

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

#### FEATURES

- The Characteristic of Cross-Modulation is good.  
CM = 101 dB $\mu$  TYP. @ f = 470 MHz, G<sub>R</sub> = -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<sub>PS</sub> = 20 dB TYP. (f = 470 MHz)
- Enhancement Type.
- Suitable for use as RF amplifier in CATV tuner.
- Automatically Mounting: Embossed Type Taping
- Small Package: 4 Pins Mini Mold

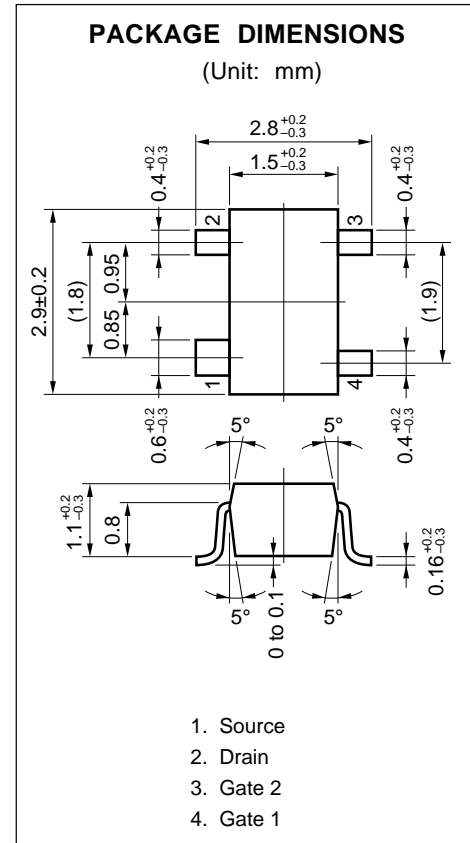
#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C)

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 $\Omega$

#### 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> = 5 V, V <sub>G2S</sub> = 4 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>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> = ±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 f = 1 kHz
Input Capacitance	C <sub>iss</sub>	2.5	3.0	3.5	pF	V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 10 mA f = 1 MHz
Output Capacitance	C <sub>oss</sub>	0.9	1.2	1.5	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		0.015	0.03	pF	
Power Gain	G <sub>PS</sub>	17.0	20.0		dB	V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 10 mA f = 470 MHz
Noise Figure 1	NF1		2.2	3.2	dB	
Noise Figure 2	NF2		0.9	2.4	dB	V <sub>DS</sub> = 6 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 10 mA f = 55 MHz

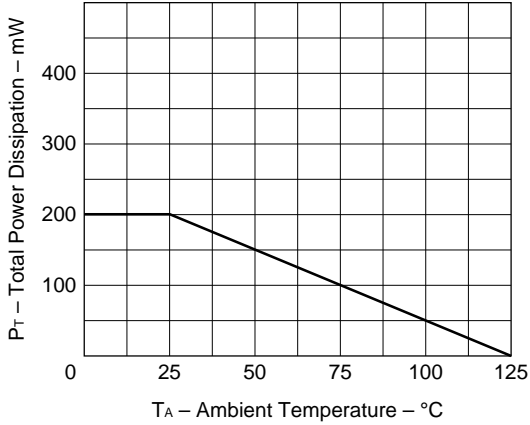
**I<sub>DSX</sub> Classification**

Class	U90/UIO*	U91/UIA*
Marking	U90	U91
I <sub>DSX</sub> (mA)	0.01 to 3.0	1.0 to 8.0

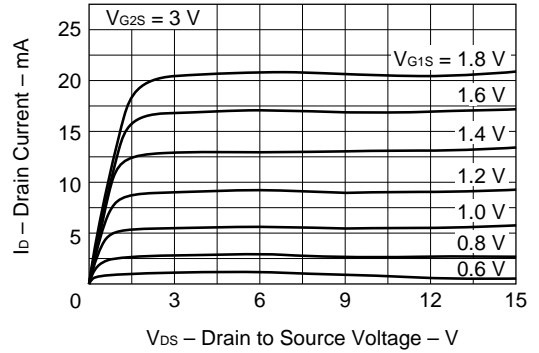
\* Old Specification/New Specification

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

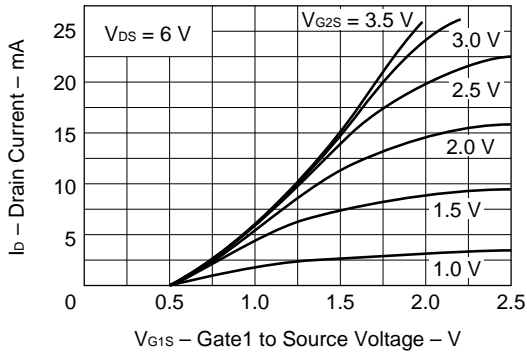
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



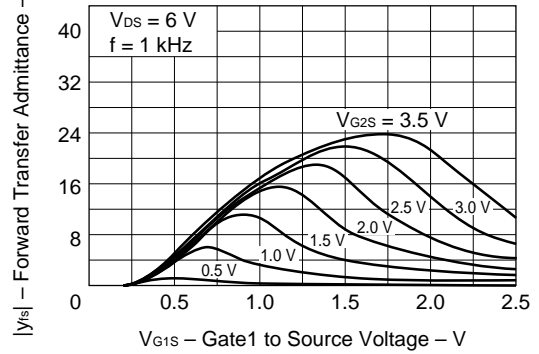
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



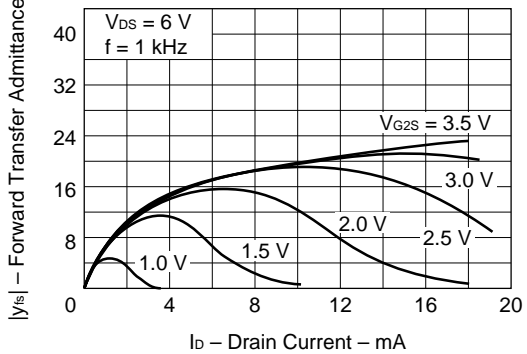
DRAIN CURRENT vs. GATE1 TO SOURCE VOLTAGE



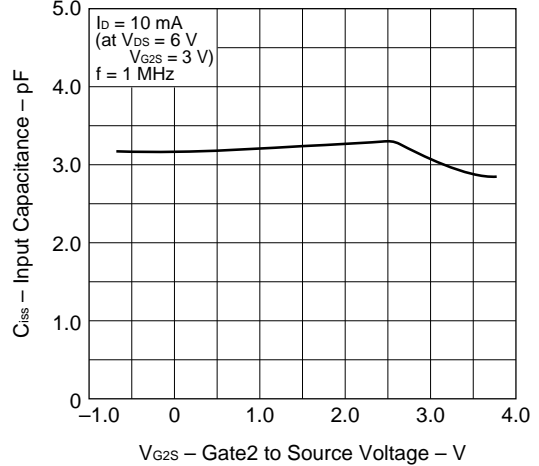
FORWARD TRANSFER ADMITTANCE vs. GATE1 TO SOURCE VOLTAGE



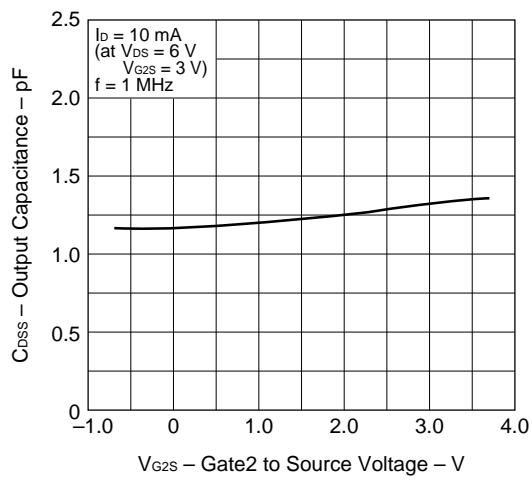
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



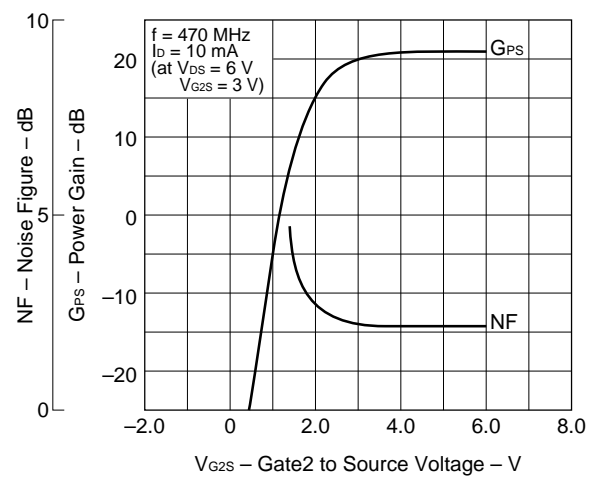
INPUT CAPACITANCE vs. GATE2 TO SOURCE VOLTAGE



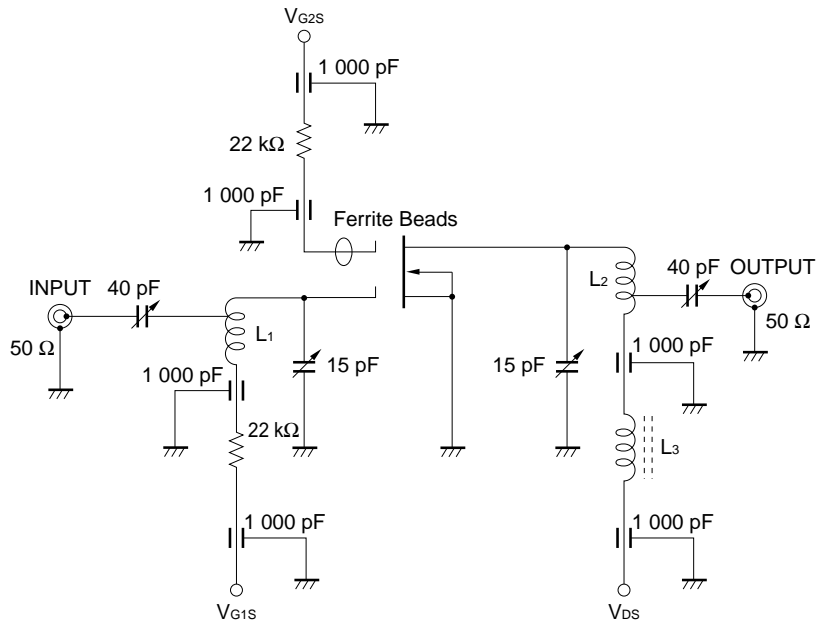
OUTPUT CAPACITANCE vs.  
GATE2 TO SOURCE VOLTAGE



POWER GAIN AND NOISE FIGURE vs.  
GATE2 TO SOURCE VOLTAGE

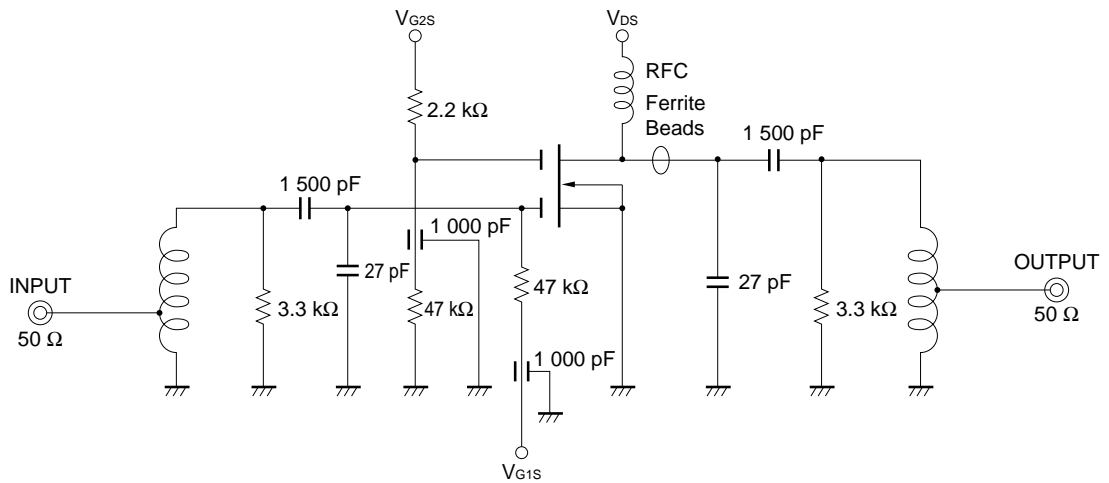


GPS AND NF TEST CIRCUIT AT  $f = 470 \text{ MHz}$



- L1:  $\phi 1.2 \text{ mm U.E.W } \phi 5 \text{ mm 1T}$
- L2:  $\phi 1.2 \text{ mm U.E.W } \phi 5 \text{ mm 1T}$
- L3: REC 2.2  $\mu\text{H}$

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



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Anti-radioactive design is not implemented in this product.