

MOS FIELD EFFECT TRANSISTOR

3SK242

RF AMPLIFIER AND MIXER FOR VHF TV TUNER

N-CHANNEL Si DUAL GATE MOS FIELD-EFFECT TRANSISTOR

4 PINS SUPER MINI MOLD

FEATURES

- Low Noise Figure : NF = 1.3 dB TYP.
- High Power Gain : $G_{ps} = 24$ dB TYP. ($f = 200$ MHz)
- Suitable for use as RF amplifier in VHF TV tuner.
- Small Package : 4 Pins Super Mini Mold

ORDERING INFORMATION

PART NUMBER	QUANTITY	PACKING STYLE
3SK242-T1	3 Kpcs/Reel.	Embossed tape 8 mm wide. Pin3 (Gate2), Pin4 (Gate1) face to perforation side of the tape.
3SK242-T2	3 Kpcs/Reel.	Embossed tape 8 mm wide. Pin1 (Source), Pin2 (Drain) face to perforation side of the tape.

* Please contact with responsible NEC person, if you require evaluation sample. Unit sample quantity shall be 50 pcs.
(Part No.: 3SK242)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

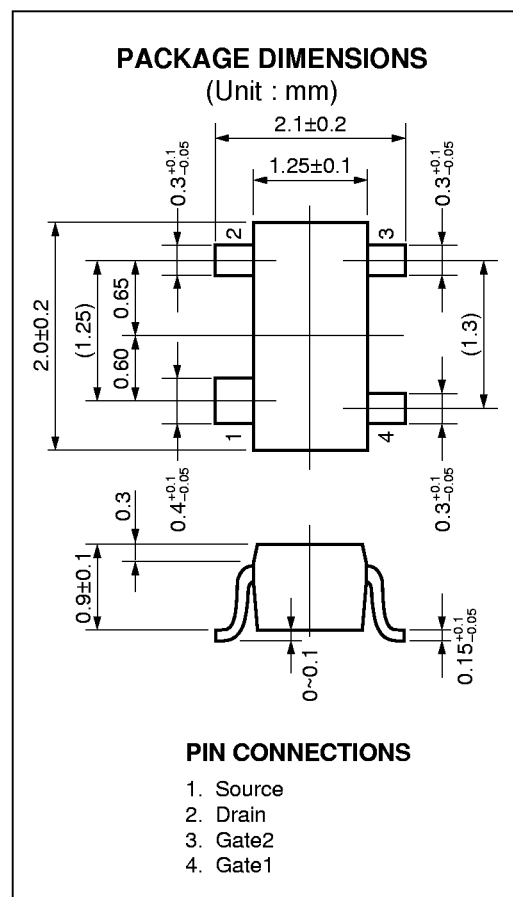
Drain to Source Voltage	V_{DSX}	20	V
Gate1 to Source Voltage	V_{G1S}	± 8	V
Gate2 to Source Voltage	V_{G2S}	± 8	V
Drain Current	I_D	25	mA
Total Power Dissipation	P_D	$130^{*1}/250^{*2}$	mW
Channel Temperature	T_{ch}	125	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to $+125$	$^\circ\text{C}$

*1: Free air

*2: 15 mm $\times$ 15 mm $\times$ 1.2 mm board by epoxy glass

PRECAUTION

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



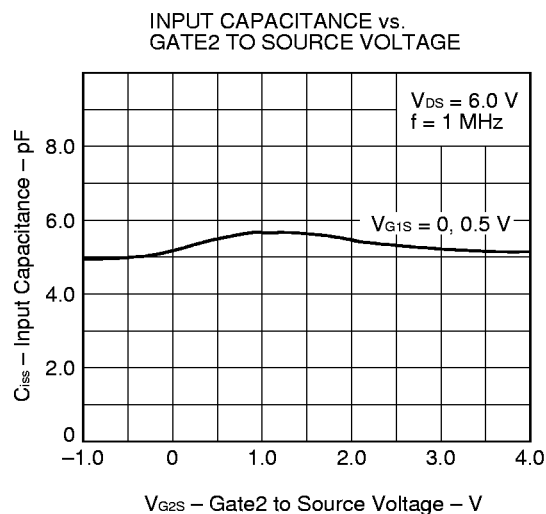
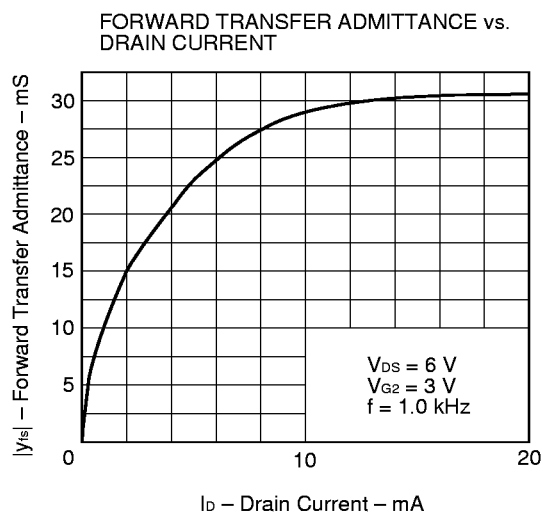
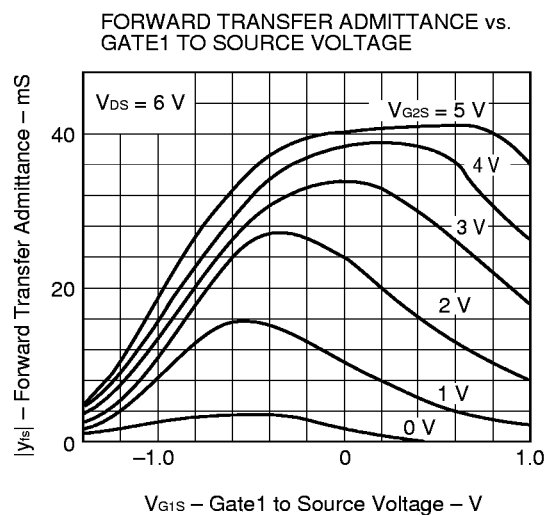
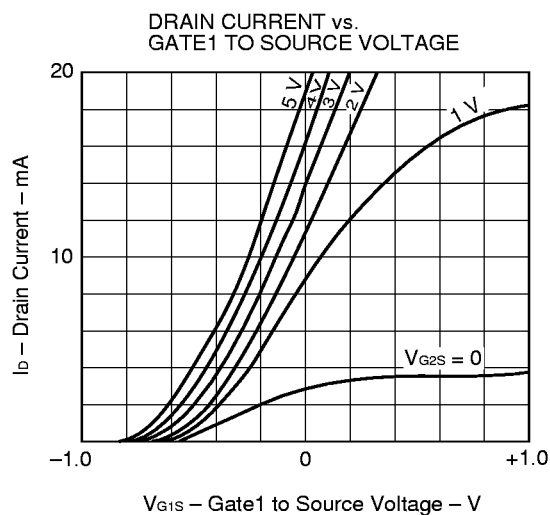
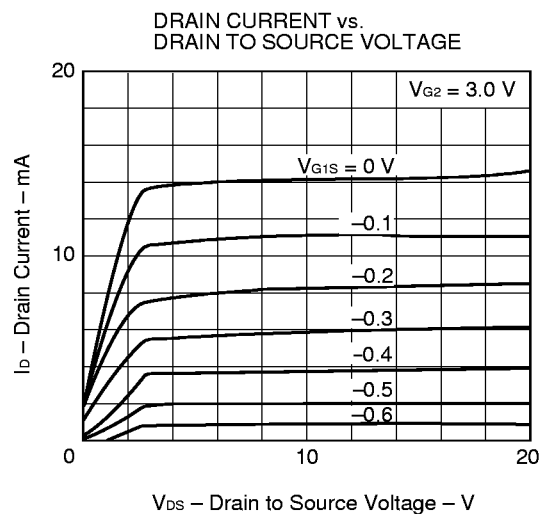
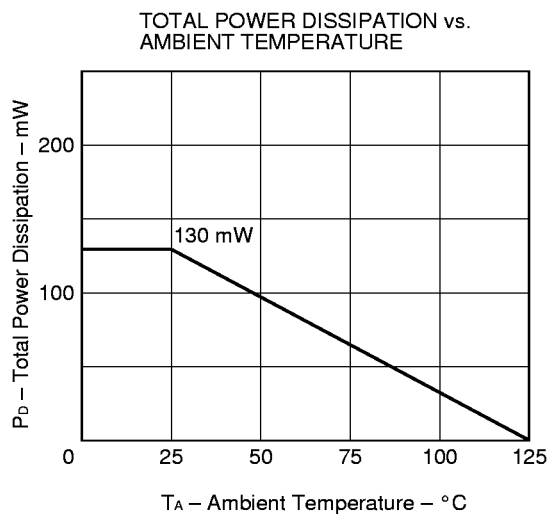
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Drain to Source Breakdown Voltage	BV _{DSX}	20			V	V _{G1S} = V _{G2S} = -2 V, I _D = 10 μA
Drain Current	I _{DSS}	7.0		25	mA	V _{DS} = 6 V, V _{G2S} = 3 V, V _{G1S} = 0
Gate1 to Source Cutoff Voltage	V _{G1S(off)}			-2.0	V	V _{DS} = 8 V, V _{G2S} = 0, I _D = 5 μA
Gate2 to Source Cutoff Voltage	V _{G2S(off)}			-1.5	V	V _{DS} = 8 V, V _{G1S} = 0, I _D = 5 μA
Gate1 Reverse Current	I _{G1SS}			±20	nA	V _{DS} = 0, V _{G2S} = 0, V _{G1S} = ±8 V
Gate2 Reverse Current	I _{G2SS}			±20	nA	V _{DS} = 0, V _{G1S} = 0, V _{G2S} = ±8 V
Forward Transfer Admittance	y _{fs}	22	28		mS	V _{DS} = 6 V, V _{G2S} = 3 V, I _D = 10 mA f = 1 kHz
Input Capacitance	C _{iss}	4.0	5.0	6.5	pF	V _{DS} = 6 V, V _{G2S} = 3 V, I _D = 10 mA f = 1 MHz
Output Capacitance	C _{oss}	2.2	2.9	3.7	pF	
Reverse Transfer Capacitance	C _{rss}		0.05	0.08	pF	
Power Gain	G _{ps}	21	24		dB	V _{DS} = 10 V, V _{G2S} = 5 V, I _D = 10 mA
Noise Figure	NF		1.3	2.5	dB	f = 200 MHz

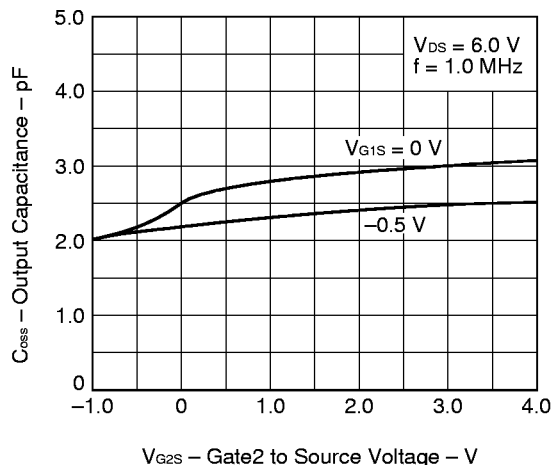
I_{DSS} Classification

Rank	V11/VAA*	V12/VAB*	V13/VAC*
Marking	V11	V12	V13
I _{DSS} (mA)	7.0 to 13.0	11.0 to 19.0	17.0 to 25.0

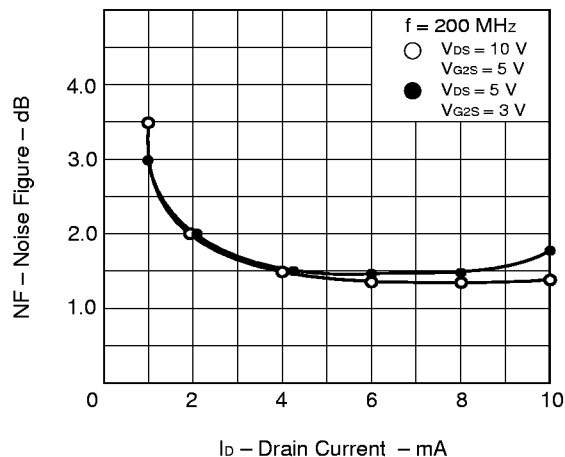
* Old Specification / New Specification

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

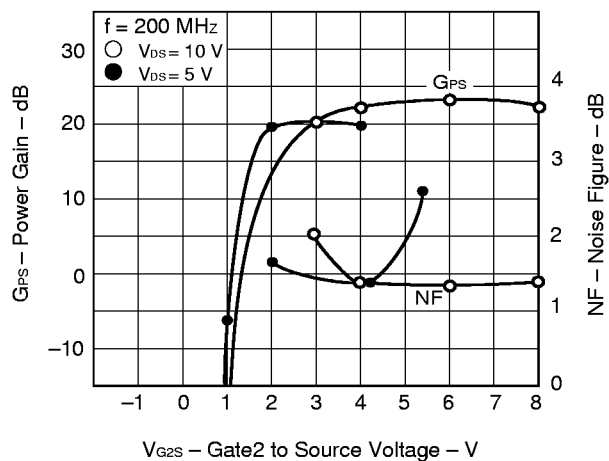
OUTPUT CAPACITANCE vs.
GATE2 TO SOURCE VOLTAGE



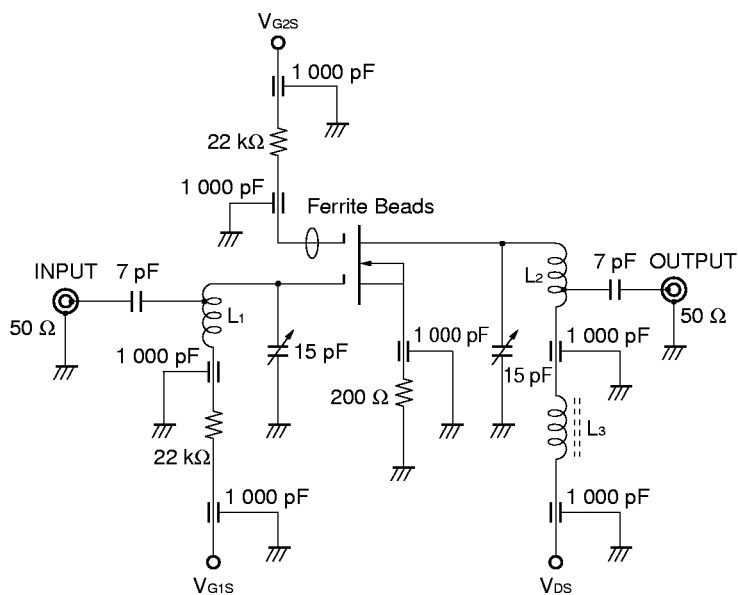
NOISE FIGURE vs. DRAIN CURRENT



NOISE FIGURE, POWER GAIN vs.
GATE2 TO SOURCE VOLTAGE



Gps AND NF TEST CIRCUIT AT f = 200 MHz



TEST CONDITION

$V_{DS} = 10 \text{ V}$, $V_{G2S} = 5 \text{ V}$, $I_D = 10 \text{ mA}$

$f = 200 \text{ MHz}$

L_1 : $\phi 0.6 \text{ mm U.E.W. } 7 \text{ mm } 3T$

L_2 : $\phi 0.6 \text{ mm U.E.W. } 7 \text{ mm } 3T$

L_3 : RFC $2.2 \mu\text{H}$