

### RF AMPLIFIER FOR UHF TUNER N-CHANNEL Si DUAL GATE MOS FIELD-EFFECT TRANSISTOR 4 PINS SUPER MINI MOLD

#### FEATURES

- Low  $V_{DD}$  Use : ( $V_{DS} = 3.5 V$ )
- Driving Battery
- Low Noise Figure :  $NF = 1.8 \text{ dB TYP. (} f = 900 \text{ MHz)}$
- High Power Gain :  $G_{PS} = 18.0 \text{ dB TYP. (} f = 900 \text{ MHz)}$
- Suitable for uses as RF amplifier in UHF TV tuner.
- Automatically Mounting : Embossed Type Taping
- Small Package : 4 Pins Super Mini Mold

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

Drain to Source Voltage	$V_{DSX}$	18	V
Gate1 to Source Voltage	$V_{G1S}$	$\pm 8^{*1}$	V
Gate2 to Source Voltage	$V_{G2S}$	$\pm 8^{*1}$	V
Gate1 to Drain Voltage	$V_{G1D}$	18	V
Gate2 to Drain Voltage	$V_{G2D}$	18	V
Drain Current	$I_D$	25	mA
Total Power Dissipation	$P_D$	130	mW
Channel Temperature	$T_{ch}$	125	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$

\*1:  $R_L \geq 10 \text{ k}\Omega$

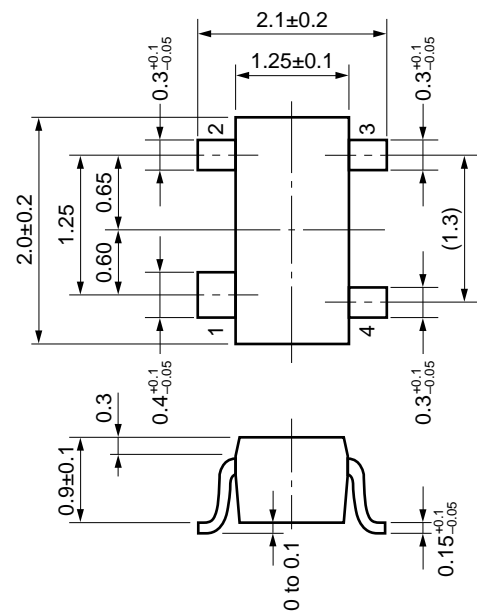
\*2: Free air

#### PRECAUTION

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

#### PACKAGE DIMENSIONS

(Unit: mm)



#### PIN CONNECTIONS

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

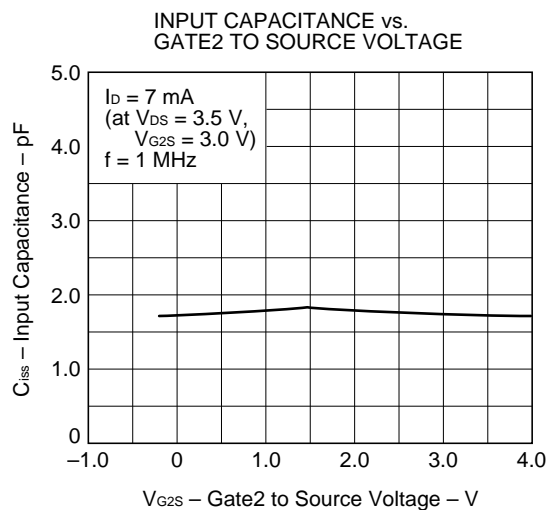
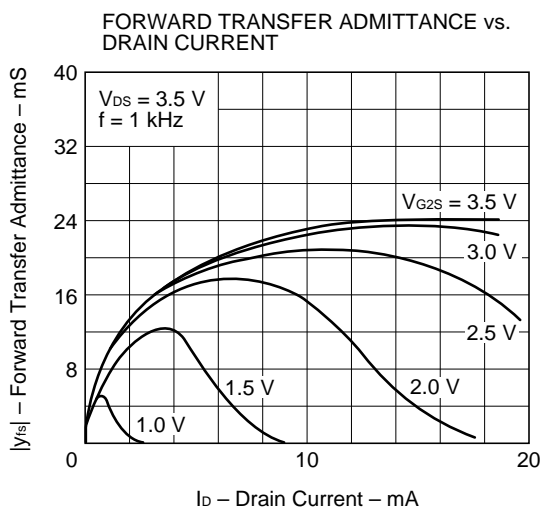
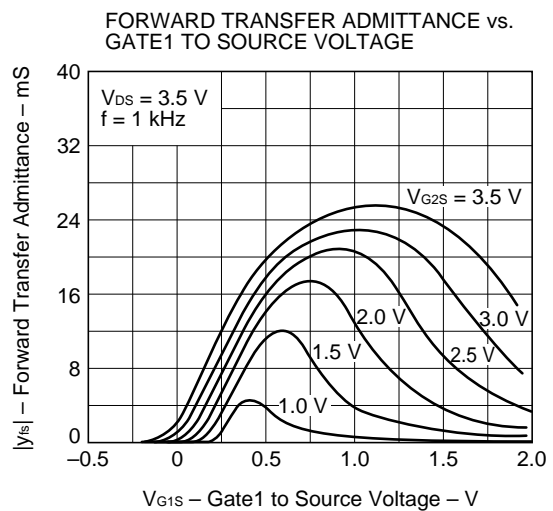
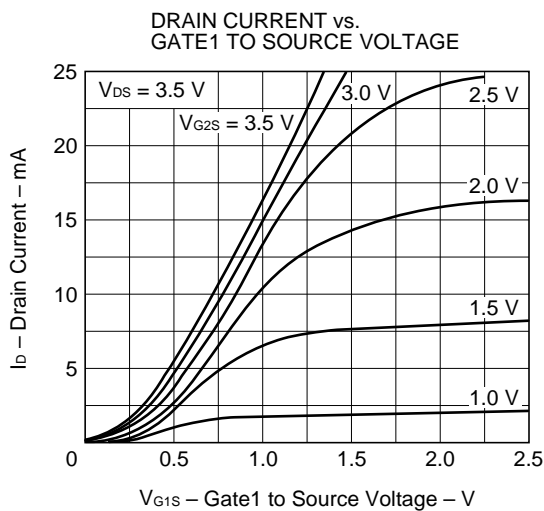
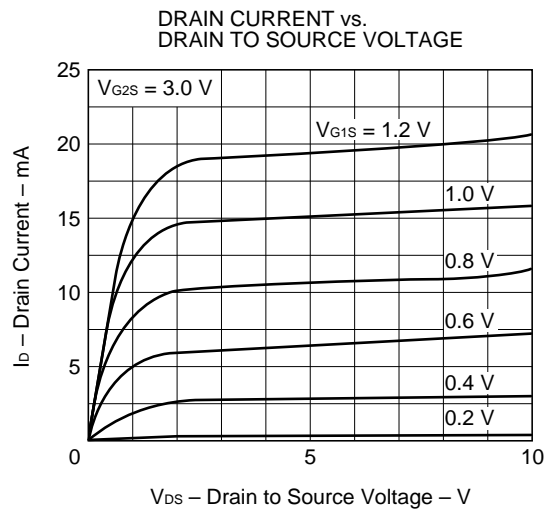
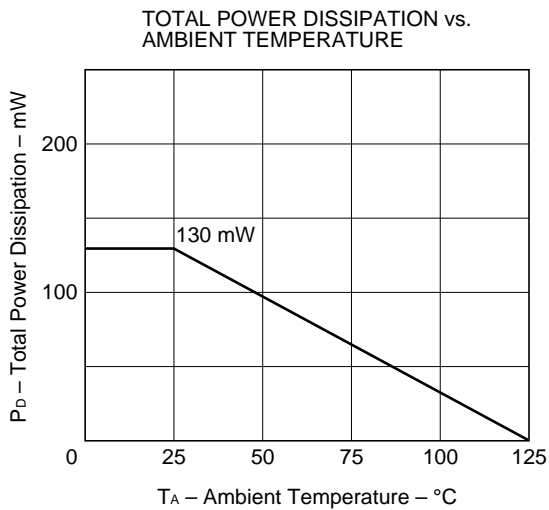
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

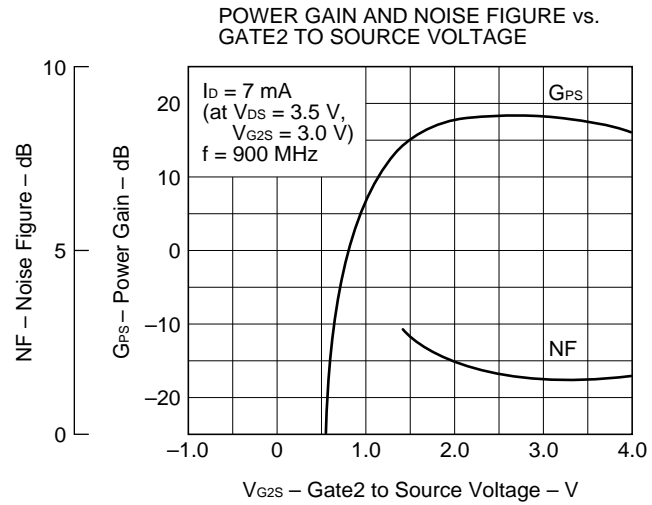
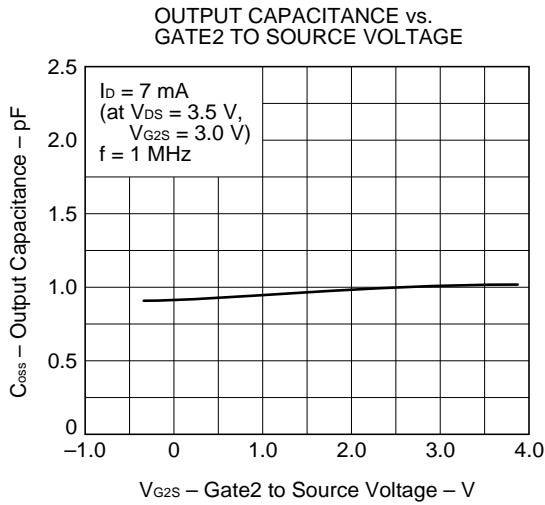
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source Breakdown Voltage	BV <sub>DSX</sub>	18			V	V <sub>G1S</sub> = V <sub>G2S</sub> = -2 V, I <sub>D</sub> = 10 μA
Drain Current	I <sub>DSX</sub>	0.5		7.0	mA	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, V <sub>G1S</sub> = 0.75 V
Gate1 to Source Cutoff Voltage	V <sub>G1S(off)</sub>	-1.0	0	+1.0	V	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 10 μA
Gate2 to Source Cutoff Voltage	V <sub>G2S(off)</sub>	0	0.5	1.0	V	V <sub>DS</sub> = 3.5 V, V <sub>G1S</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> = ±6 V
Gate2 Reverse Current	I <sub>G2SS</sub>			±20	nA	V <sub>DS</sub> = 0, V <sub>G1S</sub> = 0, V <sub>G2S</sub> = ±6 V
Forward Transfer Admittance	y <sub>fs</sub>	14	19	24	mS	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 7 mA f = 1 kHz
Input Capacitance	C <sub>iss</sub>	1.2	1.7	2.2	pF	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 7 mA f = 1 MHz
Output Capacitance	C <sub>oss</sub>	0.5	1.0	1.5	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		0.01	0.03	pF	
Power Gain	G <sub>ps</sub>	15	18	21	dB	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 7 mA
Noise Figure	NF		1.8	3.0	dB	f = 900 MHz

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

Rank	U1G
Marking	U1G
I <sub>DSX</sub> (mA)	0.5 to 7.0

TYPICAL CHARACTERISTICS (TA = 25 °C)



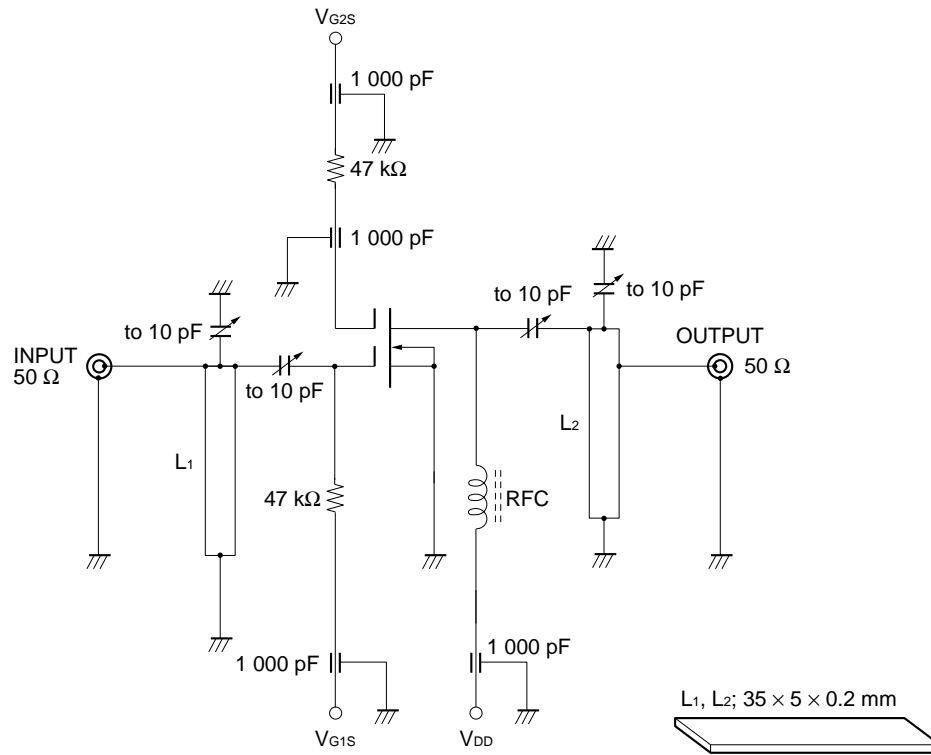


**S-Parameter**

$V_{DS} = 3.5 \text{ V}$ ,  $V_{G2S} = 3 \text{ V}$ ,  $I_D = 7 \text{ mA}$

Frequency (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	1.017	-6.5	2.057	173.3	0.035	-88.2	0.985	-2.9
200	1.000	-13.4	2.034	163.6	0.014	-121.6	0.987	-6.9
300	0.999	-19.8	1.991	155.5	0.006	67.0	0.988	-10.4
400	0.993	-26.6	1.996	146.8	0.006	71.3	0.983	-13.8
500	0.984	-32.6	1.956	136.7	0.005	117.8	0.985	-17.1
600	0.966	-39.1	1.930	130.4	0.002	-23.3	0.983	-20.8
700	0.948	-45.5	1.901	122.7	0.002	-162.4	0.979	-24.6
800	0.934	-51.4	1.897	114.5	0.003	37.8	0.986	-27.9
900	0.908	-57.5	1.897	105.6	0.011	-146.3	0.991	-32.1
1000	0.901	-83.8	1.984	96.6	0.010	-144.3	1.024	-36.4

GPS AND NF TEST CIRCUIT AT  $f = 900 \text{ MHz}$



[MEMO]

[MEMO]

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Anti-radioactive design is not implemented in this product.