



Product Features

- 50 ~ 3000MHz
- GaAs MMIC
- 43dBm Output IP3
- 13.7dB Gain
- 24dBm P1 dB
- Single +9V Supply
- SOT-89 SMT Package

Applications

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



Package Type : SOT-89

Description

AP209 is a high linearity amplifier designed with GaAs MMIC in a low cost SOT-89 package. It is designed for applications such as GSM, CDMA, W-CDMA drive devices which require high IP3.

Electrical Specifications (=+25°C, V_{DD}=+9V&+7V, Test Freq=900 MHz)

PARAMETER	UNIT	MIN	TYP	MAX	TYP
Gain	dB	12	13.7	-	13.3
Input Return Loss	dB	-	-21	-	-20
Output Return Loss	dB	-	-17	-	-17
Output IP3	dBm	39	44	-	42
1dB Compression Point	dBm	-	24	-	23
Noise Figure	dB	-	2.5	-	2.5
DC Current	mA	90	120	140	117
Supply Voltage	VDC	-	9V	-	7V
Thermal Resistance (Rth)	°C/W	-	-	40	-

OIP3 is measured with two tones, at an output power of +10dBm/tone separated by 1MHz.

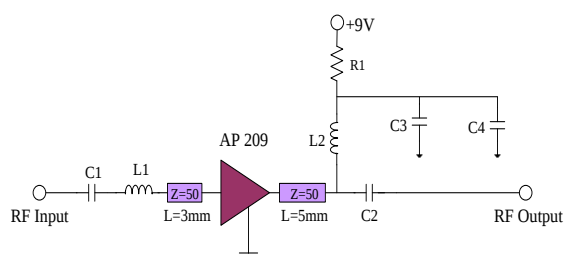
Absolute Maximum Ratings

PARAMETER	UNIT	MIN	MAX
Device Voltage	VDC	-	12
RF Input Power	dBm	-	10
Storage Temperature	°C	-40	150

Operating Ranges

PARAMETER	UNIT	MIN	TYP	MAX
Operating Frequency	MHz	50	-	3000
Device Voltage	VDC	-	9	10
Case Temperature	°C	-40	-	85

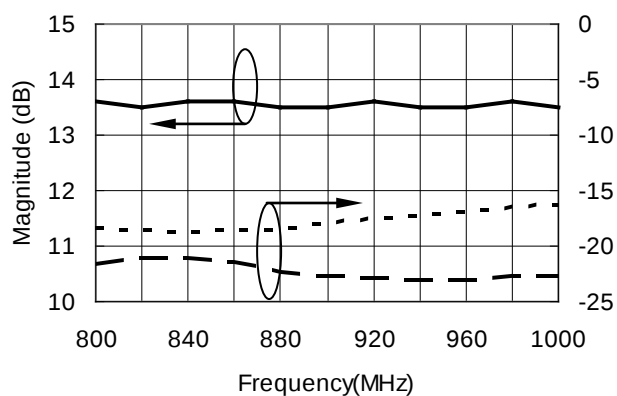
Application Circuit @ 900MHz, Vdc=+9V



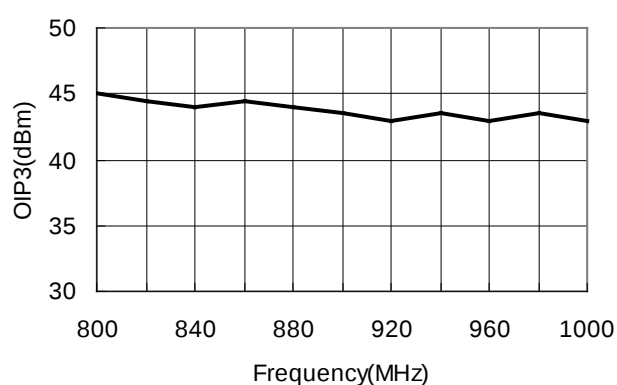
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	100 pF	L1	3.9 nH
C2	6.0 pF	L2	18 nH
C3	100 pF	R1	0 Ω
C4	0.1 μ F		

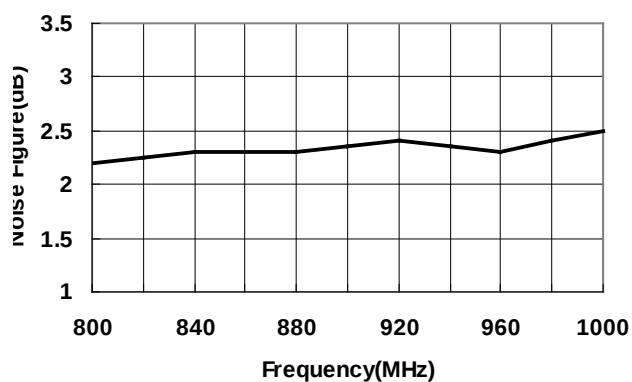
S-Parameter vs. Frequency



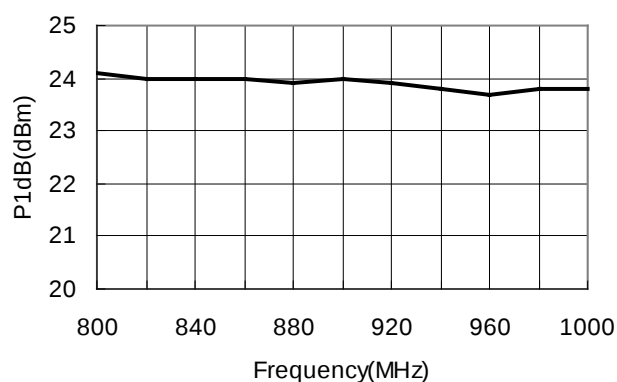
OIP3 vs. Frequency



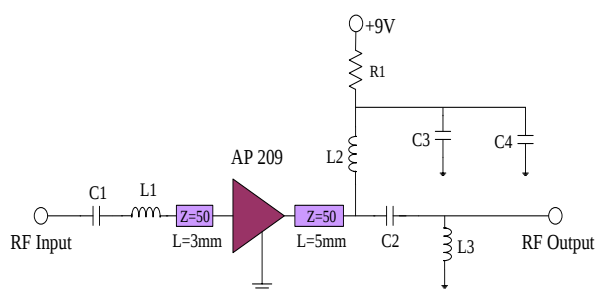
Noise Figure vs. Frequency



P1dB vs. Frequency



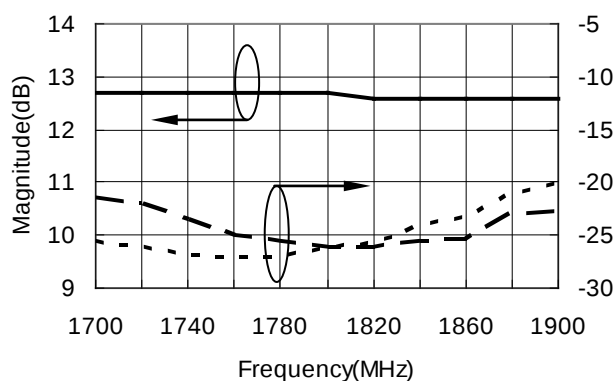
Application Circuit @ 1800MHz, Vdc=+9V



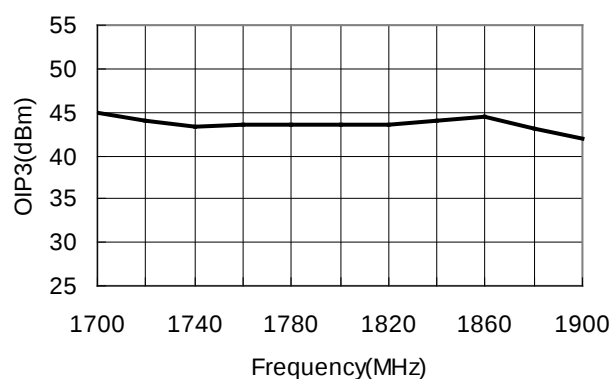
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	2.0 pF	L1	3.9 nH
C2	6.0 pF	L2	18 nH
C3	100 pF	L3	4.7 nH
C4	0.1 uF	R1	0 Ω

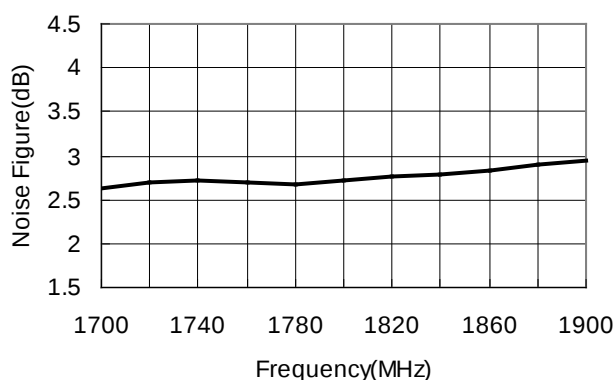
S-Parameter vs. Frequency



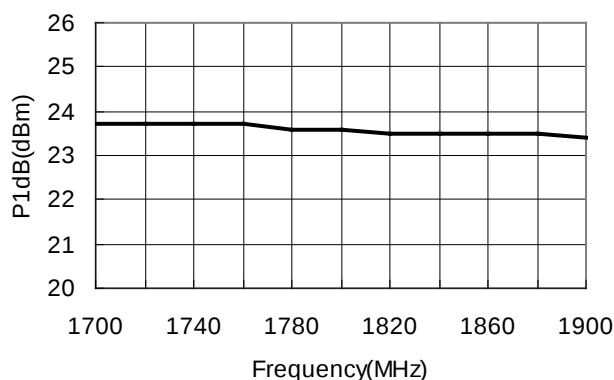
OIP3 vs. Frequency



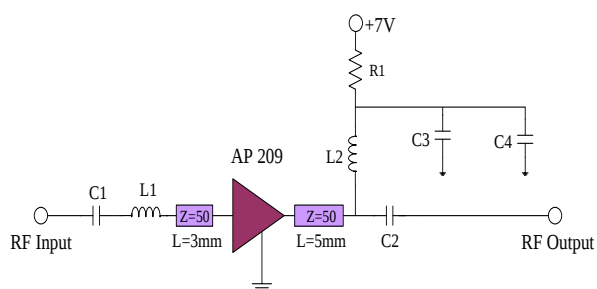
Noise Figure vs. Frequency



P1dB vs. Frequency



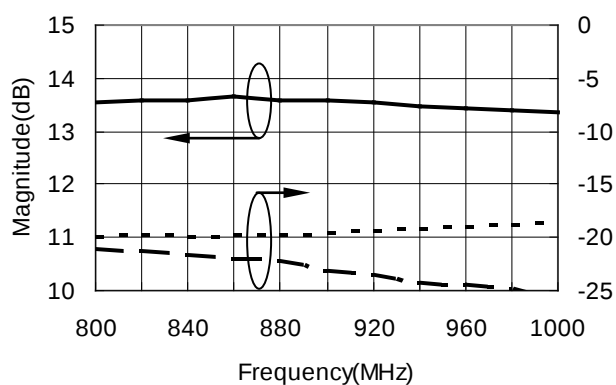
Application Circuit @ 900MHz, Vdc=+7V



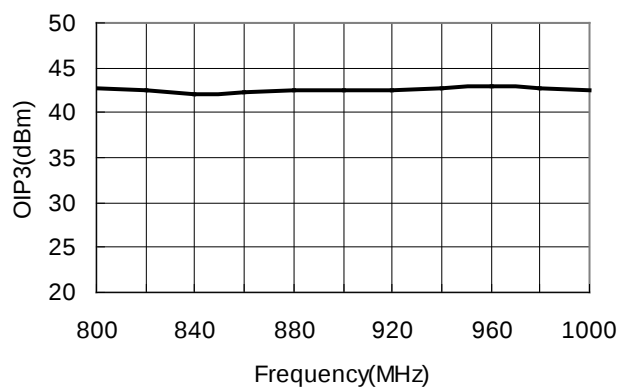
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	100 pF	L1	3.9 nH
C2	6.0 pF	L2	18 nH
C3	100 pF	R1	0 Ω
C4	0.1 uF		

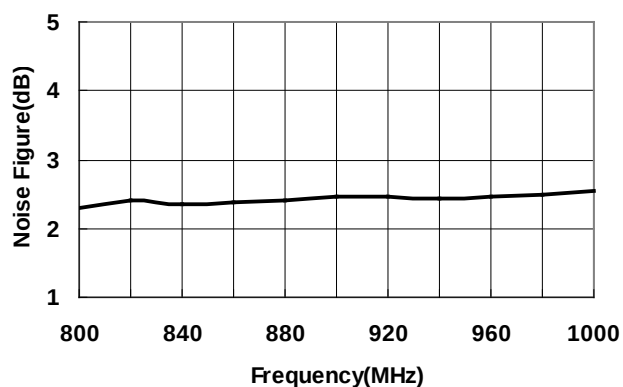
S-Parameter vs. Frequency



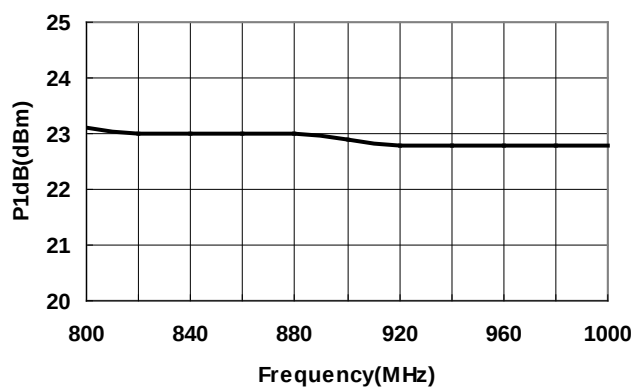
OIP3 vs. Frequency



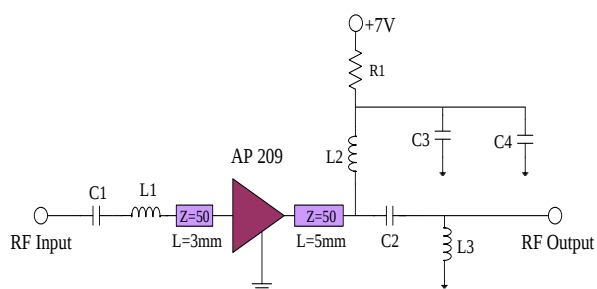
Noise Figure vs. Frequency



P1dB vs. Frequency



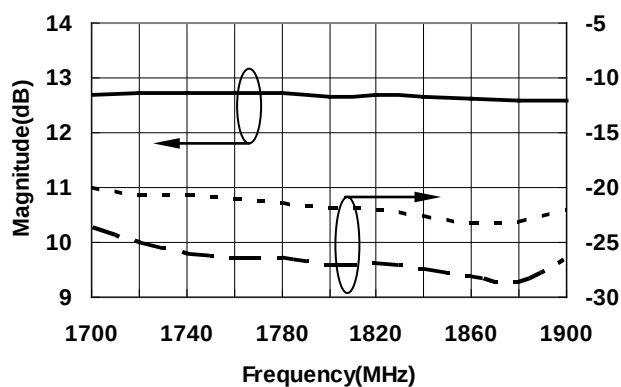
Application Circuit @ 1800MHz, Vdc=+7V



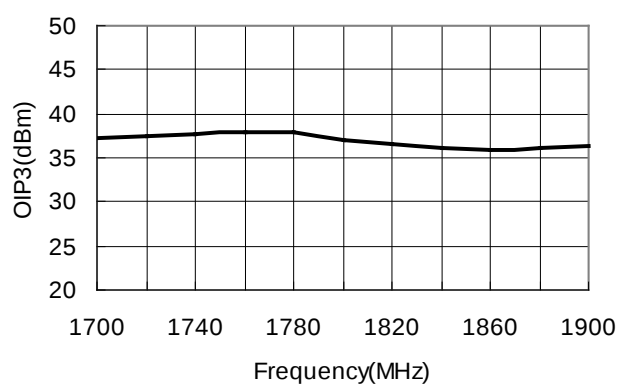
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	2.0 pF	L1	3.9 nH
C2	6.0 pF	L2	18 nH
C3	100 pF	L3	4.7 nH
C4	0.1 uF	R1	0 Ω

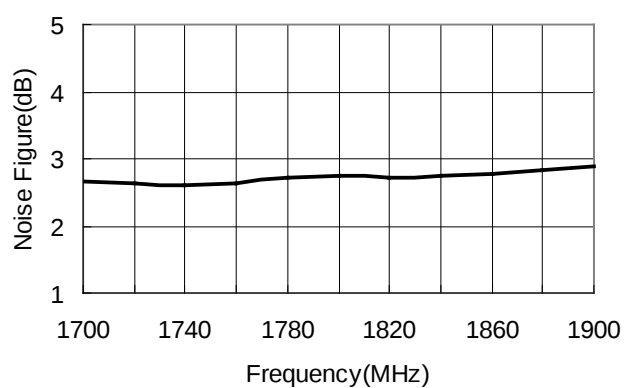
S-Parameter vs. Frequency



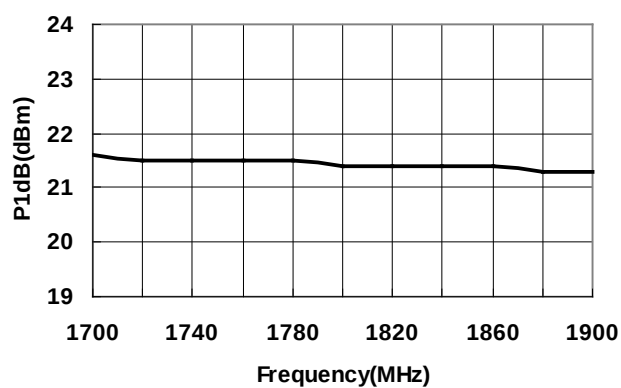
OIP3 vs. Frequency



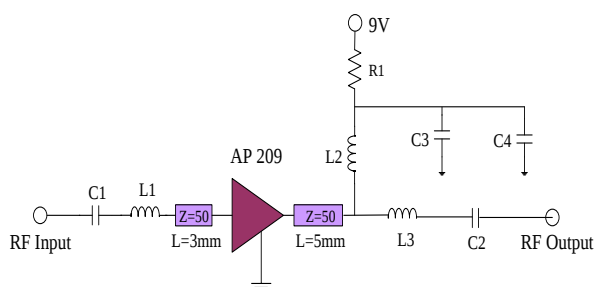
Noise Figure vs. Frequency



P1dB vs. Frequency



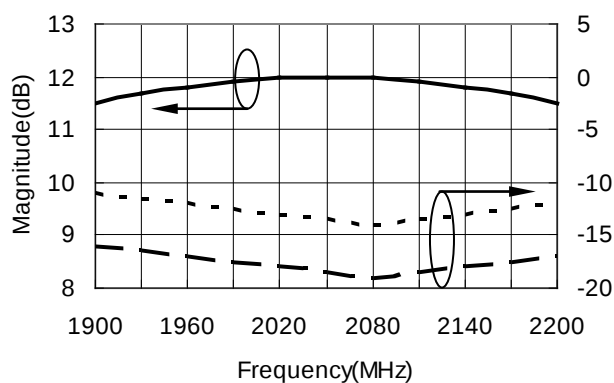
Application Circuit @ 2100MHz, Vdc=+9V



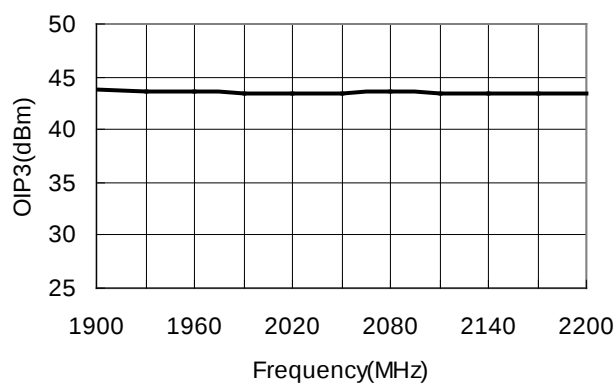
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	1.2 pF	L1, L3	3.9 nH
C2	1.5 pF	L2	18 nH
C3	100 pF	R1	0 Ω
C4	0.1 μ F		

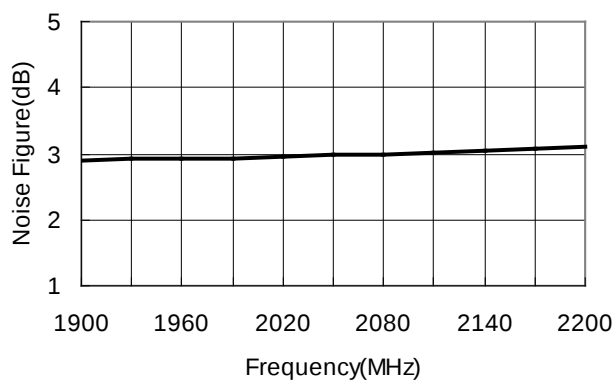
S-Parameter vs. Frequency



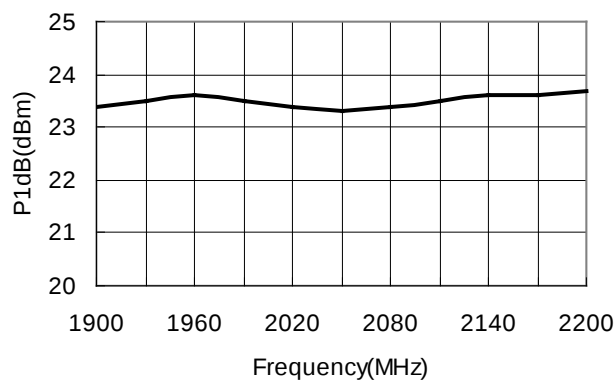
OIP3 vs. Frequency



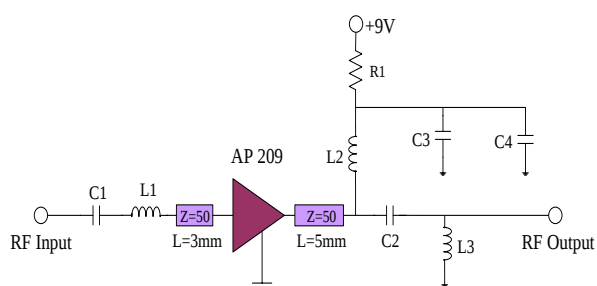
Noise Figure vs. Frequency



P1dB vs. Frequency



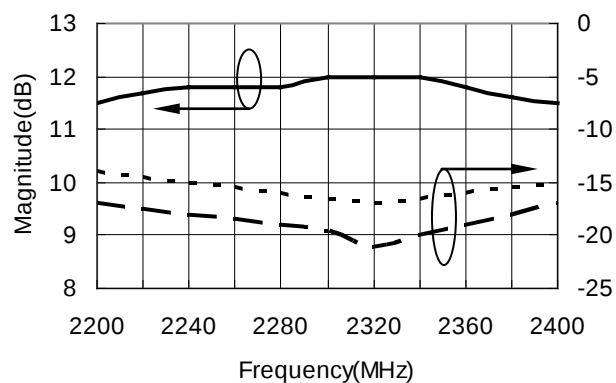
Application Circuit @ 2300MHz, Vdc=+9V



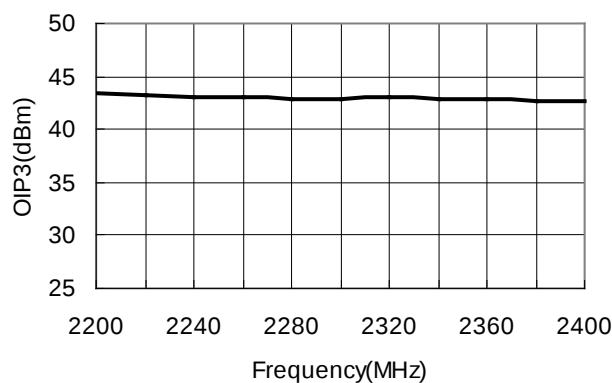
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	0.75 pF	L1	3.9 nH
C2	2.7 pF	L2	18 nH
C3	100 pF	L3	2.7 nH
C4	0.1 uF	R1	0 Ω

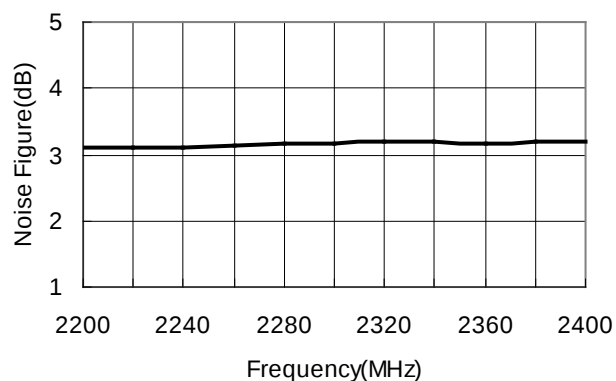
S-Parameter vs. Frequency



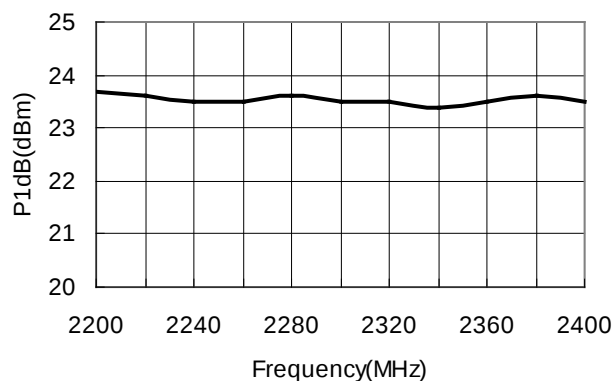
OIP3 vs. Frequency



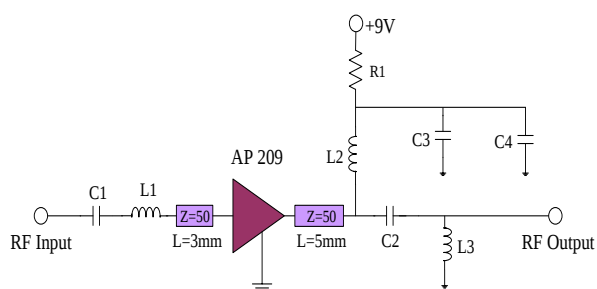
Noise Figure vs. Frequency



P1dB vs. Frequency



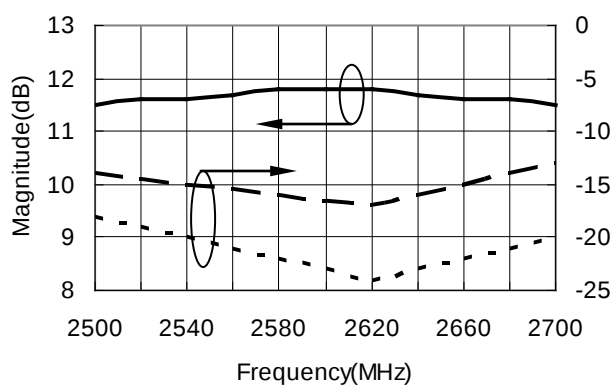
Application Circuit @ 2600MHz, Vdc=+9V



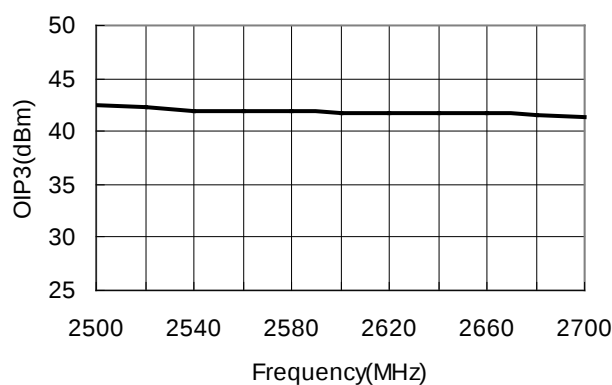
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	0.75 pF	L1	2.7 nH
C2	2.0 pF	L2	18 nH
C3	100 pF	L3	1.8 nH
C4	0.1 uF	R1	0 Ω

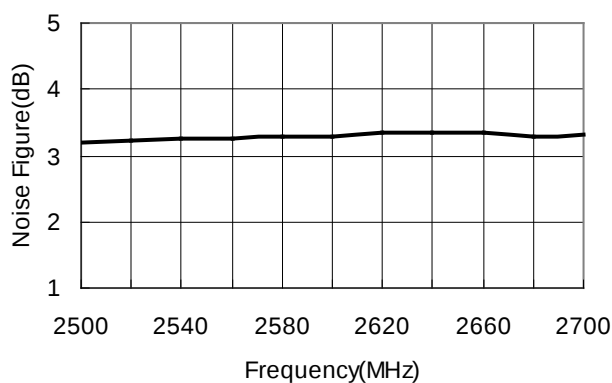
S-Parameter vs. Frequency



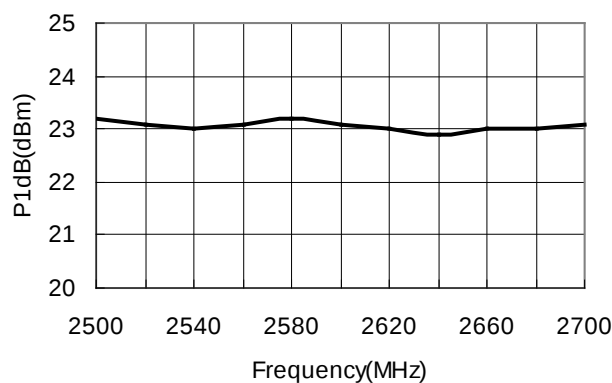
OIP3 vs. Frequency



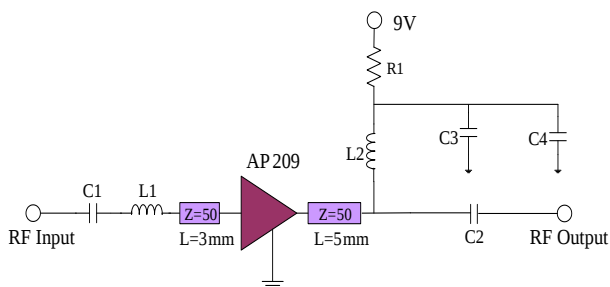
Noise Figure vs. Frequency



P1dB vs. Frequency



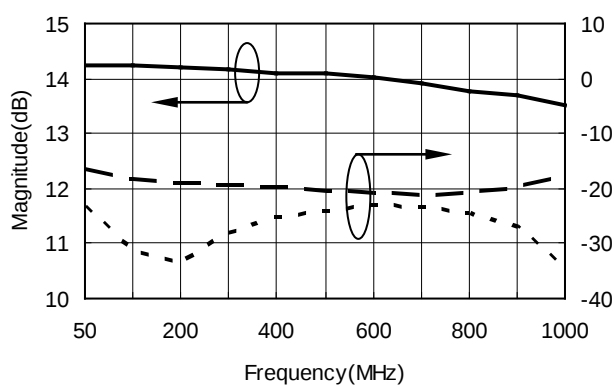
Application Circuit @ 50~1000MHz, Vdc=+9V



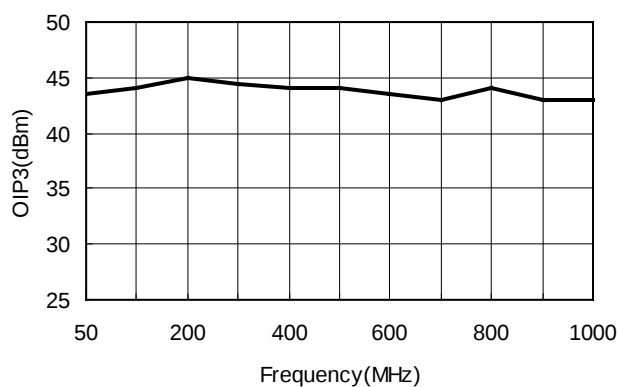
Bill of Material

PARAMETER	TYP	PARAMETER	TYP
C1	1 nF	L1	6.8 nH
C2	1 nF	L2	1 uH Wirewound 2520Type
C3	100 pF		
C4	100 nF	R1	0 Ω

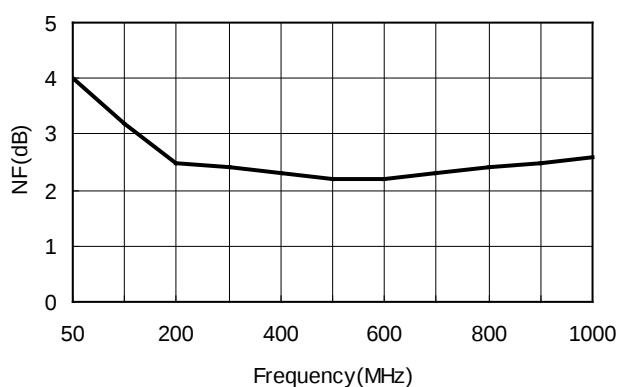
S-Parameter vs. Frequency



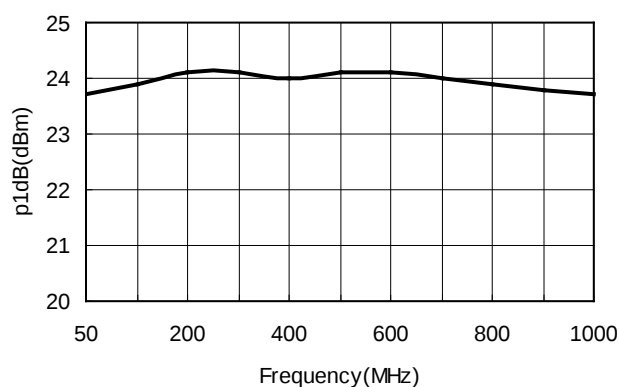
OIP3 vs. Frequency



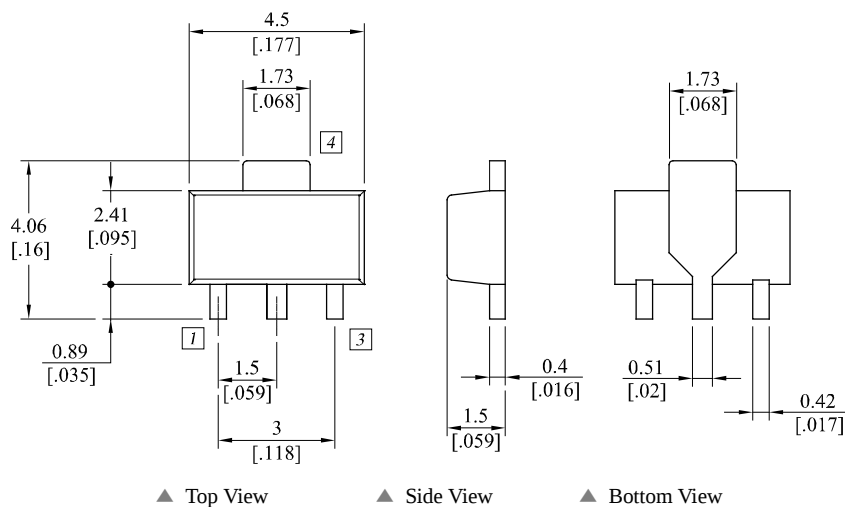
Noise Figure vs. Frequency



P1dB vs. Frequency

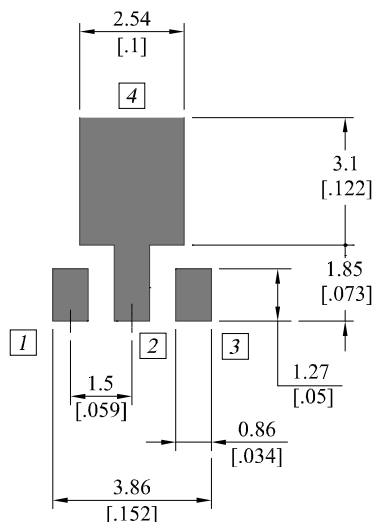


Package Dimensions (Type: SOT-89)

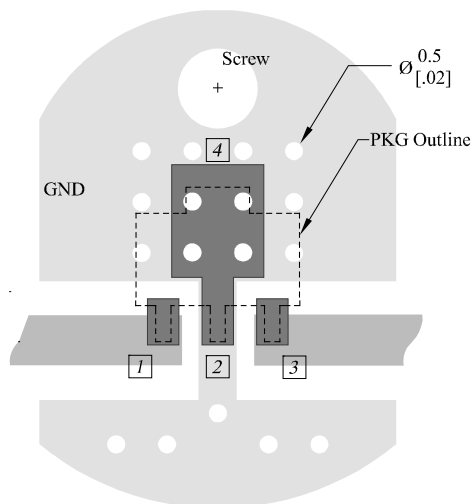
* Unit: mm[inch] | Tolerance ± 0.2 [.008]

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
AP209	2012.10.15	6.1	Change by a new document form	-

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