DATA SHEET

NEC

MOS FIELD EFFECT TRANSISTOR

3SK206

RF AMP. FOR UHF TV TUNER
N-CHANNEL GaAs DUAL GATE MES FIELD-EFFECT TRANSISTOR
4PIN MINI MOLD

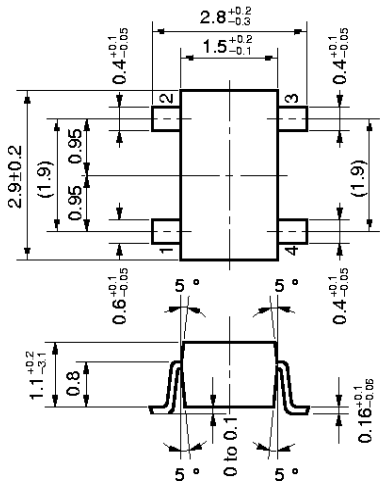
FEATURES

- Suitable for use as RF amplifier in UHF TV tuner.
- Low C_{rss}: 0.02 pF TYP.
- High G_{PS}: 20 dB TYP.
- Low NF: 1.1 dB TYP.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Drain to Source Voltage	V_{DSX}	10	V
Gate1 to Source Voltage	V_{G1S}	–4.5	V
Gate2 to Source Voltage	V_{G2S}	–4.5	V
Drain Current	I_D	80	mA
Total Power Dissipation	P_T	200	mW
Channel Temperature	T_{ch}	125	°C
Storage Temperature	T_{stg}	–55 to +125	°C

PACKAGE DIMENSIONS
in millimeters



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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source Breakdown Voltage	BV_{DSX}	10			V	V_{G1S} = –4 V, V_{G2S} = 0, I_D = 20 μA
Drain Current	I_{DSS}	10		80	mA	V_{DS} = 5 V, V_{G1S} = 0, V_{G2S} = 0
Gate1 to Source Cutoff Voltage	$V_{G1S(off)}$			–3.5	V	V_{DS} = 5 V, V_{G2S} = 0, I_D = 100 μA
Gate2 to Source Cutoff Voltage	$V_{G2S(off)}$			–3.5	V	V_{DS} = 5 V, V_{G1S} = 0, I_D = 100 μA
Gate1 Reverse Current	I_{G1SS}			10	μA	V_{DS} = 0, V_{G1S} = –4 V, V_{G2S} = 0
Gate2 Reverse Current	I_{G2SS}			10	μA	V_{DS} = 0, V_{G2S} = –4 V, V_{G1S} = 0
Forward Transfer Admittance	$\lvert y_{fs} \rvert$	25	35		mS	V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA, f = 1.0 kHz
Input Capacitance	C_{iss}	1.0	1.5	2.0	pF	V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA, f = 1.0 MHz
Reverse Transfer Capacitance	C_{rss}		0.02	0.035	pF	
Power Gain	G_{PS}	16.0	20.0		dB	V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA, f = 900 MHz
Noise Figure	NF		1.1	2.5	dB	

I_{DSS} Classification (Unit: mA)

Class	U76	U77	U78	U79
Marking	U76	U77	U78	U79
I_{DSS}	10 to 25	20 to 35	30 to 50	45 to 80

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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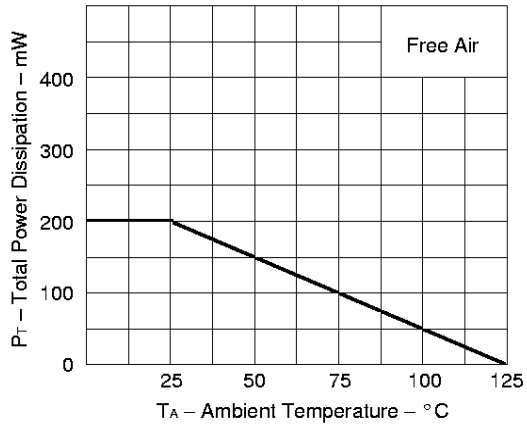
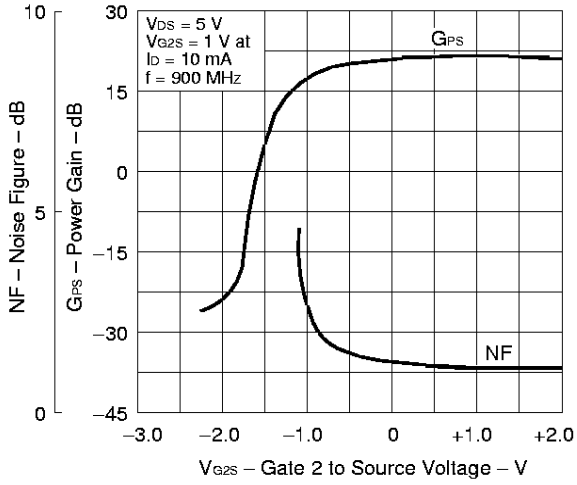
TYPICAL CHARACTERISTICS (T_A = 25 °C)

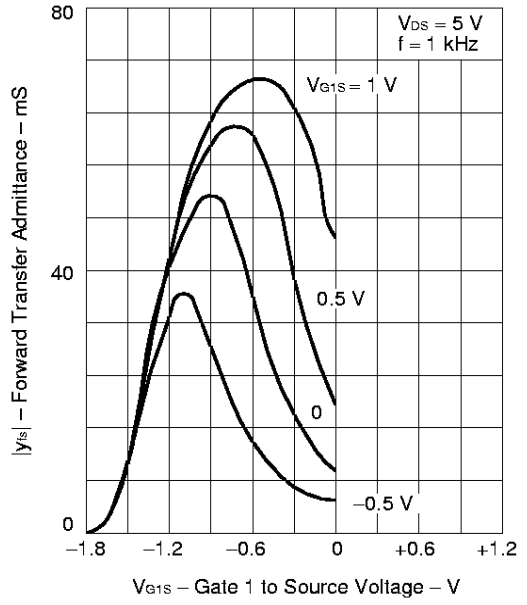
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



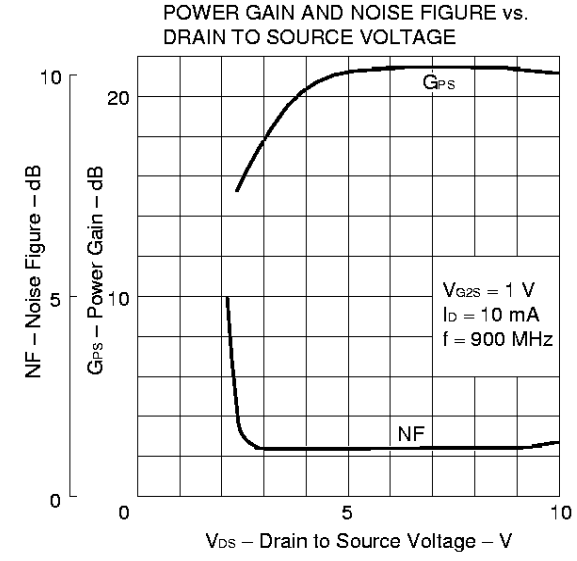
POWER GAIN AND NOISE FIGURE vs. GATE2 TO SOURCE VOLTAGE



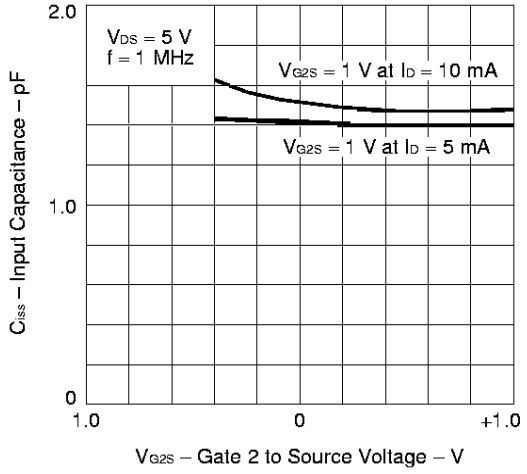
FORWARD TRANSFER ADMITTANCE vs. GATE1 TO SOURCE VOLTAGE



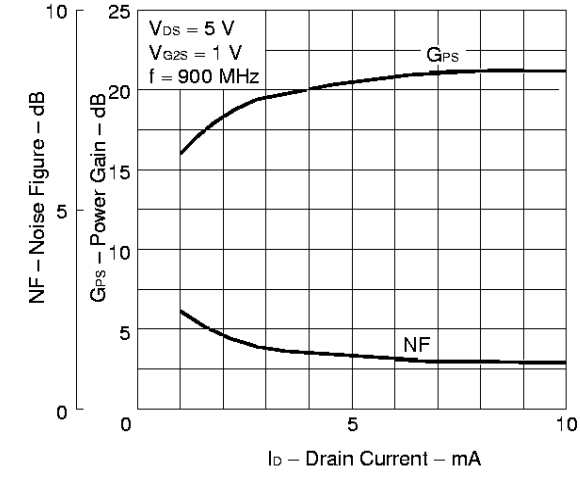
POWER GAIN AND NOISE FIGURE vs. DRAIN TO SOURCE VOLTAGE



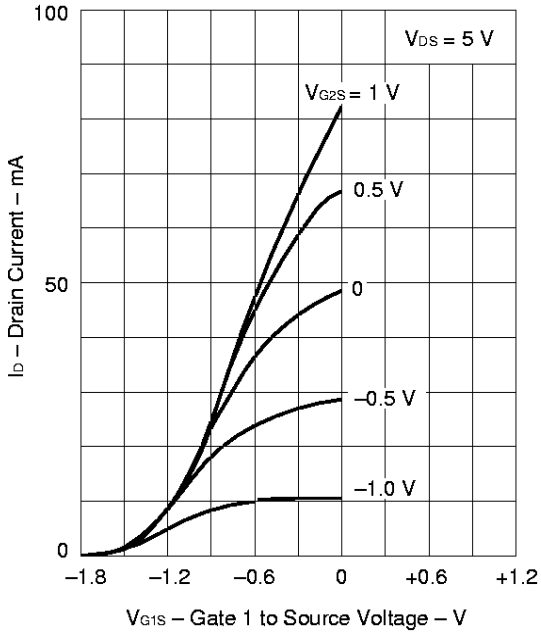
INPUT CAPACITANCE vs. GATE2 TO SOURCE VOLTAGE



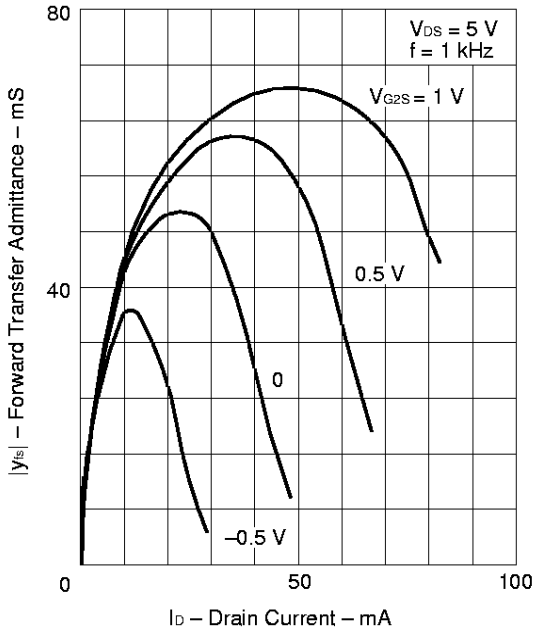
POWER GAIN AND NOISE FIGURE vs. DRAIN CURRENT



DRAIN CURRENT vs.
GATE1 TO SOURCE VOLTAGE



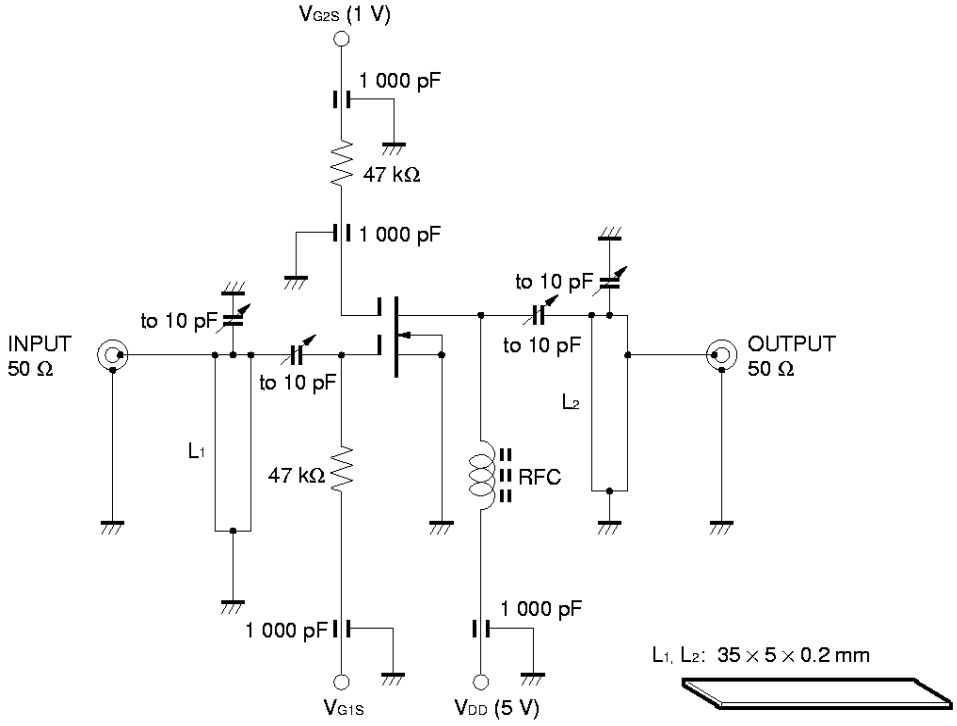
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



S-PARAMETER (V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA)

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.00	1.003	–4.9	3.938	175.0	0.004	41.9	0.963	–1.5
200.00	0.984	–11.9	4.009	164.1	0.001	–173.5	0.958	–4.2
300.00	0.985	–14.9	3.859	158.5	0.006	71.7	0.972	–4.8
400.00	0.964	–21.8	3.766	151.3	0.005	93.9	0.972	–8.2
500.00	0.928	–24.6	3.699	149.1	0.005	74.5	0.965	–8.6
600.00	0.928	–31.9	3.886	138.8	0.008	84.2	0.983	–13.1
700.00	0.869	–33.5	3.612	132.3	0.003	65.8	0.961	–12.1
800.00	0.889	–39.8	3.643	126.1	0.004	98.0	0.995	–16.2
900.00	0.832	–42.9	3.553	121.5	0.004	102.4	0.981	–17.0
1000.00	0.847	–47.1	3.817	115.2	0.003	–173.4	1.039	–20.8
1100.00	0.795	–49.8	3.681	106.1	0.010	–155.7	0.999	–22.3
1200.00	0.833	–51.4	3.747	100.4	0.021	–147.3	1.107	–25.1

900 MHz G_{PS} AND NF TEST CIRCUIT



V_{DS} = 5 V, V_{G2S} = 1 V, I_D = 10 mA

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