3SK228

GaAs Dual Gate MES FET

HITACHI

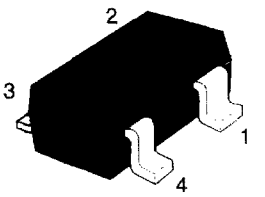
ADE-208-280
1st. Edition

Application

UHF TV tuner RF Amplifier

Outline

MPAK-4



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

Absolute Maximum Ratings (Ta = 25°C)

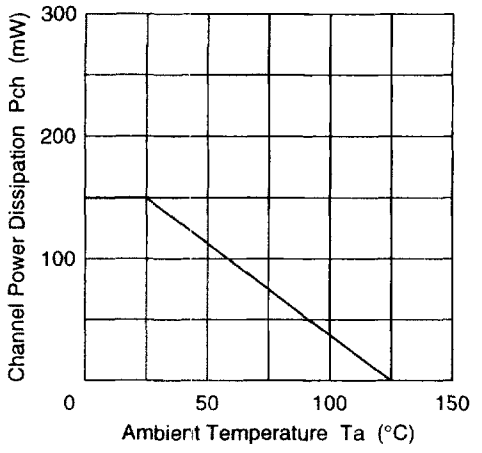
Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	12	V
Gate 1 to source voltage	V_{G1S}	–6	V
Gate 2 to source voltage	V_{G2S}	–6	V
Drain current	I_D	50	mA
Channel power dissipation	Pch	150	mW
Channel temperature	Tch	125	°C
Storage temperature	Tstg	–55 to +125	°C

Electrical Characteristics (Ta = 25°C)

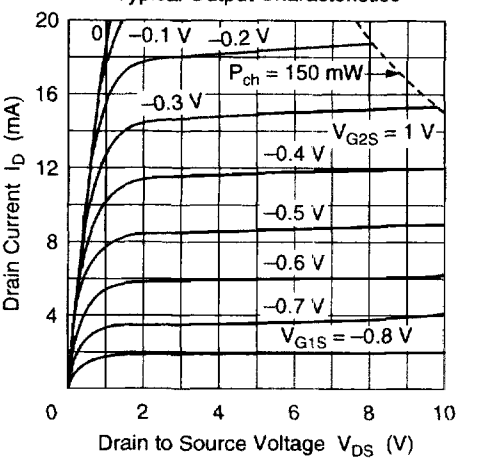
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source cutoff current	I_{DSX}	—	—	50	µA	V_{DS} = 12 V, V_{G1S} = –3 V, V_{G2S} = 0
Gate 1 to source breakdown voltage	$V_{(BR)G1SS}$	–6	—	—	V	I_{G1} = –10 µA, V_{G2S} = V_{DS} = 0
Gate 2 to source breakdown voltage	$V_{(BR)G2SS}$	–6	—	—	V	I_{G2} = –10 µA, V_{G1S} = V_{DS} = 0
Gate 1 cutoff current	I_{G1SS}	—	—	–5	µA	V_{G1S} = –5 V, V_{G2S} = V_{DS} = 0
Gate 2 cutoff current	I_{G2SS}	—	—	–5	µA	V_{G2S} = –5 V, V_{G1S} = V_{DS} = 0
Drain current	I_{DSS}	10	17	32	mA	V_{DS} = 5 V, V_{G1S} = V_{G2S} = 0
Gate 1 to source cutoff voltage	$V_{G1S(off)}$	—	–1.1	–1.5	V	V_{DS} = 5 V, V_{G2S} = 0, I_D = 100 µA
Gate 2 to source cutoff voltage	$V_{G2S(off)}$	—	–1.1	–1.5	V	V_{DS} = 5 V, V_{G1S} = 0, I_D = 100 µA
Forward transfer admittance	$\|y_{fs}\|$	20	34	—	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	19.6	—	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–".

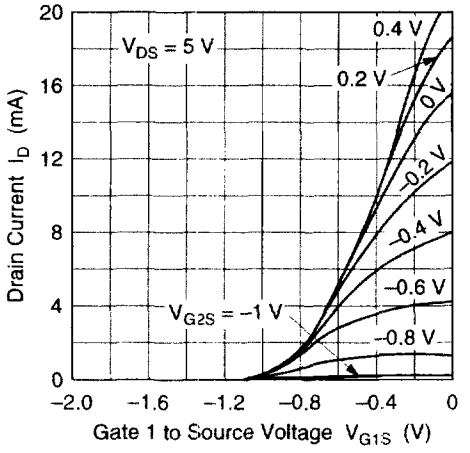
Maximum Channel Power Dissipation Curve



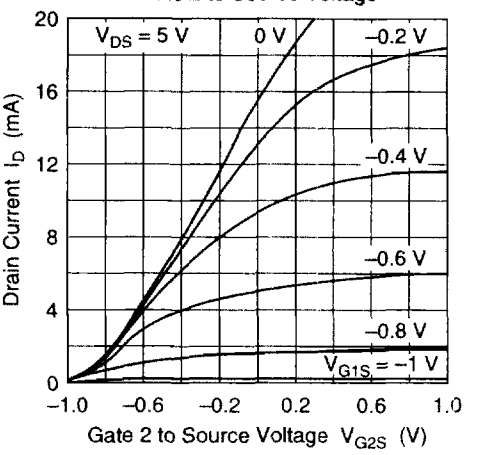
Typical Output Characteristics



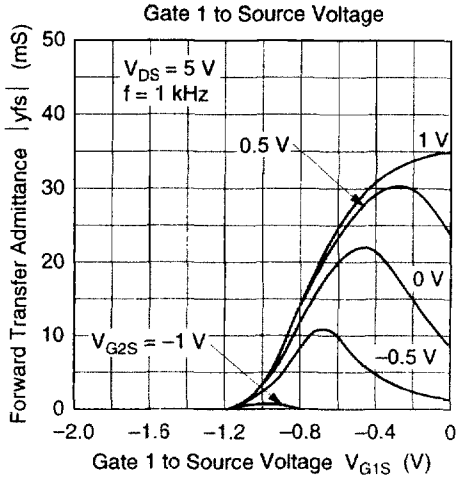
Drain Current vs. Gate 1 to Source Voltage



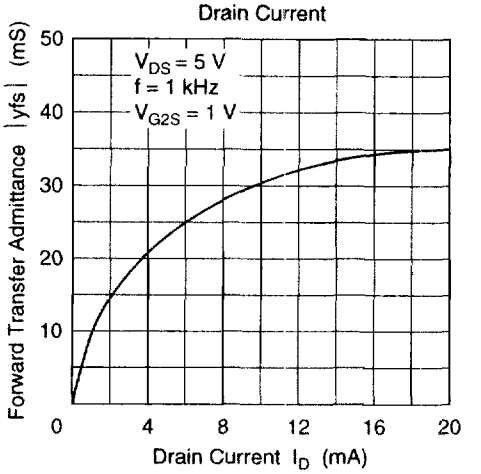
Drain Current vs. Gate 2 to Source Voltage



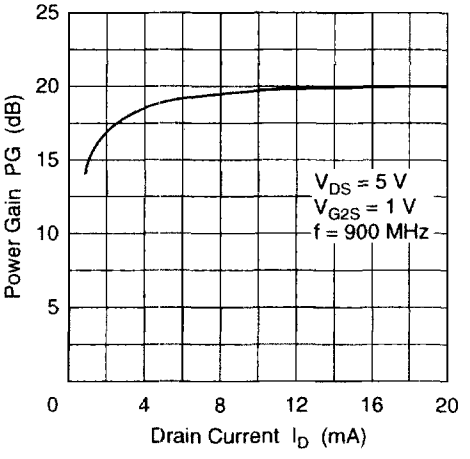
Forward Transfer Admittance vs. Gate 1 to Source Voltage



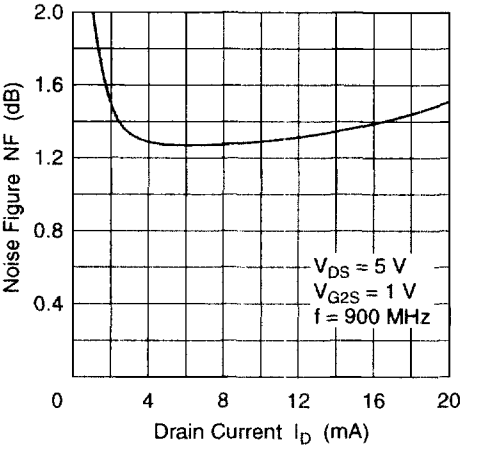
Forward Transfer Admittance vs. Drain Current



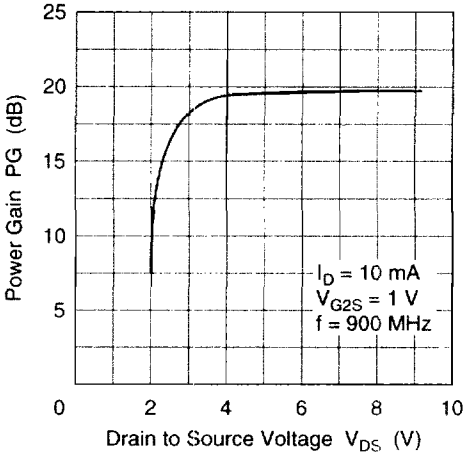
Power Gain vs. Drain Current



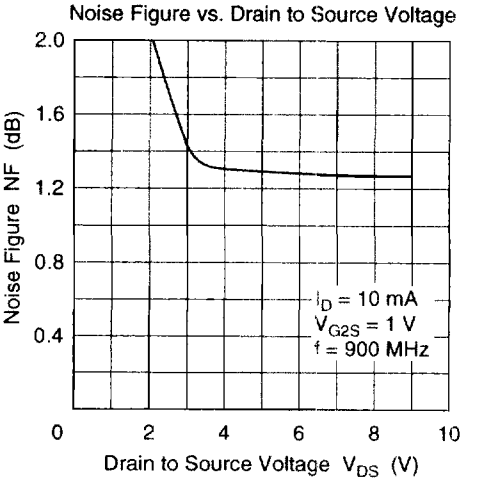
Noise Figure vs. Drain Current



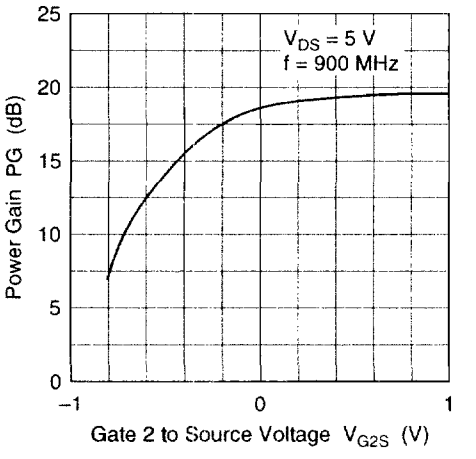
Power Gain vs. Drain to Source Voltage



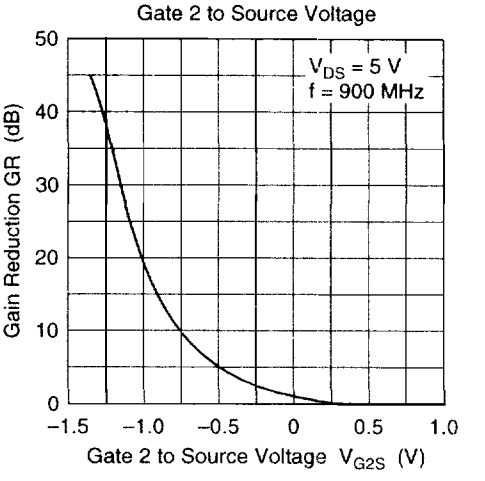
Noise Figure vs. Drain to Source Voltage



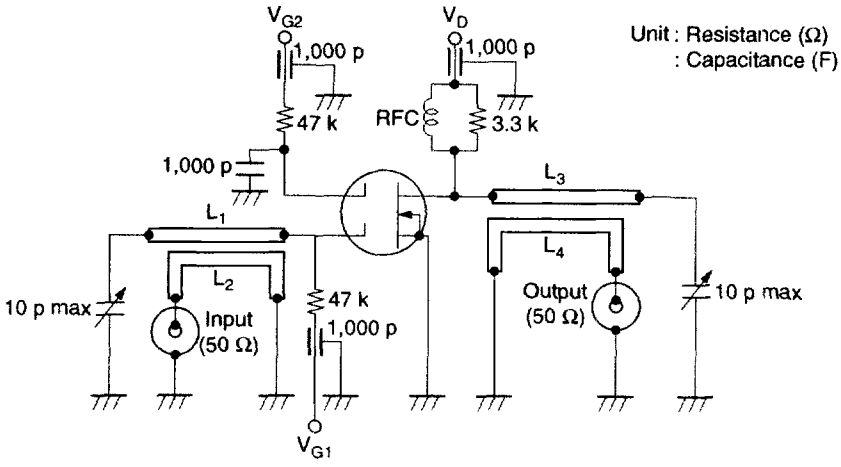
Power Gain vs. Gate 2 to Source Voltage



Gain Reduction vs. Gate 2 to Source Voltage

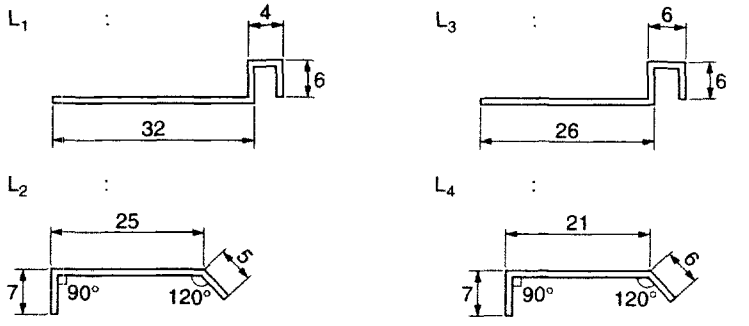


Power Gain, Noise Figure Test Circuit



Unit : Resistance (Ω)
: Capacitance (F)

L_1 to L_4 : ϕ1 mm Copper Wire



Unit : mm

RFC : 3 turn, 6 mm inside dia (ϕ1 mm Enameled Copper Wire)