HITACHI

3SK239A

GaAs N–Channel Dual Gate MESFET

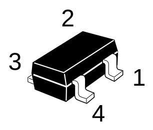
Application

UHF RF amplifier

Features

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

CMPAK-4



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

Table 1 Absolute Maximum Ratings (Ta = 25°C)

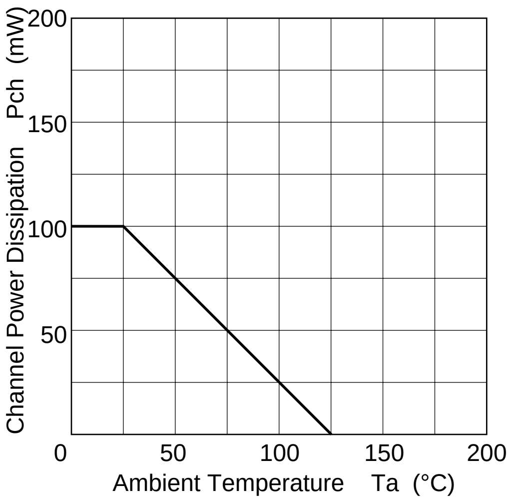
Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	12	V
Gate1 to source voltage	V_{G1S}	–6	V
Gate2 to source voltage	V_{G2S}	–6	V
Drain current	I_D	50	mA
Channel power dissipation	P_{ch}	100	mW
Channel temperature	Tch	125	°C
Storage temperature	Tstg	–55 to +125	°C

Marking is “XR–”.

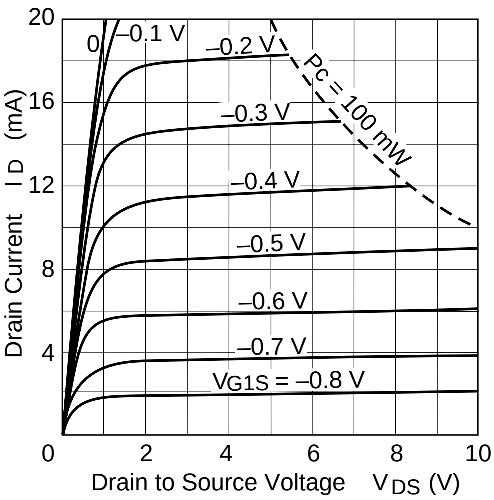
Table 2 Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source leakage current	I_{DSX}	—	—	50	µA	V_{DS} = 12 V, V_{G1S} = –3 V, V_{G2S} = 0
Gate1 to source breakdown voltage	$V_{(BR)G1SS}$	–6	—	—	V	I_{G1} = –10 µA, V_{G2S} = V_{DS} = 0
Gate2 to source breakdown voltage	$V_{(BR)G2SS}$	–6	—	—	V	I_{G2} = –10 µA, V_{G1S} = V_{DS} = 0
Gate1 leakage current	I_{G1SS}	—	—	–5	µA	V_{G1S} = –5 V, V_{G2S} = V_{DS} = 0
Gate2 leakage current	I_{G2SS}	—	—	–5	µA	V_{G2S} = –5 V, V_{G1S} = V_{DS} = 0
Drain current	I_{DSS}	14	19	28	mA	V_{DS} = 5 V, V_{G1S} = V_{G1S} = 0
Gate1 to source cutoff voltage	$V_{G1S(off)}$	—	–1.2	–1.6	V	V_{DS} = 5 V, V_{G2S} = 0, I_D = 100 µA
Gate2 to source cutoff voltage	$V_{G2S(off)}$	—	–1.2	–1.6	V	V_{DS} = 5 V, V_{G1S} = 0, I_D = 100 µA
Forward transfer admittance	$\lvert y_{fs} \rvert$	20	31	—	mS	V_{DS} = 5V, 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	

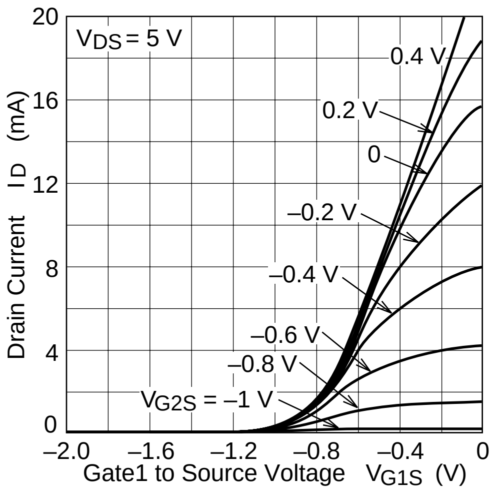
Maximum channel power dissipation curve



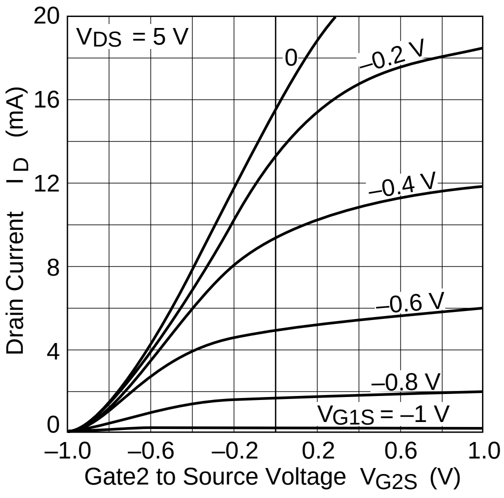
Typical output characteristics



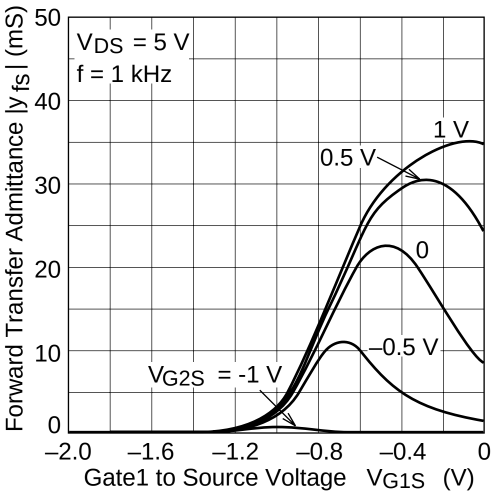
Drain current vs. gate1 to source voltage



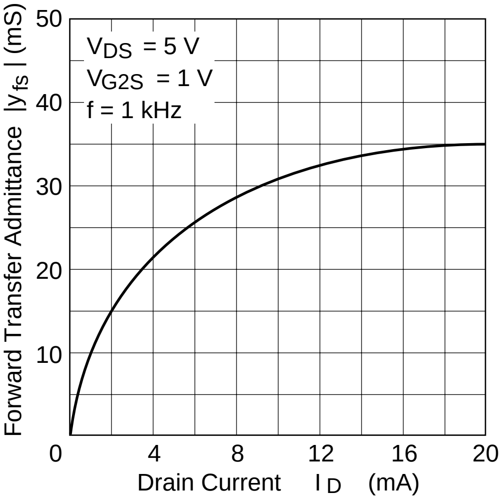
Drain current vs. gate2 to source voltage



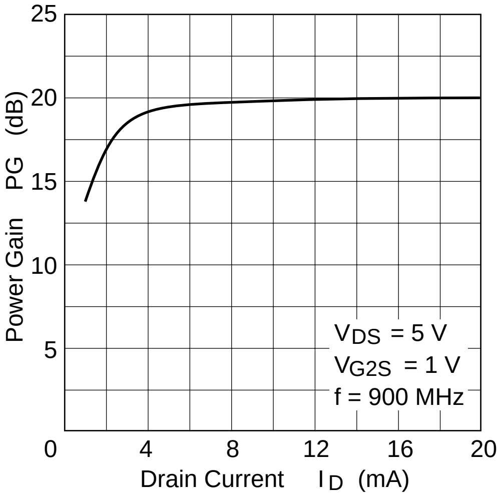
Forward transfer admittance
vs. gate1 to source voltage



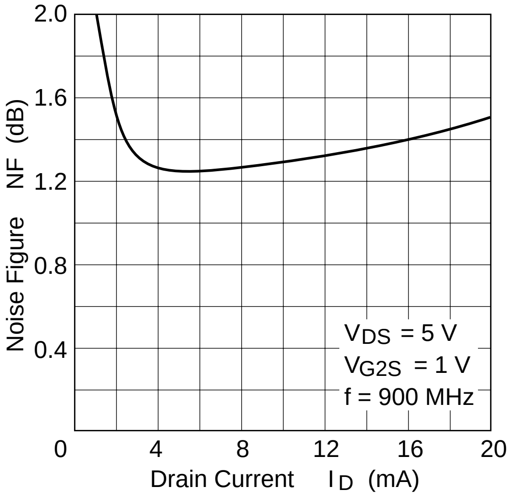
Forward transfer admittance vs. drain current



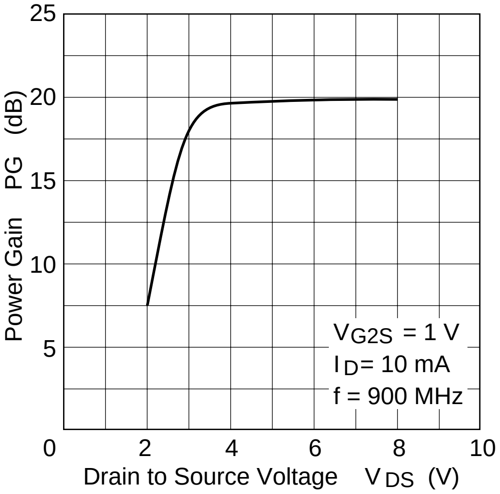
Power gain vs. drain current



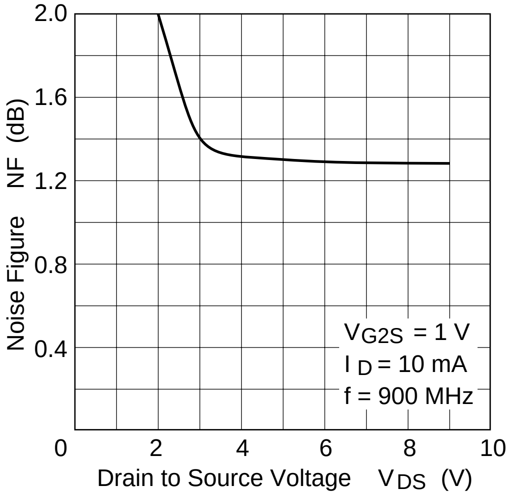
Noise figure vs. drain current



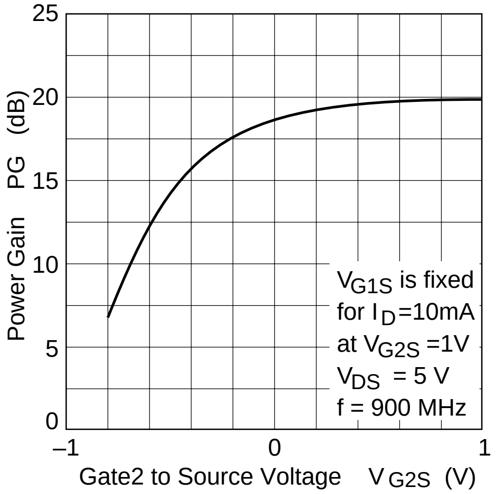
Power gain vs. drain to source voltage



Noise figure vs. drain to source voltage



Power gain vs. gate2 to source voltage



Gain reduction vs. gate2 to source voltage