
3SK194

Silicon N-Channel Dual Gate MOS FET

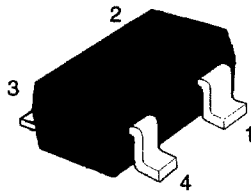
HITACHI

Application

VHF/UHF TV tuner RF amplifier

Outline

MPAK-4



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

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

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	$^\circ\text{C}$
Storage temperature	Tstg	-55 to +125	$^\circ\text{C}$

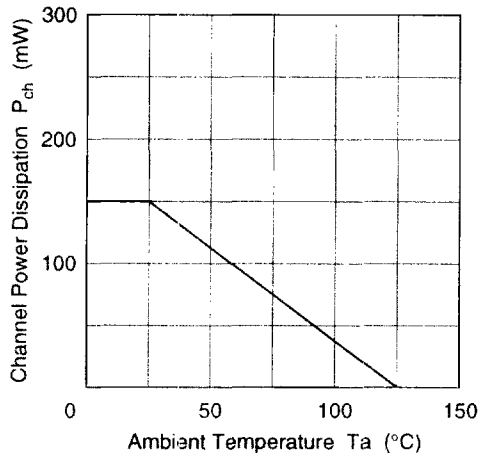
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Electrical Characteristics (T_a = 25°C)

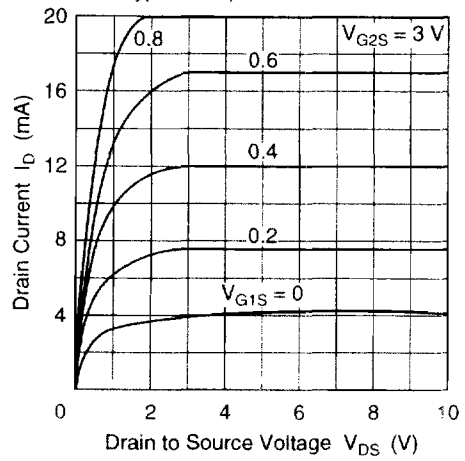
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSX}$	15	—	—	V	$I_D = 200 \mu\text{A}$, $V_{G1S} = V_{G2S} = -5 \text{ V}$
Gate 1 to source breakdown voltage	$V_{(BR)G1SS}$	± 10	—	—	V	$I_{G1} = \pm 10 \mu\text{A}$, $V_{G2S} = V_{DS} = 0$
Gate 2 to source breakdown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

Note: Marking is "1Y-".

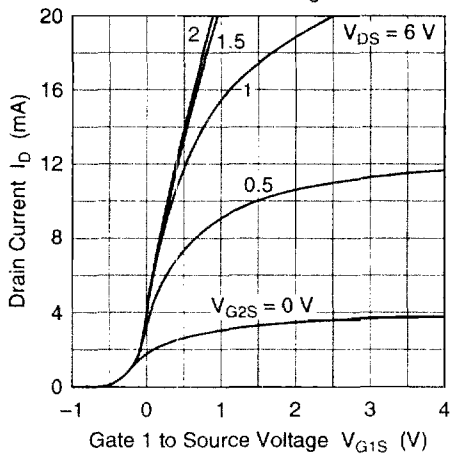
Maximum Channel Power Dissipation Curve



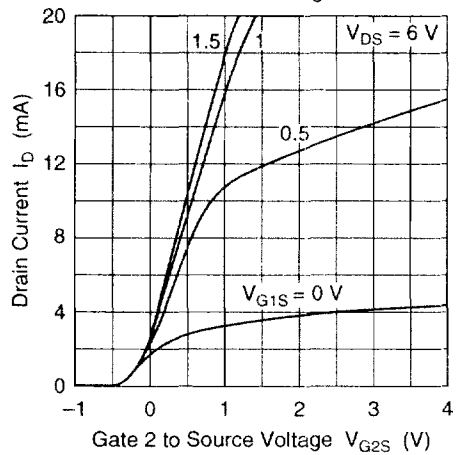
Typical Output Characteristics



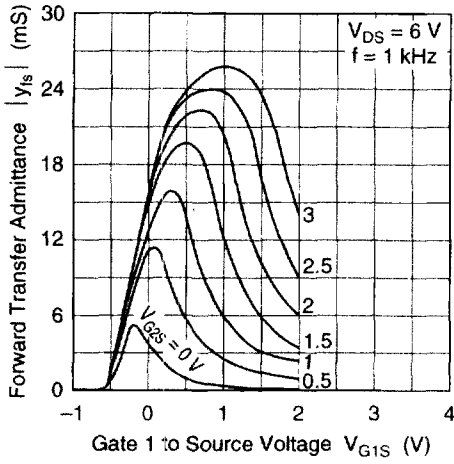
Drain Current vs. Gate 1 to Source Voltage



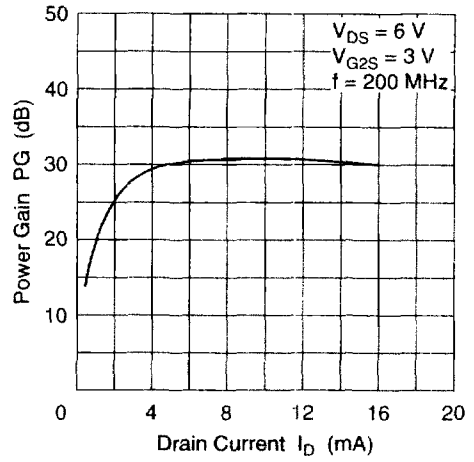
Drain Current vs. Gate 2 to Source Voltage



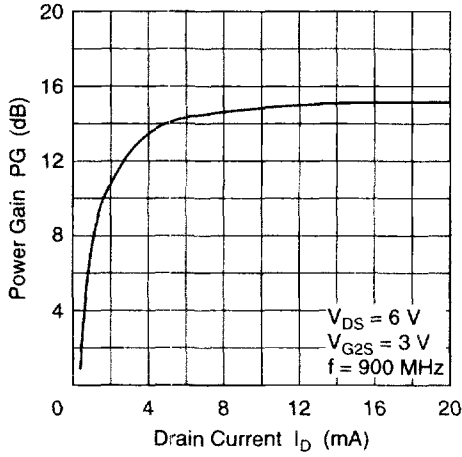
Forward Transfer Admittance vs. Gate 1 to Source Voltage



Power Gain vs. Drain Current



Power Gain vs. Drain Current



Power Gain vs. Drain to Source Voltage

