

**CBP08122126VP**

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**8 to 12 GHz – 21 dB – 26 dBm**  
**Medium Power QFN MMIC**

## General Description

The **CBP08122126VP** is a 3 stages medium power MMIC amplifier, packaged in a 4x4 mm 24 lead Plastic Surface Mount Package (ROHS).

The device is operating in the frequency range 8 to 12 GHz and is capable of more than +26 dBm of output power in saturation regime. Linear gain is more than 21 dB from 8 to 12 GHz with less than 1 dB of gain variation. The Design has been optimized to provide high efficiency, typical operating supply current is only 190 mA with a drain voltage at +8 V.

## Applications

- X band Medium Power Amplifier
- Radar / ECM / ECCM
- Test and measurement

## Features

- 3 stages Medium Power pHEMT GaAs MMIC
- High output Psat > +26 dBm
- High P1dB : + 25 dBm
- Small signal gain: 21 dB min
- 50  $\Omega$ , AC coupled RF input and output,
- Power supply: 190 mA @ +8 V (typical conditions)
- Package : QFN 4x4 mm 24 Lead

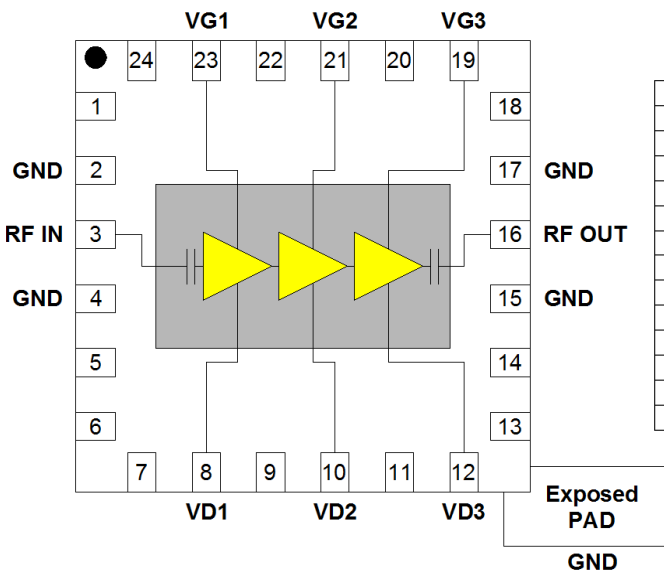
## Tools

S2P file can be provided for system design simulation.  
 DXF drawing file is available for mechanical design.  
 Evaluation board available on request.

## Ordering information

Product code	Definition
CBP08122126VP	QFN 4x4 mm 24 Lead MPA

## Functional diagram / Pinout



PINOUT			
PIN	Name	PIN	Name
1	NC	13	NC
2	GND	14	NC
3	RFIN	15	GND
4	GND	16	RFOUT
5	NC	17	GND
6	NC	18	NC
7	NC	19	VG3
8	VD1	20	NC
9	NC	21	VG2
10	VD2	22	NC
11	NC	23	VG1
12	VD3	24	NC

## Typical Characteristics (Ambient temperature T= 25°C)

Operating conditions:

Drain voltage :  $VD=VD1=VD2=VD3=+8V$

Gate voltage:  $VG=VG1=VG2=VG3$ : adjusted to obtain Drain current  $ID= (ID1+ID2+ID3)=190\text{ mA}^{(*)}$

(Typically  $VG= -0.75\text{ V}$ )

Measured parameters	Symbol	Min	Typ	Max	Unit
Frequency range	F	8		12	GHz
Small signal gain	G		21		dB
Small signal gain flatness	$\Delta G$		+/-0.5		dB
Input return loss	S11		-15	-10	dB
Output return loss	S22		-18		dB
Output power at 1dB compression	P1dB		25		dBm
Saturated output power	PSat	26	27		dBm
Drain supply voltage	VD		+ 8		V
Supply current <sup>(*)</sup>	ID		190		mA

(\*) : without RF input signal

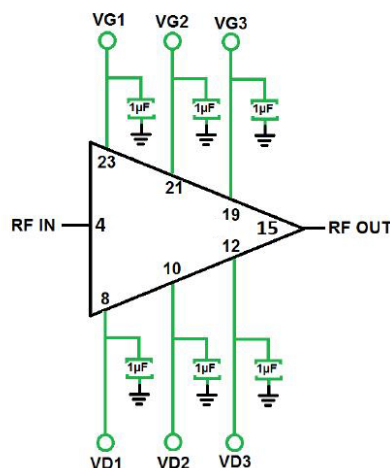
## Absolute maximum ratings

Maximum ratings	Symbols	Min	Max	Units
Drain voltage	$VD=VD1=VD2=VD3$		+8.5	V
Gate voltage	$VG=VG1=VG2=VG3$	-2.5		V
Drain current 1 <sup>(**)</sup>	ID1		50	mA
Drain current 2 <sup>(**)</sup>	ID2		75	mA
Drain current 3 <sup>(**)</sup>	ID3		185	mA
CW RF input power	Pin		+20	dBm
Continuous power dissipation	Pcw		2.3	W
Storage temperature	Tst	-55	+125	°C
Operating temperature	Top	-40	+85	°C

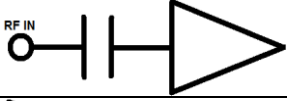
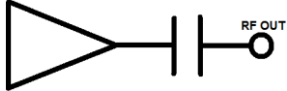
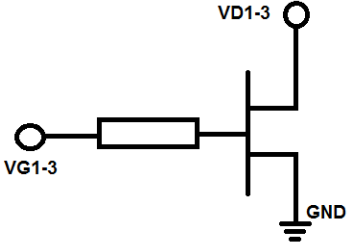


(\*\*) : with RF input signal

Operation of this device above any of these parameters may cause permanent damages.

## Application circuit



## Pin Description

Pin number	Name	Description	Electrical interface
3	RFin	AC coupled, amplifier input access. Internally matched 50 Ohms.	
16	RFout	AC coupled amplifier output access. Internally matched 50 Ohms.	
8, 10, 12	VD1, VD2, VD3	1st stage second stage and third stage drain biasing access. External 1µF 0402 decoupling capacitor are required on each VD access.	
23, 21, 19	VG1, VG2, VG3	1st stage second stage and third stage gate biasing access. External 1µF 0402 decoupling capacitor are required on each VG access.	
Exposed PAD	GND	Ground paddle must be connected to HF and DC Ground	
2, 4, 15, 17	GND	This PINS must be connected to HF and DC Ground	

## Typical Performances Measurements (Ambient temperature T= 25°C)

### Operating conditions:

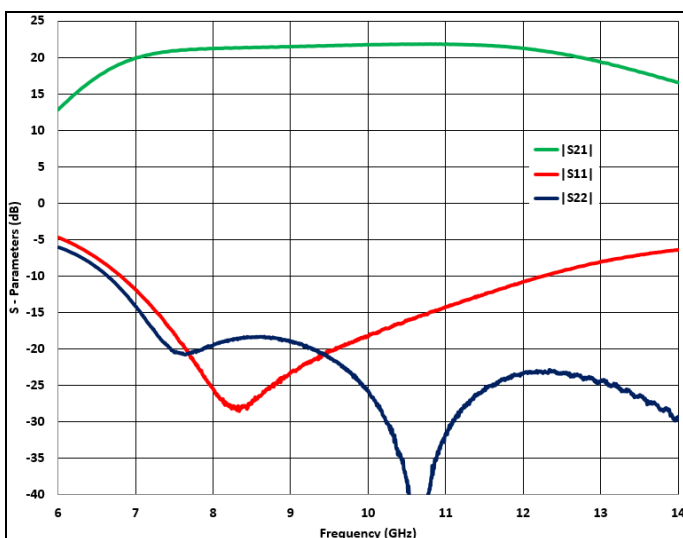
Drain voltage : VD=VD1=VD2=VD3=+8V

Gate voltage: VG=VG1=VG2=VG3: adjusted to obtain Darin current ID= (ID1+ID2+ID3)=190 mA<sup>(\*)</sup>  
(Typically VG= -0.75 V)

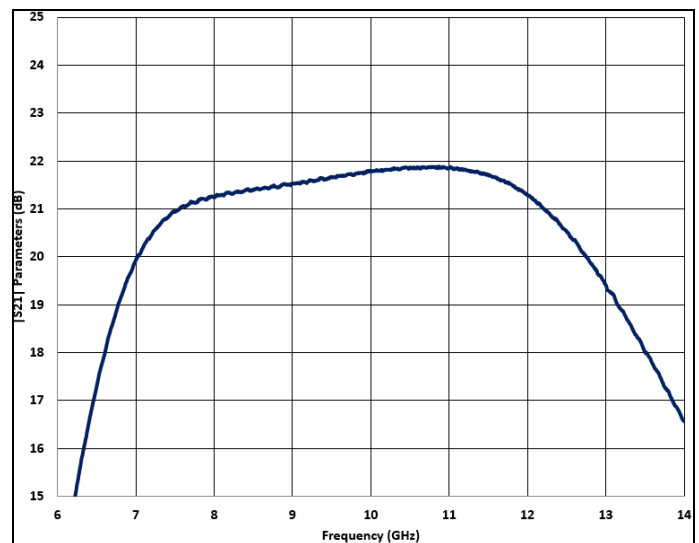
### Measurement Conditions :

Component on connectorized PCB Measurements, measurement reference planes at the component.

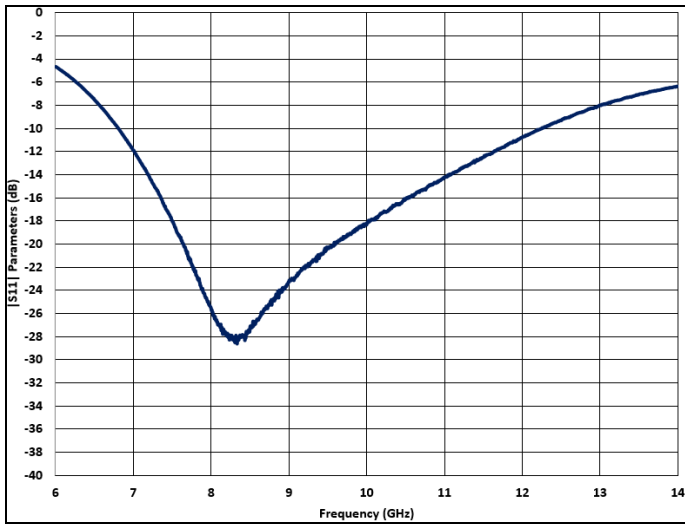
### Gain (dB)



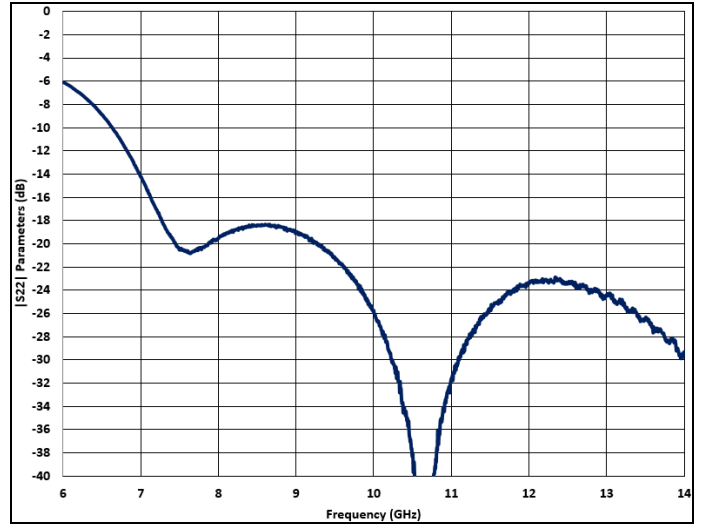
### Gain (dB)



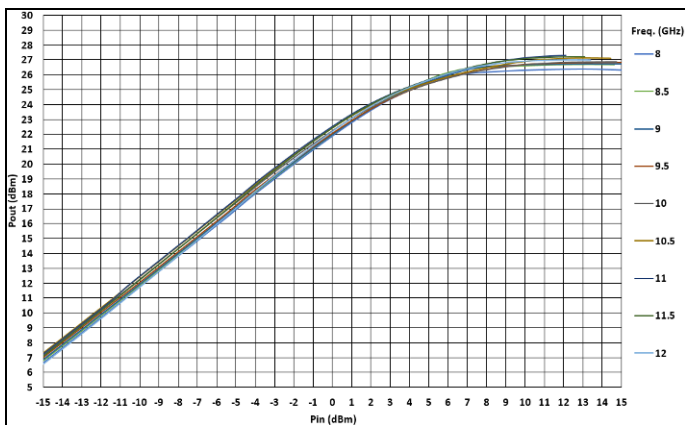
**Input Return Loss (dB):**



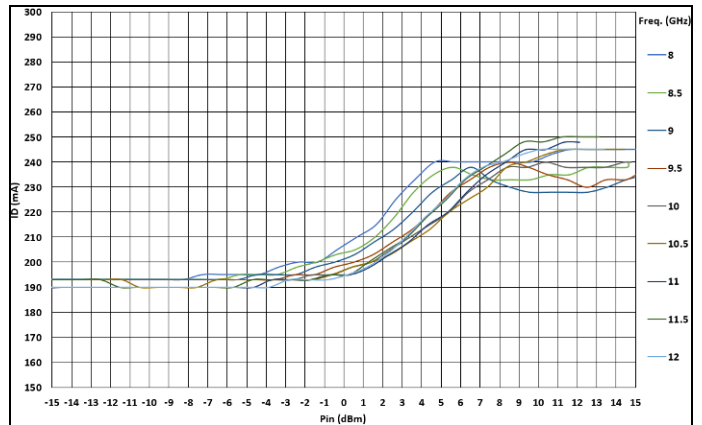
**Output Return Loss (dB):**



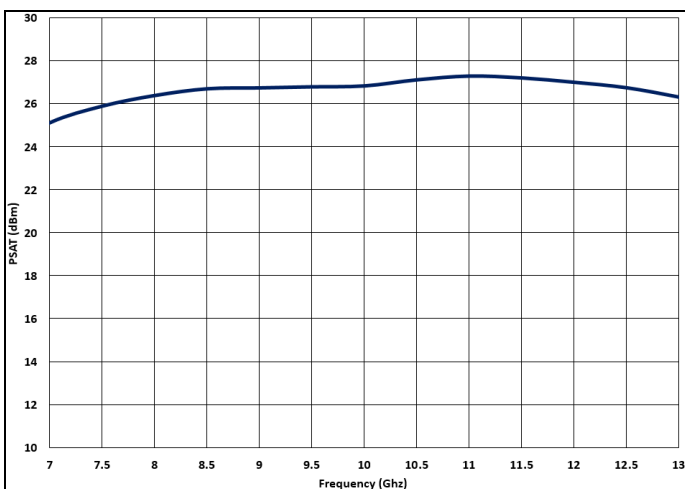
**Output Power VS Input Power :**



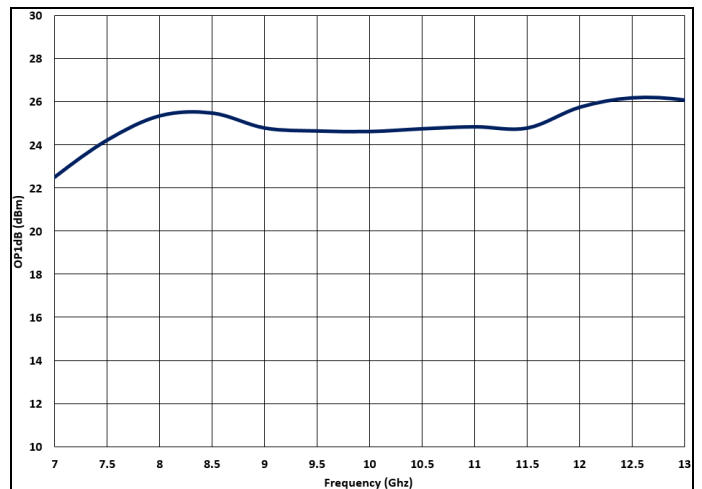
**Drain Current VS Input Power**



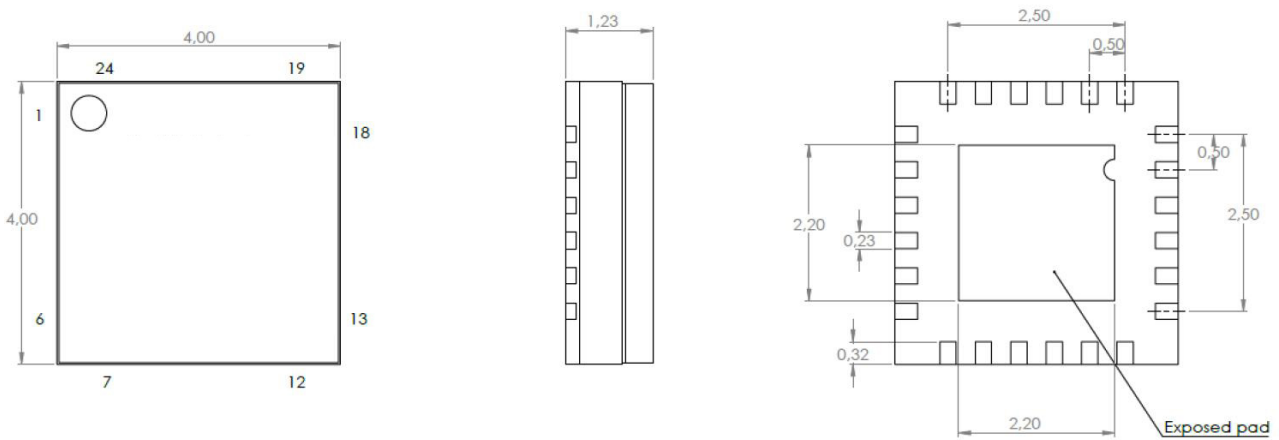
**Saturation Power VS Frequency**



**P1dB VS Frequency**

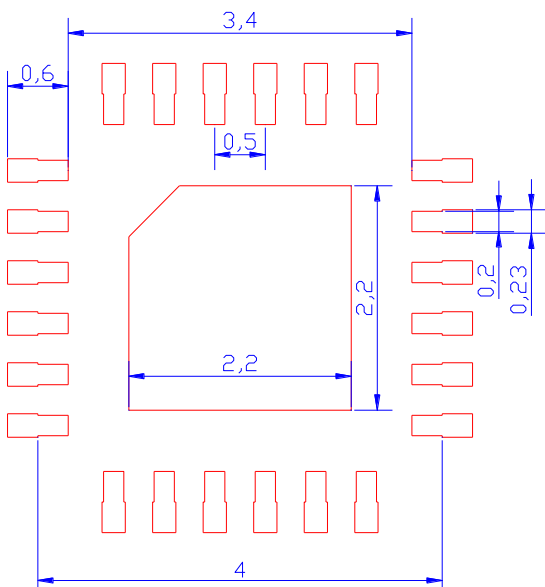


## Mechanical Drawing

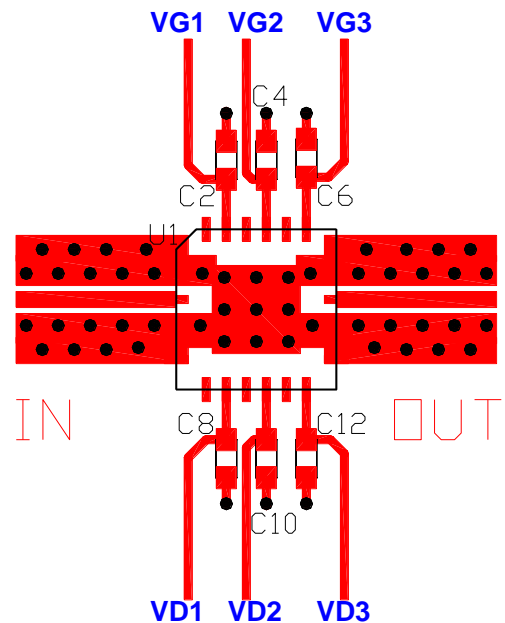


- QFN exposed PAD must be connected to ground (RF and DC).

### Recommended Land pattern



### Suggested Board Layout



C2, C4, C6, C8, C10, C12 : 0402 1μF/16V capacitor  
Substrate : RO4350B, thickness 0.254mm

## Handling

This product is sensitive to electrostatic discharge and should not be handled except at a static free workstation. Take precautions to prevent ESD; use wrist straps, grounded work surfaces and recognized anti-static techniques when handling the CBP08122126VP device.

