



AH102

Medium Power, High Linearity Amplifier

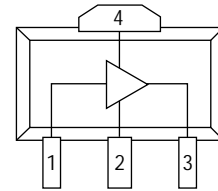
Product Features

- 350-3000 MHz Bandwidth
- +45 dBm Output IP3
- 13 dB Gain
- +27 dBm P1dB
- MTBF >10⁷ Hours
- Internally Matched
- Multiple Bias Voltages (+7.0 to +9.0 V)

Product Description

The AH102 is a medium power gain block that offers excellent dynamic range in a low cost surface mount package. The combination of a signal supply voltage and an internally matched device makes it ideal for both narrow band and broadband applications. Superior thermal design allows the product to achieve +45 dBm IP3 performance at a mounting temperature of +85°C with an associated MTBF of >10⁷ hours.

Functional Diagram



Function	Pin No.
Input	1
Ground	2
Output Bias	3
Ground	4

Specifications

Parameter	Units	Min.	Typical	Max.
Frequency Range	MHz		350-3000	
S21 - Gain	dB	12.5	13	
S11 - Input Return Loss	dB		-10	
S22 - Output Return Loss	dB		-10	
Noise Figure	dB		4.5	
Output P1dB	dBm		+27	
Output IP3	dBm	43	+45	
Operating Current Range	mA	170	200	230
Supply Voltage	V		9.0	

Test conditions unless otherwise noted.

1. T = 25°C, Vdd = 9.0 V, Freq = 800 MHz, 50 ohm system.

2. 3OIP Measured with two tones at an output power of 8 dBm/tone separated by 10 MHz. The suppression on the largest IM3 product is used to calculate the 3OIP using a 2:1 slope rule.

Absolute Maximum Ratings

Parameter	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-55 to +125 °C
DC Voltage	+11 V
RF Input Power (continuous)	+17 dBm

Typical Parameters

Parameter	Units	Typical	
Frequency	MHz	900	1900
S21	dB	13.9	13.5
S11	dB	-17.4	-15.2
S22	dB	-16.5	-15.0
Output IP3	dBm	46.2	46.0
Noise Figure	dB	3.1	3.8

Typical parameters reflect AH102 application circuit.

Ordering Information

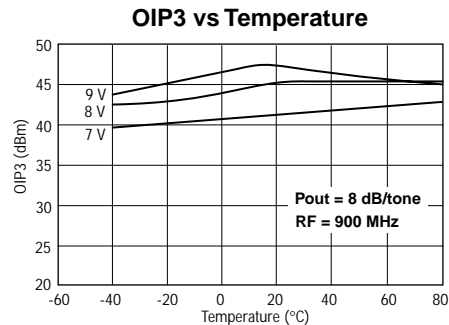
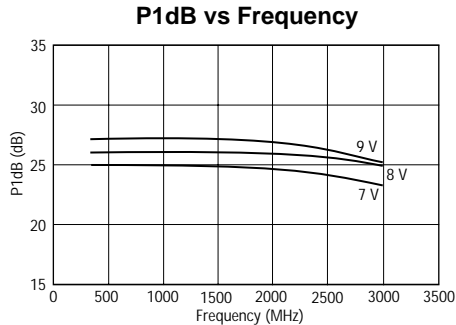
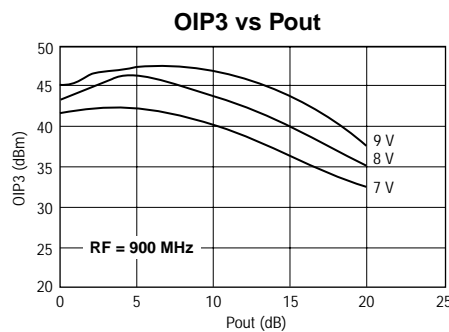
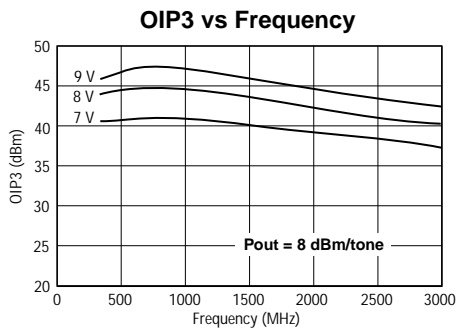
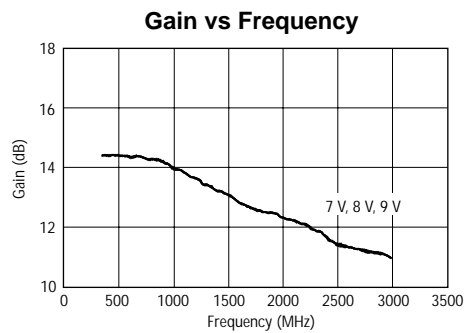
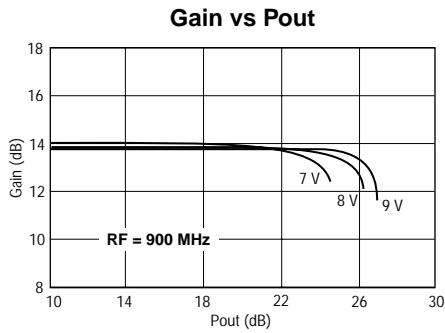
Part No.	Description
AH102	Medium Power High Linearity Amplifier (Available in tape and reel)
AH102-PCB Cell	Cellular Application Circuit
AH102-PCS/u	PCS/UMTS Application Circuit

This document contains information on a new product. Specifications and information are subject to change without notice.

AH102

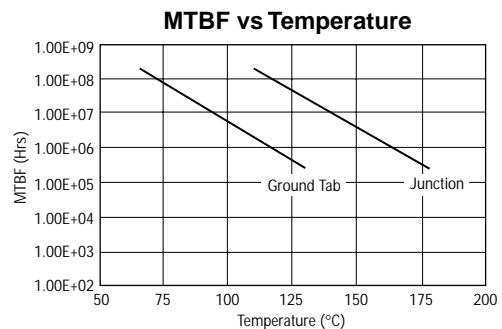
Preliminary Product Information

Performance Charts (V_{ds} = 9 V, I_{ds} = 200 mA, T = 22°C, unmatched device in a 50 ohm system)



Thermal Data

Parameter	Rating
Operating Case Temperature	-40 to +85°C
Thermal Resistance (Maximum)	25°C/W
Junction Temperature (Recommended Maximum)	+155°C

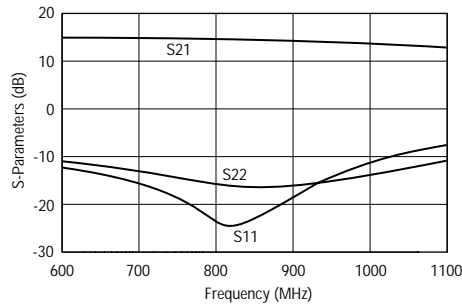


Application Circuit: 900 MHz

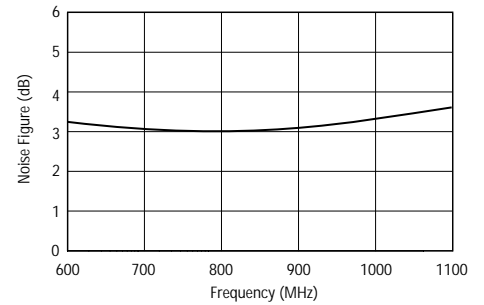
Typical Specifications

Frequency	900 MHz
S21 (dB)	13.9 dB
S11 (dB)	-17.4 dB
S22 (dB)	-16.5 dB
IP3	46.2 dBm
Noise Figure	3.1 dB
Bias	9.0 V

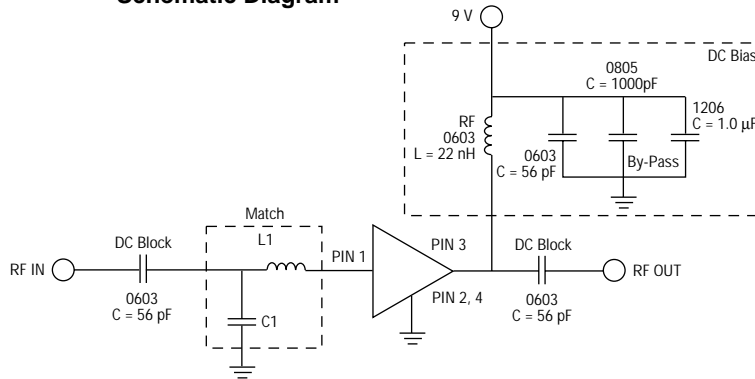
S-Parameters vs Frequency



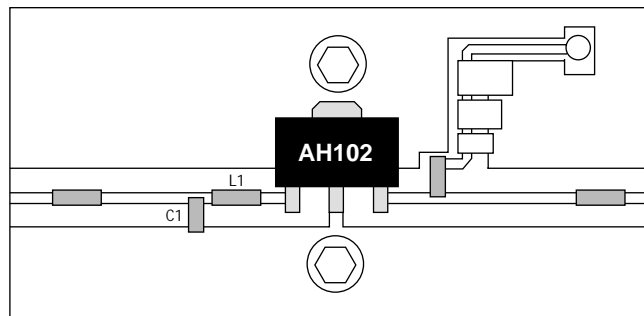
Noise Figure vs Frequency



Schematic Diagram



GETEK Board Layout



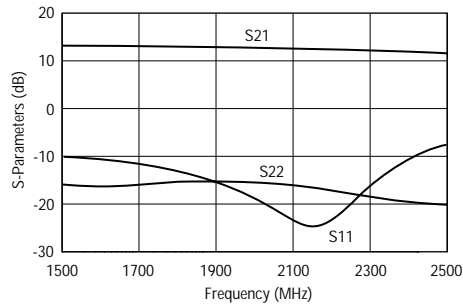
C1 = 3.3 pF L1 = 6.8 nH

Application Circuit: 1900 MHz

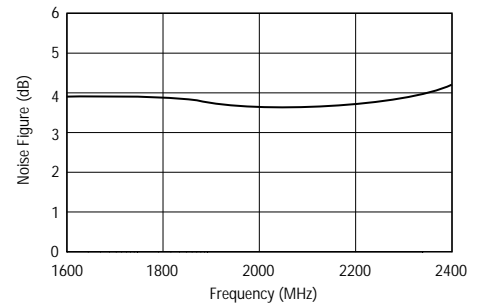
Typical Specifications

Frequency	1900 MHz
S21 (dB)	13.5 dB
S11 (dB)	-15.2 dB
S22 (dB)	-15.0 dB
IP3	46.0 dBm
Noise Figure	3.8 dB
Bias	9.0 V

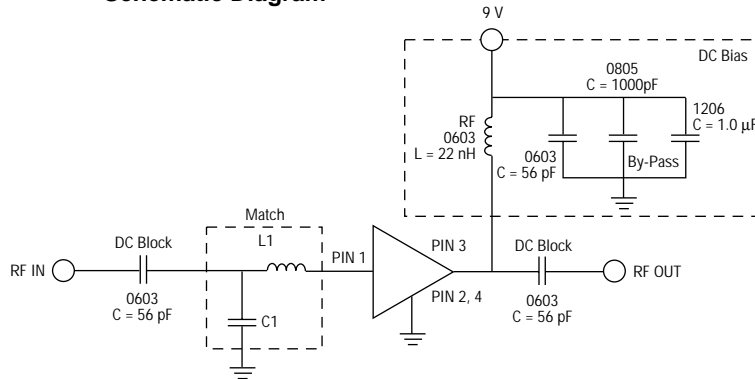
S-Parameters vs Frequency



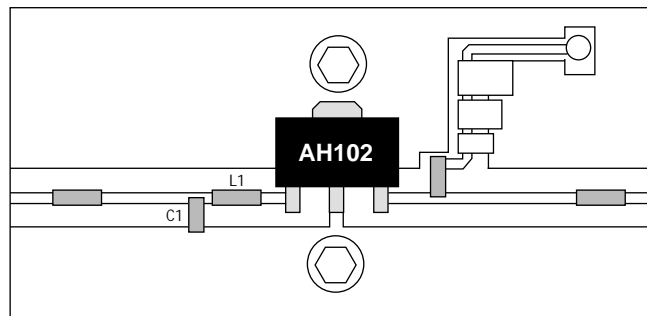
Noise Figure vs Frequency



Schematic Diagram

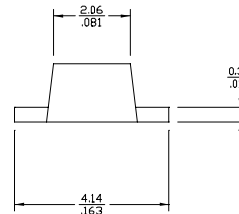
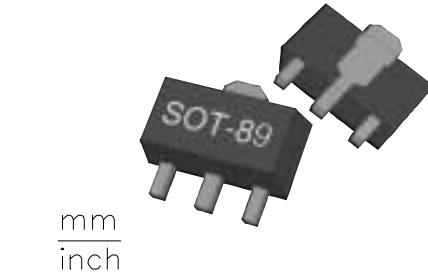
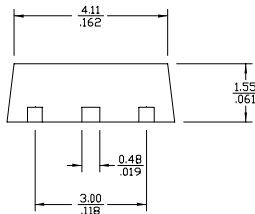
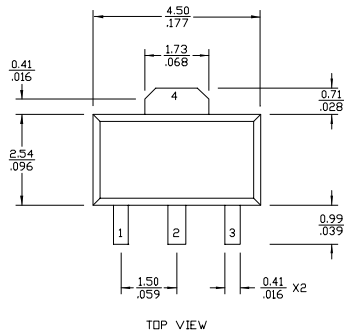


GETEK Board Layout

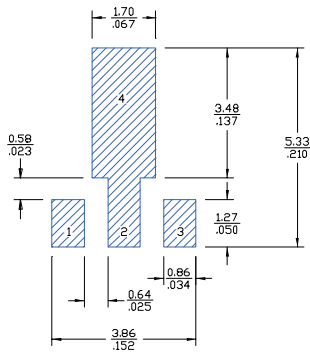


C1 = 1.5 pF L1 = 1.5 nH

Outline Drawing

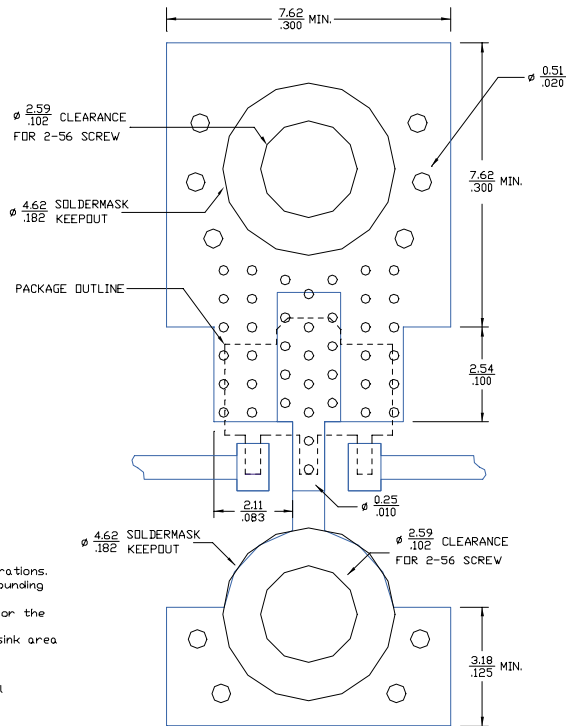


Land Pattern



FUNCTION	PIN NO.
INPUT	1
GROUND	2
OUTPUT (BIAS)	3
GROUND	4

Mounting Configuration



- Notes:
1. Ground vias are critical for thermal and RF grounding considerations.
 2. Two 2-56 screws with washers should be used for thermal grounding to the main chassis.
 3. Ground plane on the backside should extend past the holes for the 2-56 screws as a minimum.
 4. No soldermask should be applied to the backside where heat sink area contacts the main chassis.
 5. Holes for the 2-56 screws should be plated through.
 6. Keepout diameter for the 2-56 screw is to allow good thermal contact for the screw and washer.
 7. Trace width depends on PC board.
 8. A minimum of 1 oz. / 1 oz. copper should be used.

Typical Test Data

S-Parameters (Ids = 210 mA, Vds = +9 V, T = 22°C, Z = 50 ohms)

Freq (MHz)	S11 (dB)	S11 Ang	S21 (dB)	S21 Ang	S12 (dB)	S12 Ang	S22 (dB)	S22 Ang
50	-15.59	-100.98	16.33	166.81	-19.74	7.05	-18.05	-135.12
100	-18.63	-116.61	16.03	167.36	-19.65	0.63	-20.51	-172.09
200	-18.83	-127.49	15.85	162.42	-19.61	-6.29	-19.69	148.08
400	-14.97	-134.01	15.57	149.21	-19.81	-16.37	-18.95	118.13
600	-12.41	-144.26	15.25	135.43	-20.08	-25.16	-17.88	93.57
800	-10.59	-154.97	14.86	122.33	-20.47	-33.19	-17.21	72.66
1000	-9.28	-164.57	14.41	109.51	-20.79	-41.09	-16.97	52.59
1200	-8.27	-172.64	14.06	97.75	-21.31	-48.47	-16.81	30.96
1400	-7.51	-179.56	13.66	86.16	-21.74	-55.63	-16.46	7.77
1600	-6.92	-174.92	13.31	74.79	-22.22	-62.49	-15.71	-15.23
1800	-6.44	-170.01	12.99	63.61	-22.27	-69.31	-14.55	-36.49
2000	-5.91	-166.13	12.63	52.63	-23.44	-76.13	-13.56	-57.58
2200	-5.36	-160.87	12.29	41.29	-24.21	-83.19	-11.95	-75.38
2400	-4.91	-155.59	11.92	30.04	-25.07	-89.85	-10.45	-88.56
2600	-4.51	-150.21	11.57	18.85	-25.89	-96.21	-9.31	-98.65
2800	-4.16	-145.21	11.29	8.09	-26.98	-102.46	-8.48	-107.36
3000	-3.89	-139.81	11.03	-2.68	-28.01	-107.53	-7.95	-114.99
3200	-3.68	-134.22	10.81	-13.65	-29.14	-112.71	-7.77	-121.98
3400	-3.51	-129.04	10.59	-24.79	-30.39	-116.88	-7.87	-128.04
3600	-3.34	-121.85	10.41	-36.19	-31.93	-119.08	-8.32	-136.52
3800	-3.18	-115.02	10.18	-47.95	-33.69	-121.76	-9.03	-144.89
4000	-3.01	-107.46	9.91	-60.13	-35.41	-120.73	-10.07	-154.36

Typical Test Data

S-Parameters (Ids = 215 mA, Vds = +10 V, T = 22°C, Z = 50 ohms)

Freq (MHz)	S11 (dB)	S11 Ang	S21 (dB)	S21 Ang	S12 (dB)	S12 Ang	S22 (dB)	S22 Ang
50	-15.63	-100.64	16.36	166.87	-19.73	7.13	-18.29	-132.65
100	-18.66	-116.35	16.06	167.37	-19.62	0.58	-21.21	-170.52
200	-18.84	-127.07	15.85	162.40	-19.56	-6.39	-20.22	145.92
400	-14.99	-133.65	15.59	149.16	-19.77	-16.27	-19.23	114.71
600	-12.41	-144.11	15.27	135.36	-20.07	-25.37	-17.95	90.15
800	-10.59	-154.93	14.89	122.21	-20.42	-33.40	-17.12	69.05
1000	-9.27	-164.45	14.44	109.37	-20.78	-41.06	-16.68	48.98
1200	-8.29	-172.63	14.08	97.61	-21.28	-48.47	-16.39	27.89
1400	-7.52	-179.57	13.69	85.99	-21.76	-55.85	-15.97	5.59
1600	-6.96	-174.98	13.34	74.57	-22.27	-62.91	-15.12	-16.74
1800	-6.45	-170.11	13.02	63.35	-22.77	-69.85	-13.94	-36.97
2000	-5.91	-166.25	12.67	52.34	-23.45	-76.92	-12.98	-57.46
2200	-5.36	-160.97	12.31	40.98	-24.16	-84.02	-11.45	-74.92
2400	-4.92	-155.69	11.95	29.68	-24.99	-90.61	-10.01	-87.90
2600	-4.52	-150.33	11.60	18.46	-25.81	-97.22	-8.91	-98.24
2800	-4.16	-145.21	11.31	7.69	-26.93	-103.38	-8.11	-106.73
3000	-3.89	-139.90	11.06	-3.10	-27.89	-109.00	-7.59	-114.56
3200	-3.67	-134.31	10.84	-14.07	-29.07	-114.73	-7.42	-121.70
3400	-3.50	-129.11	10.63	-25.26	-30.57	-119.32	-7.49	-127.90
3600	-3.33	-121.90	10.44	-36.68	-31.74	-122.19	-7.91	-136.49
3800	-3.18	-115.01	10.23	-48.49	-33.93	-123.59	-8.58	-145.17
4000	-3.00	-107.56	9.96	-60.72	-35.83	-123.86	-9.55	-154.83