

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

FEATURES

- The Characteristic of Cross-Modulation is good.
CM = 101 dB μ TYP. @ f = 470 MHz, G_R = -30 dB
- Low Noise Figure: NF1 = 2.2 dB TYP. (f = 470 MHz)
NF2 = 0.9 dB TYP. (f = 55 MHz)
- High Power Gain: G_{PS} = 20.0 dB TYP. (f = 470 MHz)
- Low Reverse Transfer Capacitance C_{rss} = 0.015 pF TYP.
- 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}	±8(±10)*1	V
Gate2 to Source Voltage	V _{G2S}	±8(±10)*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	200	mW
Channel Temperature	T _{ch}	130*2/250*3	°C
Storage Temperature	T _{stg}	-55 to +125	°C

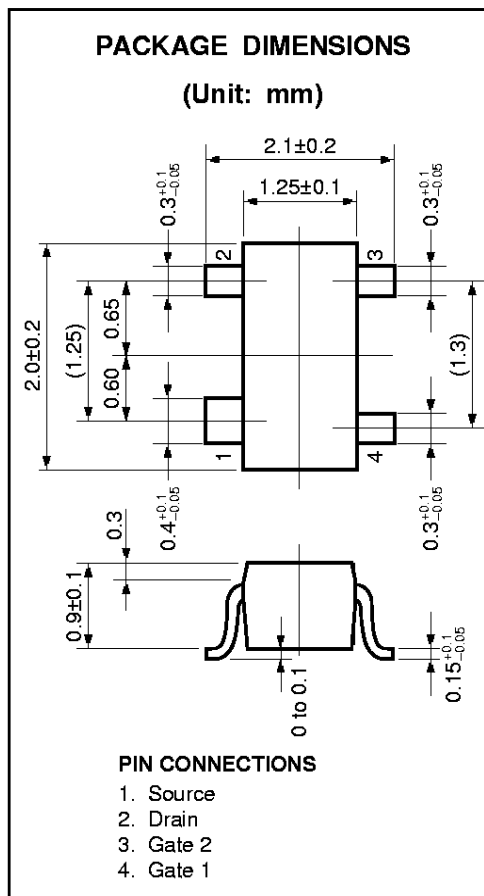
*1 R_L ≥ 10 kΩ

*2 Free air

*3 15 mm × 15 mm × 1.2 mm board by epoxy glass

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_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source Breakdown Voltage	BV _{DSX}	18			V	V _{G1S} = V _{G2S} = -2 V, I _D = 10 μA
Drain Current	I _{DSX}	0.01		8.0	mA	V _{DS} = 5 V, V _{G2S} = 4 V, V _{G1S} = 0.75 V
Gate1 to Source Cutoff Voltage	V _{G1S(off)}	0		+1.0	V	V _{DS} = 6 V, V _{G2S} = 3 V, I _D = 10 μA
Gate2 to Source Cutoff Voltage	V _{G2S(off)}	0		+1.0	V	V _{DS} = 6 V, V _{G1S} = 3 V, I _D = 10 μA
Gate1 Reverse Current	I _{G1SS}			±20	nA	V _{DS} = 0, V _{G2S} = 0, V _{G1S} = ±8 V
Gate2 Reverse Current	I _{G2SS}			±20	nA	V _{DS} = 0, V _{G1S} = 0, V _{G2S} = ±8 V
Forward Transfer Admittance	y _{fs}	15	19.5		mS	V _{DS} = 5 V, V _{G2S} = 4 V, I _D = 10 mA f = 1 kHz
Input Capacitance	C _{iss}	2.5	3.0	3.5	pF	V _{DS} = 6 V, V _{G2S} = 3 V, I _D = 10 mA f = 1 MHz
Output Capacitance	C _{oss}	0.9	1.2	1.5	pF	
Reverse Transfer Capacitance	C _{rss}		0.015	0.03	pF	
Power Gain	G _{ps}	17.0	20.0	23.0	dB	V _{DS} = 6 V, V _{G2S} = 3 V, I _D = 10 mA f = 470 MHz
Noise Figure 1	NF1		2.2	3.2	dB	V _{DS} = 6 V, V _{G2S} = 3 V, I _D = 10 mA f = 55 MHz
Noise Figure 2	NF2		0.9	2.4	dB	

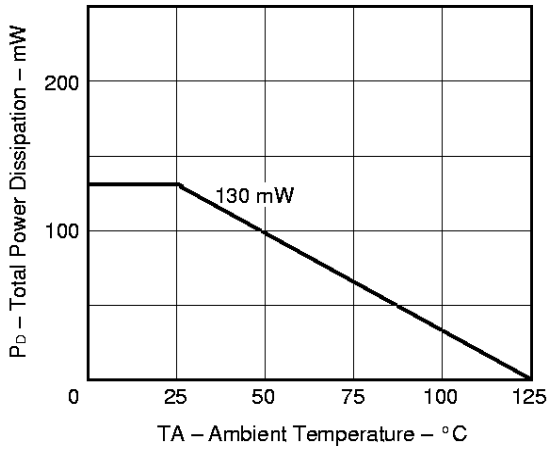
I_{DSX} Classification

Rank	U90/UIO*	U91/UIA*
Marking	U90	U91
I _{DSX} (mA)	0.01 to 3.0	1.0 to 8.0

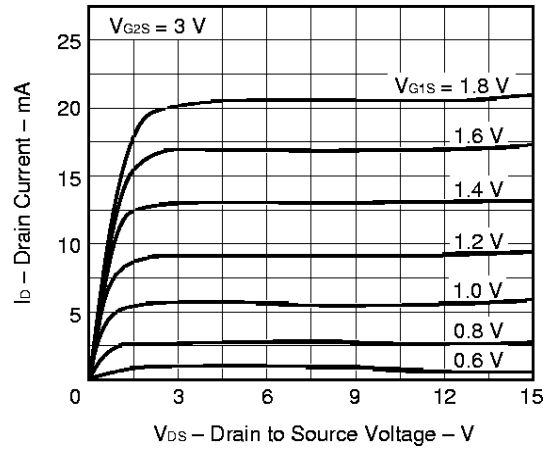
* Old Specification / New Specification

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

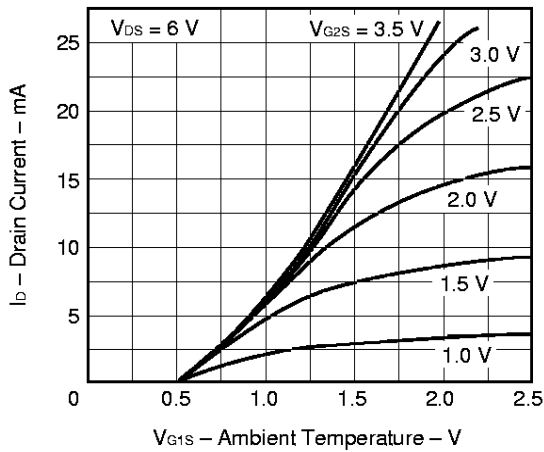
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



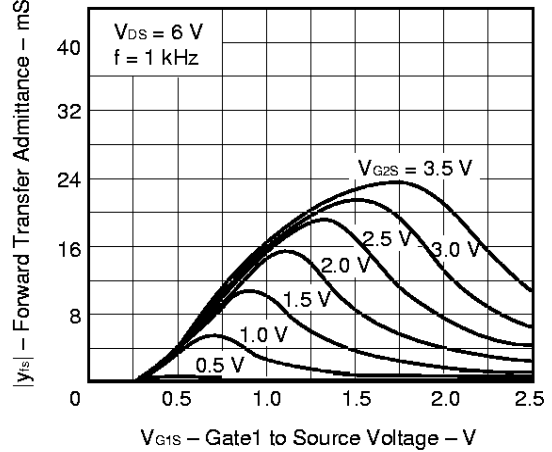
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



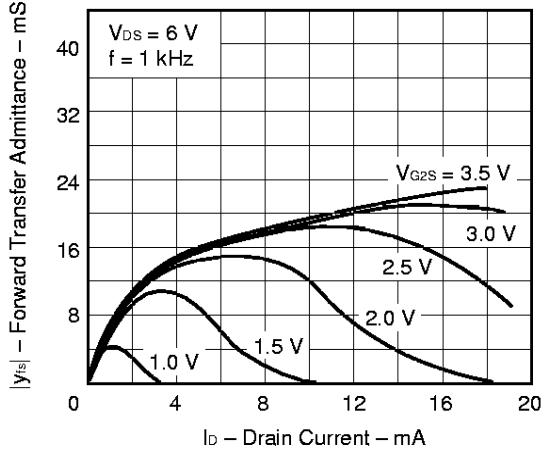
DRAIN CURRENT vs. GATE1 TO SOURCE VOLTAGE



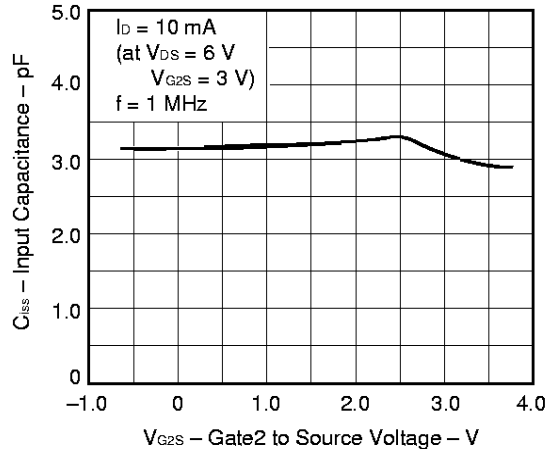
FORWARD TRANSFER ADMITTANCE vs. GATE1 TO SOURCE VOLTAGE



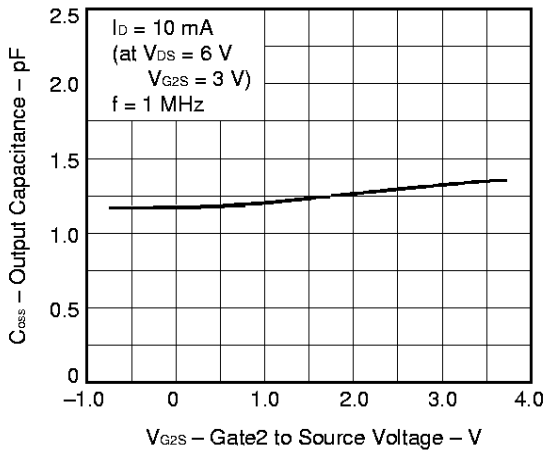
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



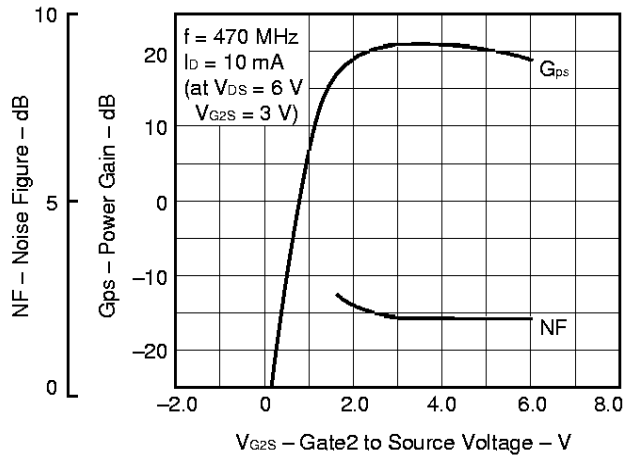
INPUT CAPACITANCE vs. GATE2 TO SOURCE VOLTAGE



OUTPUT CAPACITANCE vs.
GATE2 TO SOURCE VOLTAGE



POWER GAIN AND NOISE FIGURE
vs. GATE2 TO SOURCE VOLTAGE

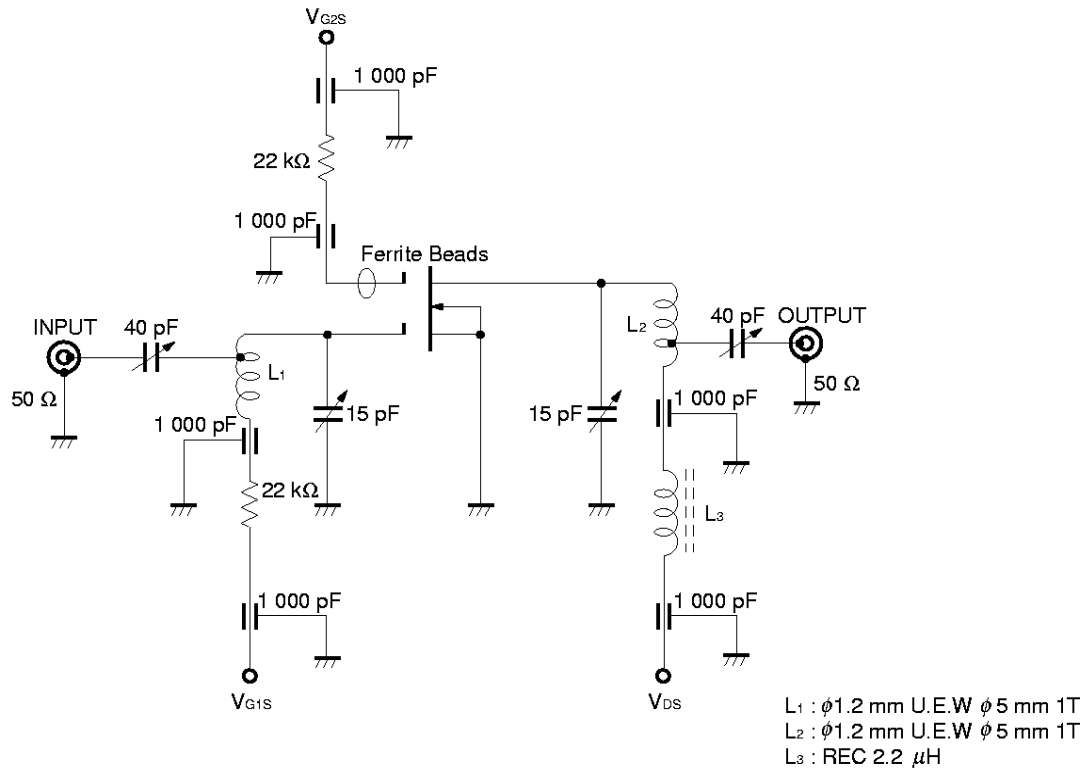


S-PARAMETER

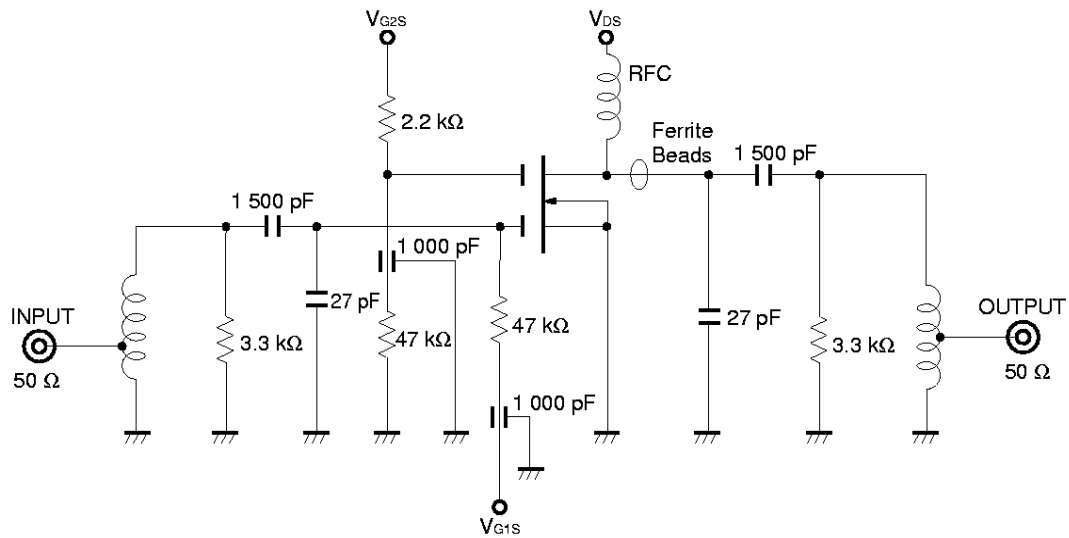
$V_{DS} = 6\text{ V}$, $V_{G2S} = 3\text{ V}$, $I_D = 10\text{ mA}$, ($Z_o = 50\ \Omega$)

FREQUENCY MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	1.000	-11.3	1.899	165.3	0.002	34.5	1.000	-4.5
150	0.997	-17.0	1.896	157.5	0.000	161.9	1.000	-6.7
200	0.984	-21.9	1.850	150.6	0.003	91.5	0.998	-8.6
250	0.968	-27.2	1.811	143.7	0.003	81.6	0.994	-10.7
300	0.936	-32.2	1.741	136.9	0.003	82.9	0.973	-12.6
350	0.918	-38.1	1.707	129.3	0.004	91.9	0.974	-14.9
400	0.903	-43.4	1.668	122.7	0.004	105.7	0.965	-17.2
450	0.880	-49.6	1.628	115.5	0.004	99.1	0.954	-19.7
500	0.864	-55.1	1.578	108.6	0.004	110.1	0.945	-22.3
550	0.854	-60.8	1.551	102.2	0.004	101.0	0.937	-25.2
600	0.851	-66.2	1.525	95.4	0.004	112.7	0.933	-28.2

G_{PS} AND NF TEST CIRCUIT AT f = 470 MHz



NF TEST CIRCUIT AT f = 55 MHz



[MEMO]

[MEMO]

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Anti-radioactive design is not implemented in this product.