To our customers,

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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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MOS FIELD EFFECT TRANSISTOR

Phase-out/Discontinued

3SK254

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

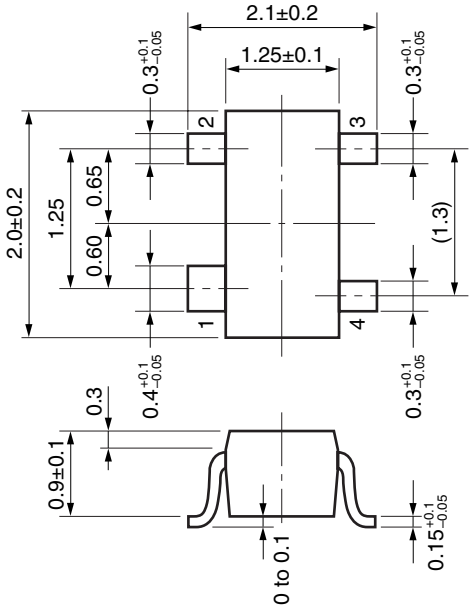
ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Drain to Source Voltage	V_{DSX}	18	V
Gate1 to Source Voltage	V_{G1S}	±8*1	V
Gate2 to Source Voltage	V_{G2S}	±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

PACKAGE DIMENSIONS
(Unit: mm)



PIN CONNECTIONS

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

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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Date Published October 2001 CP(K)
Printed in Japan

The mark ★ shows major revised points.

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

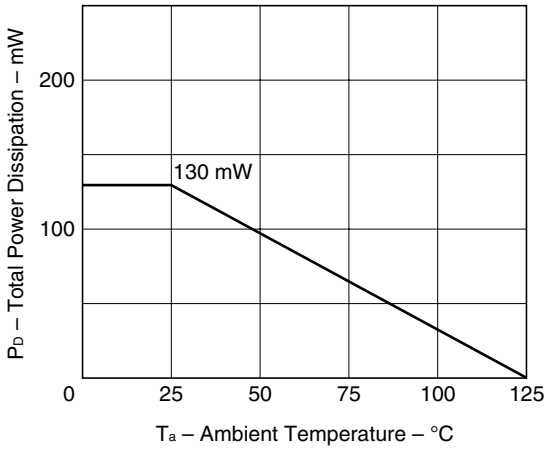
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source Breakdown Voltage	BV_{DSX}	18			V	V_{G1S} = V_{G2S} = –2 V, I_D = 10 μA
Drain Current	I_{DSX}	0.1		5.0	mA	V_{DS} = 3.5 V, V_{G2S} = 3 V, V_{G1S} = 0.5 V
Gate1 to Source Cutoff Voltage	$V_{G1S(off)}$	–1.0	0	+1.0	V	V_{DS} = 3.5 V, 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	
Power Gain	G_{ps}	16	19	22	dB	V_{DS} = 3.5 V, V_{G2S} = 3 V, I_D = 7 mA f = 470 MHz
Noise Figure 1	NF1		2.0	3.0	dB	
Noise Figure 2	NF2		0.8	2.3	dB	V_{DS} = 3.5 V, V_{G2S} = 3 V, I_D = 7 mA f = 55 MHz

I_{DSX} Classification

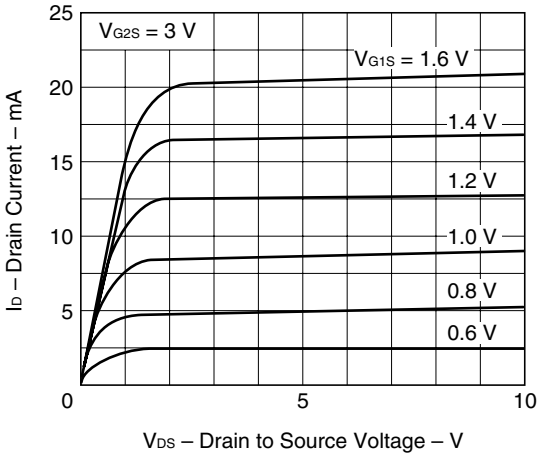
Rank	U1E
Marking	U1E
★ I_{DSX} (mA)	0.1 to 5.0

TYPICAL CHARACTERISTICS (T_A = 25 °C)

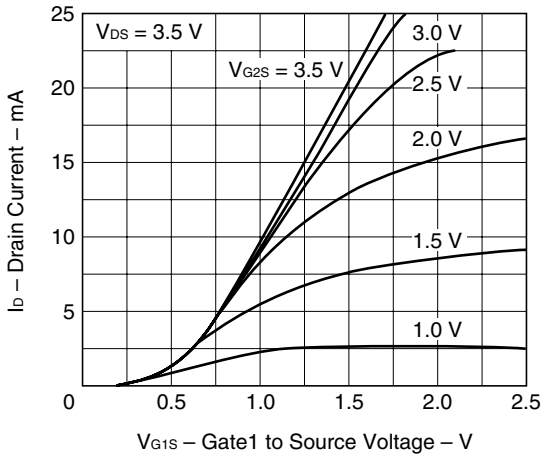
TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE



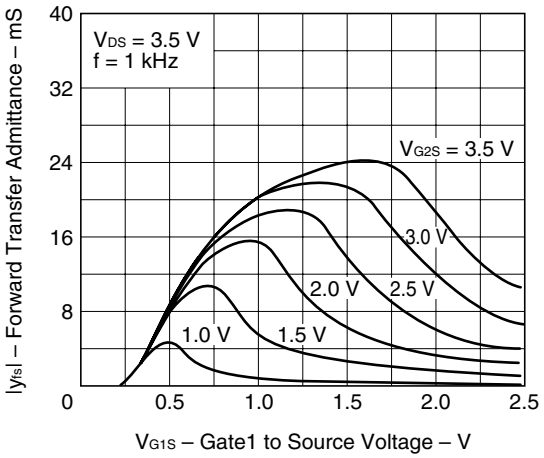
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



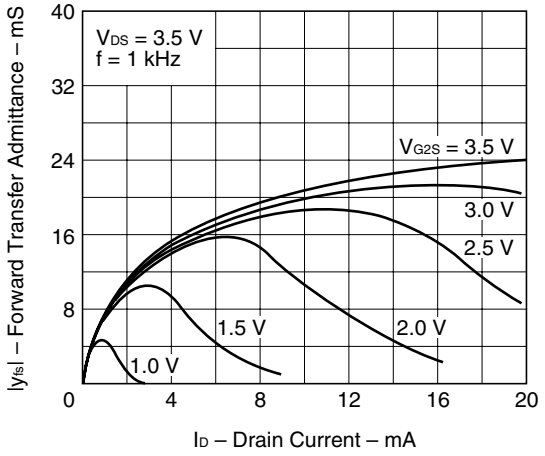
DRAIN CURRENT vs.
GATE1 TO SOURCE VOLTAGE



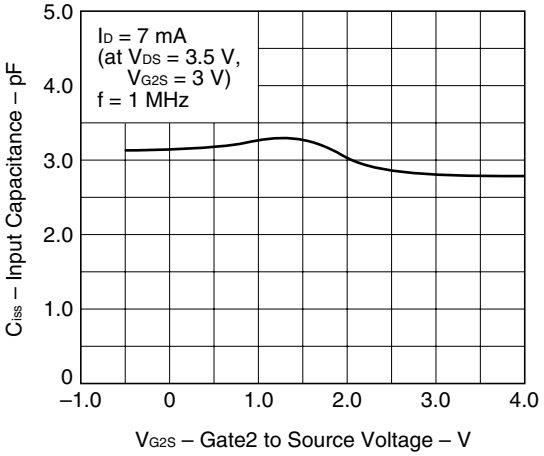
FORWARD TRANSFER ADMITTANCE vs.
GATE1 TO SOURCE VOLTAGE



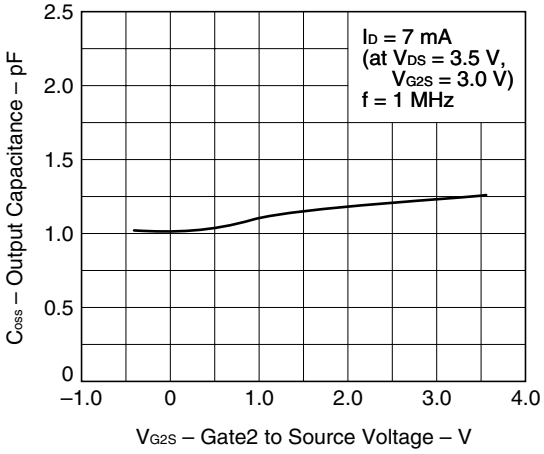
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



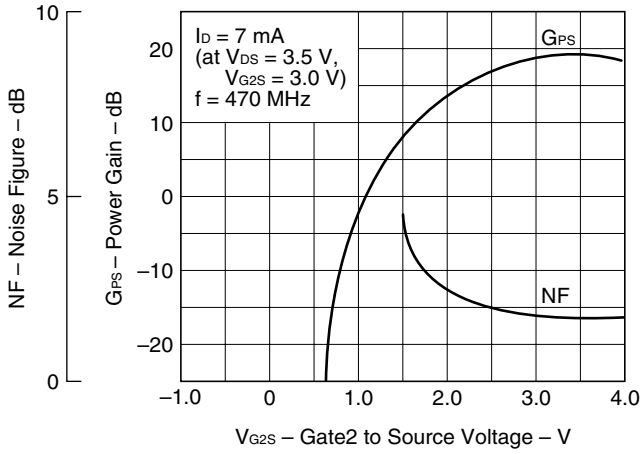
INPUT CAPACITANCE vs.
GATE2 TO SOURCE VOLTAGE



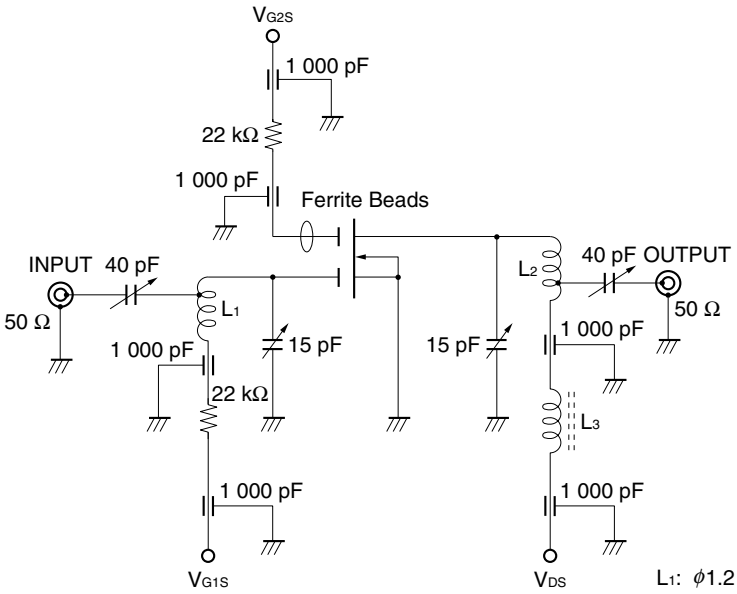
OUTPUT CAPACITANCE vs.
GATE2 TO SOURCE VOLTAGE



POWER GAIN AND NOISE FIGURE vs.
GATE2 TO SOURCE VOLTAGE

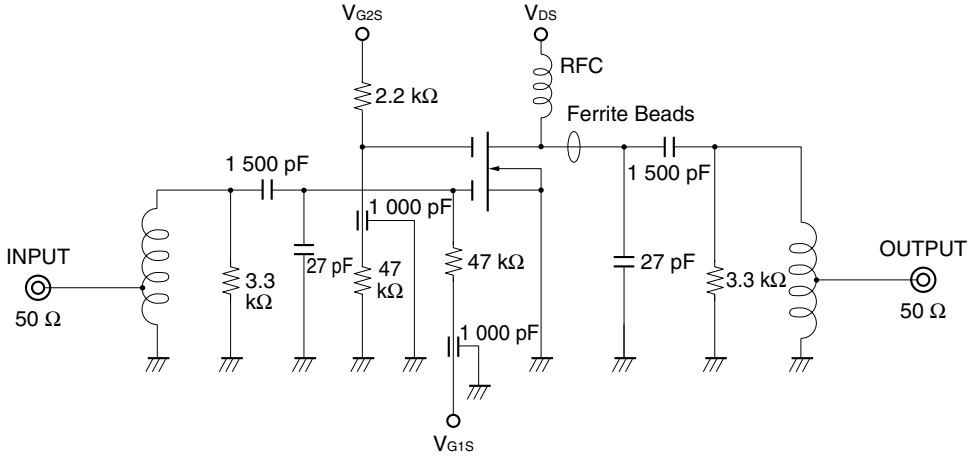


G_{PS} AND NF TEST CIRCUIT AT f = 470 MHz



L1: ϕ1.2 mm U.E.W ϕ5 mm 1T
L2: ϕ1.2 mm U.E.W ϕ5 mm 1T
L3: REC 2.2 μH

NF TEST CIRCUIT AT f = 55 MHz



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M8E 00.4-0110

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