BB301M

Built in Biasing Circuit MOS FET IC
VHF RF Amplifier

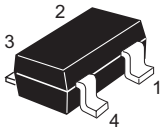
REJ03G0824-0300
(Previous ADE-208-506A)
Rev.3.00
Aug.10.2005

Features

- Built in Biasing Circuit; To reduce using parts cost & PC board space.
- Low noise characteristics;
  (NF = 1.3 dB typ. at f = 200 MHz)
- Withstanding to ESD;
  Built in ESD absorbing diode. Withstand up to 200V at C=200pF, Rs=0 conditions.
- Provide mini mold packages; MPAK-4(SOT-143Rmod)

Outline

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



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

Notes: 1. Marking is “AW–”.
2. BB301M is individual type number of RENESAS BBFET.

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 –0	V
Gate2 to source voltage	V_{G2S}	±6	V
Drain current	I_D	25	mA
Channel power dissipation	Pch	150	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

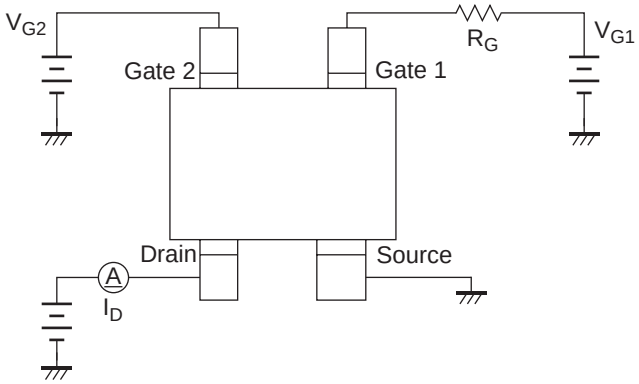
Electrical Characteristics

(Ta = 25°C)

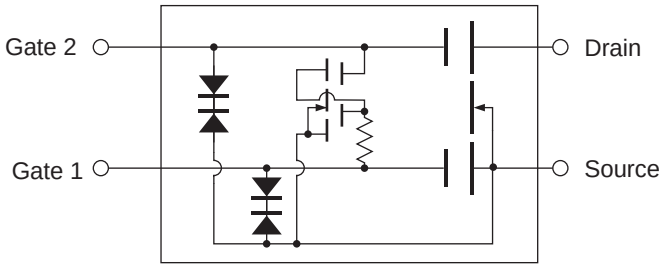
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	6	—	—	V	I_D = 200 µA, V_{G1S} = V_{G2S} = 0
Gate1 to source breakdown voltage	$V_{(BR)G1SS}$	+6	—	—	V	I_{G1} = +10 µA, V_{G2S} = V_{DS} = 0
Gate2 to source breakdown voltage	$V_{(BR)G2SS}$	±6	—	—	V	I_{G2} = ±10 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	$V_{G1S(off)}$	0.4	—	1.0	V	V_{DS} = 5 V, V_{G2S} = 4 V I_D = 100 µA
Gate2 to source cutoff voltage	$V_{G2S(off)}$	0.4	—	1.0	V	V_{DS} = 5 V, V_{G1S} = 5 V I_D = 100 µA
Drain current	$I_{D(op)}$	10	15	20	mA	V_{DS} = 5 V, V_{G1} = 5 V V_{G2S} = 4 V, R_G = 100 kΩ
Forward transfer admittance	$\|y_{fs}\|$	15	20	—	mS	V_{DS} = 5 V, V_{G1} = 5 V, V_{G2S} =4 V R_G = 100 kΩ, f = 1 kHz
Input capacitance	Ciss	2.2	3.0	3.9	pF	V_{DS} = 5 V, V_{G1} = 5 V
Output capacitance	Coss	0.9	1.2	1.6	pF	V_{G2S} =4 V, R_G = 100 kΩ
Reverse transfer capacitance	Crss	—	0.018	0.04	pF	f = 1 MHz
Power gain	PG	22	26	—	dB	V_{DS} = 5 V, V_{G1} = 5 V, V_{G2S} =4 V
Noise figure	NF	—	1.3	1.9	dB	R_G = 100 kΩ, f = 200 MHz

Main Characteristics

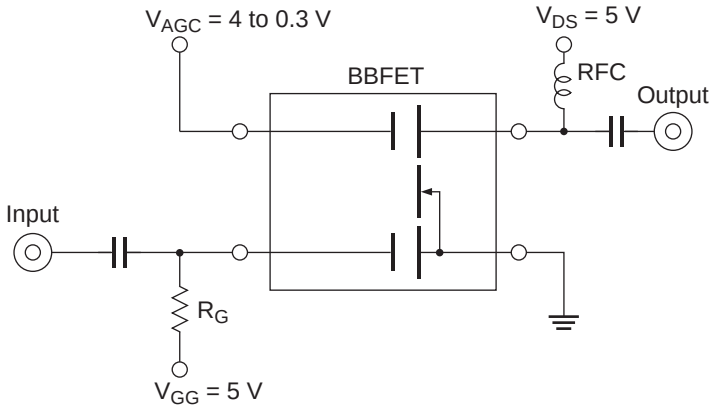
Test Circuit for Operating Items ($I_{D(op)}$, |yfs|, Ciss, Coss, Crss, NF, PG)



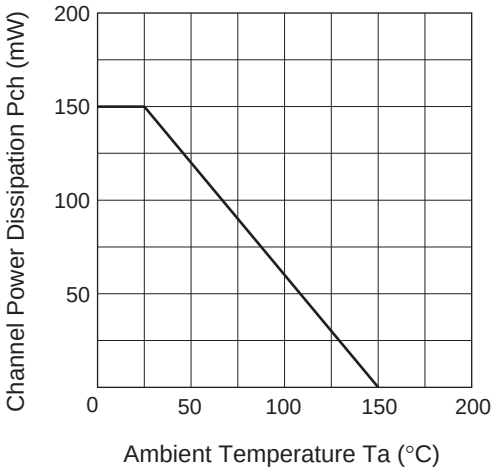
Equivalent Circuit



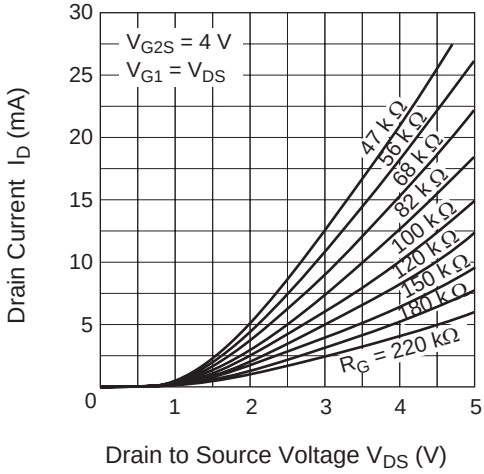
Application Circuit



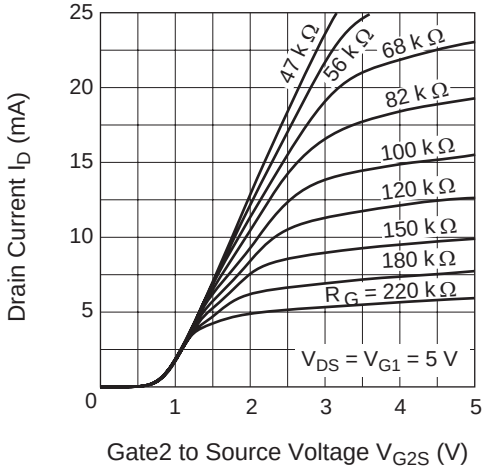
Maximum Channel Power Dissipation Curve



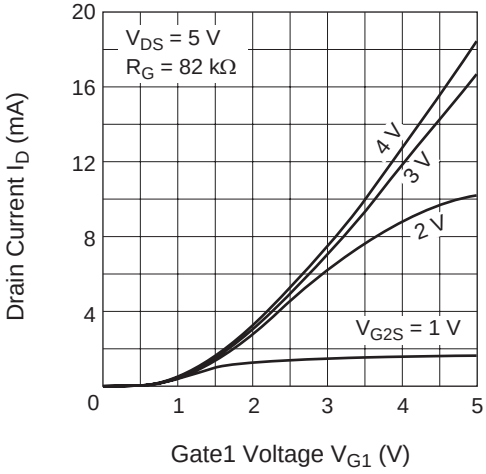
Typical Output Characteristics



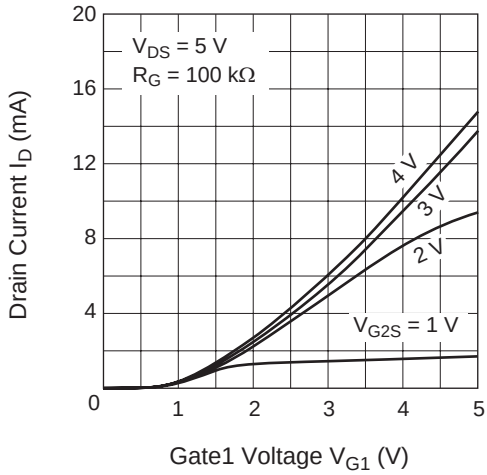
Drain Current vs. Gate2 to Source Voltage



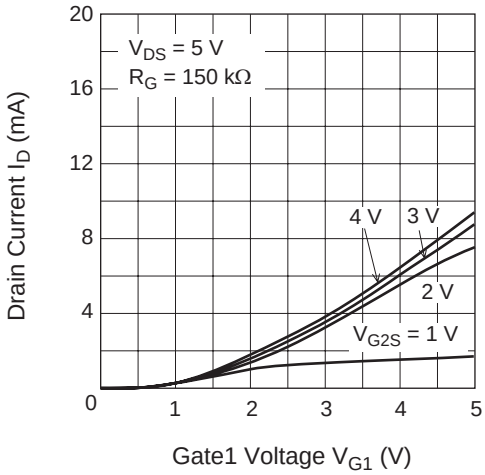
Drain Current vs. Gate1 Voltage



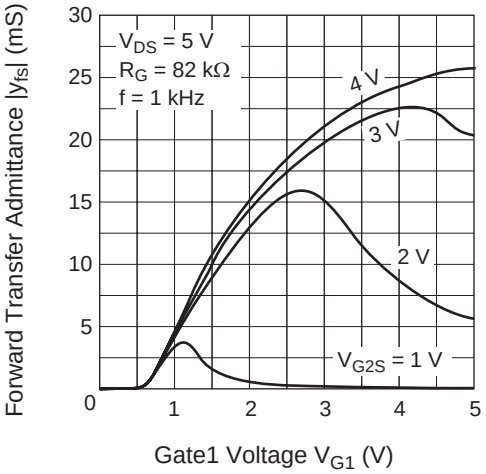
Drain Current vs. Gate1 Voltege



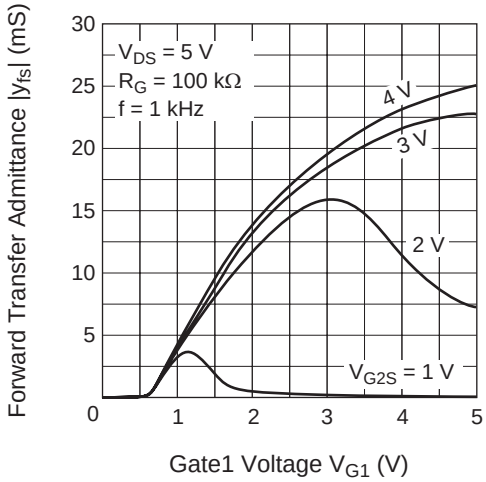
Drain Current vs. Gate1 Voltege



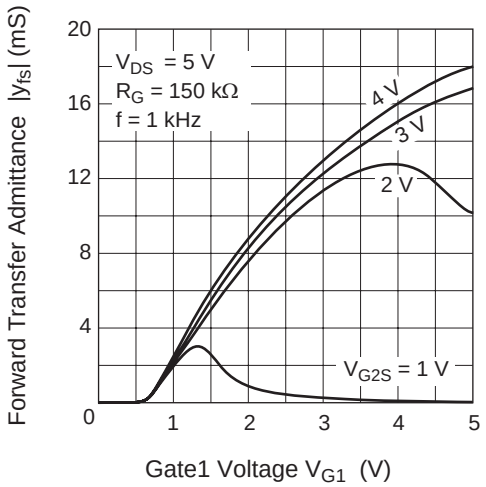
Forward Transfer Admittance vs. Gate1 Voltage



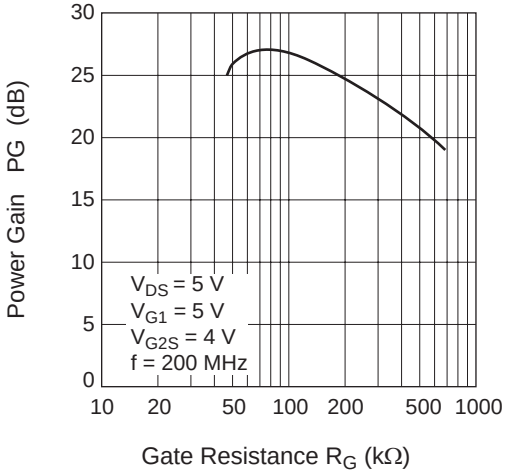
Forward Transfer Admittance vs. Gate1 Voltage



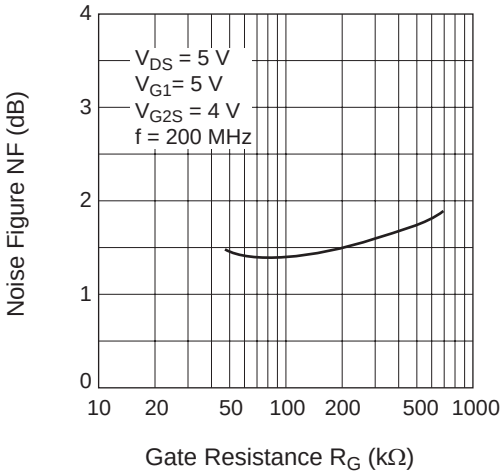
Forward Transfer Admittance vs. Gate1 Voltage



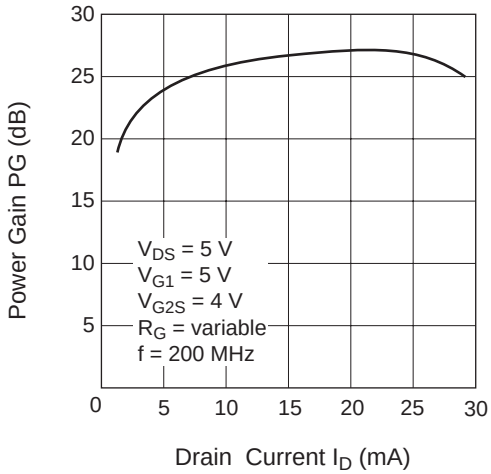
Power Gain vs. Gate Resistance



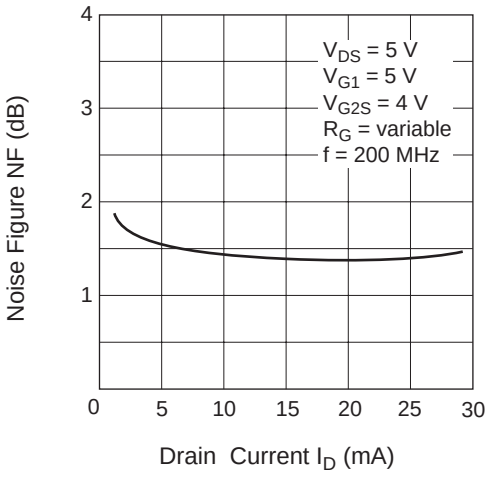
Noise Figure vs. Gate Resistance



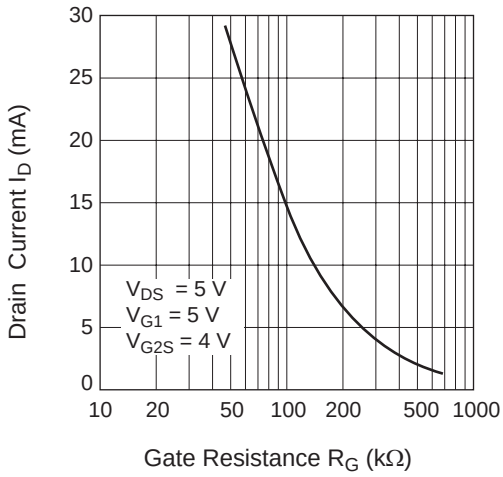
Power Gain vs. Drain Current



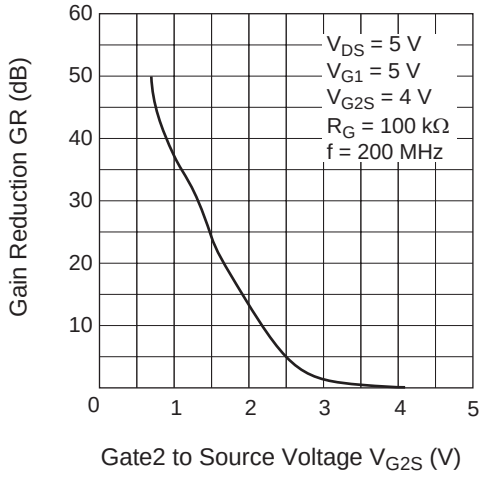
Noise Figure vs. Drain Current



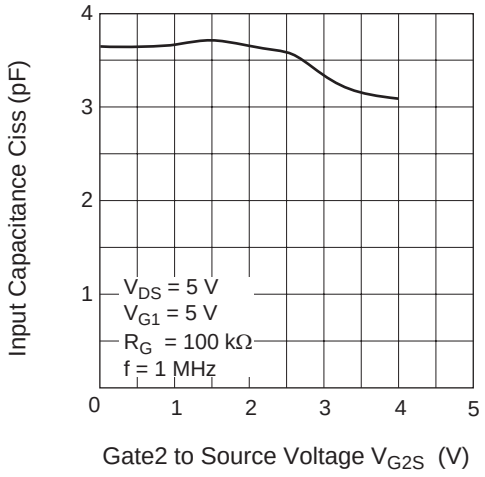
Drain Current vs. Gate Resistance



Gain Reduction vs.
Gate2 to Source Voltage

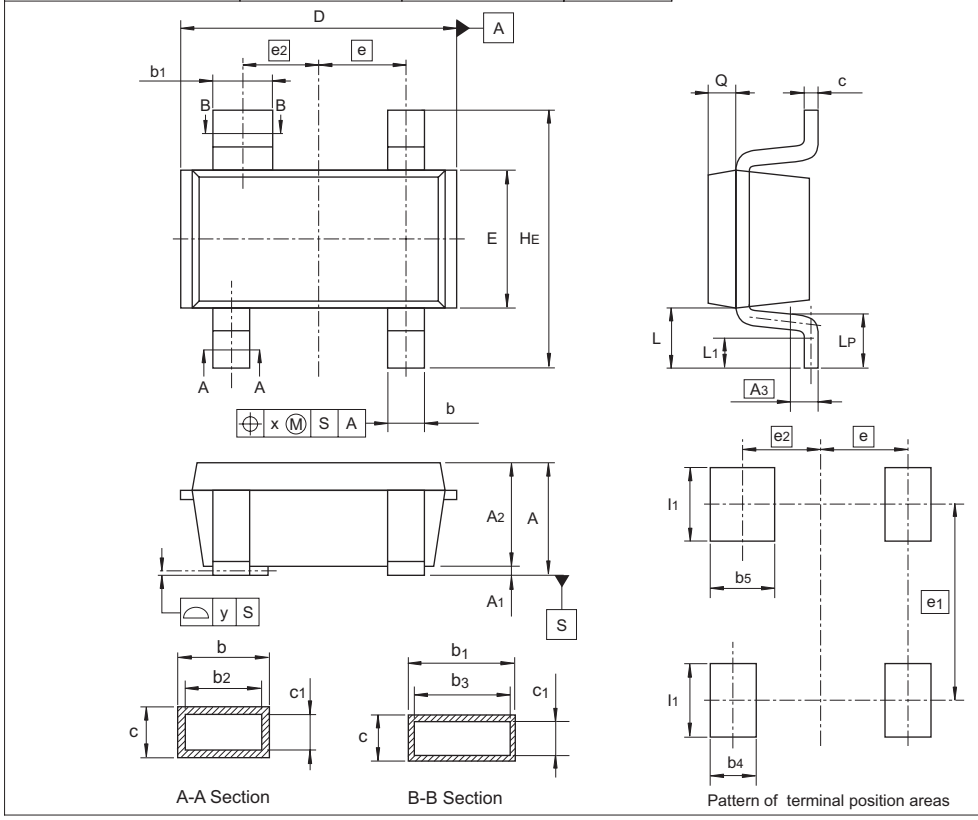


Input Capacitance vs.
Gate2 to Source Voltage



Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-61AA	PLSP0004ZA-A	MPAK-4 / MPAK-4V	0.013g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	1.0	–	1.3
A_1	0	–	0.1
A_2	1.0	1.1	1.2
A_3	–	0.25	–
b	0.35	0.42	0.5
b_1	0.55	0.62	0.7
b_2	–	0.4	–
b_3	–	0.6	–
c	0.1	0.13	0.15
c_1	–	0.11	–
D	2.7	–	3.1
E	1.35	1.5	1.65
e	–	0.95	–
e_2	–	0.85	–
H_E	2.2	2.8	3.0
L	0.35	–	0.75
L_1	0.15	–	0.55
L_P	0.25	–	0.65
x	–	–	0.05
y	–	–	0.05
b_4	–	–	0.55
b_5	–	–	0.75
e_1	–	1.95	–
I_1	–	–	1.05
Q	–	0.3	–

Ordering Information

Part Name	Quantity	Shipping Container
BB301MAW-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 Europe Limited
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Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

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Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
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Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
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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
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