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# 3SK239A

GaAs Dual Gate MES FET

# HITACHI

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## Application

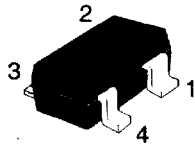
UHF RF amplifier

## Features

- Excellent low noise characteristics  
(NF = 1.3 dB Typ at f = 900 MHz)
- Capable of low voltage operation

## Outline

CMPAK-4



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

# 3SK239A

## Absolute Maximum Ratings (Ta = 25°C)

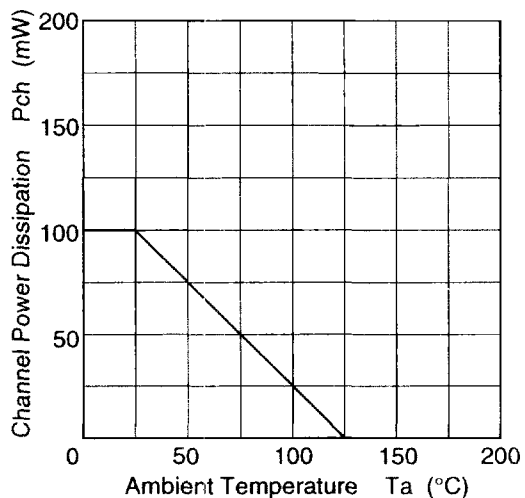
Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DS}$	12	V
Gate 1 to source voltage	$V_{G1S}$	-6	V
Gate 2 to source voltage	$V_{G2S}$	-6	V
Drain current	$I_D$	50	mA
Channel power dissipation	Pch	100	mW
Channel temperature	Tch	125	°C
Storage temperature	Tstg	-55 to +125	°C

## Electrical Characteristics (Ta = 25°C)

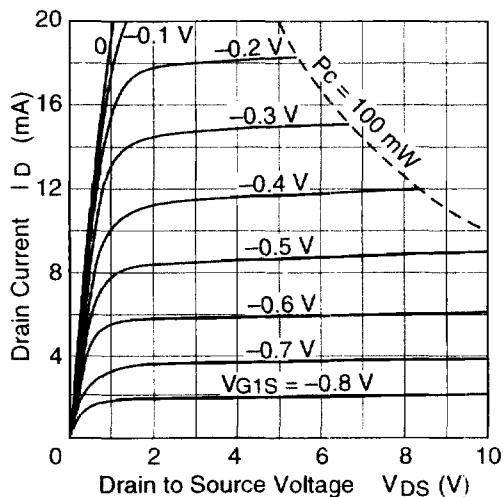
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source leakage current	$I_{DSX}$	—	—	50	$\mu$ A	$V_{DS} = 12$ V, $V_{G1S} = -3$ V, $V_{G2S} = 0$
Gate 1 to source breakdown voltage	$V_{(BR)G1SS}$	-6	—	—	V	$I_{G1} = -10$ $\mu$ A, $V_{G2S} = V_{DS} = 0$
Gate 2 to source breakdown voltage	$V_{(BR)G2SS}$	-6	—	—	V	$I_{G2} = -10$ $\mu$ A, $V_{G1S} = V_{DS} = 0$
Gate 1 leakage current	$I_{G1SS}$	—	—	-5	$\mu$ A	$V_{G1S} = -5$ V, $V_{G2S} = V_{DS} = 0$
Gate 2 leakage current	$I_{G2SS}$	—	—	-5	$\mu$ A	$V_{G2S} = -5$ V, $V_{G1S} = V_{DS} = 0$
Drain current	$I_{DSS}$	14	19	28	mA	$V_{DS} = 5$ V, $V_{G1S} = V_{G2S} = 0$
Gate 1 to source cutoff voltage	$V_{G1S(off)}$	—	-1.2	-1.6	V	$V_{DS} = 5$ V, $V_{G2S} = 0$ , $I_D = 100$ $\mu$ A
Gate 2 to source cutoff voltage	$V_{G2S(off)}$	—	-1.2	-1.6	V	$V_{DS} = 5$ V, $V_{G1S} = 0$ , $I_D = 100$ $\mu$ A
Forward transfer admittance	$ y_{fs} $	20	31	—	mS	$V_{DS} = 5$ V, $V_{G2S} = 1$ V, $I_D = 10$ mA, $f = 1$ kHz
Input capacitance	Ciss	—	0.58	1.0	pF	$V_{DS} = 5$ V, $V_{G1S} = V_{G2S} = -3$ V, $f = 1$ MHz
Output capacitance	Coss	—	0.36	0.6	pF	
Reverse transfer capacitance	Crss	—	0.028	0.05	pF	
Power gain	PG	17	19	—	dB	$V_{DS} = 5$ V, $V_{G2S} = 1$ V, $I_D = 10$ mA, $f = 900$ MHz
Noise figure	NF	—	1.3	2.0	dB	

Note: Marking is "XR-".

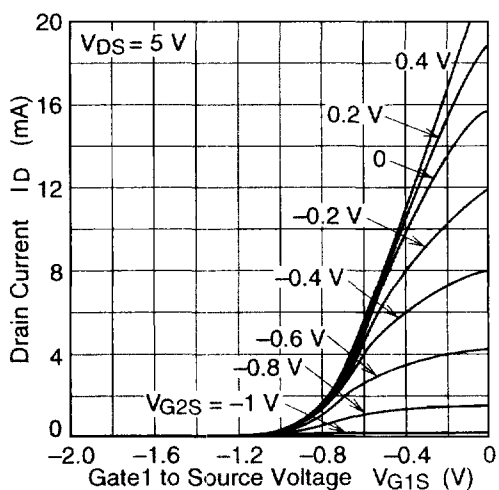
Maximum Channel Power Dissipation Curve



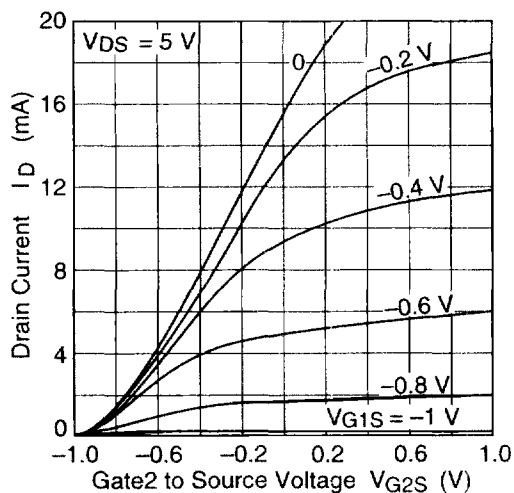
Typical Output Characteristics



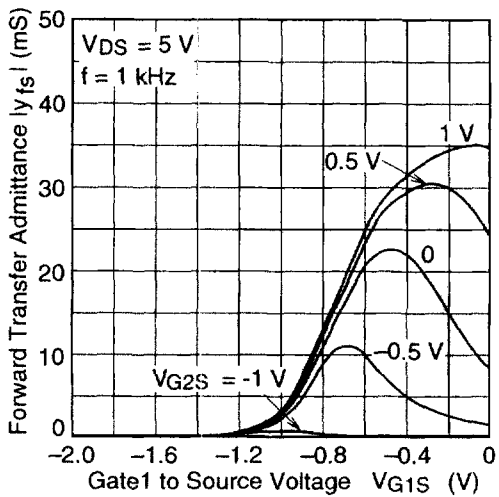
Drain Current vs. Gate1 to Source Voltage



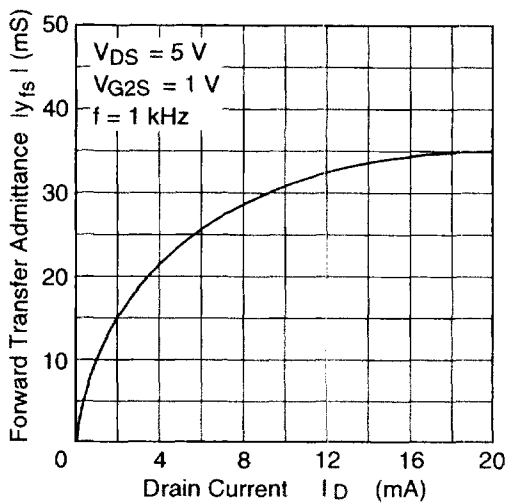
Drain Current vs. Gate2 Source Voltage



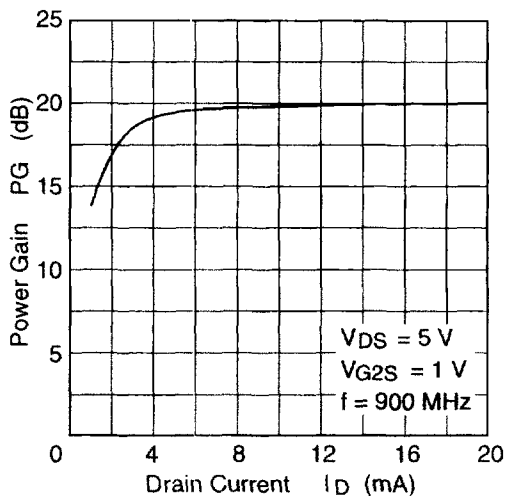
Forward Transfer Admittance vs. Gate1 to Source Voltage



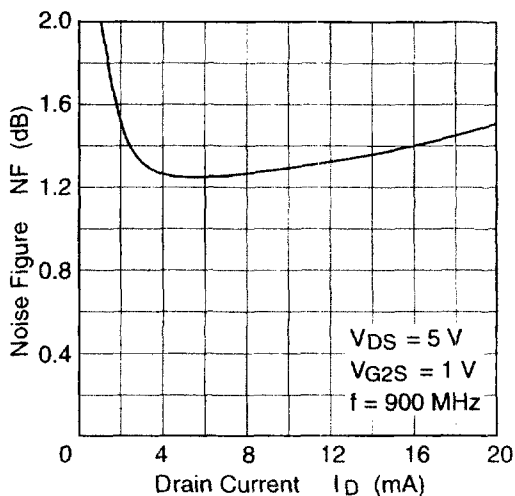
Forward Transfer Admittance vs. Drain Current



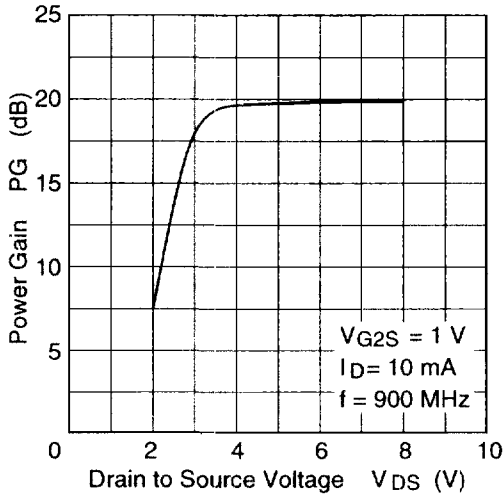
Power Gain vs. Drain Current



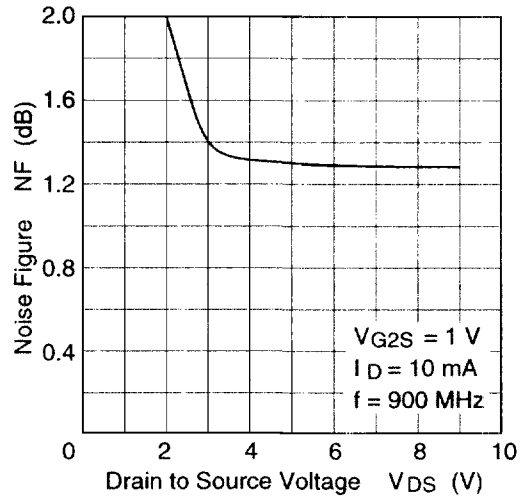
Noise Figure vs. Drain Current



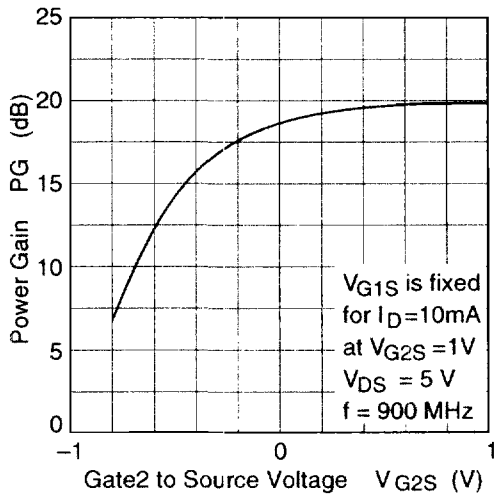
Power Gain vs. Drain to Source Voltage



Noise Figure vs. Drain to Source Voltage



Power Gain vs. Gate2 to Source Voltage



Gain Reduction vs. Gate2 to Source Voltage

