3SK317

Silicon N-Channel Dual Gate MOS FET
UHF / VHF RF Amplifier

HITACHI

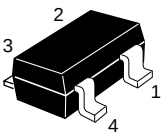
ADE-208-778 (Z)
1st. Edition
Mar. 1999

Features

- Low noise characteristics;
  (NF = 1.0 dB typ. at f = 200 MHz)
- High power gain characteristics ;
  (PG = 27.6 dB typ. at f = 200 MHz)

Outline

CMPAK-4



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

Note: Marking is “ZR-”.

Hitachi semiconductor

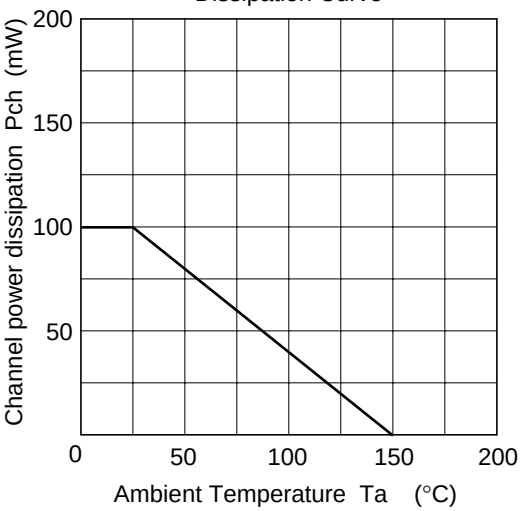
Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	14	V
Gate1 to source voltage	V_{G1S}	±8	V
Gate2 to source voltage	V_{G2S}	±8	V
Drain current	I_D	25	mA
Channel power dissipation	Pch	100	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

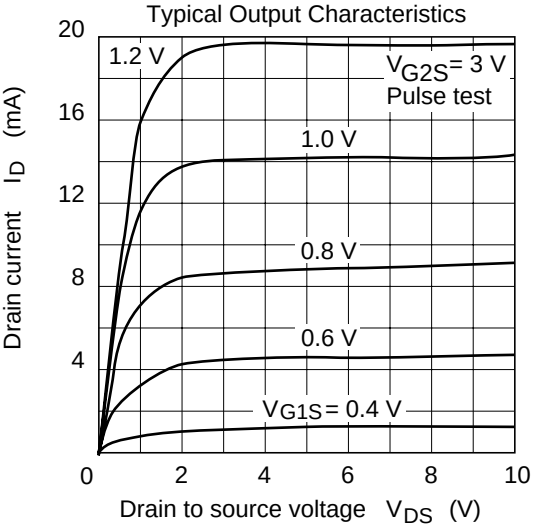
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	14	—	—	V	I_D = 200 µA V_{G1S} = V_{G2S} = -3 V
Gate1 to source breakdown voltage	$V_{(BR)G1SS}$	±8	—	—	V	I_{G1} = ±10 µA V_{G2S} = V_{DS} = 0
Gate2 to source breakdown voltage	$V_{(BR)G2SS}$	±8	—	—	V	I_{G2} = ±10 µA V_{G1S} = V_{DS} = 0
Gate1 to source cutoff current	I_{G1SS}	—	—	±100	nA	V_{G1S} = ±6 V V_{G2S} = V_{DS} = 0
Gate2 to source cutoff current	I_{G2SS}	—	—	±100	nA	V_{G2S} = ±6 V V_{G1S} = V_{DS} = 0
Gate1 to source cutoff voltage	$V_{G1S(off)}$	0	0.2	1	V	V_{DS} = 10 V, V_{G2S} = 3 V I_D = 100 µA
Gate2 to source cutoff voltage	$V_{G2S(off)}$	0	0.3	1	V	V_{DS} = 10 V, V_{G1S} = 3 V I_D = 100 µA
Drain current	$I_{DS(op)}$	4	8	14	mA	V_{DS} = 6 V, V_{G1S} = 0.75 V V_{G2S} = 3 V
Forward transfer admittance	$\|y_{fs}\|$	20	25	—	mS	V_{DS} = 6 V, V_{G2S} = 3 V I_D = 10 mA , f = 1 kHz
Input capacitance	C_{iss}	2.4	3.1	3.5	pF	V_{DS} = 6 V, V_{G2S} = 3 V
Output capacitance	C_{oss}	0.8	1.1	1.4	pF	I_D = 10 mA , f = 1 MHz
Reverse transfer capacitance	C_{rss}	—	0.021	0.04	pF	
Power gain	PG	24	27.6	—	dB	V_{DS} = 6 V, V_{G2S} = 3 V
Noise figure	NF	—	1.0	1.5	dB	I_D = 10 mA , f = 200 MHz
Power gain	PG	12	15.6	—	dB	V_{DS} = 6 V, V_{G2S} = 3 V
Noise figure	NF	—	3	4	dB	I_D = 10 mA , f = 900 MHz
Noise figure	NF	—	2.7	3.5	dB	V_{DS} = 6 V, V_{G2S} = 3 V I_D = 10 mA , f = 60 MHz

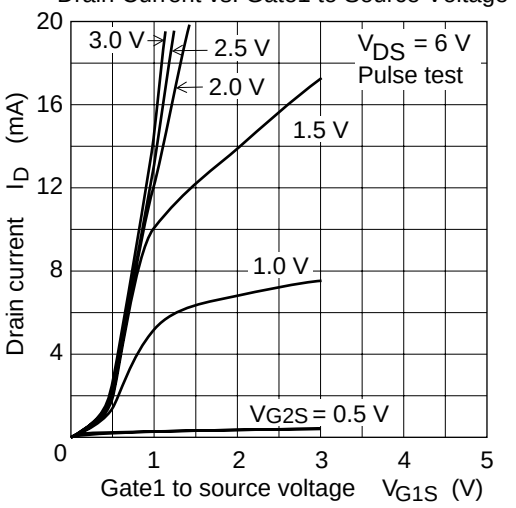
Maximum Channel Power Dissipation Curve



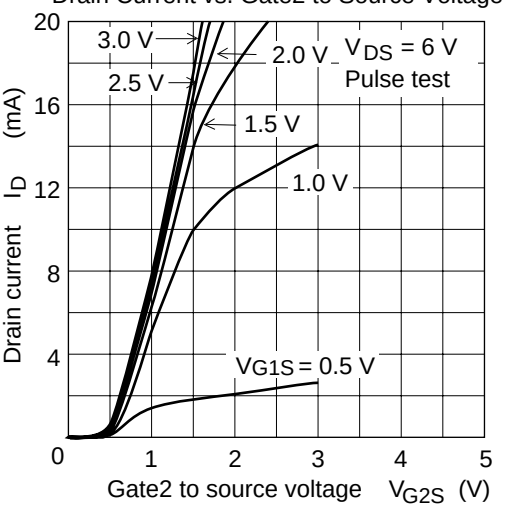
Typical Output Characteristics



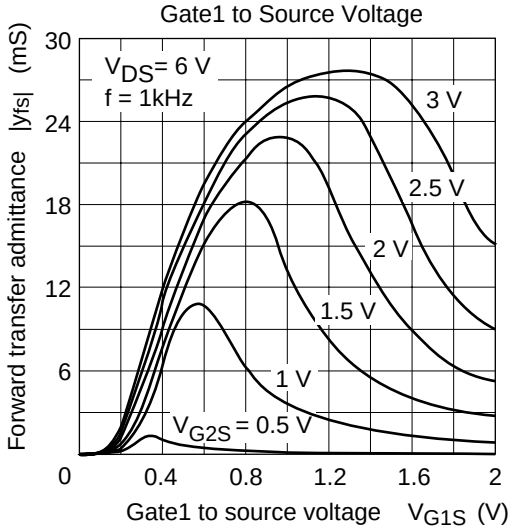
Drain Current vs. Gate1 to Source Voltage



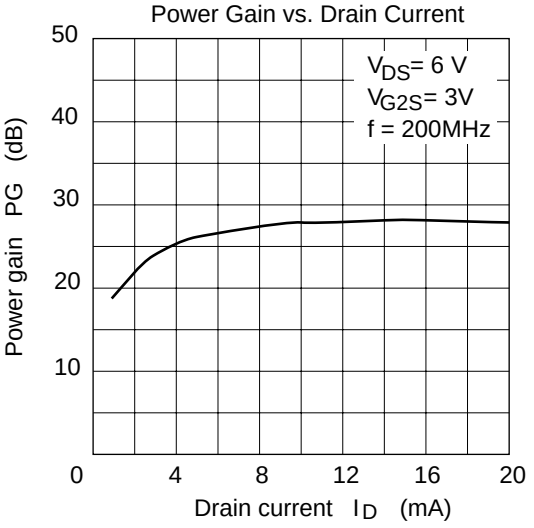
Drain Current vs. Gate2 to Source Voltage



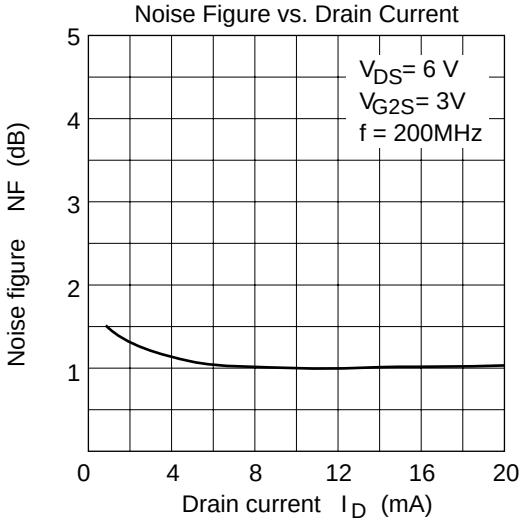
Forward Transfer Admittance vs. Gate1 to Source Voltage



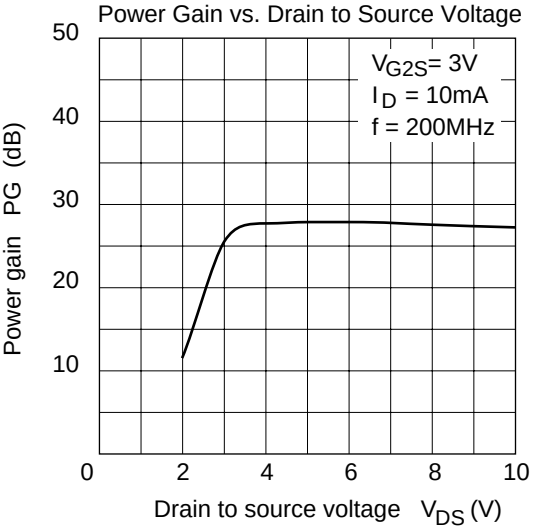
Power Gain vs. Drain Current



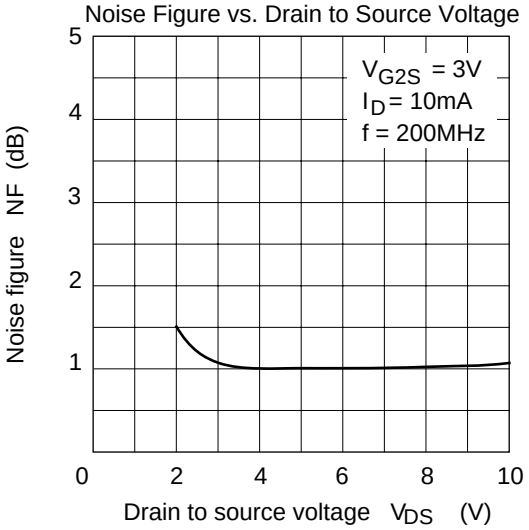
Noise Figure vs. Drain Current



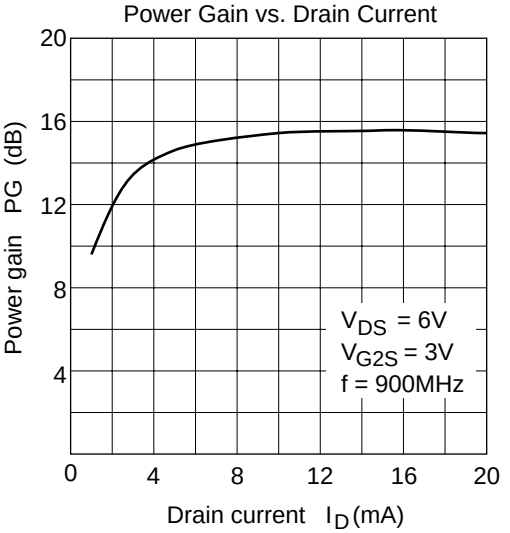
Power Gain vs. Drain to Source Voltage



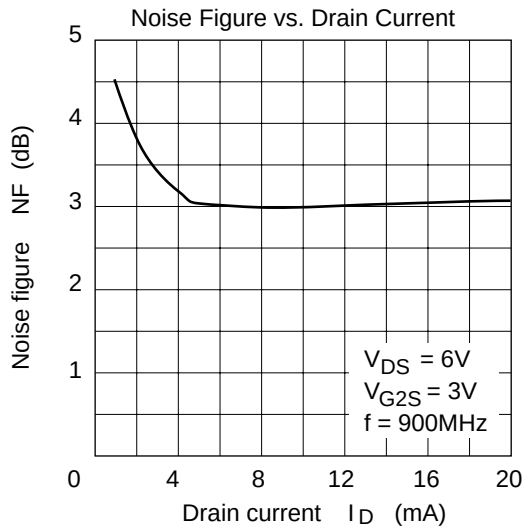
Noise Figure vs. Drain to Source Voltage



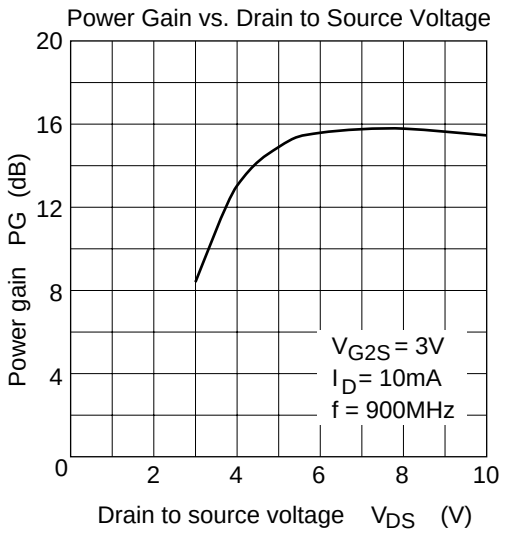
Power Gain vs. Drain Current

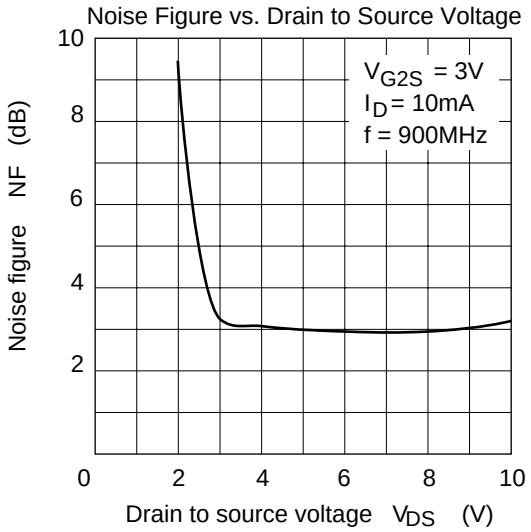


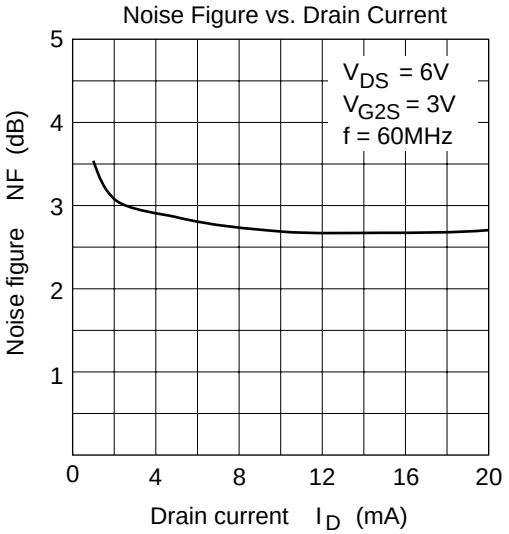
Noise Figure vs. Drain Current

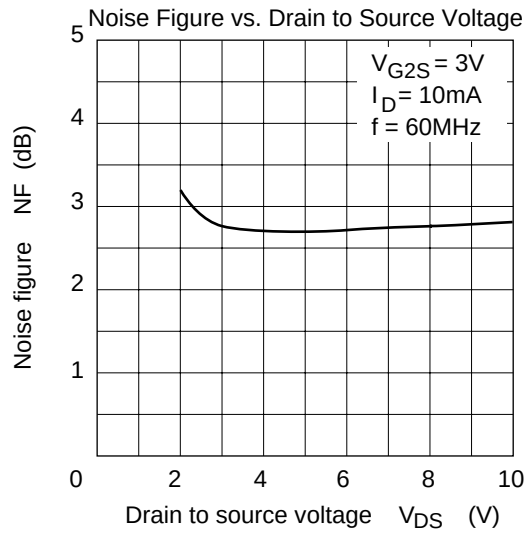


Power Gain vs. Drain to Source Voltage



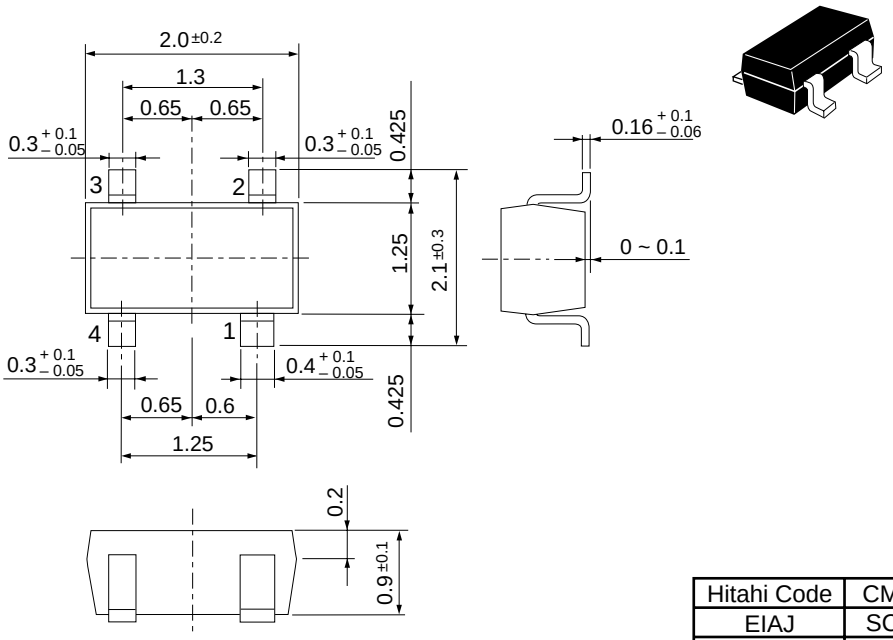

Noise Figure vs. Drain to Source Voltage
Noise figure NF (dB)
10
8
6
4
2
0
2
4
6
8
10
Drain to source voltage V_{DS} (V)
V_{G2S} = 3V
I_D = 10mA
f = 900MHz


Noise Figure vs. Drain Current
Noise figure NF (dB)
5
4
3
2
1
0
4
8
12
16
20
Drain current I_D (mA)
V_{DS} = 6V
V_{G2S} = 3V
f = 60MHz


Noise Figure vs. Drain to Source Voltage
Noise figure NF (dB)
5
4
3
2
1
0
2
4
6
8
10
Drain to source voltage V_{DS} (V)
V_{G2S} = 3V
I_D = 10mA
f = 60MHz

Package Dimensions

Unit: mm



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