

## MOS FIELD EFFECT TRANSISTOR

3SK254

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

#### **FEATURES**

• Low Vdd Use : (Vds = 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 :  $G_{PS} = 19.0 \text{ dB TYP.}$  (f = 470 MHz)

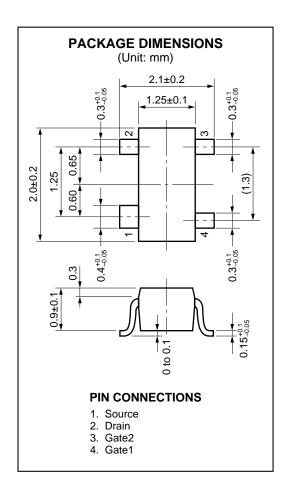
· Suitable for use as RF amplifier in CATV tuner.

Automatically Mounting : Embossed Type Taping
 Small Package : 4 Pins Super Mini Mold

## ABSOLUTE MAXIMUM RATINGS (TA = 25 $^{\circ}$ C)

Drain to Source Voltage	VDSX	18	V
Gate1 to Source Voltage	$V_{G1S}$	±8*1	V
Gate2 to Source Voltage	V <sub>G2</sub> S	±8*1	V
Gate1 to Drain Voltage	$V_{\text{G1D}}$	18	V
Gate2 to Drain Voltage	$V_{\text{G2D}}$	18	V
Drain Current	ΙD	25	mΑ
Total Power Dissipation	PD	130 <b>*²</b>	mW
Channel Temperature	Tch	125	°C
Storage Temperature	$T_{stg}$	-55 to +125	°C

\*1:  $RL \ge 10 \text{ k}\Omega$ \*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 (TA = 25 $^{\circ}$ C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
Drain to Source Breakdown Voltage	BV <sub>DSX</sub>	18			V	$V_{G1S} = V_{G2S} = -2 \text{ V}, \text{ ID} = 10 \mu\text{A}$	
Drain Current	IDSX	0.1		5.0	mA	VDS = 3.5 V, VG2S = 3 V, VG1S = 0.5 V	
Gate1 to Source Cutoff Voltage	V <sub>G1S(off)</sub>	-1.0	0	+1.0	٧	$V_{DS} = 3.5 \text{ V}, V_{G2S} = 3 \text{ V}, I_{D} = 10 \mu A$	
Gate2 to Source Cutoff Voltage	VG2S(off)	0	0.5	1.0	V	$V_{DS} = 3.5 \text{ V}, V_{G1S} = 3 \text{ V}, I_{D} = 10 \mu A$	
Gate1 Reverse Current	I <sub>G1SS</sub>			±20	nA	VDS = 0, VG2S = 0, VG1S = ±6 V	
Gate2 Reverse Current	I <sub>G2SS</sub>			±20	nA	VDS = 0, VG1S = 0, VG2S = ±6 V	
Forward Transfer Admittance	yfs	14	18	23	mS	$V_{DS} = 3.5 \text{ V}, V_{G2S} = 3 \text{ V}, I_{D} = 7 \text{ mA}$ $f = 1 \text{ kHz}$	
Input Capacitance	Ciss	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	Coss	0.9	1.2	1.5	pF		
Reverse Transfer Capacitance	Crss		0.01	0.03	pF		
Power Gain	Gps	16	19	22	dB	VDS = 3.5 V, VG2S = 3 V, ID = 7 mA	
Noise Figure 1	NF1		2.0	3.0	dB	f = 470 MHz	
Noise Figure 2	NF2		0.8	2.3	dB	V <sub>DS</sub> = 3.5 V, V <sub>G2S</sub> = 3 V, I <sub>D</sub> = 7 mA f = 55 MHz	

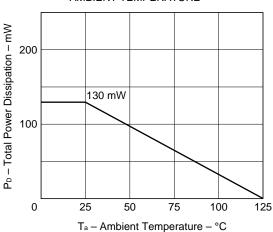
# losx Classification

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

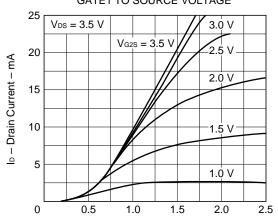
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## TYPICAL CHARACTERISTICS (TA = 25 °C)



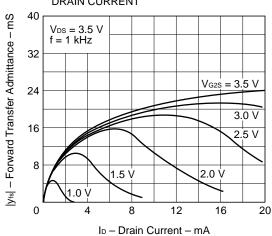


#### DRAIN CURRENT vs. GATE1 TO SOURCE VOLTAGE

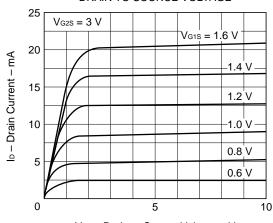


# FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT

V<sub>G1S</sub> - Gate1 to Source Voltage - V

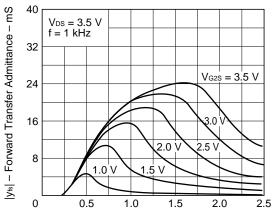


#### DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



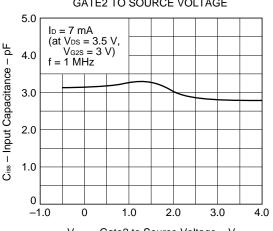
V<sub>DS</sub> - Drain to Source Voltage - V

# FORWARD TRANSFER ADMITTANCE vs. GATE1 TO SOURCE VOLTAGE



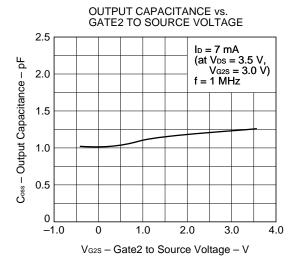
V<sub>G1S</sub> - Gate1 to Source Voltage - V

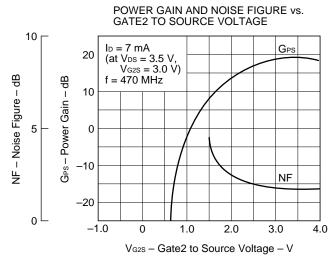
#### INPUT CAPACITANCE vs. GATE2 TO SOURCE VOLTAGE



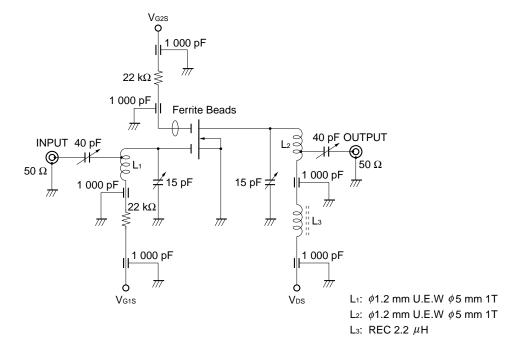
V<sub>G2S</sub> – Gate2 to Source Voltage – V



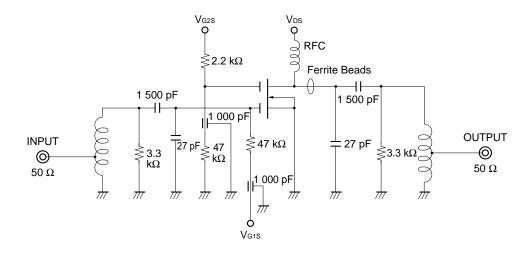




## GPS AND NF TEST CIRCUIT AT f = 470 MHz



## NF TEST CIRCUIT AT f = 55 MHz



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Anti-radioactive design is not implemented in this product.

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