3SK194

Silicon N-Channel Dual Gate MOS FET

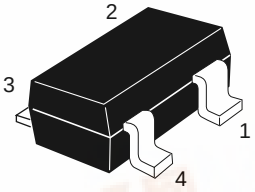
HITACHI

Application

VHF/UHF TV tuner RF amplifier

Outline

MPAK-4



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

Hitachi

Absolute Maximum Ratings (Ta = 25°C)

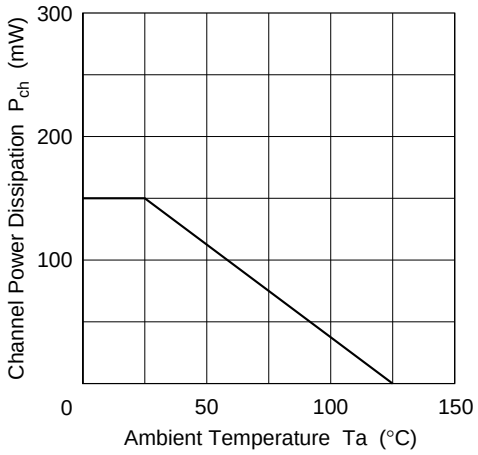
Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	15	V
Gate 1 to source voltage	V_{G1S}	±10	V
Gate 2 to source voltage	V_{G2S}	±10	V
Drain current	I_D	35	mA
Channel power dissipation	Pch	150	mW
Channel temperature	Tch	125	°C
Storage temperature	Tstg	–55 to +125	°C

Electrical Characteristics (Ta = 25°C)

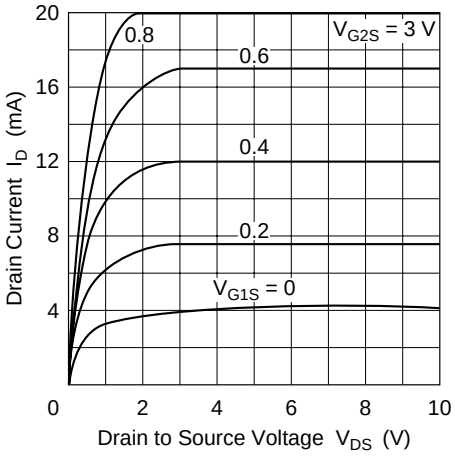
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSX}$	15	—	—	V	I_D = 200 µA, $V_{G1S} = V_{G2S}$ = –5 V
Gate 1 to source breakdown voltage	$V_{(BR)G1SS}$	±10	—	—	V	I_{G1} = ±10 µA, $V_{G2S} = V_{DS}$ = 0
Gate 2 to source breakdown voltage	$V_{(BR)G2SS}$	±10	—	—	V	I_{G2} = ±10 µA, $V_{G1S} = V_{DS}$ = 0
Gate 1 cutoff current	I_{G1SS}	—	—	±100	nA	V_{G1S} = ±8 V, $V_{G2S} = V_{DS}$ = 0
Gate 2 cutoff current	I_{G2SS}	—	—	±100	nA	V_{G2S} = ±8 V, $V_{G1S} = V_{DS}$ = 0
Gate 1 to source cutoff voltage	$V_{G1S(off)}$	—	—	–1.0	V	V_{DS} = 10 V, V_{G2S} = 3 V, I_D = 100 µA
Gate 2 to source cutoff voltage	$V_{G2S(off)}$	—	—	–1.5	V	V_{DS} = 10 V, V_{G1S} = 3 V, I_D = 100 µA
Drain current	I_{DSS}	0	—	10	mA	V_{DS} = 6 V, V_{G1S} = 0, V_{G2S} = 3 V
Forward transfer admittance	$\|y_{fs}\|$	17	—	—	mS	V_{DS} = 6 V, V_{G2S} = 3 V, I_D = 10 mA, f = 1 kHz
Input capacitance	Ciss	—	2.8	3.5	pF	V_{DS} = 6 V, V_{G2S} = 3 V, I_D = 10 mA, f = 1 MHz
Output capacitance	Coss	—	1.8	2.5	pF	
Reverse transfer capacitance	Crss	—	0.02	—	pF	
Power gain	PG	12	15	—	dB	V_{DS} = 6 V, V_{G2S} = 3 V, I_D = 10 mA, f = 900 MHz
Noise figure	NF	—	3.0	4.5	dB	
Noise figure	NF	—	3.0	4.0	dB	V_{DD} = 12 V, V_{AGC} = 10.5 V, f = 60 MHz
Power gain	PG	27	30	—	dB	V_{DS} = 6 V, V_{G2S} = 3 V, I_D = 10 mA, f = 200 MHz
Noise figure	NF	—	1.0	2.5	dB	

Note: Marking is “IY–”.

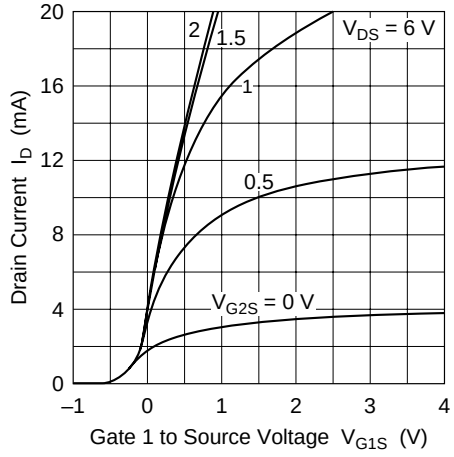
Maximum Channel Power Dissipation Curve



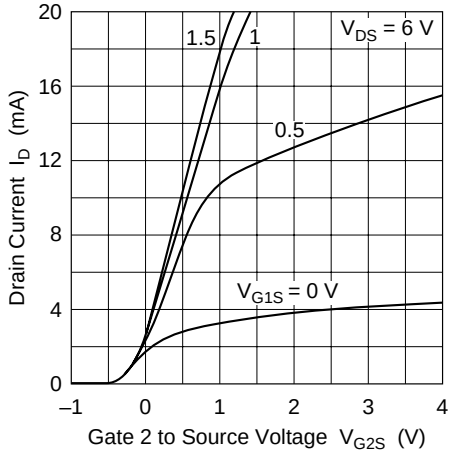
Typical Output Characteristics



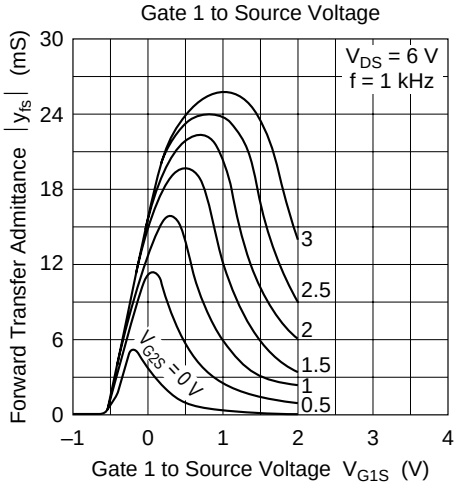
Drain Current vs. Gate 1 to Source Voltage



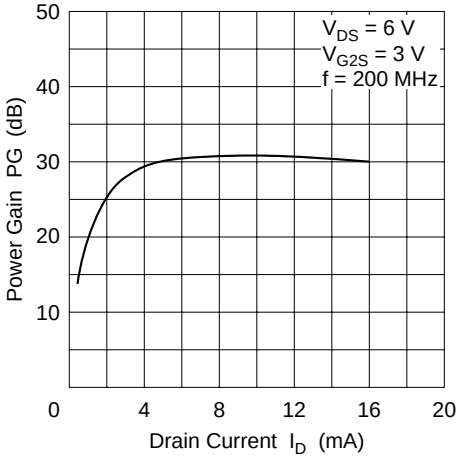
Drain Current vs. Gate 2 to Source Voltage



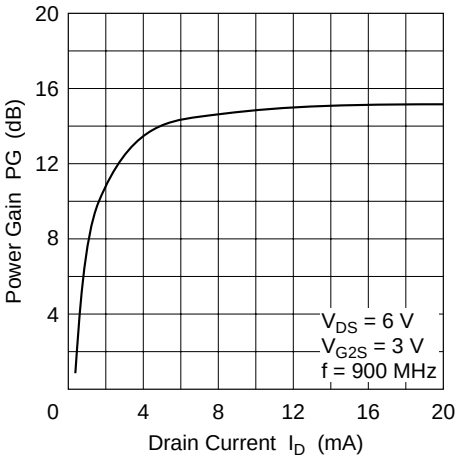
Forward Transfer Admittance vs. Gate 1 to Source Voltage



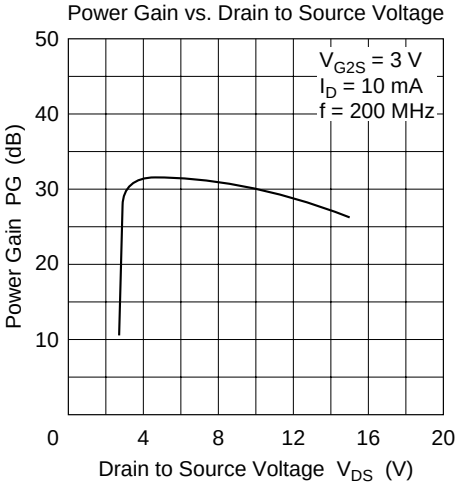
Power Gain vs. Drain Current



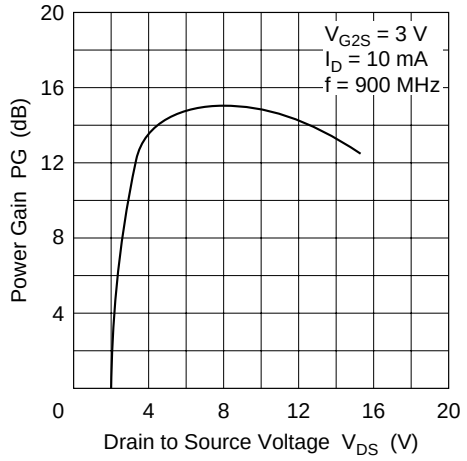
Power Gain vs. Drain Current



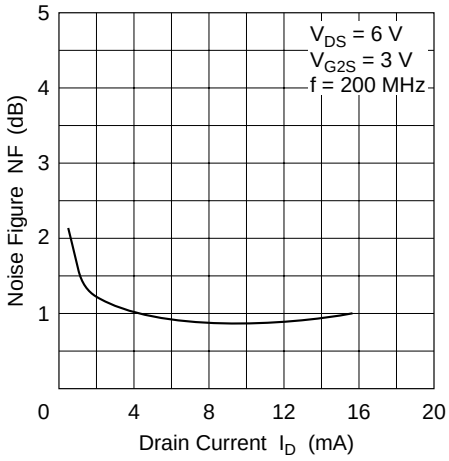
Power Gain vs. Drain to Source Voltage



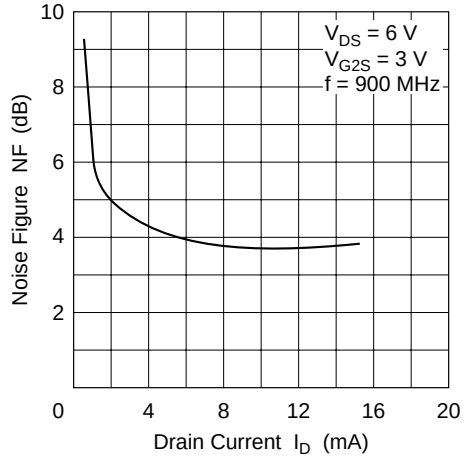
Power Gain vs. Drain to Source Voltage



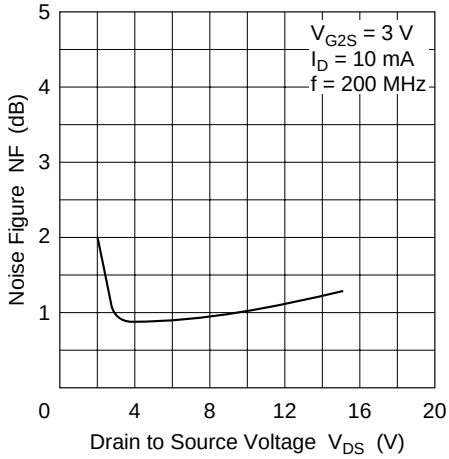
Noise Figure vs. Drain Current



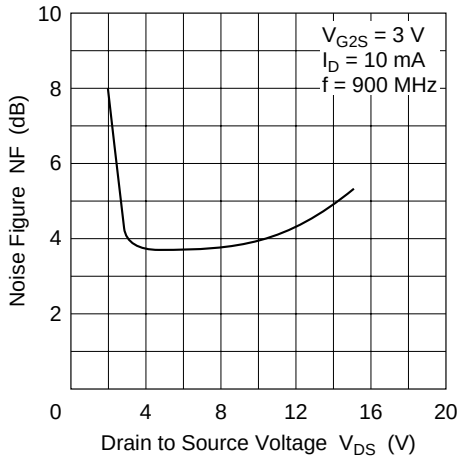
Noise Figure vs. Drain Current



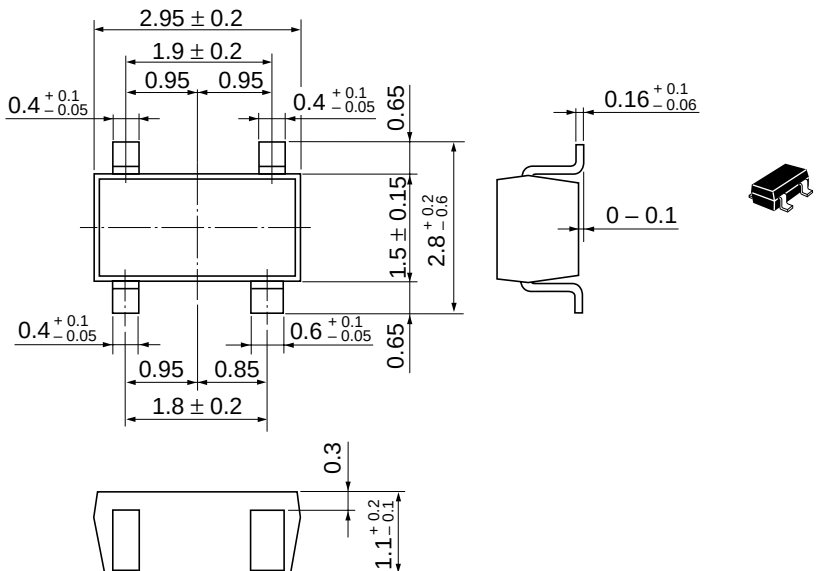
Noise Figure vs. Drain to Source Voltage



Noise Figure vs.
Drain to Source Voltage



Unit: mm


2.95 ± 0.2
1.9 ± 0.2
0.95
0.95
0.4 +0.1 −0.05
0.4 +0.1 −0.05
0.65
1.5 ± 0.15
2.8 +0.2 −0.6
0.16 +0.1 −0.06
0 – 0.1
0.4 +0.1 −0.05
0.6 +0.1 −0.05
0.65
0.95
0.85
1.8 ± 0.2
0.3
1.1 +0.2 −0.1

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