



# 3SK318

Silicon N-Channel Dual Gate MOS FET  
UHF RF Amplifier

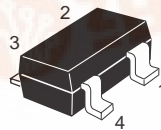
REJ03G0819-0200  
(Previous ADE-208-600)  
Rev.2.00  
Aug.10.2005

## 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: PTSP0004ZA-A  
(Package name: CMPAK-4)



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

Note: Marking is "YB-".

## Absolute Maximum Ratings

(Ta = 25°C)

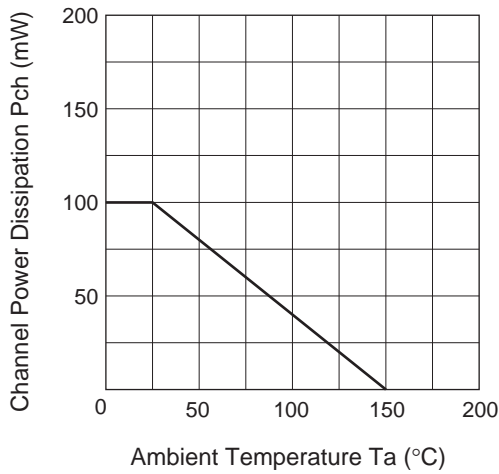
Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DS}$	6	V
Gate1 to source voltage	$V_{G1S}$	±6	V
Gate2 to source voltage	$V_{G2S}$	±6	V
Drain current	$I_D$	20	mA
Channel power dissipation	Pch	100	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

## Electrical Characteristics

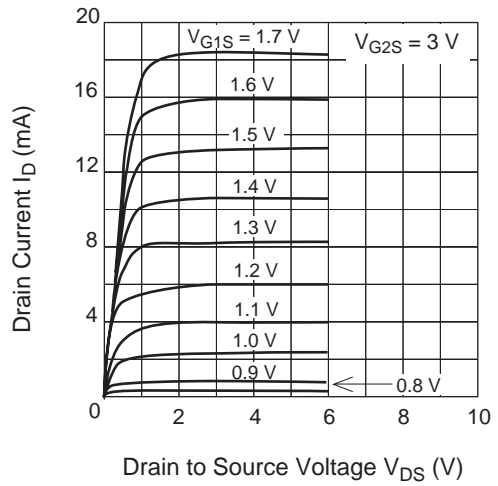
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	6	—	—	V	$I_D = 200 \mu A, V_{G1S} = V_{G2S} = 0$
Gate1 to source breakdown voltage	$V_{(BR)G1SS}$	±6	—	—	V	$I_{G1} = \pm 10 \mu A, V_{G2S} = V_{DS} = 0$
Gate2 to source breakdown voltage	$V_{(BR)G2SS}$	±6	—	—	V	$I_{G2} = \pm 10 \mu A, V_{G1S} = V_{DS} = 0$
Gate1 to source cutoff current	$I_{G1SS}$	—	—	±100	nA	$V_{G1S} = \pm 5 V, V_{G2S} = V_{DS} = 0$
Gate2 to source cutoff current	$I_{G2SS}$	—	—	±100	nA	$V_{G2S} = \pm 5 V, V_{G1S} = V_{DS} = 0$
Gate1 to source cutoff voltage	$V_{G1S(off)}$	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	$V_{G2S(off)}$	0.5	0.7	1.0	V	$V_{DS} = 5 V, V_{G1S} = 3 V$ $I_D = 100 \mu A$
Drain current	$I_{DS(op)}$	0.5	4	10	mA	$V_{DS} = 3.5 V, V_{G1S} = 1.1 V$ $V_{G2S} = 3 V$
Forward transfer admittance	$ y_{fs} $	18	24	32	mS	$V_{DS} = 3.5 V, V_{G2S} = 3 V$ $I_D = 10 mA, f = 1 kHz$
Input capacitance	$C_{iss}$	1.3	1.6	1.9	pF	$V_{DS} = 3.5 V, V_{G2S} = 3 V$ $I_D = 10 mA, f = 1 MHz$
Output capacitance	$C_{oss}$	0.9	1.2	1.5	pF	
Reverse transfer capacitance	$C_{rss}$	—	0.019	0.03	pF	
Power gain	PG	18	21	—	dB	$V_{DS} = 3.5 V, V_{G2S} = 3 V$
Noise figure	NF	—	1.4	2.2	dB	$I_D = 10 mA, f = 900 MHz$

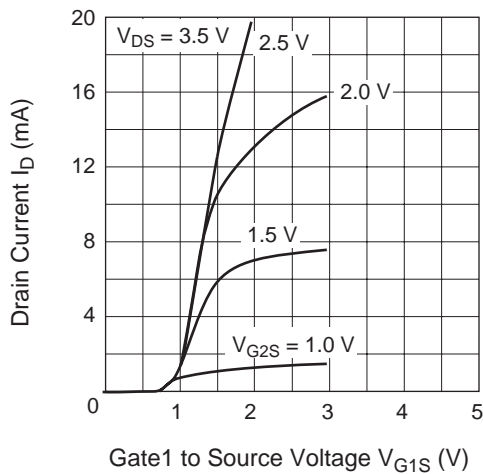
Maximum Channel Power Dissipation Curve



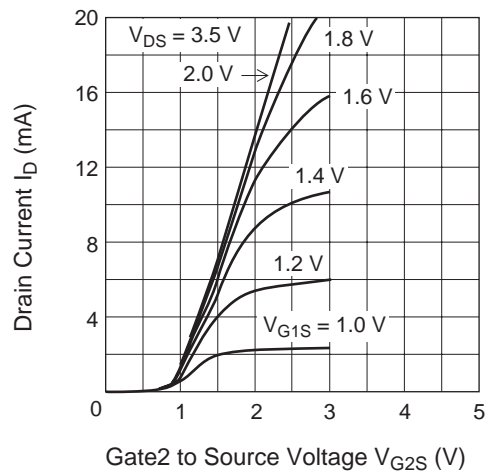
Typical Output Characteristics



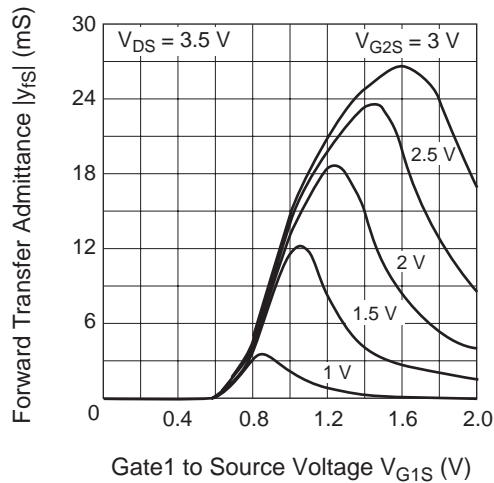
Drain Current vs. Gate1 to Source Voltage



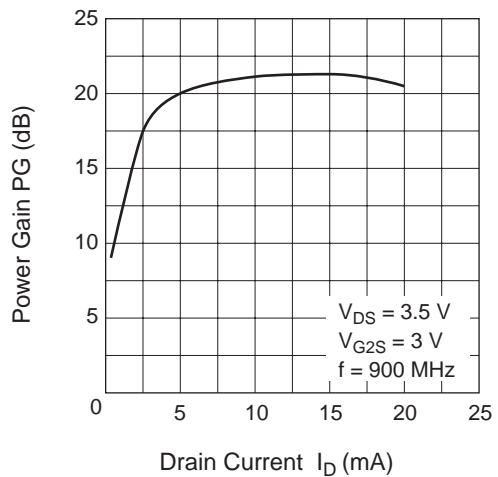
Drain Current vs. Gate2 to Source Voltage



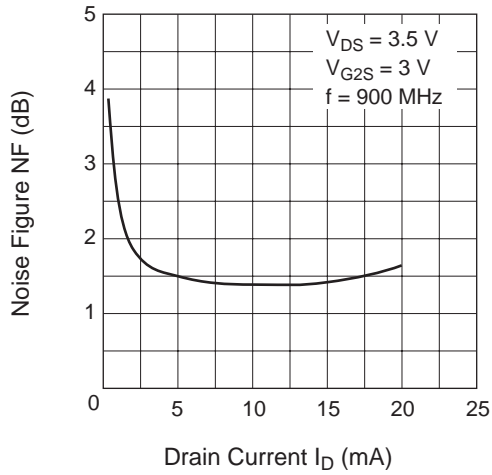
Forward Transfer Admittance vs. Gate1 Voltage



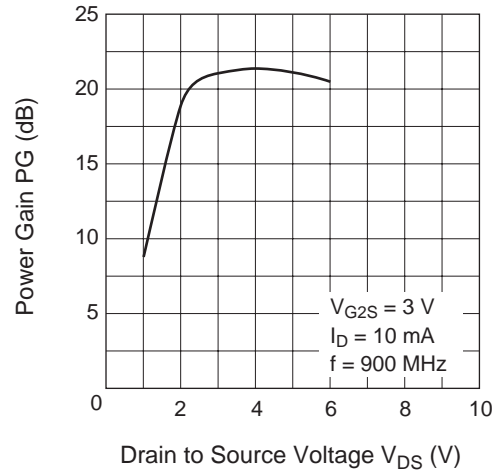
Power Gain vs. Drain Current



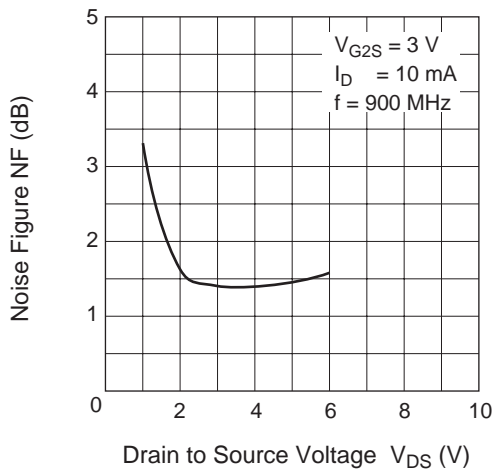
Noise Figure vs. Drain Current



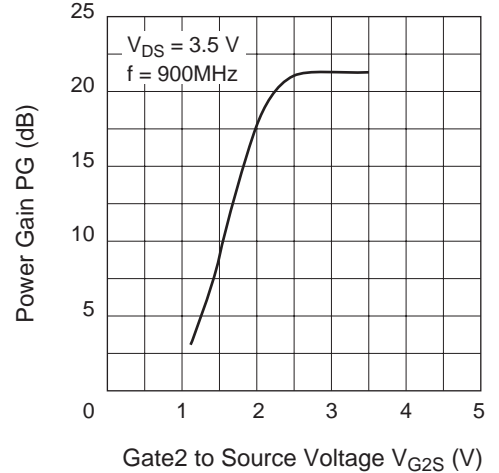
Power Gain vs. Drain to Source Voltage



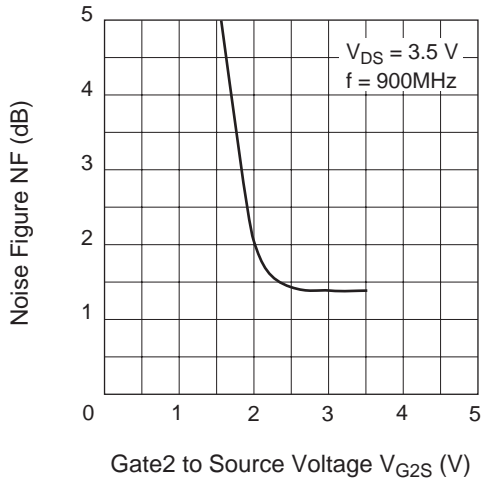
Noise Figure vs. Drain to Source Voltage

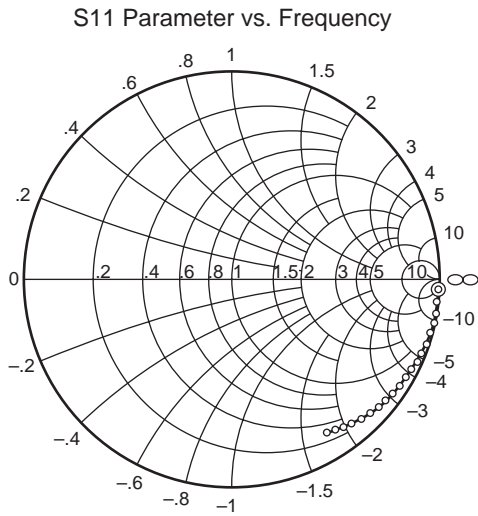


Power Gain vs. Gate2 to Source Voltage

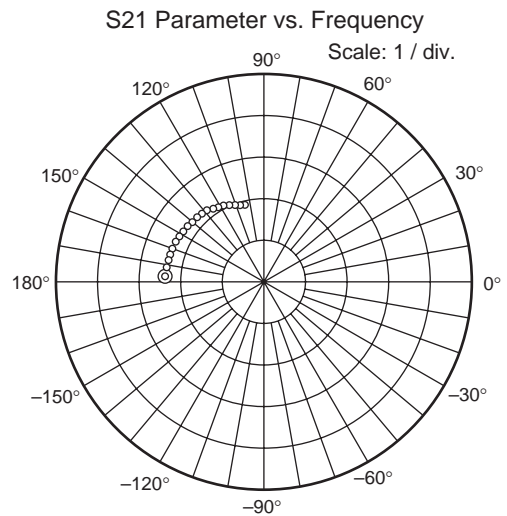


Noise Figure vs. Gate2 to Source Voltage

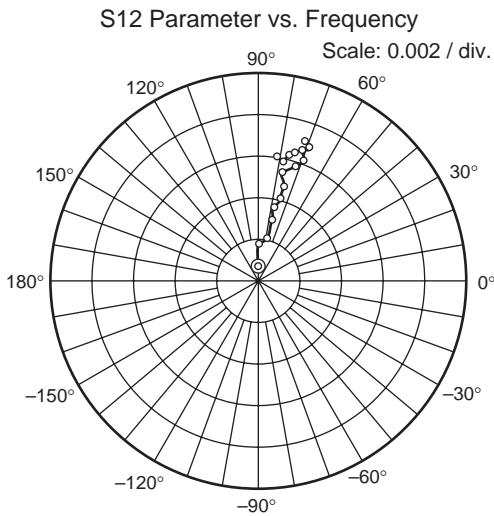




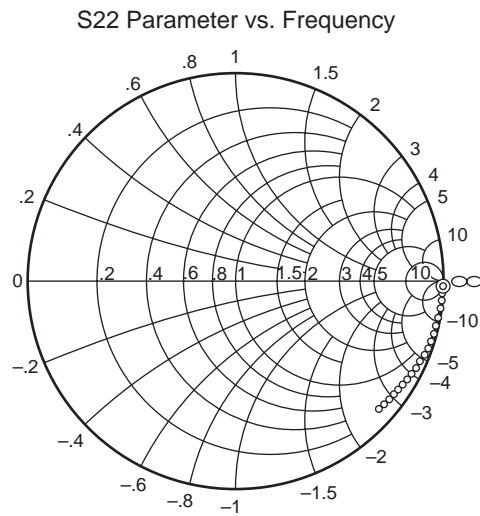
Test Condition :  $V_{DS} = 3.5\text{ V}$ ,  $V_{GS} = 3\text{ V}$   
 $I_D = 10\text{ mA}$   
 50 to 1000 MHz (50 MHz step)



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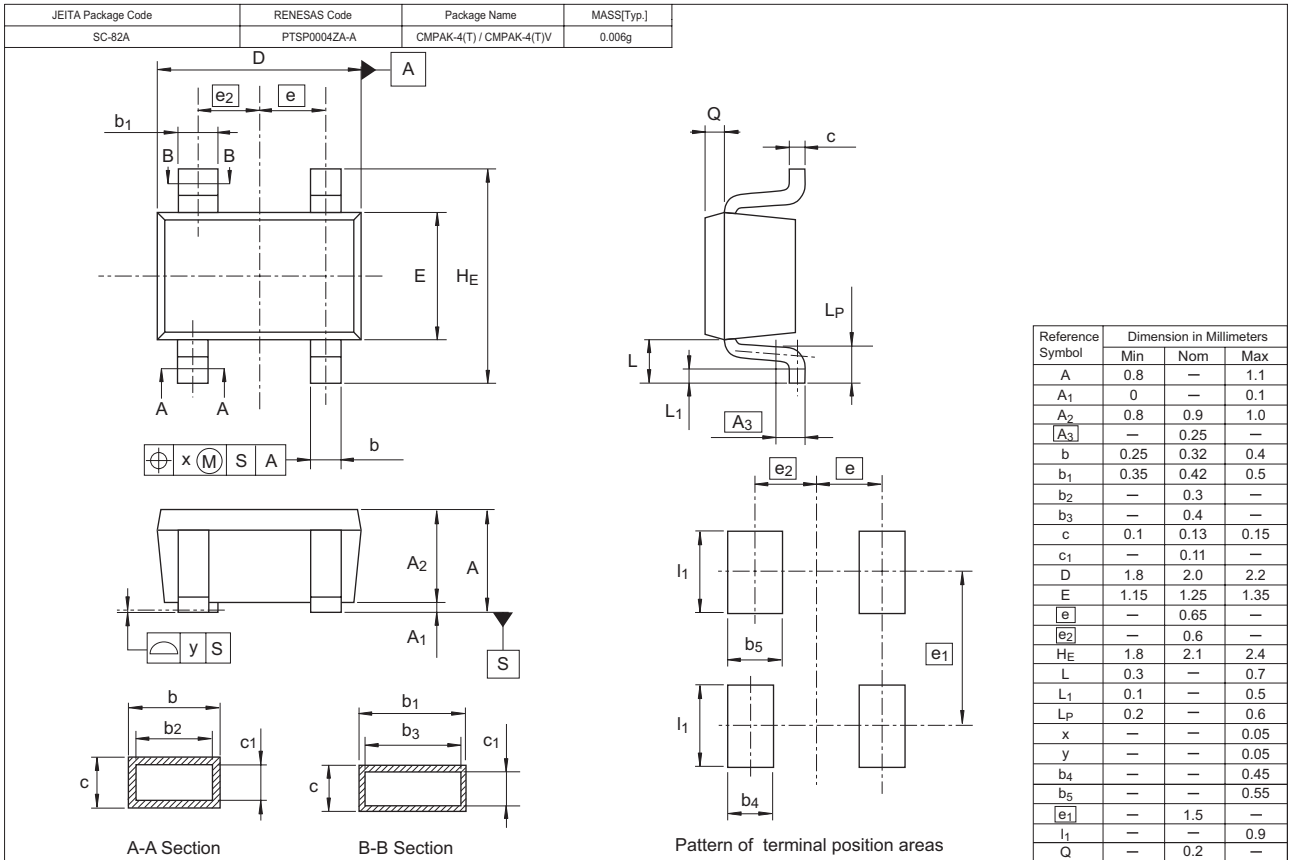


## S Parameter

 $(V_{DS} = 3.5V, V_{GS} = 3V, I_D = 10mA, Z_0 = 50\Omega)$ 

Freq. (MHz)	S11		S21		S12		S22	
	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
3SK318YB-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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**Renesas Technology America, Inc.**

450 Holger Way, San Jose, CA 95134-1368, U.S.A  
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

**Renesas Technology Europe Limited**

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.  
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

**Renesas Technology Hong Kong Ltd.**

7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong  
Tel: <852> 2265-6688, Fax: <852> 2730-6071

**Renesas Technology Taiwan Co., Ltd.**

10th Floor, No.99, Fushing North Road, Taipei, Taiwan  
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

**Renesas Technology (Shanghai) Co., Ltd.**

Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China  
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

**Renesas Technology Singapore Pte. Ltd.**

1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632  
Tel: <65> 6213-0200, Fax: <65> 6278-8001

**Renesas Technology Korea Co., Ltd.**

Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea  
Tel: <82> 2-796-3115, Fax: <82> 2-796-2145

**Renesas Technology Malaysia Sdn. Bhd.**

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel: <603> 7955-9390, Fax: <603> 7955-9510