To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Not recommend for new design

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Not recommend for new design

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

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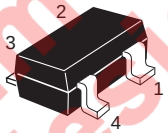
Outline

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

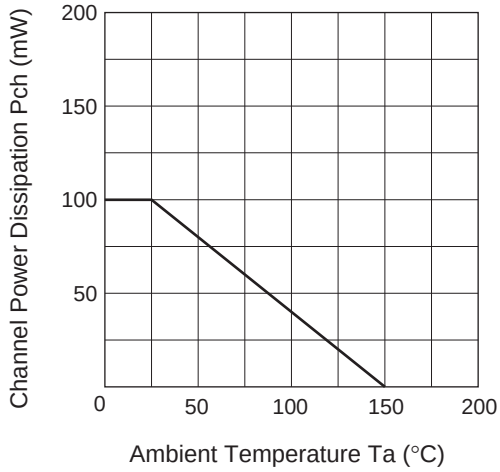
Electrical Characteristics

(Ta = 25°C)

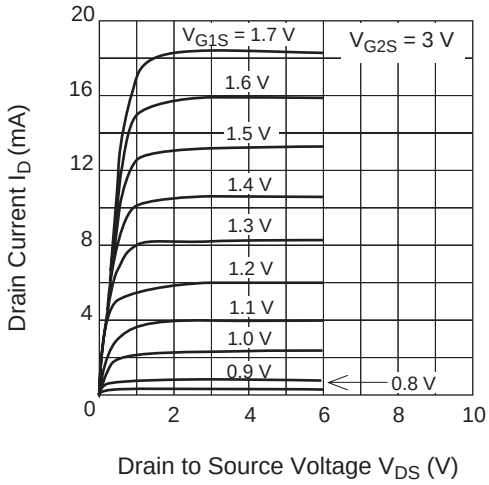
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	6	—	—	V	I_D = 200 µA, V_{G1S} = V_{G2S} = 0
Gate1 to source breakdown voltage	$V_{(BR)G1SS}$	±6	—	—	V	I_{G1} = ±10 µA, V_{G2S} = V_{DS} = 0
Gate2 to source breakdown voltage	$V_{(BR)G2SS}$	±6	—	—	V	I_{G2} = ±10 µA, V_{G1S} = V_{DS} = 0
Gate1 to source cutoff current	I_{G1SS}	—	—	±100	nA	V_{G1S} = ±5 V, V_{G2S} = V_{DS} = 0
Gate2 to source cutoff current	I_{G2SS}	—	—	±100	nA	V_{G2S} = ±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 = 100µA
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 µA
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 I_D = 10 mA , f = 900 MHz
Noise figure	NF	—	1.4	2.2	dB	

Not recommend for new design

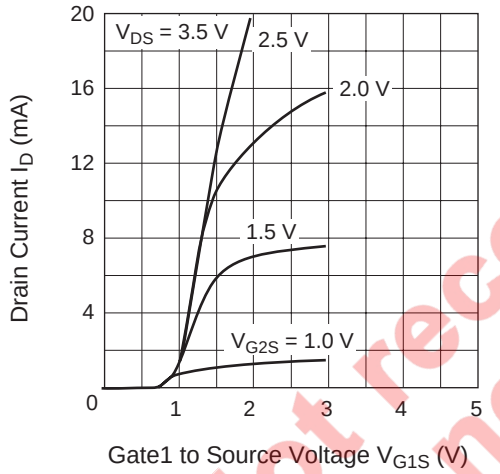
Maximum Channel Power Dissipation Curve



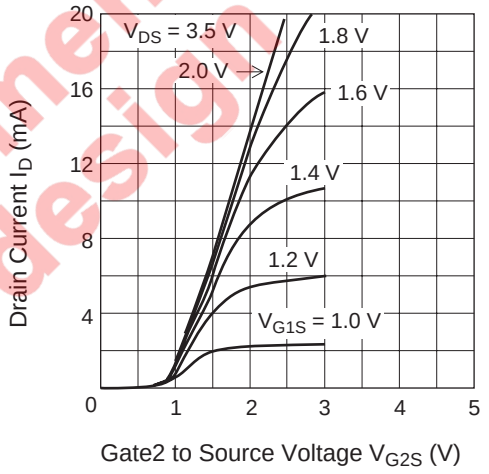
Typical Output Characteristics



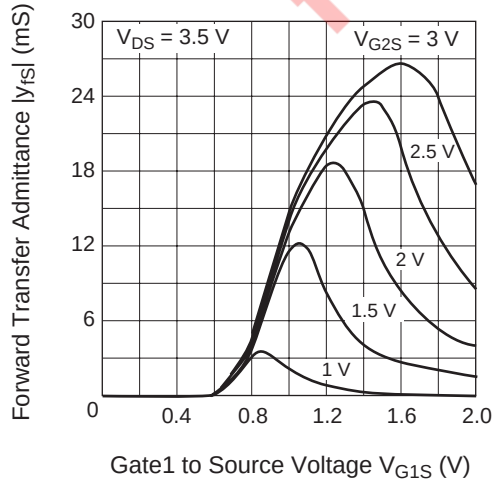
Drain Current vs. Gate1 to Source Voltage



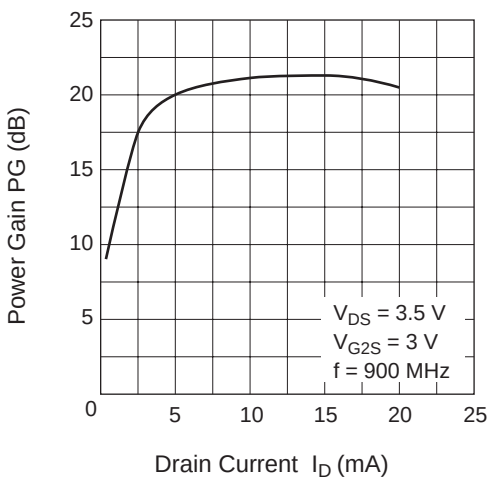
Drain Current vs. Gate2 to Source Voltage



Forward Transfer Admittance vs. Gate1 Voltage



Power Gain vs. Drain Current



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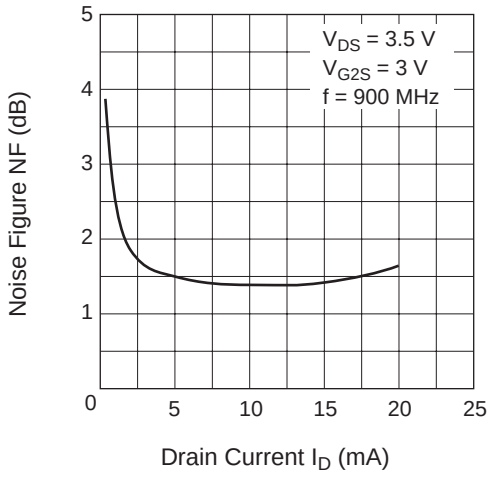
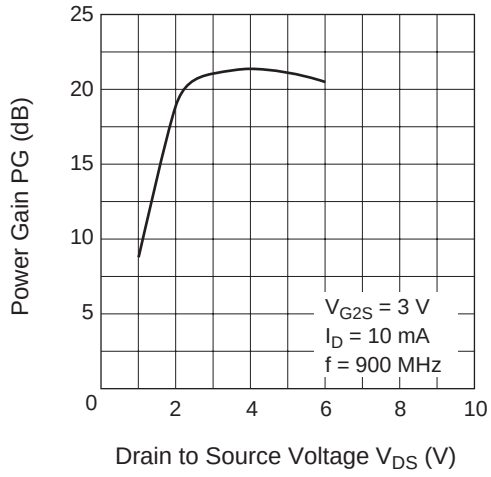
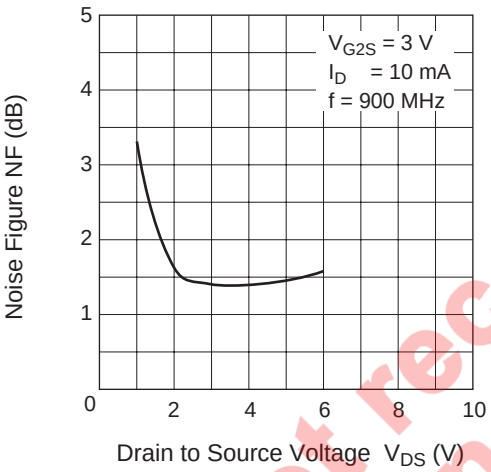
Noise Figure vs. Drain Current



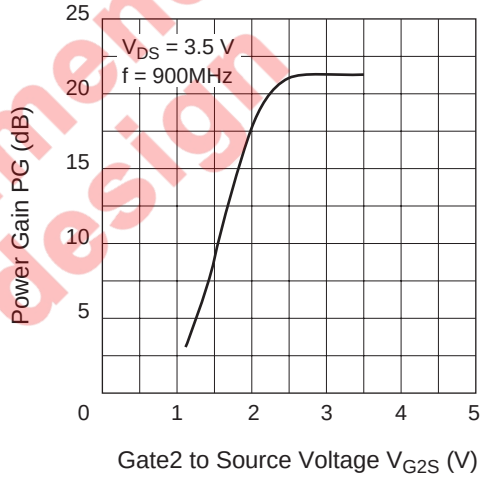
Power Gain vs. Drain to Source Voltage



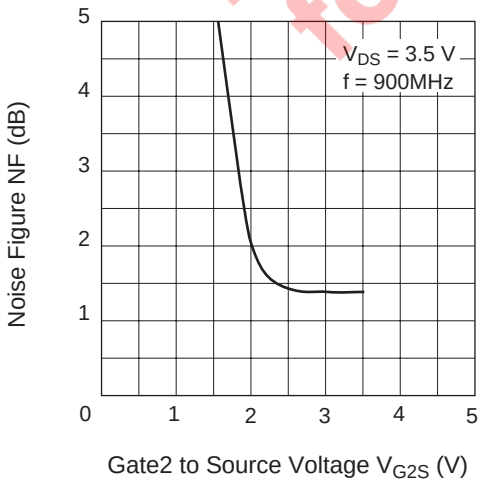
Noise Figure vs. Drain to Source Voltage



Power Gain vs. Gate2 to Source Voltage



Noise Figure vs. Gate2 to Source Voltage



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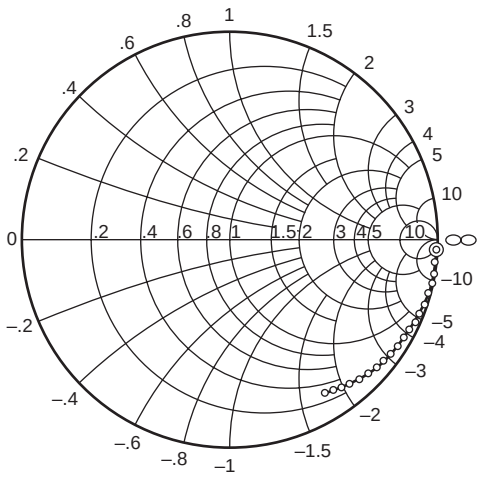
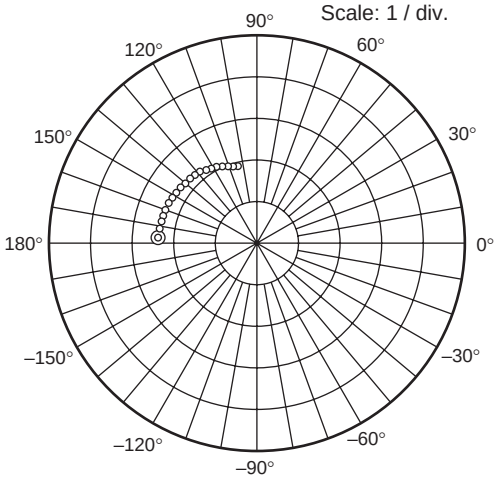
S11 Parameter vs. Frequency



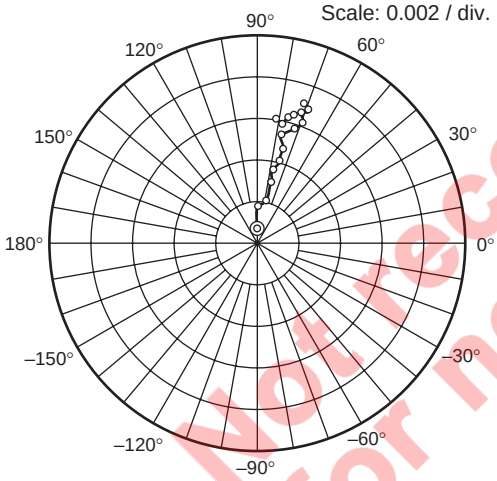
Test Condition : V_{DS} = 3.5 V , V_{G2S} = 3 V
I_D = 10mA
50 to 1000 MHz (50 MHz step)

S21 Parameter vs. Frequency



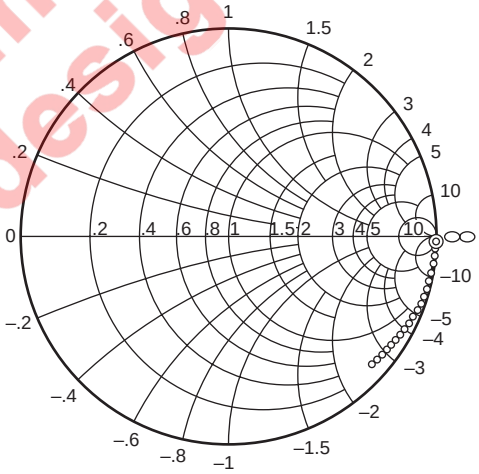
Test Condition : V_{DS} = 3.5 V , V_{G2S} = 3 V
I_D = 10mA
50 to 1000 MHz (50 MHz step)

S12 Parameter vs. Frequency



Test Condition : V_{DS} = 3.5 V , V_{G2S} = 3 V
I_D = 10mA
50 to 1000 MHz (50 MHz step)

S22 Parameter vs. Frequency



Test Condition : V_{DS} = 3.5 V , V_{G2S} = 3 V
I_D = 10mA
50 to 1000 MHz (50 MHz step)

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S Parameter

(V_{DS} = 3.5V, V_{G2S} = 3V, I_D = 10mA, Zo = 50Ω)

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

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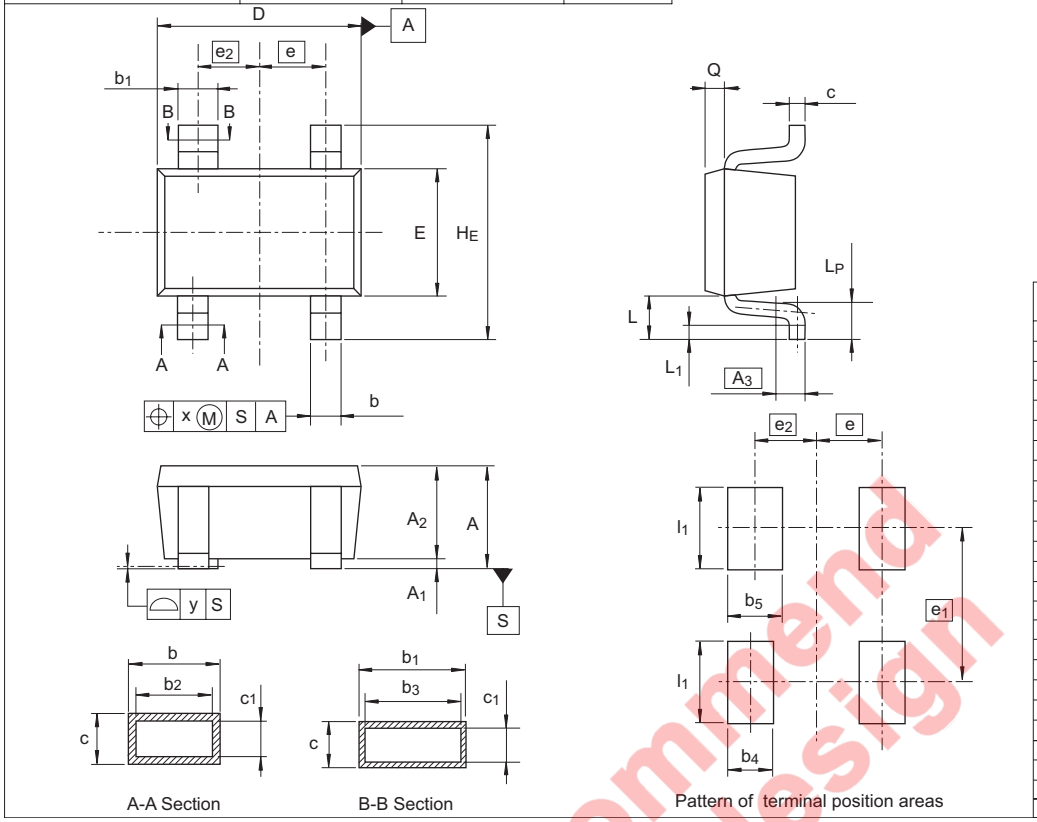
Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-82A	PTSP0004ZA-A	CMPAK-4(T) / CMPAK-4(T)V	0.006g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.8	—	1.1
A_1	0	—	0.1
A_2	0.8	0.9	1.0
A_3	—	0.25	—
b	0.25	0.32	0.4
b_1	0.35	0.42	0.5
b_2	—	0.3	—
b_3	—	0.4	—
c	0.1	0.13	0.15
c_1	—	0.11	—
D	1.8	2.0	2.2
E	1.15	1.25	1.35
e	—	0.65	—
e_2	—	0.6	—
H_E	1.8	2.1	2.4
L	0.3	—	0.7
L_1	0.1	—	0.5
L_P	0.2	—	0.6
x	—	—	0.05
y	—	—	0.05
b_4	—	—	0.45
b_5	—	—	0.55
e_1	—	1.5	—
l_1	—	—	0.9
Q	—	0.2	—

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Part Name	Quantity	Shipping Container
3SK318YB-TL-E	3000	ϕ 178 mm Reel, 8 mm Emboss Taping

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