

## 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 :  $NF = 1.8$  dB TYP. ( $f = 900$  MHz)
- High Power Gain :  $G_{PS} = 18.0$  dB TYP. ( $f = 900$  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 ( $T_A = 25$ °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	°C
Storage Temperature	$T_{stg}$	-55 to +125	°C

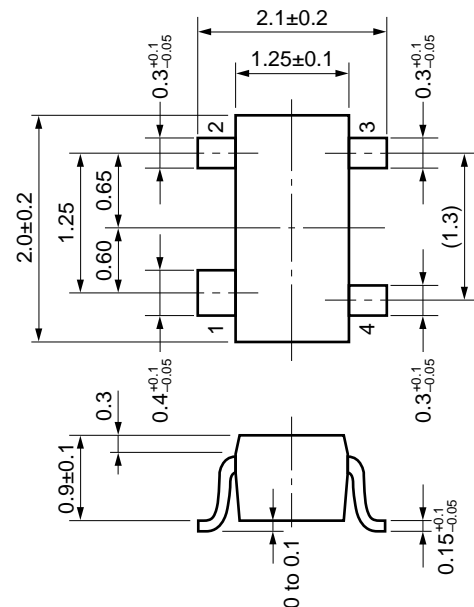
\*1:  $R_L \geq 10$  k $\Omega$

\*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

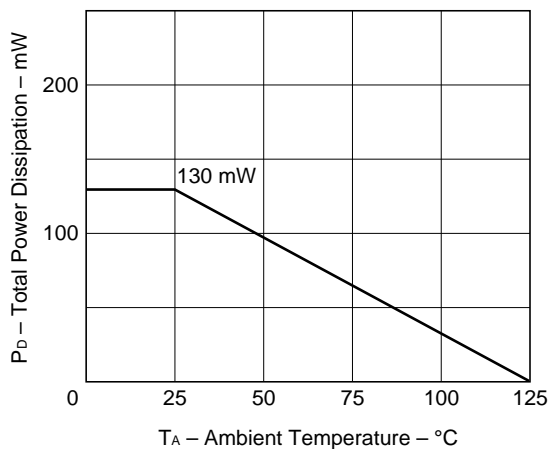
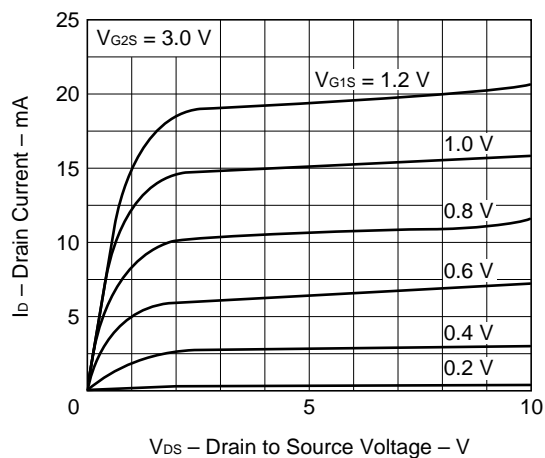
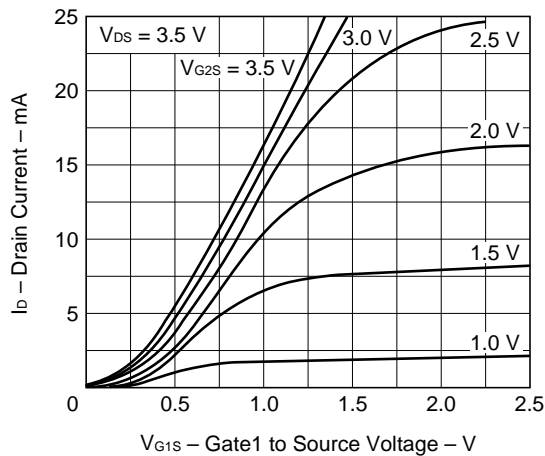
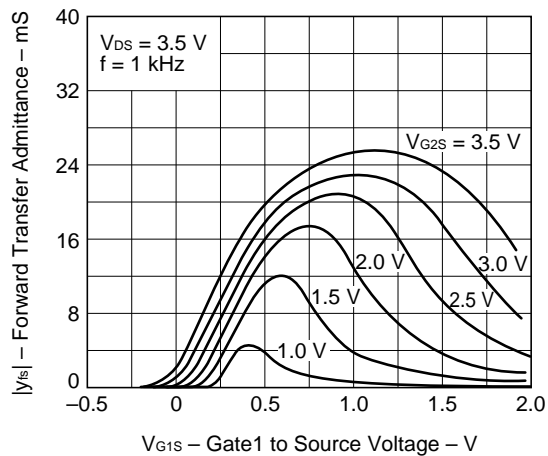
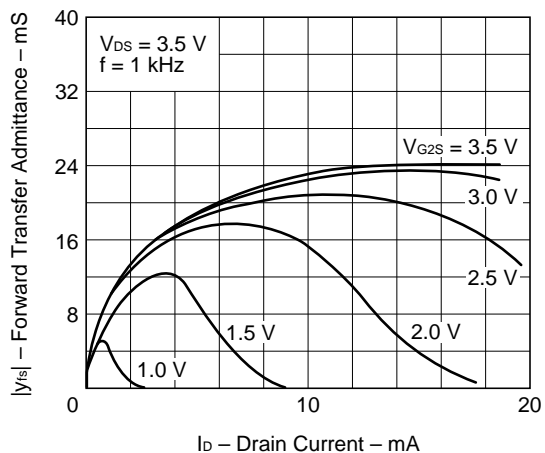
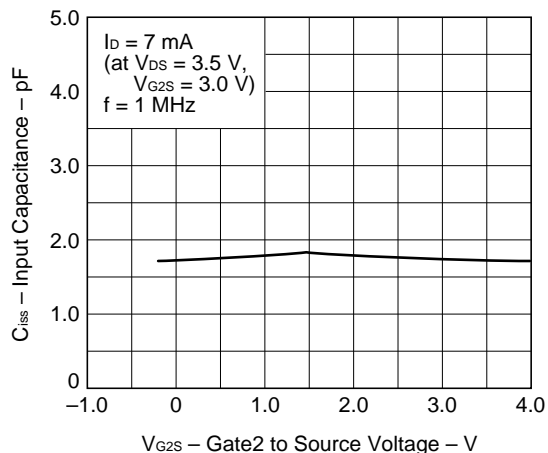
1. Source
2. Drain
3. Gate2
4. Gate1

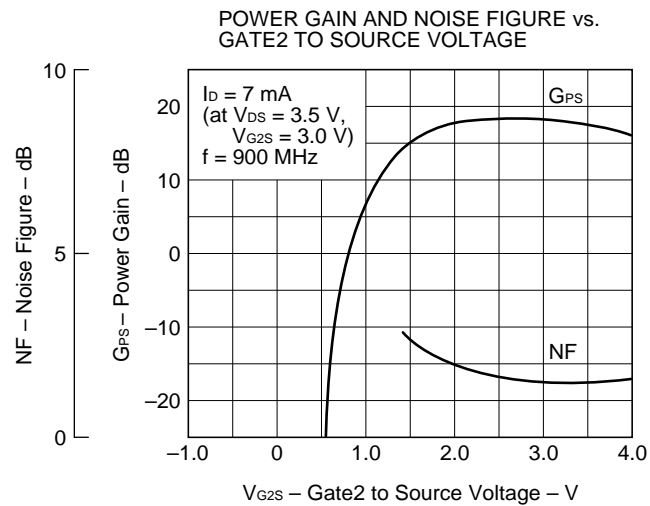
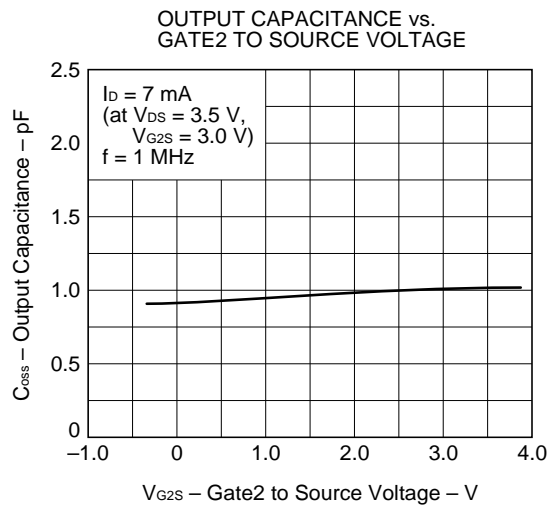
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

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	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 7 mA f = 900 MHz
Power Gain	G <sub>ps</sub>	15	18	21	dB	
Noise Figure	NF		1.8	3.0	dB	

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

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

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

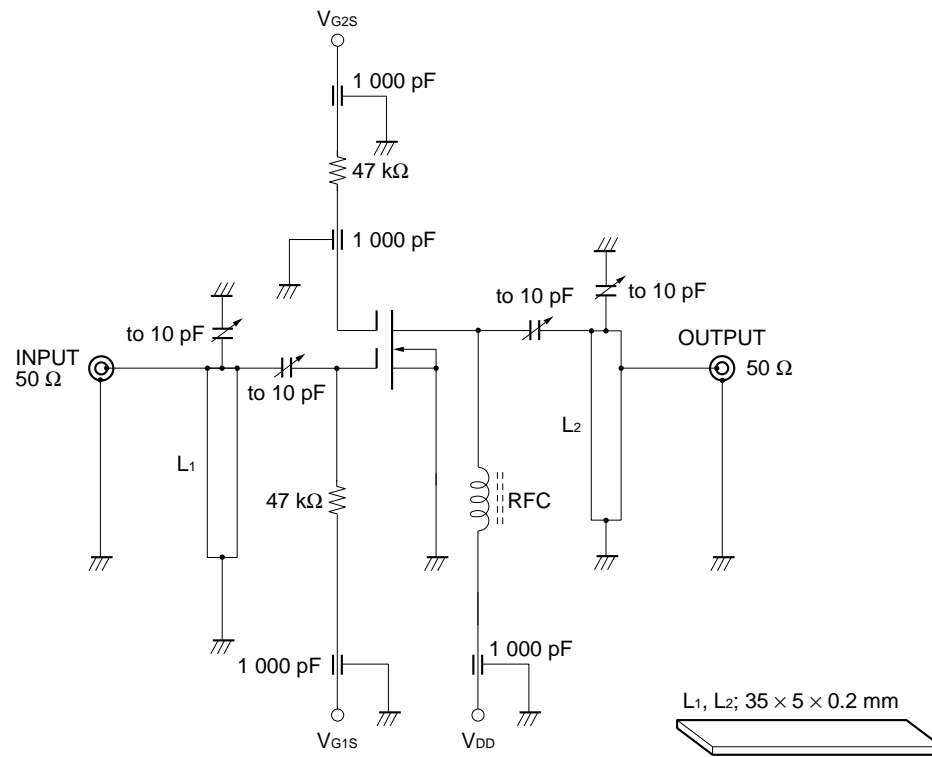


### S-Parameter

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

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.