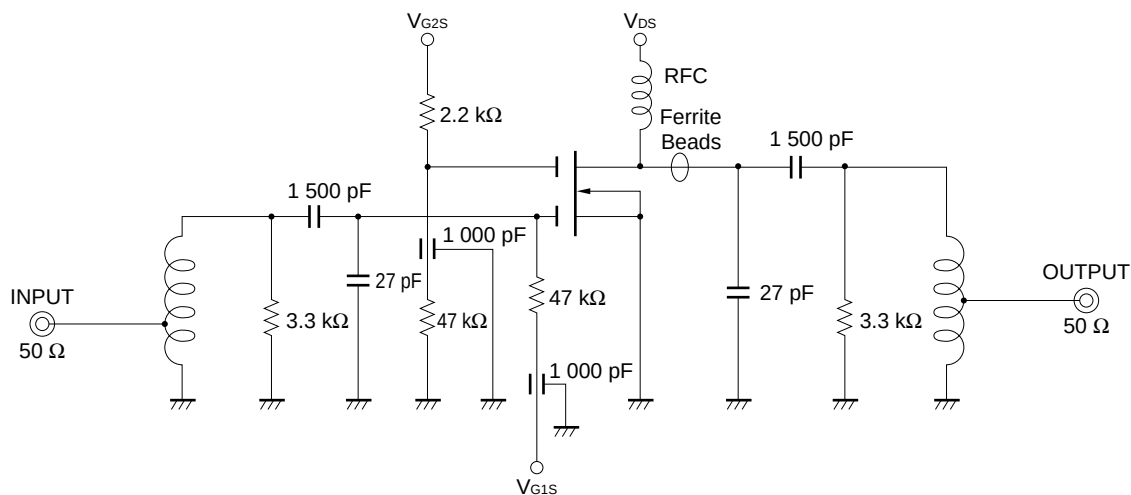
OUTPUT CAPACITANCE vs.  
GATE2 TO SOURCE VOLTAGE



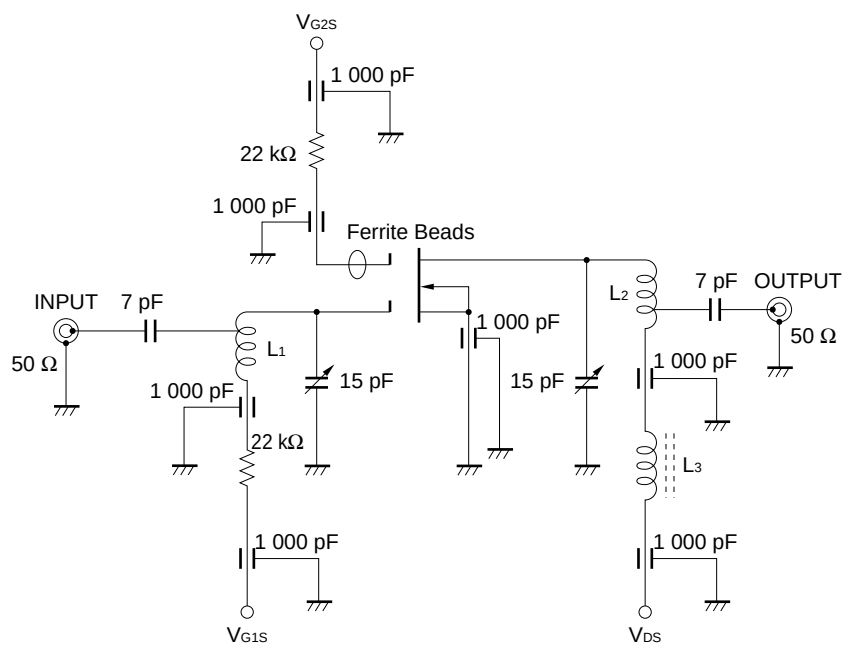
POWER GAIN AND NOISE FIGURE vs.  
GATE2 TO SOURCE VOLTAGE



NF TEST CIRCUIT AT  $f = 55 \text{ MHz}$



GPS AND NF TEST CIRCUIT AT  $f = 200 \text{ MHz}$



L1:  $\phi 0.6 \text{ mm U.E.W } \phi 7 \text{ mm } 3 \text{ T}$   
 L2:  $\phi 0.6 \text{ mm U.E.W } \phi 7 \text{ mm } 3 \text{ T}$   
 L3: RFC  $2.2 \mu\text{H}$

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Anti-radioactive design is not implemented in this product.