

# 3SK319

Silicon N-Channel Dual Gate MOS FET UHF RF Amplifier

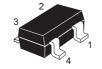
REJ03G0820-0200 (Previous ADE-208-602) Rev.2.00 Aug.10.2005

### Features

- Low noise characteristics; (NF= 1.4 dB typ. at f= 900 MHz)
- Excellent cross modulation characteristics
- Capable low voltage operation; +B= 5V

### Outline

RENESAS Package code: PLSP0004ZA-A (Package name: MPAK-4)



1. Source 2. Gate1

3. Gate2 4. Drain

Note: Marking is "YB-".



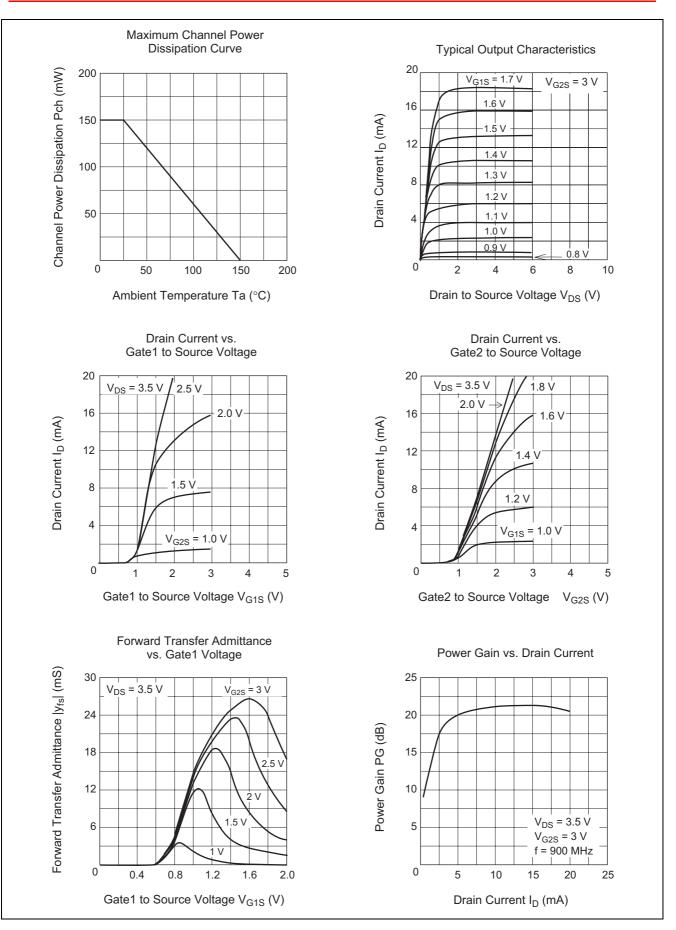
## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Drain to source voltage	V <sub>DS</sub>	6	V
Gate1 to source voltage	V <sub>G1S</sub>	±6	V
Gate2 to source voltage	V <sub>G2S</sub>	±6	V
Drain current	ID	20	mA
Channel power dissipation	Pch	150	mW
Channel temperature	Tch	150	٥°
Storage temperature	Tstg	-55 to +150	٥°

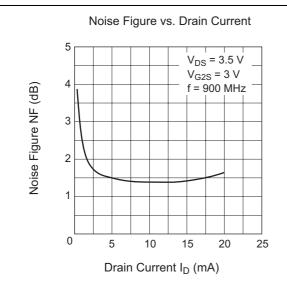
## **Electrical Characteristics**

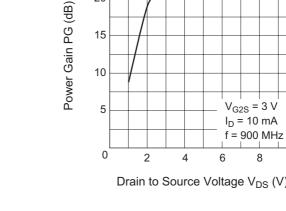
						$(Ta = 25^{\circ}C)$
Item	Symbol	Min	Тур	Max	Unit	Test conditions
Drain to source breakdown voltage	V <sub>(BR)DSS</sub>	6	_	_	V	$I_D = 200 \ \mu A, \ V_{G1S} = V_{G2S} = 0$
Gate1 to source breakdown voltage	V <sub>(BR)G1SS</sub>	±6	_	_	V	$I_{G1} = \pm 10 \ \mu A, \ V_{G2S} = V_{DS} = 0$
Gate2 to source breakdown	V <sub>(BR)G2SS</sub>	±6	_	_	V	$I_{G2} = \pm 10 \ \mu A, \ V_{G1S} = V_{DS} = 0$
voltage						
Gate1 to source cutoff current	I <sub>G1SS</sub>		_	±100	nA	$V_{G1S} = \pm 5 V, V_{G2S} = V_{DS} = 0$
Gate2 to source cutoff current	I <sub>G2SS</sub>		-	±100	nA	$V_{G2S} = \pm 5 V, V_{G1S} = V_{DS} = 0$
Gate1 to source cutoff voltage	V <sub>G1S(off)</sub>	0.5	0.7	1.0	V	$V_{DS}$ = 5 V, $V_{G2S}$ = 3 V, $I_D$ = 100 $\mu$ A
Gate2 to source cutoff voltage	V <sub>G2S(off)</sub>	0.5	0.7	1.0	V	$V_{DS} = 5 \text{ V}, V_{G1S} = 3 \text{ V}, I_D = 100 \ \mu\text{A}$
Drain current	I <sub>DS(op)</sub>	0.5	4	10	mA	$V_{DS} = 3.5 \text{ V}, V_{G1S} = 1.1 \text{ V},$
						$V_{G2S} = 3 V$
Forward transfer admittance	y <sub>fs</sub>	18	24	32	mS	$V_{DS} = 3.5 \text{ V}, V_{G2S} = 3 \text{ V}$
						I <sub>D</sub> = 10 mA , f = 1 kHz
Input capacitance	Ciss	1.3	1.6	1.9	pF	$V_{DS} = 3.5V, V_{G2S} = 3V$
Output capacitance	Coss	0.9	1.2	1.5	pF	$I_D = 10 \text{mA}$ , f = 1MHz
Reverse transfer capacitance	Crss		0.019	0.03	pF	
Power gain	PG	18	21		dB	$V_{DS} = 3.5 \text{ V}, V_{G2S} = 3 \text{ V}$
Noise figure	NF		1.4	2.2	dB	$I_D = 10 \text{ mA}$ , f = 900 MHz







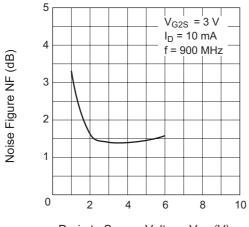




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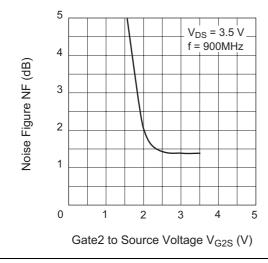
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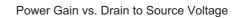
Noise Figure vs. Drain to Source Voltage



Drain to Source Voltage  $V_{DS}$  (V)

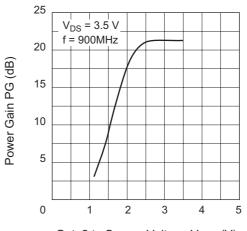
Noise Figure vs. Gate2 to Source Voltage



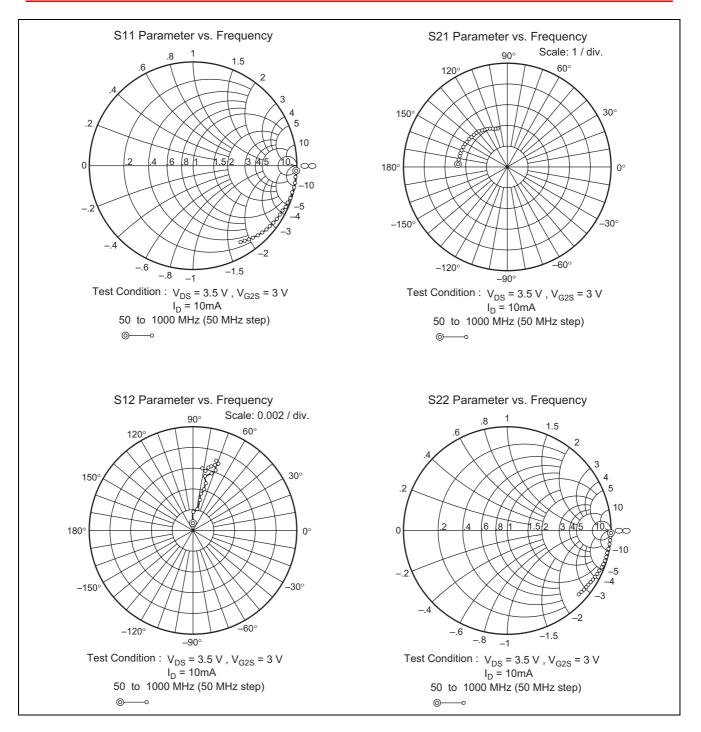


8 10 Drain to Source Voltage V<sub>DS</sub> (V)

Power Gain vs. Gate2 to Source Voltage



Gate2 to Source Voltage  $V_{G2S}$  (V)



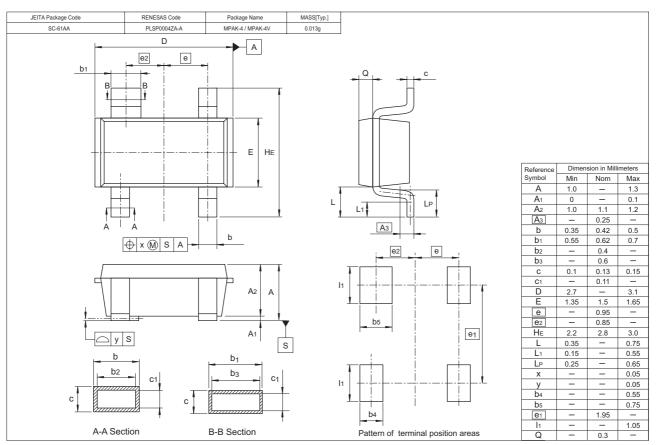
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## **S** Parameter

Freq.	S	11	S	21	S	12	S	22
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
50	1.000	-2.8	2.41	176.3	0.00068	89.1	0.999	-2.2
100	0.998	-5.8	2.41	171.9	0.00176	88.5	0.996	-4.5
150	0.997	-9.1	2.39	167.6	0.00223	80.7	0.996	-6.7
200	0.994	-12.2	2.38	163.7	0.00303	76.6	0.994	-8.7
250	0.994	-15.1	2.37	159.8	0.00365	79.1	0.991	-11.0
300	0.986	-18.5	2.35	155.5	0.00414	75.4	0.988	-13.2
350	0.978	-21.3	2.30	151.4	0.00484	75.0	0.983	-15.3
400	0.972	-24.1	2.28	147.6	0.00533	78.0	0.980	-17.4
450	0.969	-27.0	2.26	143.6	0.00588	71.6	0.976	-19.6
500	0.954	-29.7	2.23	140.0	0.00617	69.5	0.971	-21.7
550	0.955	-32.8	2.19	135.9	0.00666	71.5	0.966	-23.7
600	0.941	-35.7	2.17	132.2	0.00672	70.6	0.960	-25.6
650	0.932	-38.3	2.14	128.6	0.00694	69.0	0.955	-27.8
700	0.924	-41.3	2.09	125.0	0.00709	71.4	0.948	-29.9
750	0.919	-44.1	2.07	121.5	0.00689	69.0	0.942	-31.8
800	0.905	-46.9	2.03	117.9	0.00699	68.9	0.937	-33.8
850	0.896	-49.2	2.00	114.7	0.00644	74.2	0.930	-35.8
900	0.884	-52.4	1.96	110.4	0.00633	75.5	0.923	-37.6
950	0.880	-54.7	1.93	107.1	0.00585	77.8	0.917	-39.8
1000	0.866	-57.7	1.89	103.8	0.00605	82.1	0.910	-41.9



## **Package Dimensions**



### **Ordering Information**

Part Name	Quantity	Shipping Container
3SK319YB-TL-E	3000	φ 178 mm Reel, 8 mm Emboss Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.



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