

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

#### FEATURES

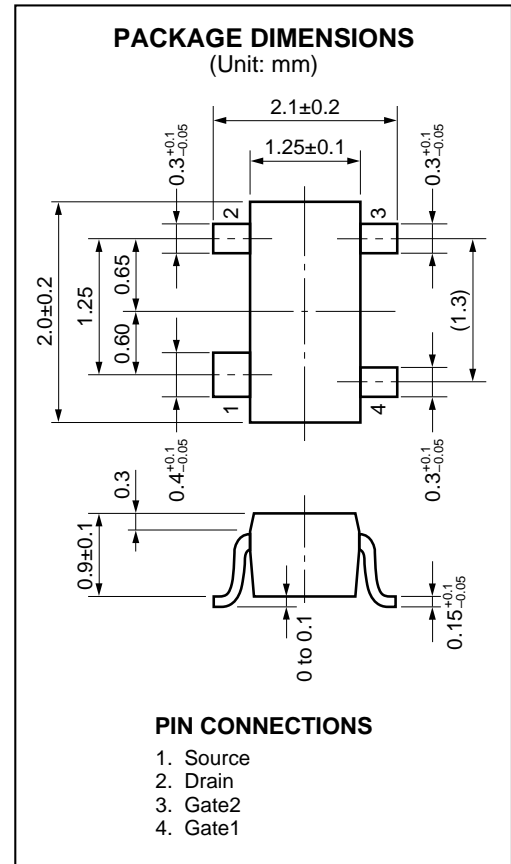
- Low  $V_{DD}$  Use : ( $V_{DS} = 3.5$  V)
- Driving Battery
- Low Noise Figure :  $NF1 = 2.0$  dB TYP. ( $f = 470$  MHz)  
 $NF2 = 0.8$  dB TYP. ( $f = 55$  MHz)
- High Power Gain :  $G_{PS} = 19.0$  dB TYP. ( $f = 470$  MHz)
- Suitable for use as RF amplifier in CATV tuner.
- Automatically Mounting : 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	$P_D$	$130^{*2}$	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.

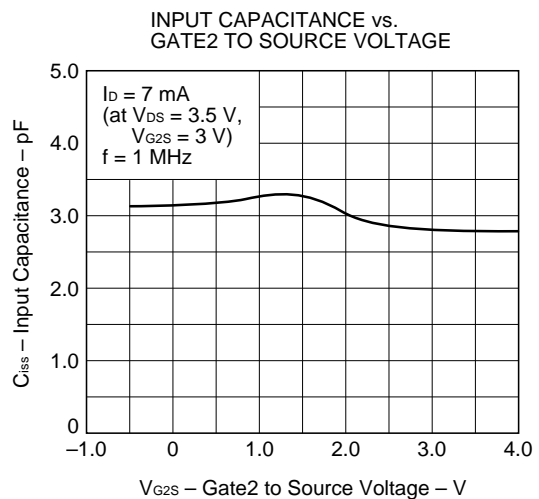
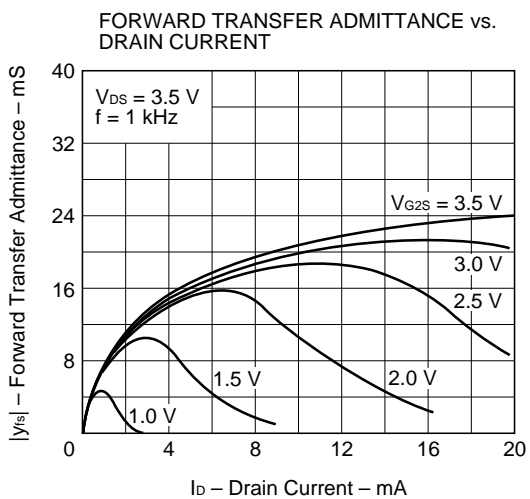
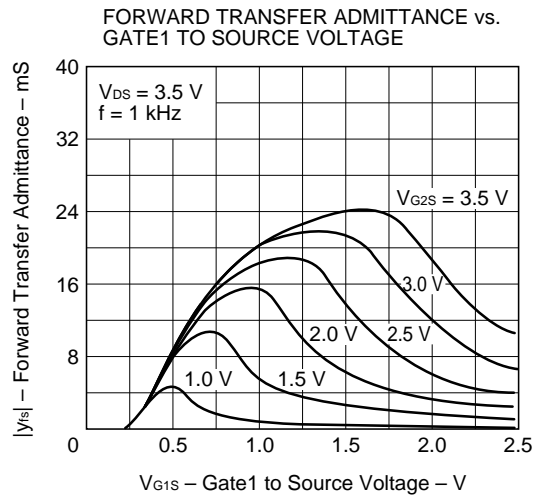
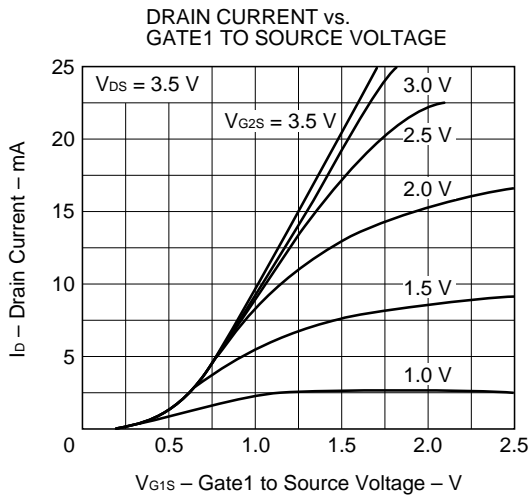
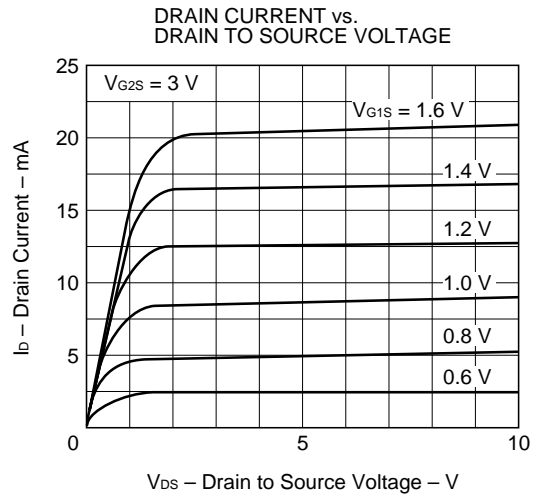
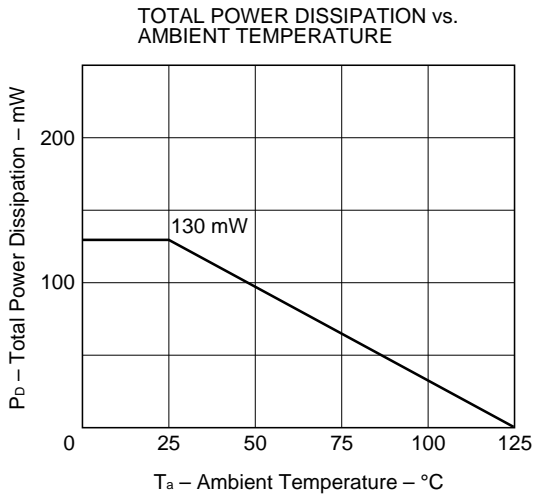
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

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>	0.1		5.0	mA	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, V <sub>G1S</sub> = 0.5 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	18	23	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>	2.4	2.9	3.4	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>	0.9	1.2	1.5	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		0.01	0.03	pF	
Power Gain	G <sub>ps</sub>	16	19	22	dB	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 7 mA f = 470 MHz
Noise Figure 1	NF1		2.0	3.0	dB	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 7 mA f = 55 MHz
Noise Figure 2	NF2		0.8	2.3	dB	

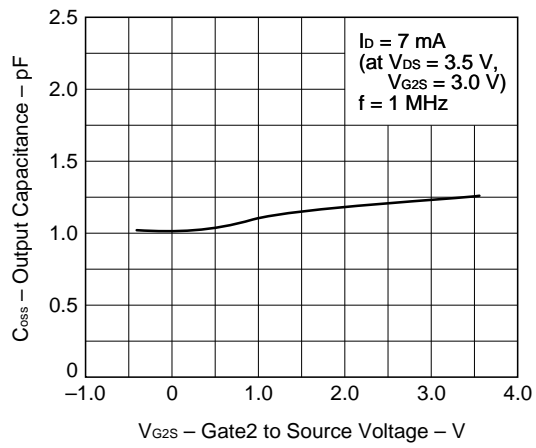
**I<sub>DSX</sub> Classification**

Rank	U1E
Marking	U1E
I <sub>DSX</sub> (mA)	0.1 to 0.5

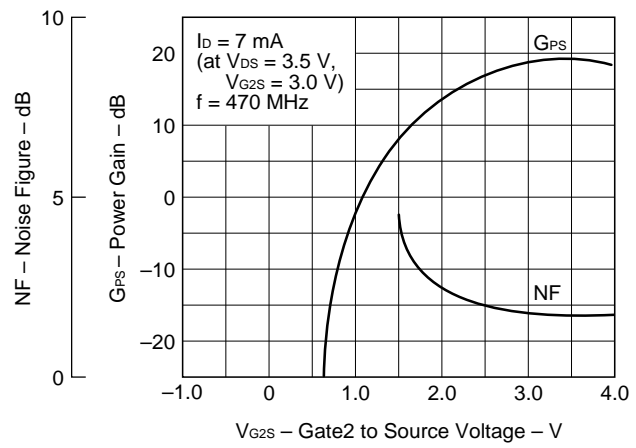
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)



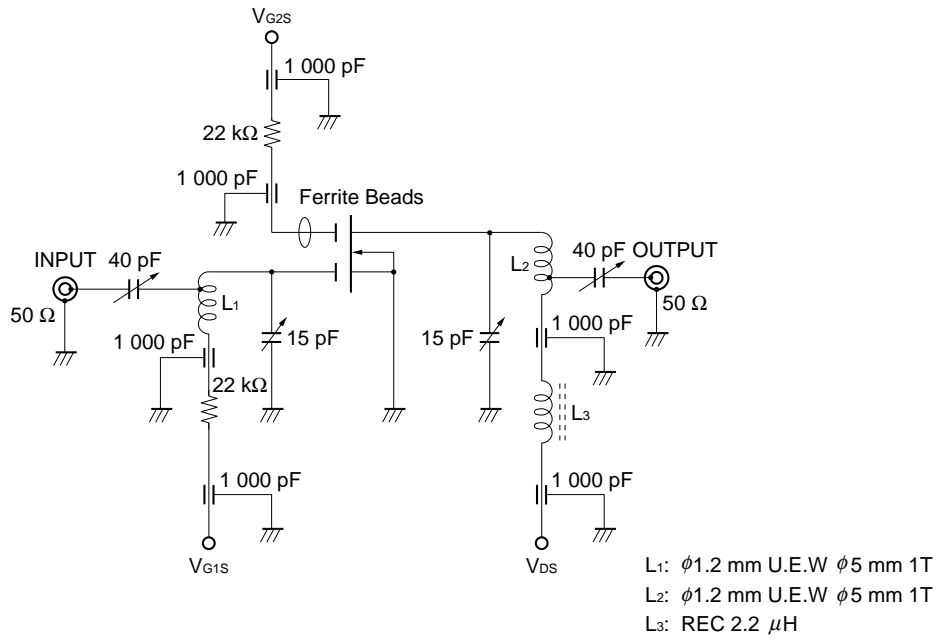
OUTPUT CAPACITANCE vs.  
GATE2 TO SOURCE VOLTAGE



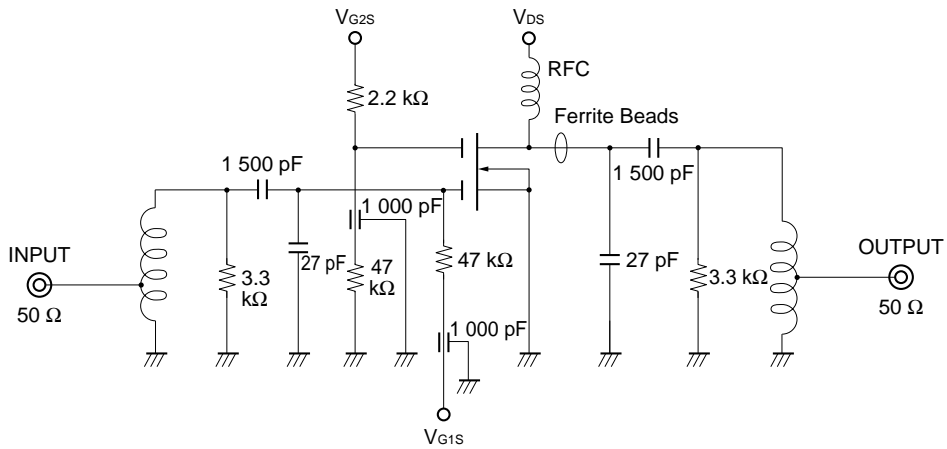
POWER GAIN AND NOISE FIGURE vs.  
GATE2 TO SOURCE VOLTAGE



GPS AND NF TEST CIRCUIT AT  $f = 470 \text{ MHz}$



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



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Anti-radioactive design is not implemented in this product.