
BB301M

Build in Biasing Circuit MOS FET IC
VHF RF Amplifier

HITACHI

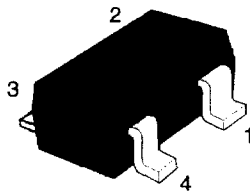
ADE-208-506
1st. Edition

Features

- Build 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; Build in ESD absorbing diode. Withstand up to 200 V at $C = 200$ pF, $R_s = 0$ conditions.

Outline

MPAK-4



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

BB301M

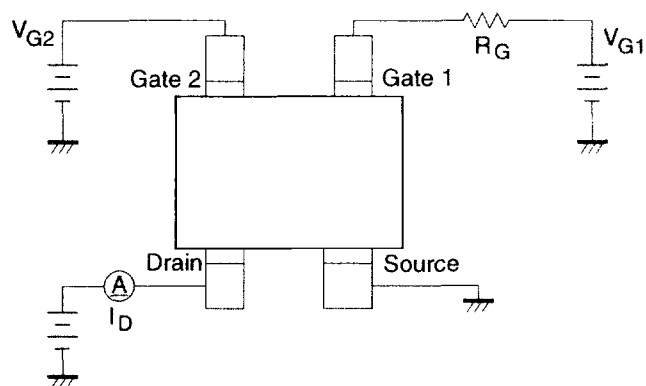
Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	6	V
Gate 1 to source voltage	V_{G1S}	+6 –0	V
Gate 2 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

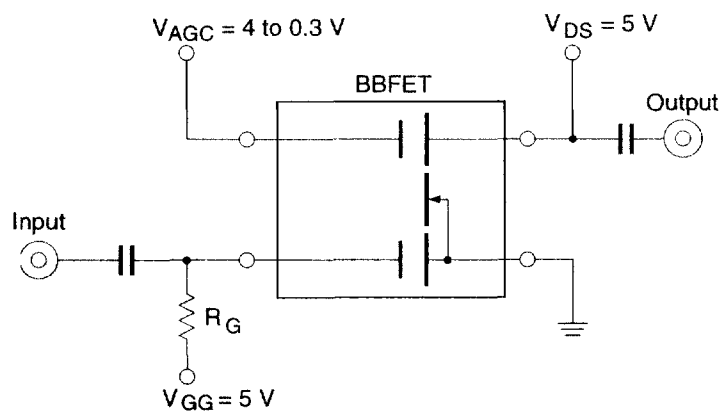
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	6	—	—	V	$I_D = 200 \mu A$ $V_{G1S} = V_{G2S} = 0$
Gate 1 to source breakdown voltage	$V_{(BR)G1SS}$	+6	—	—	V	$I_{G1} = +10 \mu A$ $V_{G2S} = V_{DS} = 0$
Gate 2 to source breakdown voltage	$V_{(BR)G2SS}$	±6	—	—	V	$I_{G2} = \pm 10 \mu A$ $V_{G1S} = V_{DS} = 0$
Gate 1 to source cutoff current	I_{G1SS}	—	—	+100	nA	$V_{G1S} = +5 V$ $V_{G2S} = V_{DS} = 0$
Gate 2 to source cutoff current	I_{G2SS}	—	—	±100	nA	$V_{G2S} = \pm 5 V$ $V_{G1S} = V_{DS} = 0$
Gate 1 to source cutoff voltage	$V_{G1S(off)}$	0.4	—	1.0	V	$V_{DS} = 5 V$, $V_{G2S} = 4 V$ $I_D = 100 \mu A$
Gate 2 to source cutoff voltage	$V_{G2S(off)}$	0.4	—	1.0	V	$V_{DS} = 5 V$, $V_{G1S} = 5 V$ $I_D = 100 \mu A$
Drain current	$I_{D(op)}$	10	15	20	mA	$V_{DS} = 5 V$, $V_{G1} = 5 V$ $V_{G2S} = 4 V$, $R_G = 100 k\Omega$
Forward transfer admittance	$ y_{fs} $	15	20	—	mS	$V_{DS} = 5 V$, $V_{G1} = 5 V$ $V_{G2S} = 4 V$ $R_G = 100 k\Omega$, $f = 1 kHz$
Input capacitance	C_{iss}	2.2	3.0	4.0	pF	$V_{DS} = 5 V$, $V_{G1} = 5 V$
Output capacitance	C_{oss}	0.9	1.2	1.6	pF	$V_{G2S} = 4 V$, $R_G = 100 k\Omega$
Reverse transfer capacitance	C_{rss}	—	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	$R_G = 100 k\Omega$, $f = 200 MHz$

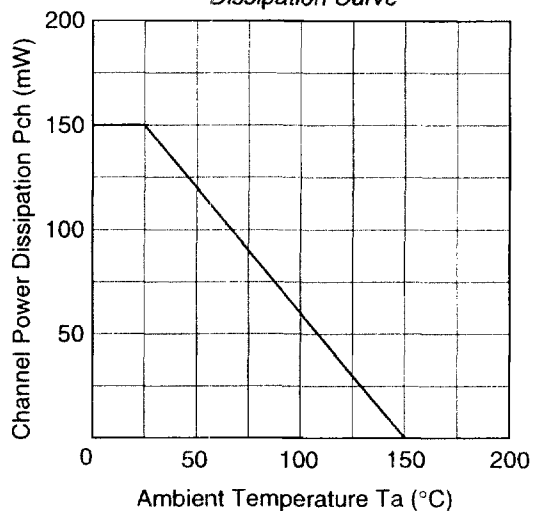
Note: Marking is "AW--".

Main CharacteristicsTest Circuit for Operating Items ($I_{D(op)}$, I_{yfs1} , C_{iss} , C_{oss} , C_{rss} , NF, PG)

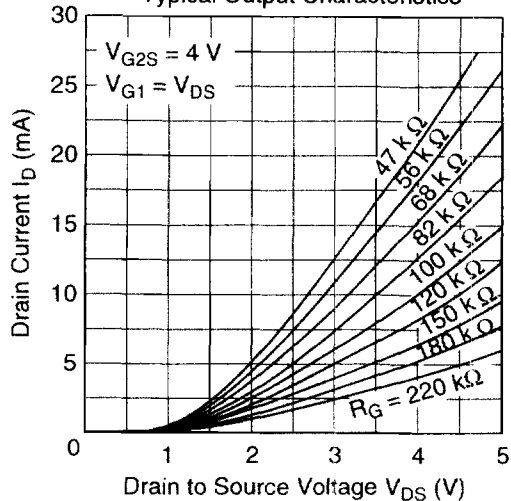
Application Circuit



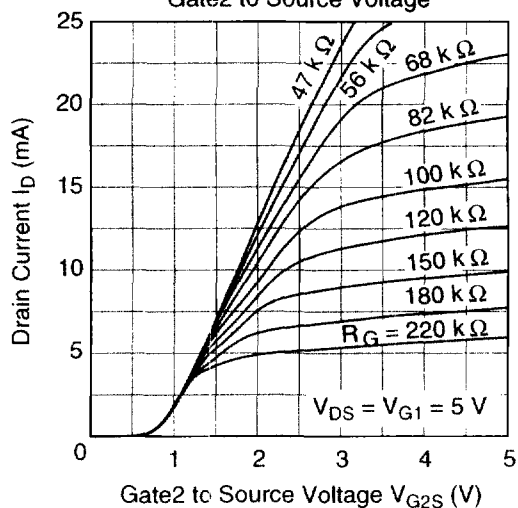
Maximum Channel Power
Dissipation Curve



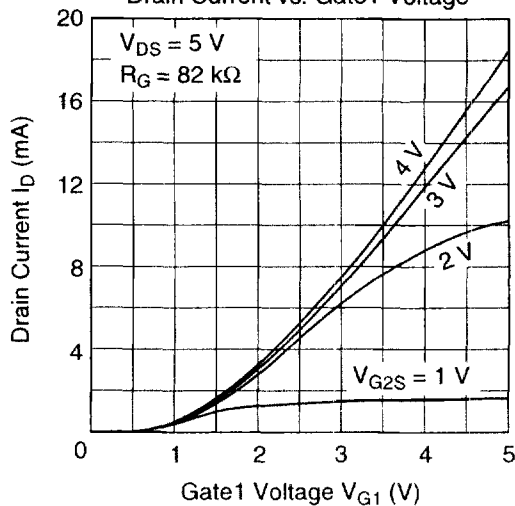
Typical Output Characteristics

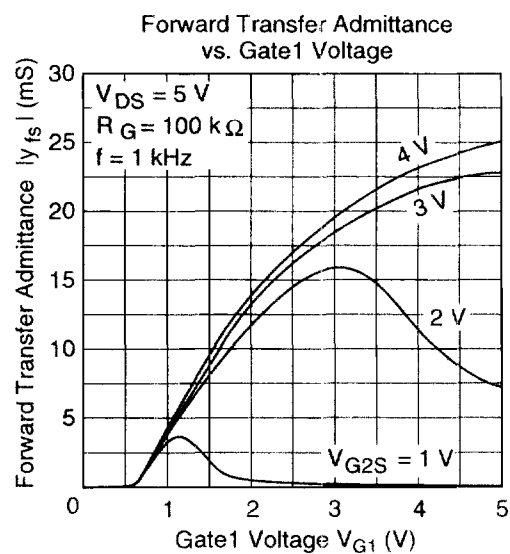
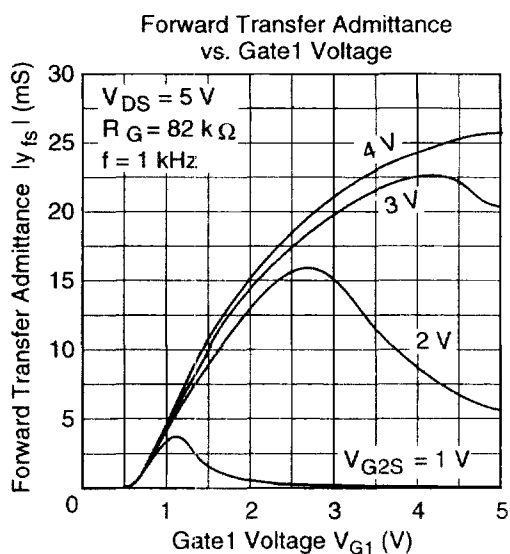
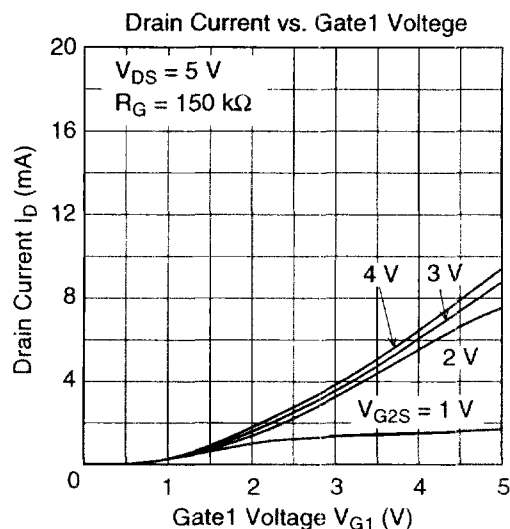
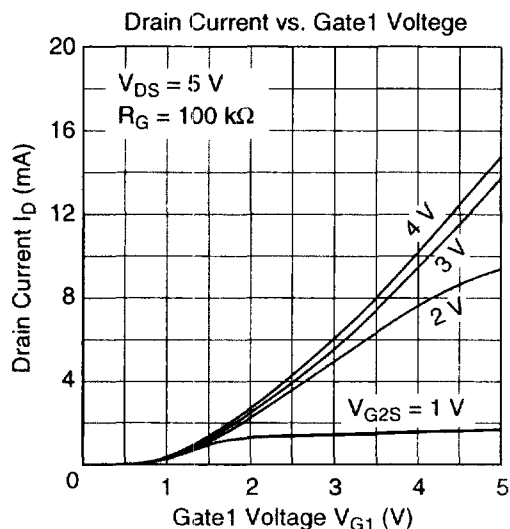


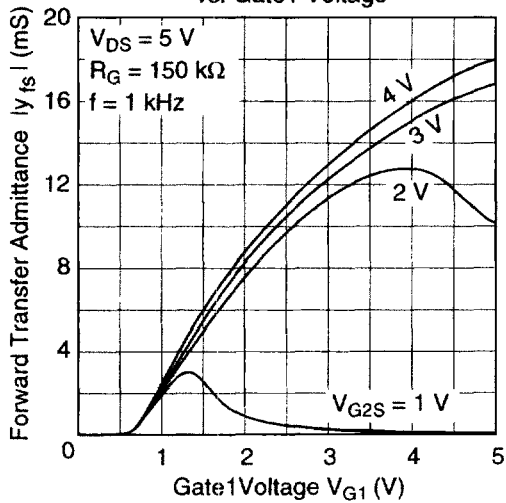
Drain Current vs.
Gate2 to Source Voltage



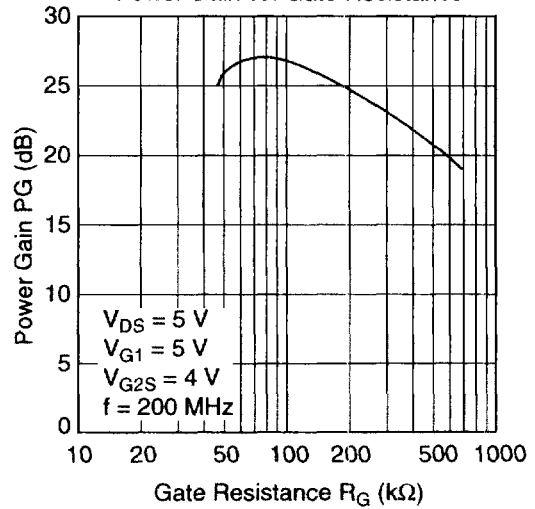
Drain Current vs. Gate1 Voltage



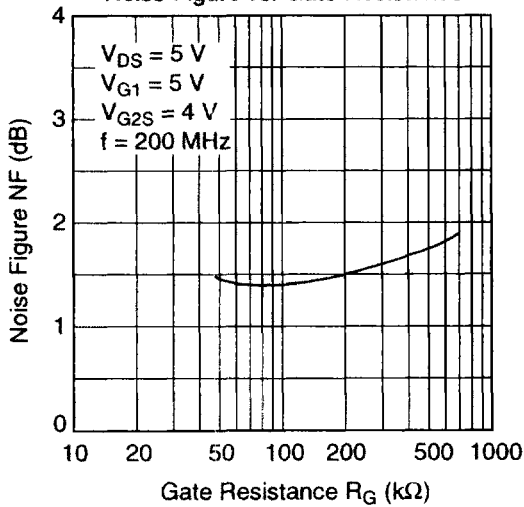


Forward Transfer Admittance
vs. Gate1 Voltage

Power Gain vs. Gate Resistance



Noise Figure vs. Gate Resistance



Power Gain vs. Drain Current

