



Product Features

- DC ~ 500MHz
- GaAs HBT MMIC
- 40dBm Output IP3
- 18dB Gain
- 19.8dBm P1 dB
- Pb Free / RoHS Standard

Applications

- CDMA, W-CDMA Medium Power Amplifier
- High Linearity Drive Amplifier



Package Type : SOT-89

Description

AP112 is a gain block amplifier designed with GaAs HBT MMIC in a low cost SOT-89 package. This MMIC amplifier is designed for use as driver devices for infrastructure equipment in the DC ~ 500MHz

Electrical Specifications @ Ta=+25 °C, V_{DD}=+5V, +4.5V, Fc=880 MHz

PARAMETER	UNIT	MIN	TYP	MAX	TYP
Gain	dB	17.8	18	-	17.8
Input Return Loss	dB	-	-14	-	-13.6
Output Return Loss	dB	-	-12	-	-11.7
Output IP3	dBm	38	40.5	-	37
1dB Compression Point	dBm	-	19.8	-	18.6
Noise Figure	dB	-	2.9	3.1	2.8
DC Current	mA	90	110	130	75
Supply Voltage	VDC	-	5V	-	4.7V

OIP3 is measured with two tones, at an output power of 5dBm/tone separated by 1MHz

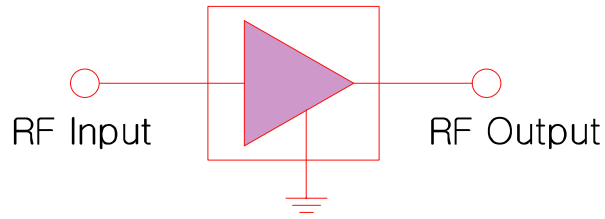
Absolute Maximum Ratings

PARAMETER	UNIT	MIN	MAX
Device Voltage	VDC	-	5.5
RF Input Power	dBm	-	10
Storage Temperature	°C	-40	150

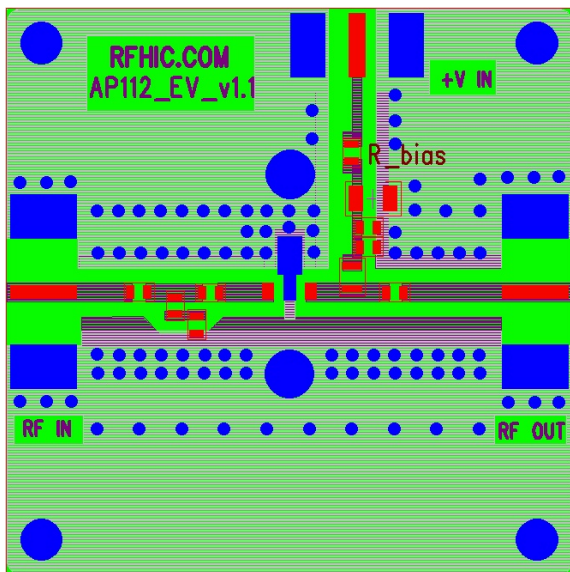
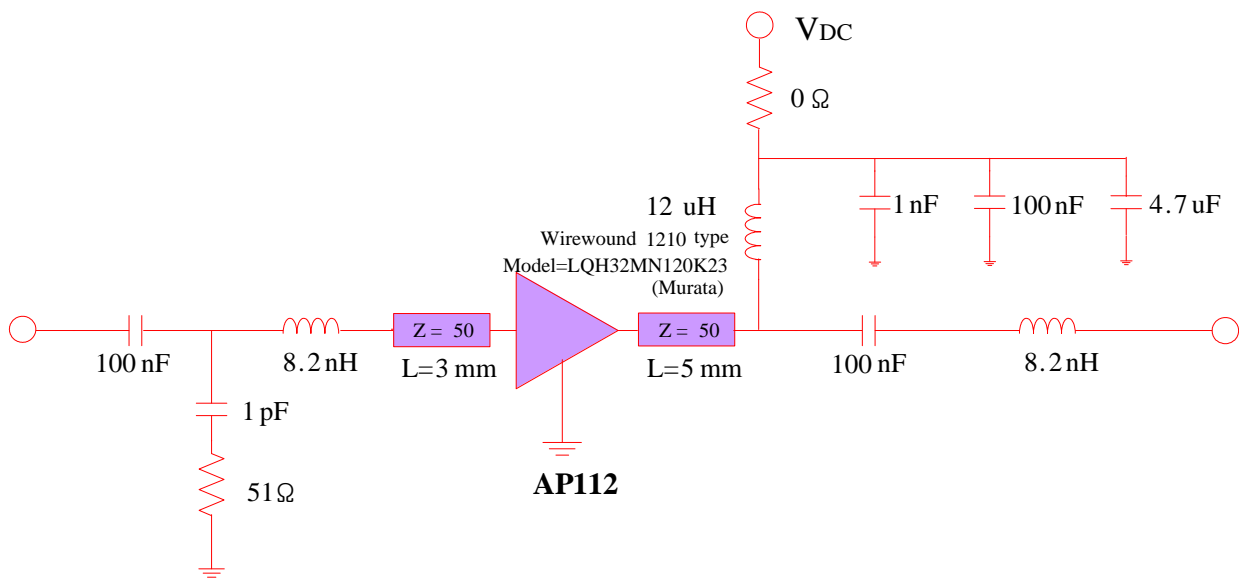
Operating Ranges

PARAMETER	UNIT	MIN	TYP	MAX
Operating Frequency	MHz	DC	-	500
Device Voltage	VDC	-	5	5.3
Case Temperature	°C	-40	-	85

Block Diagram



Application Circuit



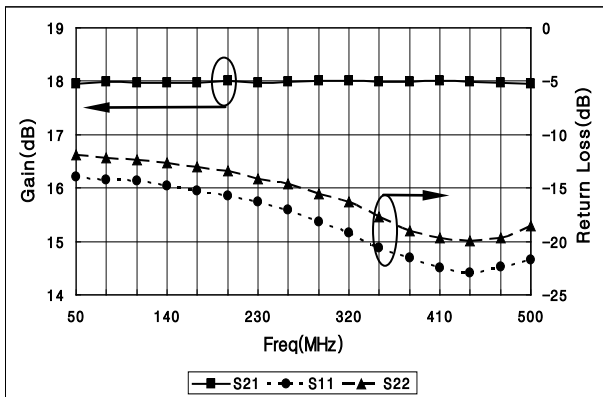
Recommended Bias Resistor Values

Vsupply	Rbias(5V)	Rbias(4.8V)	Rbias(4.5V)
6V	10	15	33
7V	20	28	55
8V	30	41	77
9V	40	53	57

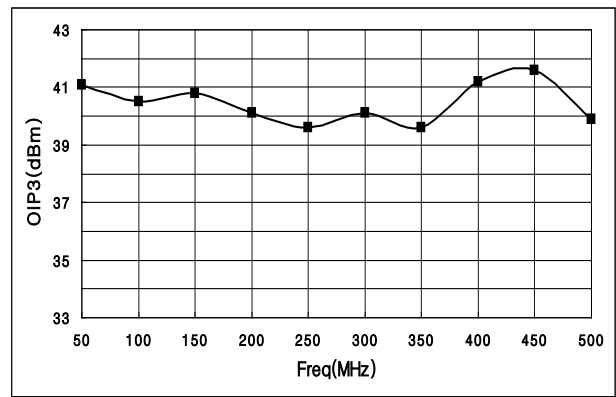
Performance Charts @ $V_d=5V, I_d=110mA, T_c=25^\circ C$

Frequency	MHz	50	100	150	200	250	300	350	400	450	500
Gain	dB	17.96	17.97	17.97	18	17.98	18	18	17.98	17.96	17.96
S11	dB	-13.9	-14.4	-14.9	-15.7	-16.9	-18.4	-19.7	-21.5	-22.2	-20.7
S22	dB	-11.9	-12.3	-12.7	-13.5	-14.5	-15.9	-17.3	-19.1	-19.5	-18.1
OIP3	dBm	41.1	40.5	40.8	40.1	39.6	40.1	39.6	41.2	41.6	39.9
P1dB	dBm	19.8	19.9	19.9	20	20	20	20.1	20.1	19.9	19.8
Noise Figure	dB	2.85	2.94	3.01	3.06	3.11	3.18	3.21	3.26	3.31	3.36

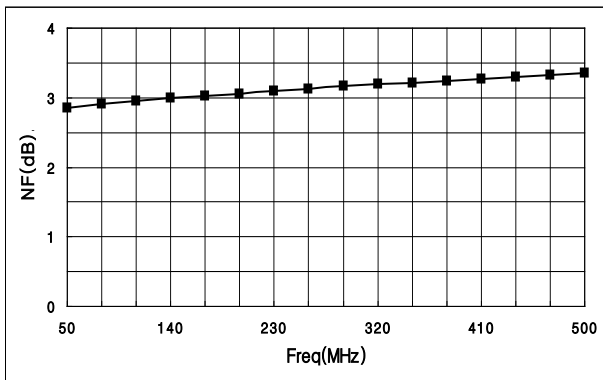
S-Parameter vs. Frequency



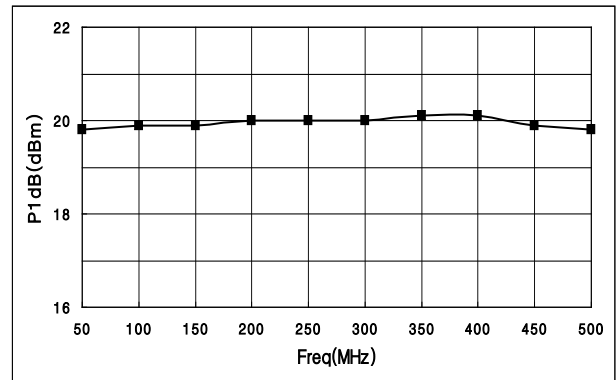
OIP3 vs. Frequency



Noise Figure vs. Frequency



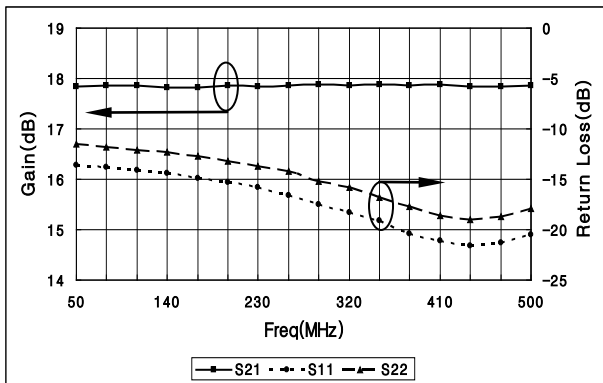
P1dB vs. Frequency



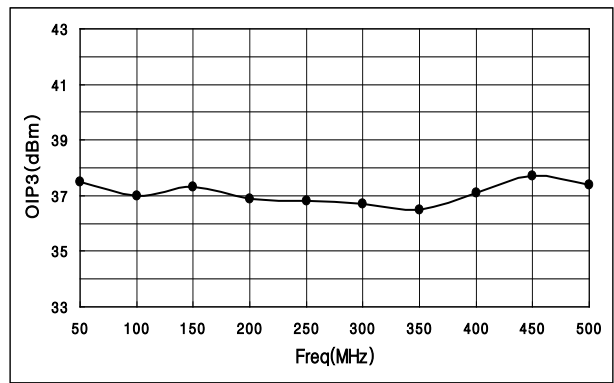
Performance Charts @ $V_d=4.7V, I_d=75mA, T_c=25^\circ C$

Frequency	MHz	50	100	150	200	250	300	350	400	450	500
Gain	dB	17.84	17.83	17.83	17.85	17.86	17.87	17.88	17.91	17.84	17.86
S11	dB	-13.6	-14	-14.5	-15.3	-16.3	-17.8	-19.1	-20.7	-21.7	-20.5
S22	dB	-11.6	-11.8	-12.4	-13.2	-14.1	-15.4	-16.8	-18.3	-19.1	-17.9
OIP3	dBm	37.5	37	37.3	36.9	36.8	36.7	36.5	37.1	37.7	37.4
P1dB	dBm	18.6	18.6	18.6	18.6	18.8	18.6	18.7	18.7	18.7	18.7
Noise Figure	dB	2.8	2.84	2.92	3	3.04	3.12	3.16	3.23	3.27	3.32

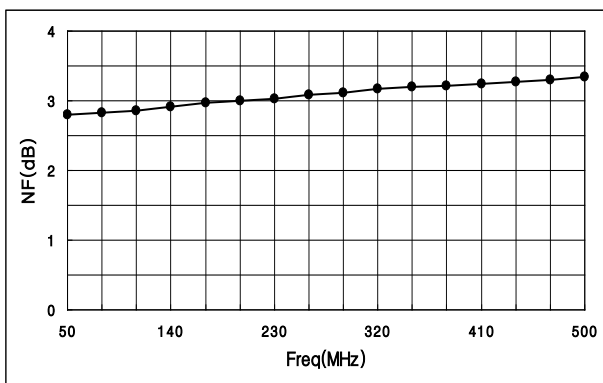
S-Parameter vs. Frequency



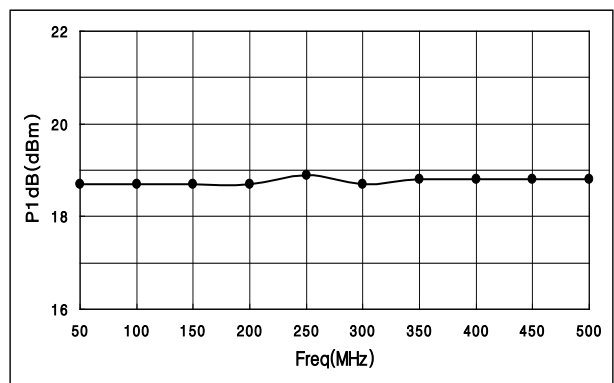
OIP3 vs. Frequency



Noise Figure vs. Frequency

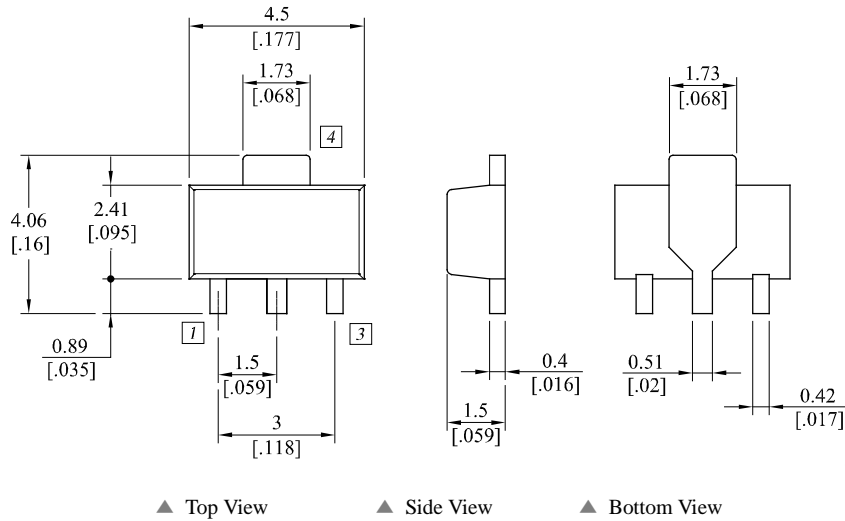


P1dB vs. Frequency



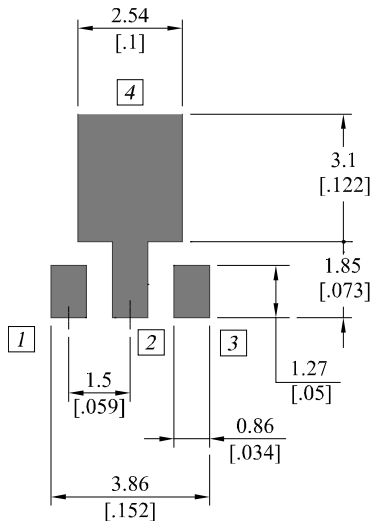
Package Dimensions (Type: SOT-89)

* Unit: mm[inch] | Tolerance ±0.2[.008]

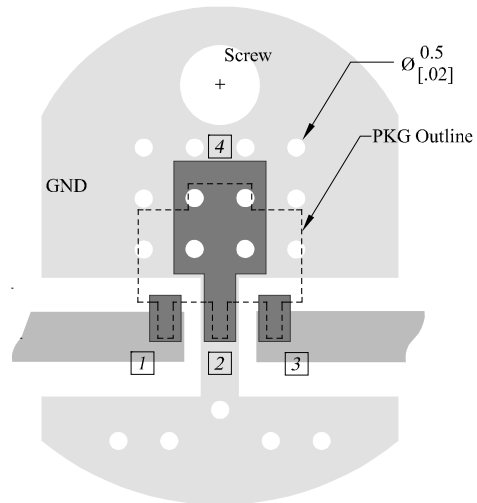


Pin Description			
Pin No	Function	Pin No	Function
1	Input	4	GND
2	GND	-	-
3	Output / Bias	-	-

Recommended Pattern



Recommended Mounting Configuration



* Mounting Configuration Notes

1. Ground / thermal via holes are critical for the proper performance of this device.
2. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
3. Mounting screws can be added near the part to fasten the board to a heatsink. Ensure that the ground / thermal via hole region contacts the heatsink.
4. Do not put solder mask on the backside of the PCB in the region where the board contacts the heatsink.
5. RF trace width depends upon the PCB material and construction.
6. Use 1 oz. Copper minimum.

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
AP112	2012.10.12	6.1	Change by a new document form -	-

RFHIC Corporation reserves the right to make changes to any products herein or to discontinue any product at any time without notice. While product specifications have been thoroughly examined for reliability, RFHIC Corporation strongly recommends buyers to verify that the information they are using is accurate before ordering. RFHIC Corporation does not assume any liability for the suitability of its products for any particular purpose, and disclaims any and all liability, including without limitation consequential or incidental damages. RFHIC products are not intended for use in life support equipment or application where malfunction of the product can be expected to result in personal injury or death. Buyer uses or sells such products for any such unintended or unauthorized application, buyer shall indemnify, protect and hold RFHIC Corporation and its directors, officers, stockholders, employees, representatives and distributors harmless against any and all claims arising out of such unauthorized use.

Sales, inquiries and support should be directed to the local authorized geographic distributor for RFHIC Corporation. For customers in the US, please contact the US Sales Team at 919-677-8780. For all other inquiries, please contact the International Sales Team at 82-31-250-5078.