

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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

FEATURES

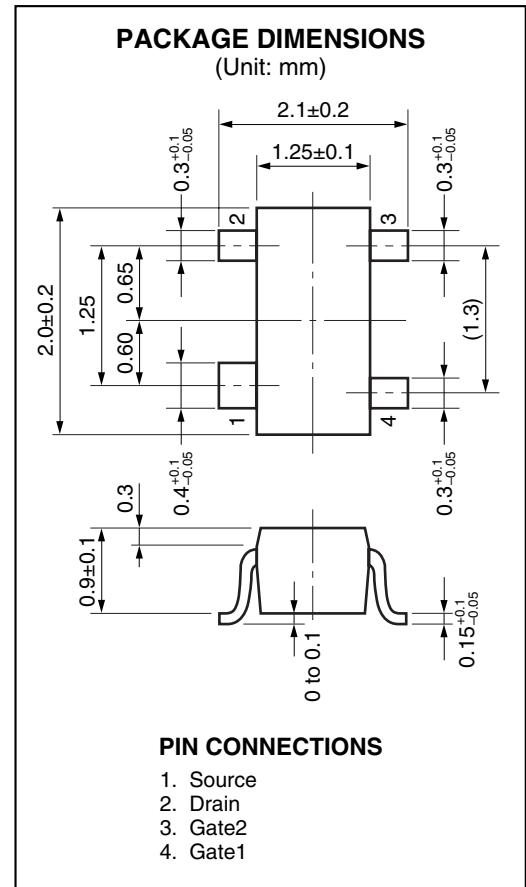
- Low V_{DD} Use : ($V_{DS} = 3.5$ V)
- Driving Battery
- Low Noise Figure : $NF1 = 2.0$ dB TYP. ($f = 470$ MHz)
 $NF2 = 0.8$ dB TYP. ($f = 55$ MHz)
- High Power Gain : $G_{PS} = 19.0$ dB TYP. ($f = 470$ MHz)
- Suitable for use as RF amplifier in CATV tuner.
- Automatically Mounting : Embossed Type Taping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

*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.

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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}	0.1		5.0	mA	V _{DS} = 3.5 V, V _{G2S} = 3 V, V _{G1S} = 0.5 V
Gate1 to Source Cutoff Voltage	V _{G1S(off)}	-1.0	0	+1.0	V	V _{DS} = 3.5 V, V _{G2S} = 3 V, I _D = 10 μA
Gate2 to Source Cutoff Voltage	V _{G2S(off)}	0	0.5	1.0	V	V _{DS} = 3.5 V, V _{G1S} = 3 V, I _D = 10 μA
Gate1 Reverse Current	I _{G1SS}			±20	nA	V _{DS} = 0, V _{G2S} = 0, V _{G1S} = ±6 V
Gate2 Reverse Current	I _{G2SS}			±20	nA	V _{DS} = 0, V _{G1S} = 0, V _{G2S} = ±6 V
Forward Transfer Admittance	Y _{fs}	14	18	23	mS	V _{DS} = 3.5 V, V _{G2S} = 3 V, I _D = 7 mA f = 1 kHz
Input Capacitance	C _{iss}	2.4	2.9	3.4	pF	V _{DS} = 3.5 V, V _{G2S} = 3 V, I _D = 7 mA f = 1 MHz
Output Capacitance	C _{oss}	0.9	1.2	1.5	pF	
Reverse Transfer Capacitance	C _{rss}		0.01	0.03	pF	V _{DS} = 3.5 V, V _{G2S} = 3 V, I _D = 7 mA f = 470 MHz
Power Gain	G _{ps}	16	19	22	dB	
Noise Figure 1	NF1		2.0	3.0	dB	V _{DS} = 3.5 V, V _{G2S} = 3 V, I _D = 7 mA f = 55 MHz
Noise Figure 2	NF2		0.8	2.3	dB	

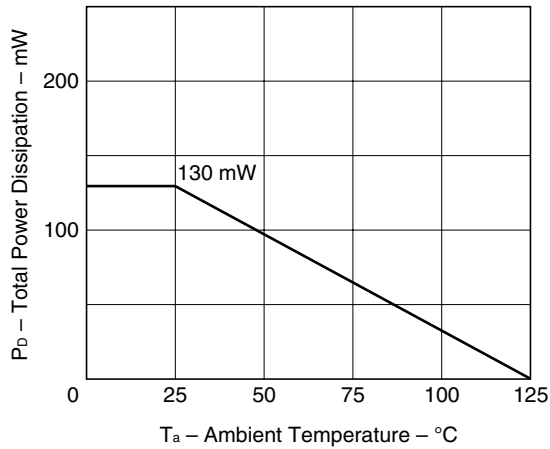
I_{DSX} Classification

Rank	U1E
Marking	U1E
I _{DSX} (mA)	0.1 to 5.0

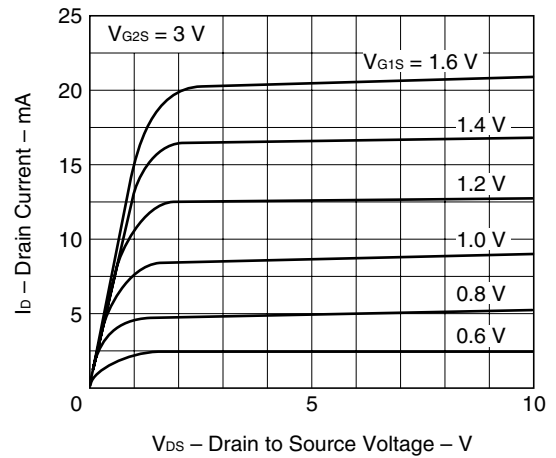
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TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$)

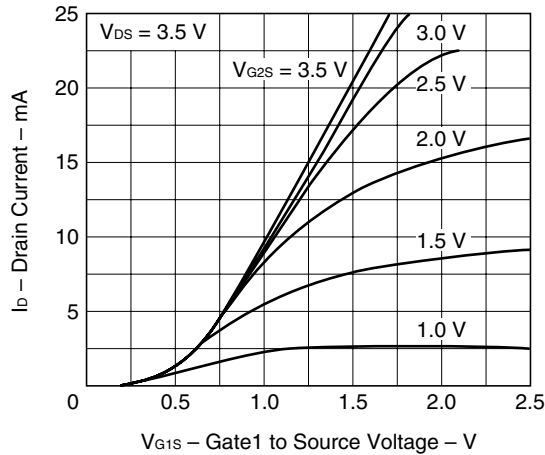
TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE



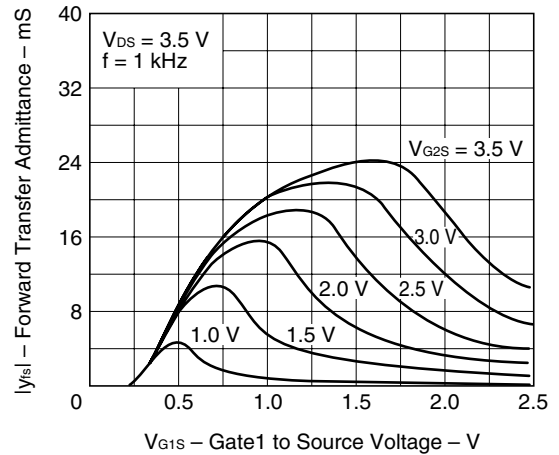
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



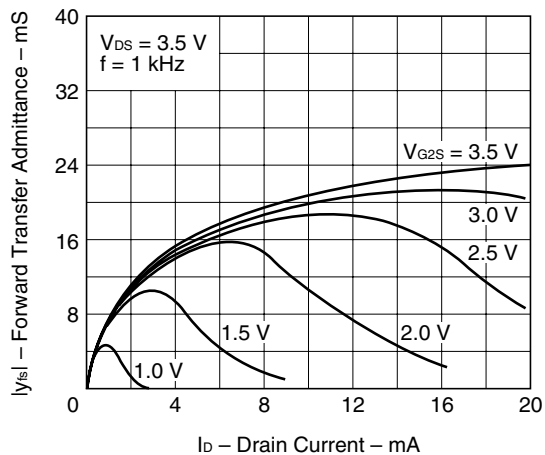
DRAIN CURRENT vs.
GATE1 TO SOURCE VOLTAGE



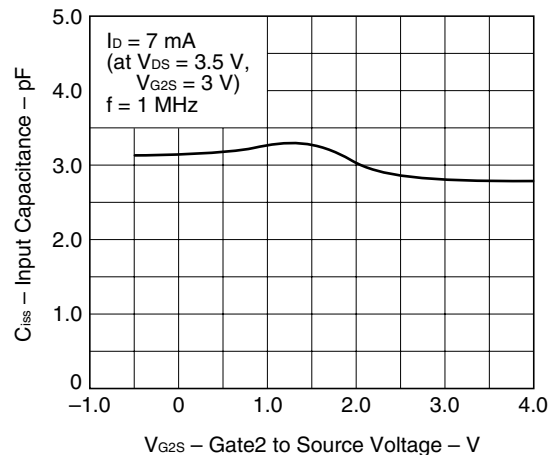
FORWARD TRANSFER ADMITTANCE vs.
GATE1 TO SOURCE VOLTAGE



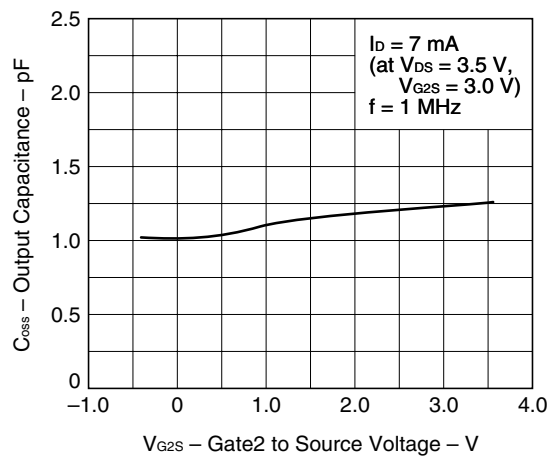
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



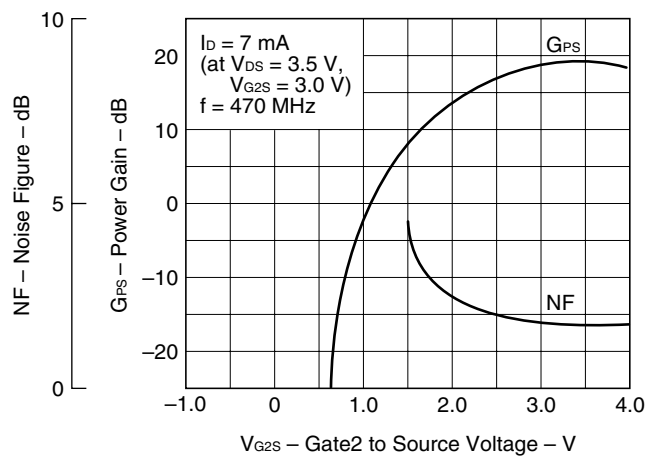
INPUT CAPACITANCE vs.
GATE2 TO SOURCE VOLTAGE



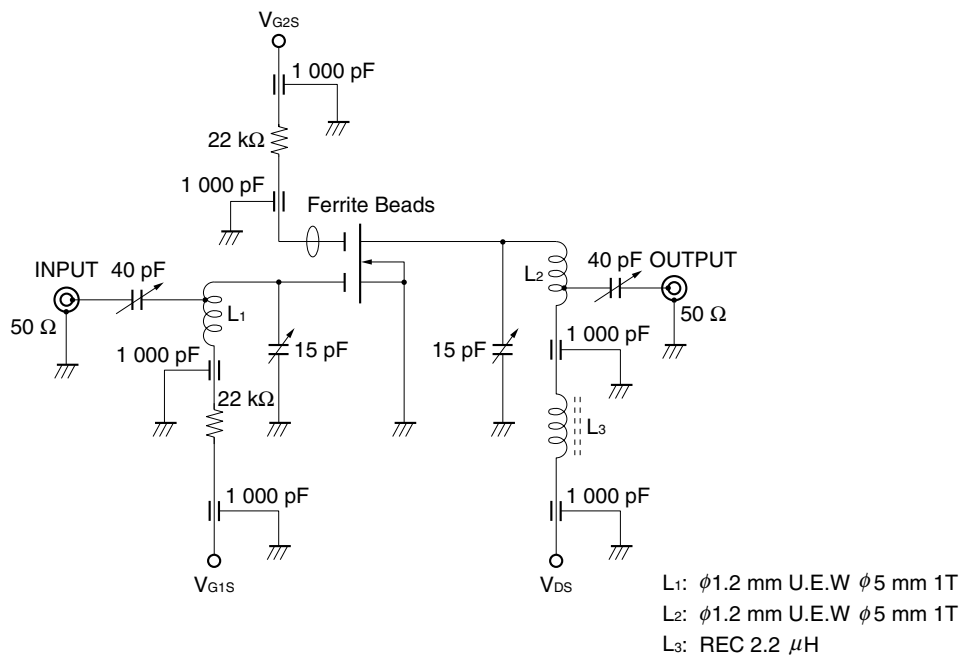
OUTPUT CAPACITANCE vs.
GATE2 TO SOURCE VOLTAGE



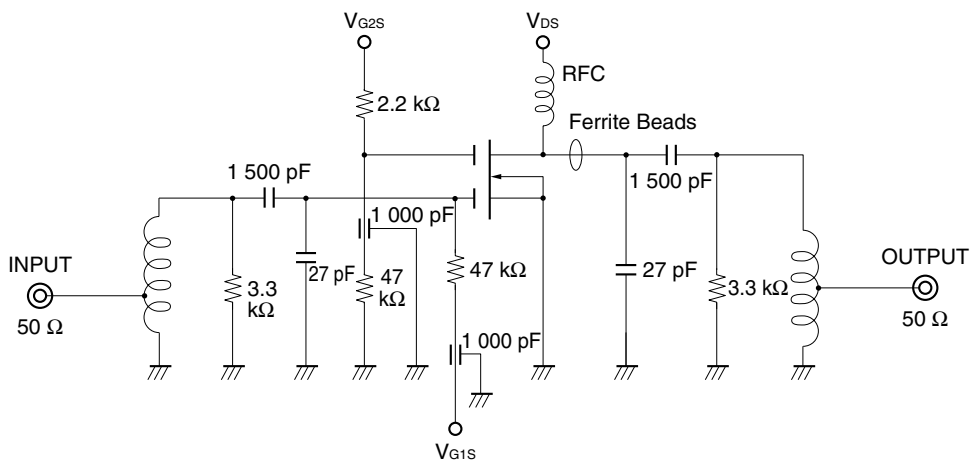
POWER GAIN AND NOISE FIGURE vs.
GATE2 TO SOURCE VOLTAGE



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



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



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