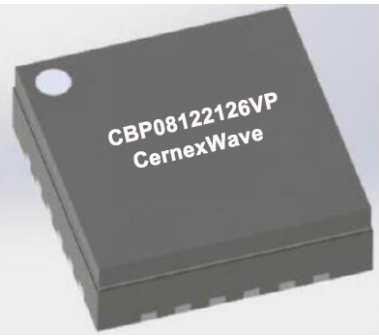



**CBP08122126VP**

**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.

## Features

- 3 stages Medium Power pHEMT GaAs MMIC
- High output Psat > +26 dBm
- High P1dB : + 25 dBm
- Small signal gain: 21 dB min
- 50 Ω, 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.

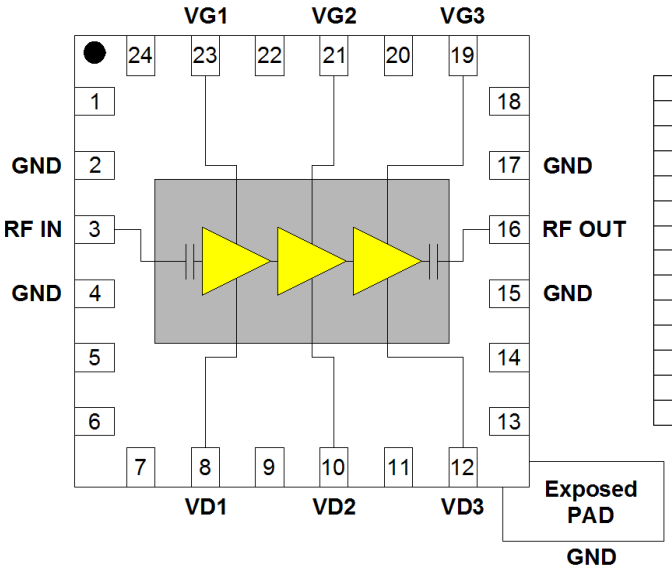
## Applications

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

## 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 Darin current ID= (ID1+ID2+ID3)=190 mA(*)
(Typically VG= -0.75 V)

| Measured parameters | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Frequency range | F | 8 | | 12 | GHz |
| Small signal gain | G | | 21 | | dB |
| Small signal gain flatness | ΔG | | +/-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 (*) | ID | | 190 | | mA |

(*) : without RF input signal

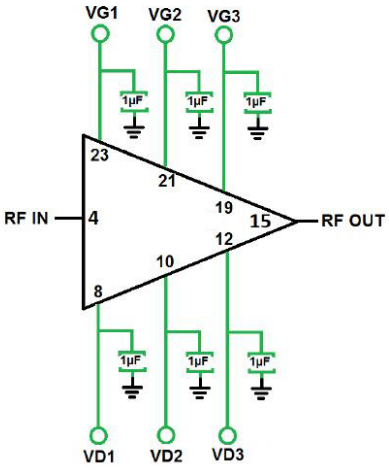
## Absolute maximum ratings

| 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(**) | ID1 | | 50 | mA |
| Drain current 2(**) | ID2 | | 75 | mA |
| Drain current 3(**) | 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 |

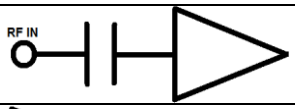
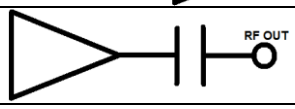
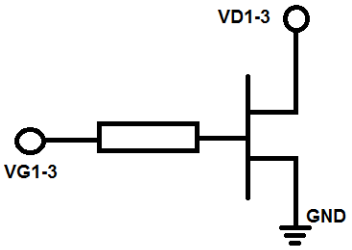
(**) : with RF input signal

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 | 1rst 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 | 1rst 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 | |

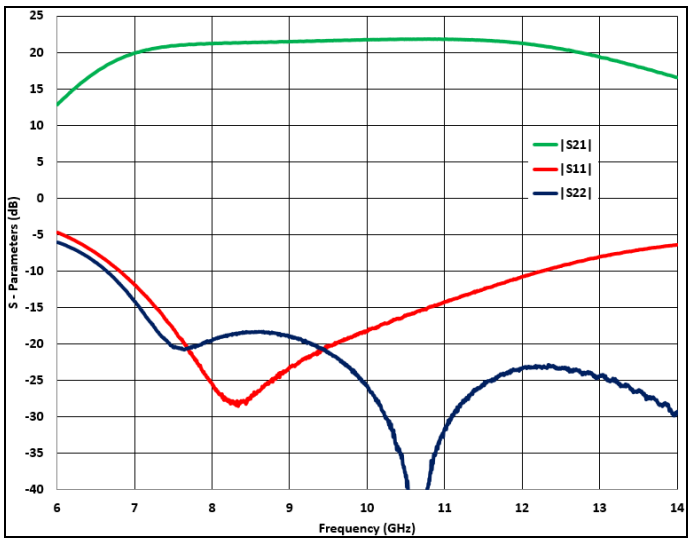
## Typical Performances Measurements (Ambient temperature T= 25°C)

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(*)
(Typically VG= -0.75 V)

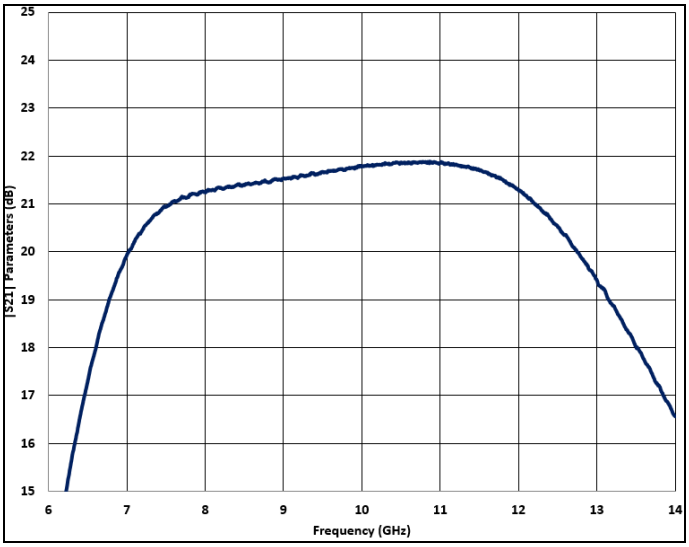
Measurement Conditions :

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

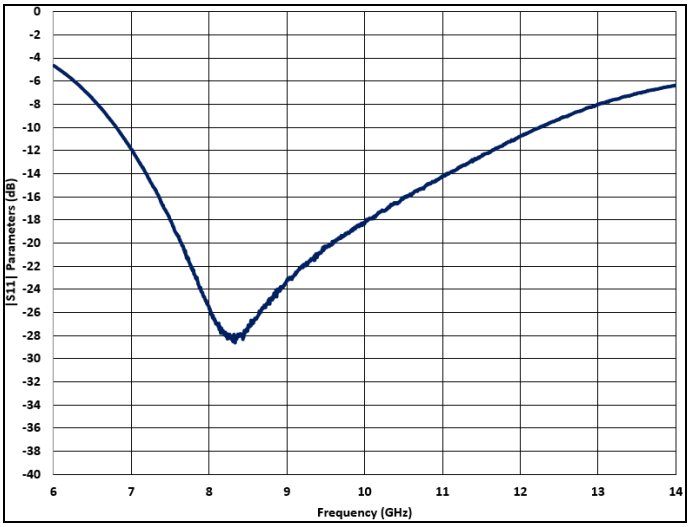
### Gain (dB)



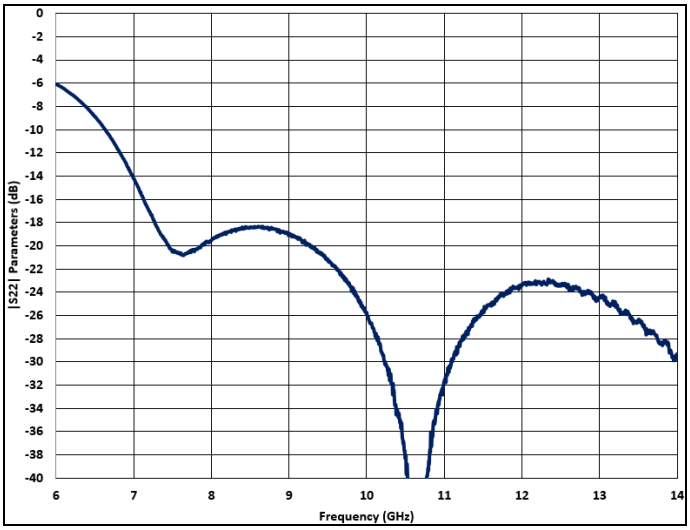

### Gain (dB)



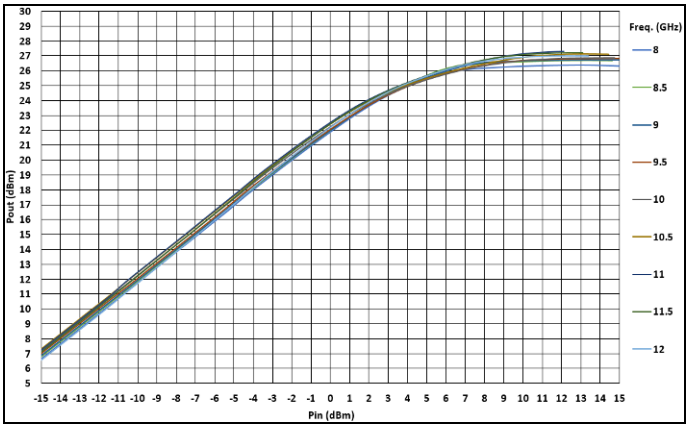
## Input Return Loss (dB):



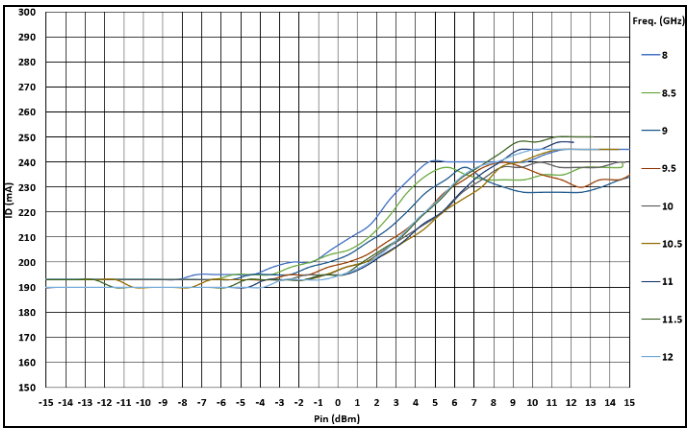

## Output Return Loss (dB):



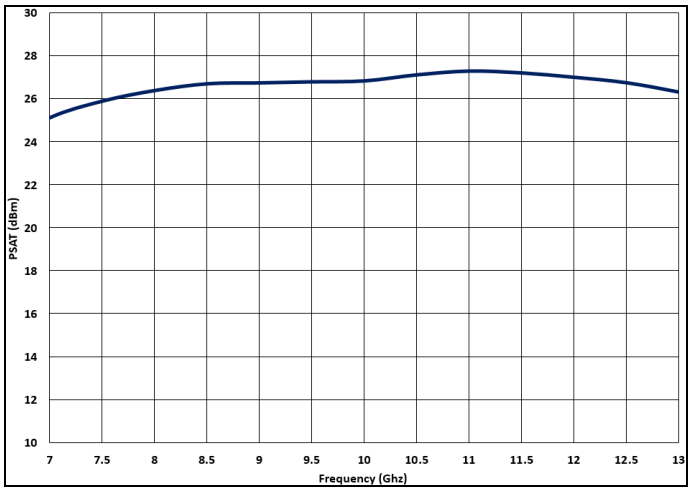

## Output Power VS Input Power :



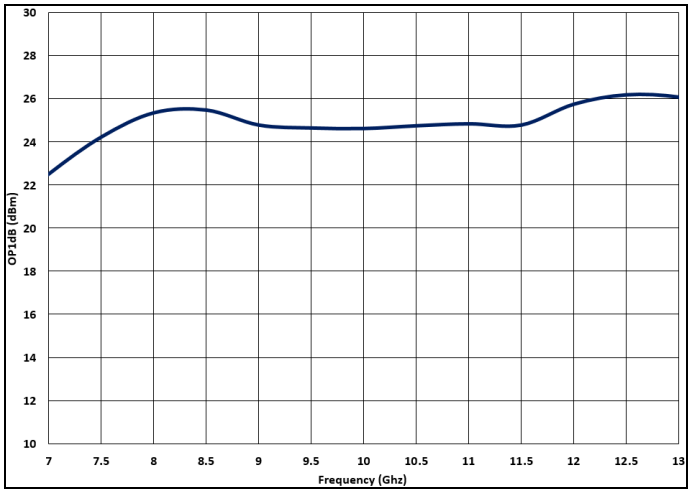

## Drain Current VS Input Power



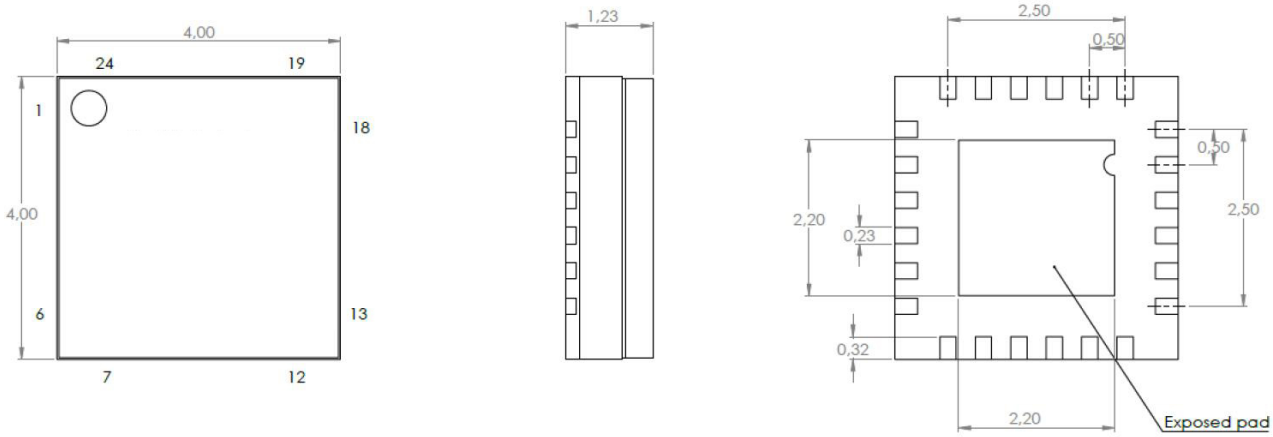

## Saturation Power VS Frequency




## P1dB VS Frequency

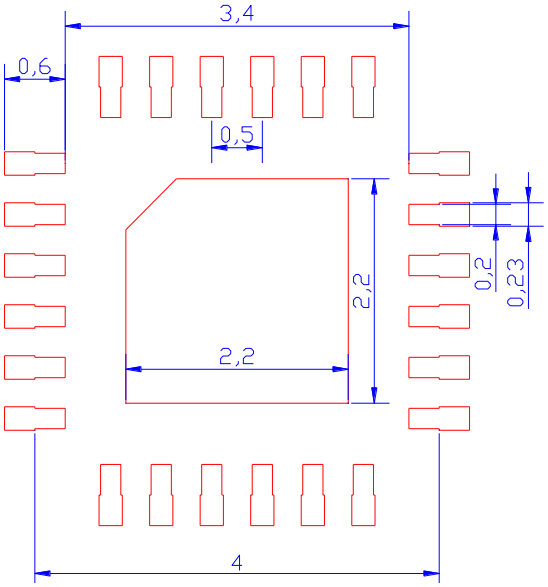


## Mechanical Drawing

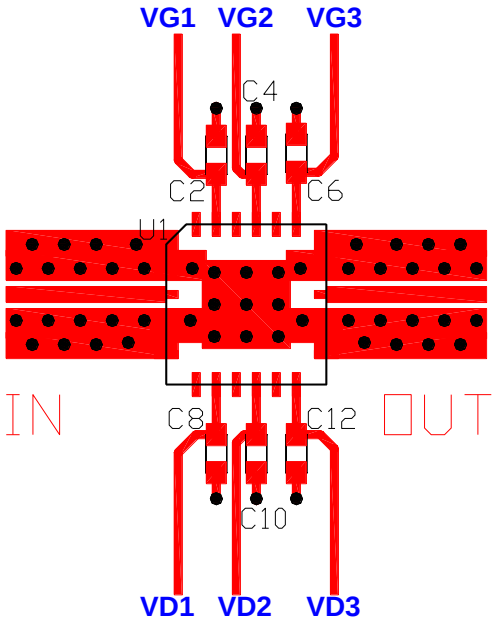



- QFN exposed PAD must be connected to ground (RF and DC).

## 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.