



AG402

InGaP HBT Gain Block

The Communications Edge™

Preliminary Product Information

Product Features

- DC - 5000MHz
- +17 dBm P1dB at 900MHz
- +32 dBm OIP3 at 900MHz
- 15 dB Gain at 900MHz
- Single Voltage Supply
- SOT-86 or SOT-89 SMT Package
- Internally matched to 50 Ω

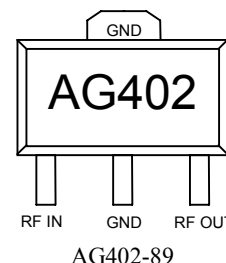
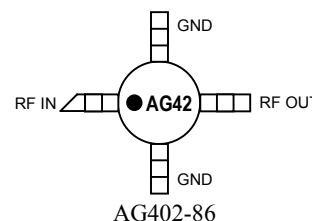
Product Description

The AG402 is a general-purpose buffer amplifier that offers high dynamic range in a low-cost surface-mount package. At 900 MHz, the AG402 typically provides 15 dB of gain, +32 dBm Output IP3, and +17 dBm P1dB. The device combines dependable performance with consistent quality to maintain MTBF values exceeding 100 years at mounting temperatures of +85°C and is housed in a SOT-86 and SOT-89 industry standard SMT packages.

The AG402 consists of Darlington pair amplifiers using the high reliability InGaP/GaAs HBT technology process technology and only requires DC-blocking capacitors, a bias resistor, and an inductive RF choke for operation.

The broadband MMIC amplifier can be directly applied to various current and next generation wireless technologies such as GPRS, GSM, CDMA, W-CDMA, and UMTS. In addition, the AG402 will work for other various applications within the DC to 5 GHz frequency range such as CATV and fixed wireless.

Functional Diagram



Specifications

Parameters ¹	Units	Min	Typ	Max
Frequency Range	MHz		DC-5000	
S21 - Gain	dB		15	
S11 - Input Return Loss	dB		-15	
S22 - Output Return Loss	dB		-15	
Output P1dB	dBm		+17	
Output IP3	dBm		+32	
Noise Figure	dB		4.3	
Device Voltage	V		5.0	
Device Current	mA		60	

Test conditions unless otherwise noted

1. T = 25°C, Supply Voltage = +6 V, R_{bias} = 16 Ω , Frequency = 900MHz, 50 Ω System.

2. 3OIP measured with two tones at an output power of 0 dBm/line separated by 10MHz. The suppression on the largest IM3 product is used to calculate the 3OIP using a 2:1 rule.

Typical Parameters

Parameter ¹	Units	Typical	
Frequency	MHz	900	1900
S21	dB	15	14
S11	dB	-15	-12
S22	dB	-25	-20
Output P1dB	dBm	+17	+16
Output IP3	dBm	+32	+29
Noise Figure	dB	4.3	4.5
Supply Voltage	V	6	6
Device Current	mA	60	60

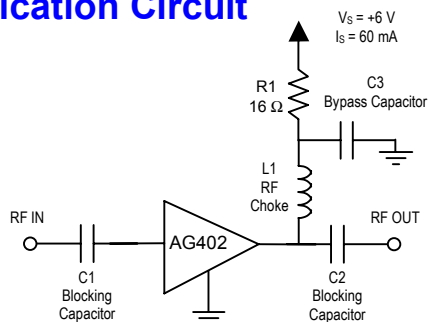
1. Data represents typical performance in an application board with T = 25°C, V_s = +6 V, and R_{bias} = 16 Ω in a 50 Ω system.

Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-40 to +125 °C

Operation of this device above any of these parameters may cause permanent damage

Application Circuit



Ordering Information

Part No.	Description
AG402-86	InGaP HBT Gain Block SOT-86 Style Package (Available in Tape & Reel)
AG402-89	InGaP HBT Gain Block SOT-89 Style Package (Available in Tape & Reel)
AG402-86PCB	Fully Assembled Application Board
AG402-89PCB	Fully Assembled Application Board

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AG402

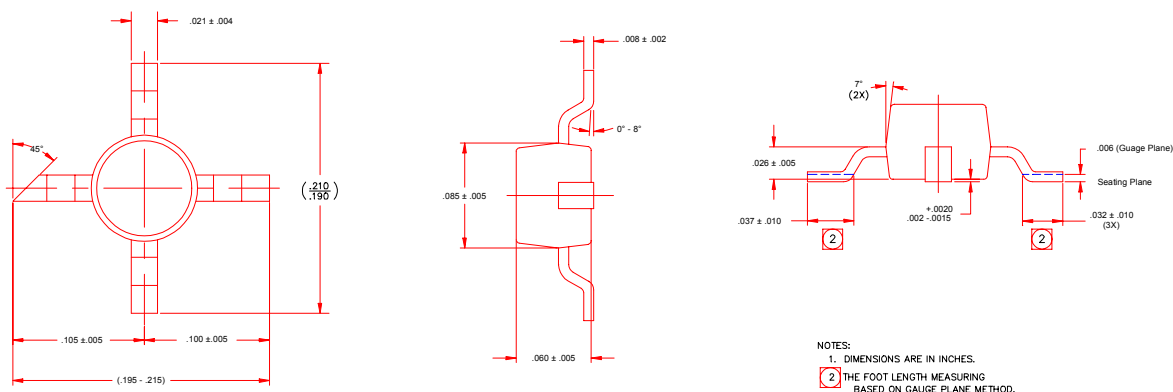
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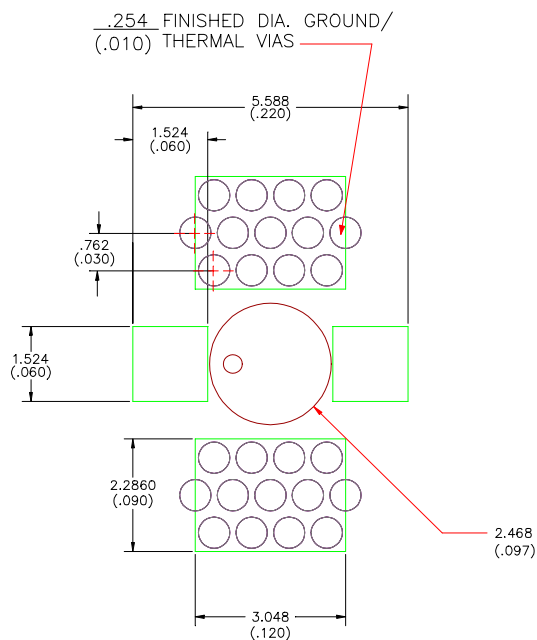
Preliminary Product Information

AG402-86 Package Information

Outline Drawing



Land Pattern



Mounting Configuration Notes

NOTES:

1. THERMAL/GROUND VIAS ARE CRITICAL FOR THE PROPER PERFORMANCE OF THIS PART. VIAS SHOULD USE A .013" DIAMETER DRILL AND HAVE A FINAL, PLATED THRU DIAMETER OF .010".
2. ADD AS MUCH COPPER AS POSSIBLE TO INNER AND OUTER LAYERS NEAR THE PART TO ENSURE OPTIMAL THERMAL PERFORMANCE.
3. MOUNTING SCREWS ARE RECOMMENDED NEAR THE PART TO FASTEN THE BOARD TO A HEATSINK. ENSURE THAT THE THERMAL/GROUND VIAS CONTACT THE HEATSINK.
4. DO NOT PUT SOLDER MASK ON THE BACK SIDE OF THE PC BOARD IN THE REGIONS WHERE THE BOARD CONTACTS THE HEATSINK.
5. RF TRACE WIDTH DEPENDS UPON THE PC BOARD MATERIAL AND CONSTRUCTION.
6. USE 1 OZ. COPPER MINIMUM.
7. DIMENSIONS ARE IN MILLIMETERS / (INCHES).

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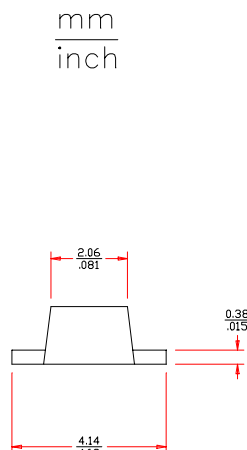
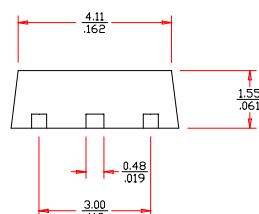
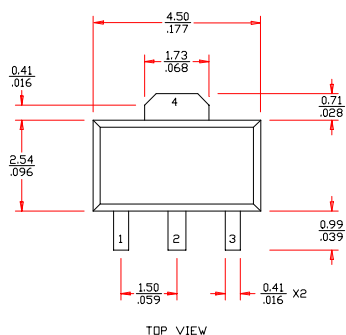
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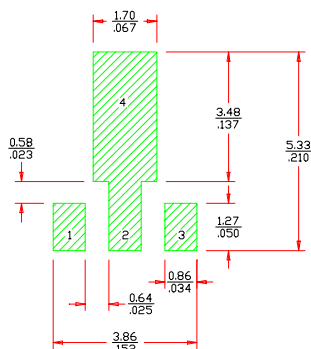
Preliminary Product Information

AG402-89 Package Information

Outline Drawing

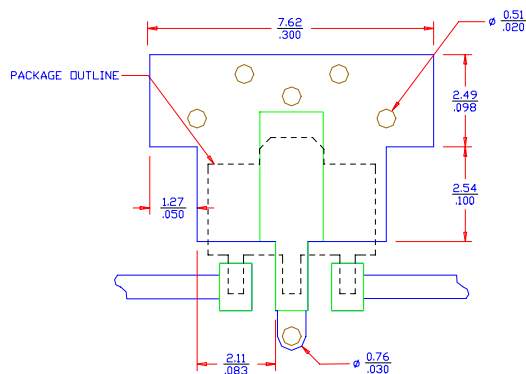


Land Pattern



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.

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