

MOS FIELD EFFECT TRANSISTOR

3SK230

RF AMP. FOR VHF/CATV TUNER

N-CHANNEL SILICON DUAL-GATE MOS FIELD-EFFECT TRANSISTOR

4 PINS MINI MOLD

FEATURES

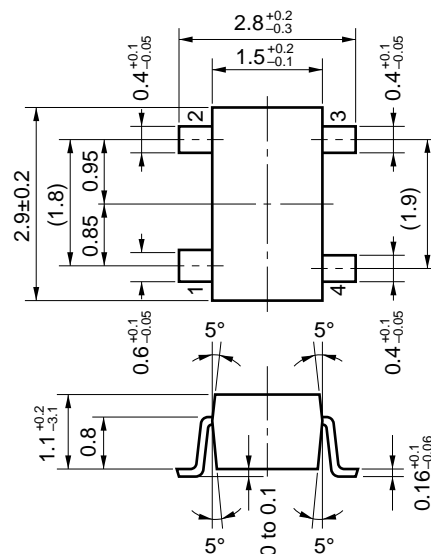
- The Characteristic of Cross-Modulation is good.
CM = 108 dB μ (TYP.) @f = 470 MHz, G_R = -30 dB
- Low Noise Figure NF1 = 2.2 dB TYP. (@ = 470 MHz)
 NF2 = 0.9 dB TYP. (@ = 55 MHz)
- High Power Gain G_{PS} = 19.5 dB TYP. (@ = 470 MHz)
- Enhancement Typ.
- Suitable for use as RF amplifier in CATV tuner.
- Automatically Mounting: Embossed Type Taping
- Small Package: 4 Pins Mini Mold Package. (SC-61)

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}	125	°C
Storage Temperature	T _{stg}	-55 to +125	°C
R _L ≥ 10 k Ω			

PACKAGE DIMENSIONS

(Unit: mm)



PIN CONNECTIONS

1. Source
2. Drain
3. Gate 2
4. Gate 1

PRECAUTION: Avoid high static voltages or electric fields so that this device would not suffer from any damage due to those voltages or fields.

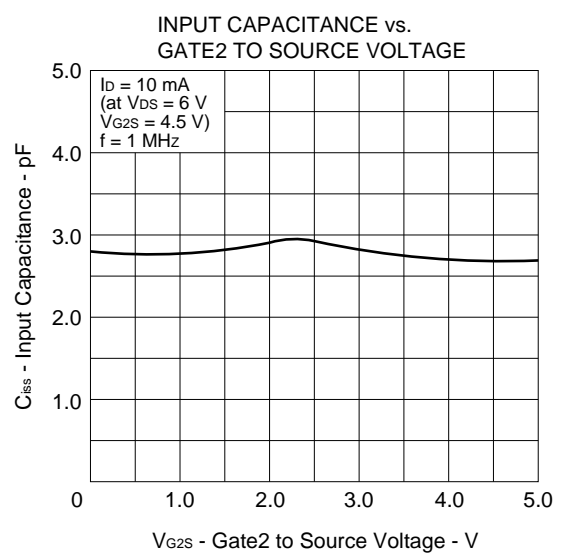
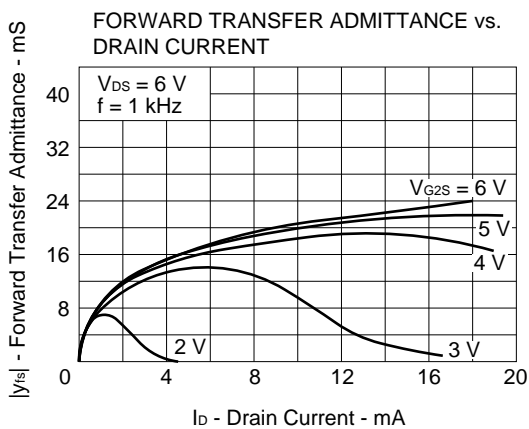
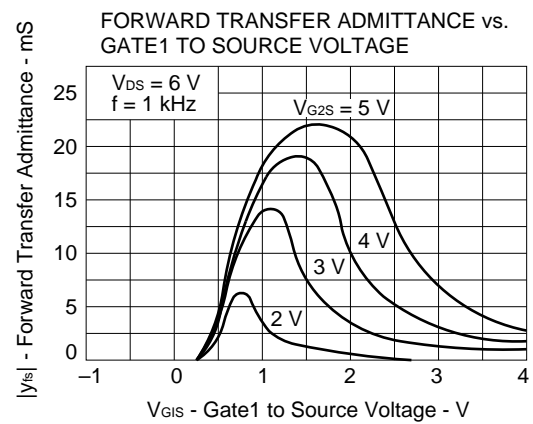
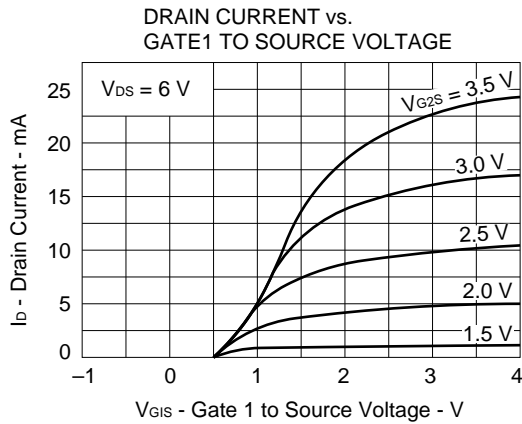
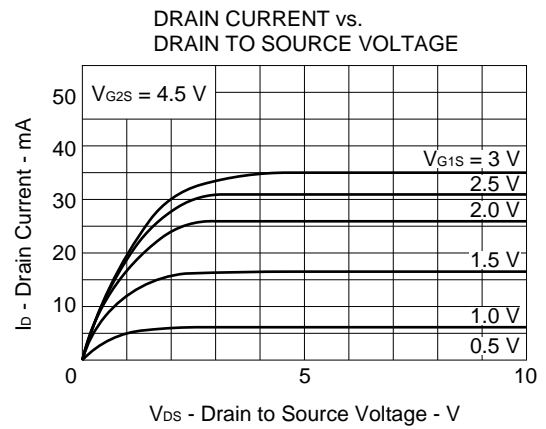
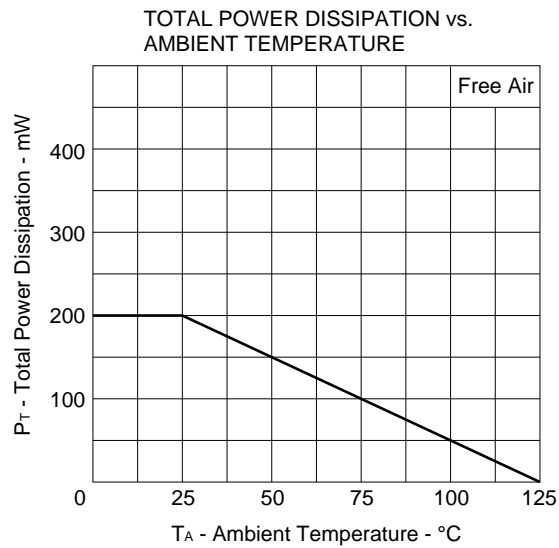
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

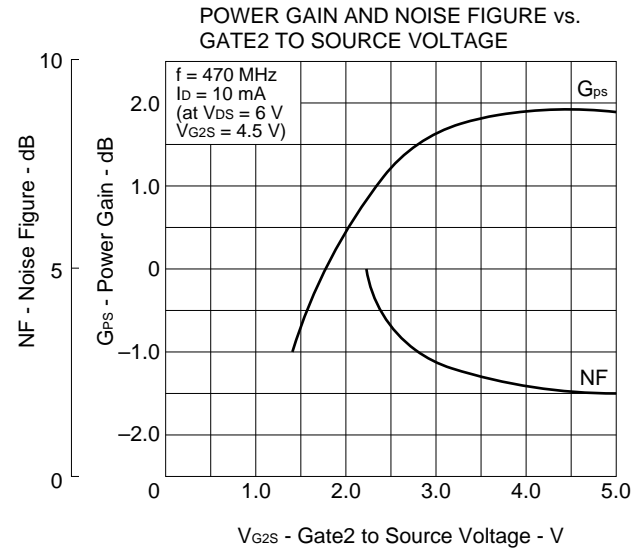
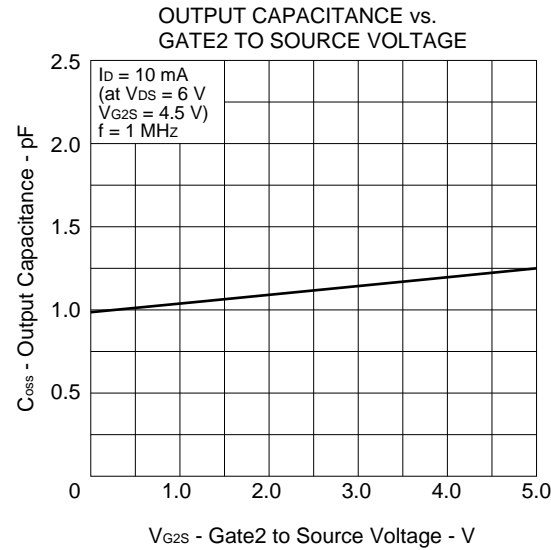
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source Breakdown Voltage	BV _{DSX}	18			V	V _{G1S} = V _{G2S} = -2 V, I _D = 10 μA
Drain Current	I _{DSX}	0.01		8.0	mA	V _{DS} = 6 V, V _{G2S} = 4.5 V, V _{G1S} = 0.75 V
Gate1 to Source Cutoff Voltage	V _{G1S(off)}	0		+1.0	V	V _{DS} = 6 V, V _{G2S} = 3 V, I _D = 10 μA
Gate2 to Source Cutoff Voltage	V _{G2S(off)}	+0.6	+1.1	+1.6	V	V _{DS} = 6 V, V _{G1S} = 3 V, I _D = 10 μA
Gate1 Reverse Current	I _{G1SS}			±20	nA	V _{DS} = V _{G2S} = 0, V _{G1S} = ±8 V
Gate2 Reverse Current	I _{G2SS}			±20	nA	V _{DS} = V _{G1S} = 0, V _{G2S} = ±8 V
Forward Transfer Admittance	y _{fs}	16	20	24	mS	V _{DS} = 6 V, V _{G2S} = 4.5 V, I _D = 10 mA f = 1 kHz
Input Capacitance	C _{iss}	2.3	2.8	3.3	pF	V _{DS} = 6 V, V _{G2S} = 4.5 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}	16.5	19.5	22.5	dB	V _{DS} = 6 V, V _{G2S} = 4.5 V, I _D = 10 mA f = 470 MHz
Noise Figure 1	NF1		2.2	3.2	dB	V _{DS} = 6 V, V _{G2S} = 4.5 V, I _D = 10 mA f = 55 MHz
Noise Figure 2	NF2		0.9	2.4	dB	

I_{DSX} Classification

Rank	U1A	U1B
Marking	U1A	U1B
I _{DSX} (mA)	0.01 to 3.0	1.0 to 8.0

CHARACTERISTIC CURVE ($T_A = 25^\circ\text{C}$)



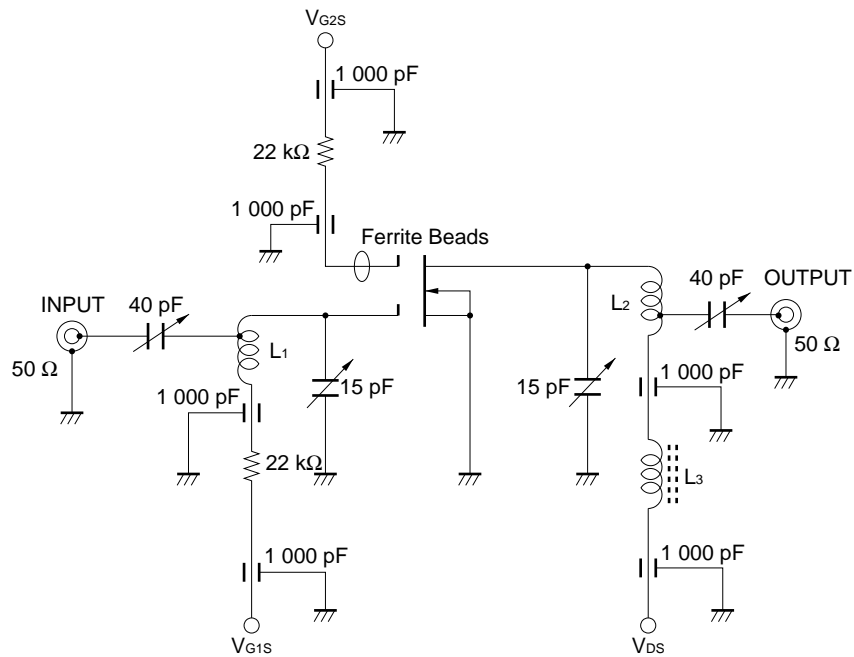


S-PARAMETER

$V_{DS} = 6\text{ V}$, $V_{G2S} = 4.5\text{ V}$, $I_D = 10\text{ mA}$, ($Z_o = 50\ \Omega$)

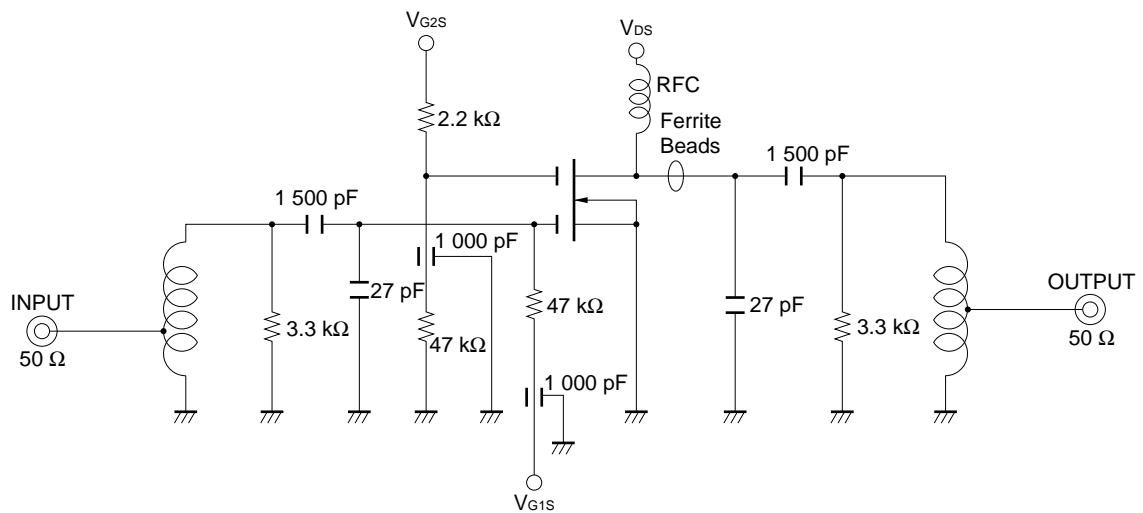
FREQUENCY		S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
100	1.000	−14.7	2.160	160.5	0.008	12.8	0.942	−8.2	
200	0.960	−24.5	1.953	148.3	0.003	81.1	0.947	−9.6	
300	0.926	−34.3	1.868	135.8	0.005	−146.8	0.906	−16.4	
400	0.876	−45.0	1.760	121.2	0.003	−59.5	0.908	−19.4	
500	0.853	−54.4	1.691	109.4	0.003	84.3	0.915	−25.1	
600	0.842	−63.1	1.608	97.6	0.004	−87.0	0.889	−29.0	

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



L1: $\phi 1.2 \text{ mm U.E.W } \phi 5 \text{ mm IT}$
 L2: $\phi 1.2 \text{ mm U.E.W } \phi 5 \text{ mm IT}$
 L3: REC 2.2 μH

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



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Anti-radioactive design is not implemented in this product.