

CDC281721P
DC to 28 GHz – 15 dB – 20 dBm Medium Power QFN MMIC

Description

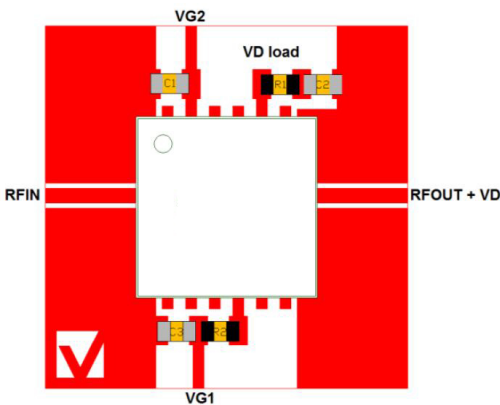
The **CDC281721P** is a distributed amplifier designed on a 0.15 μm pHEMT process, packaged in a 5x5mm 24 lead Plastic Surface Mount Package (ROHS).

The device is capable of more than +21dBm of output power at saturation regime, up to 28GHz. And more than +19 dBm of output power at 1 dB of gain compression, up to 20GHz. It provides 15 dB of linear gain from DC to 28 GHz. The Design has been optimized to provide high efficiency. The supply current is as low as 200 mA when operating with $V_D=+9V$.

Applications

- Wide band MPA
- Radar / ECM / ECCM
- Test and measurement
- Broadband / datalink communication

Suggested Board Layout and recommended decoupling components



C1, C2, C3 : 0402 1 μF /16V capacitor
R1, R2 : 10 Ω resistor

Features

- Distributed amplifier pHEMT GaAs MMIC
- Wide band: DC to 28 GHz.
- Flat group delay
- 50 Ω RF Single ended input and output
- DC coupled IN, DC coupled Out
- P1dB >+19dBm DC to 20GHz
- High output Psat >+21dBm DC to 28GHz
- Small signal gain : 15dB from DC to 28GHz
- Power supply: 200 mA @ +9V
- Package : QFN 5x5mm 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
CDC281721P	QFN 5x5mm 24Lead MPA

Typical Characteristics

Tamb = 25°C, VD = +9V, VG2=+2V, ID = 200 mA.

Parameter measured	Symbol	Min	Typ	Max	Unit
Frequency range	F	DC		28	GHz
Small signal gain	G		15		dB
Small signal gain flatness	ΔG		+/-1		dB
Input return loss	S11	-5	-8		dB
Output return loss	S22		-10		dB
Output P1 dB from DC to 20GHz	P1dB		20		dBm
Saturated output power	PSat		22		dBm
Drain supply voltage	VD		9		V
Supply current	ID		200		mA

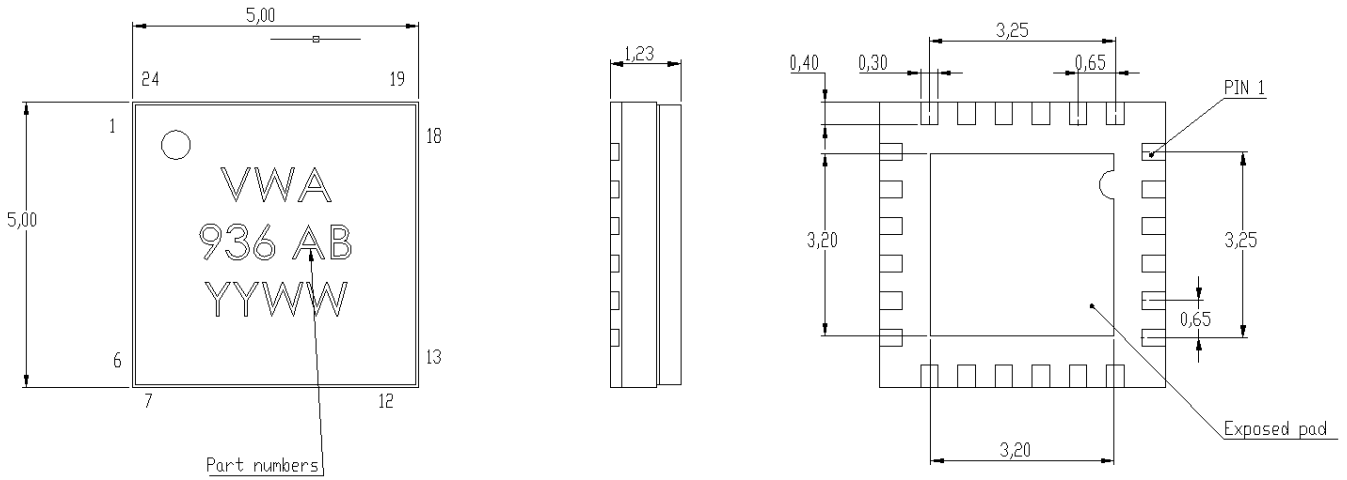
Environmental parameters

Environment Parameters	Symbols	Min	Max	Units
Storage temperature	Tst	-55	+85	°C
Operating temperature	Top	-40	+85	°C

Absolute maximum ratings

Maximum ratings	Symbols	Min	Max	Units
Positive external DC bias voltage	VD		10	V
RF input power (In)	Pin max		20	dBm
Continuous power dissipation (@ 85°C)	Pcw		2	W

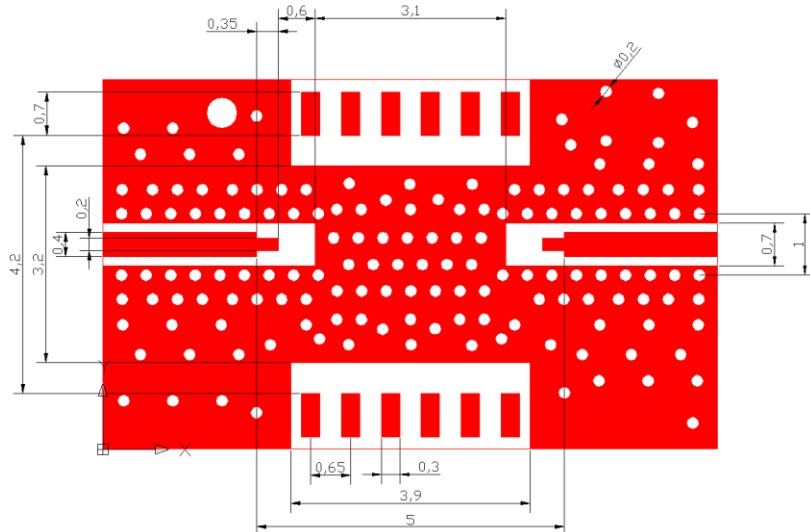
Mechanical Drawing



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

Recommended Layout

- Substrate : Rogers RO4350
- Thickness : 0.254 mm



Access description

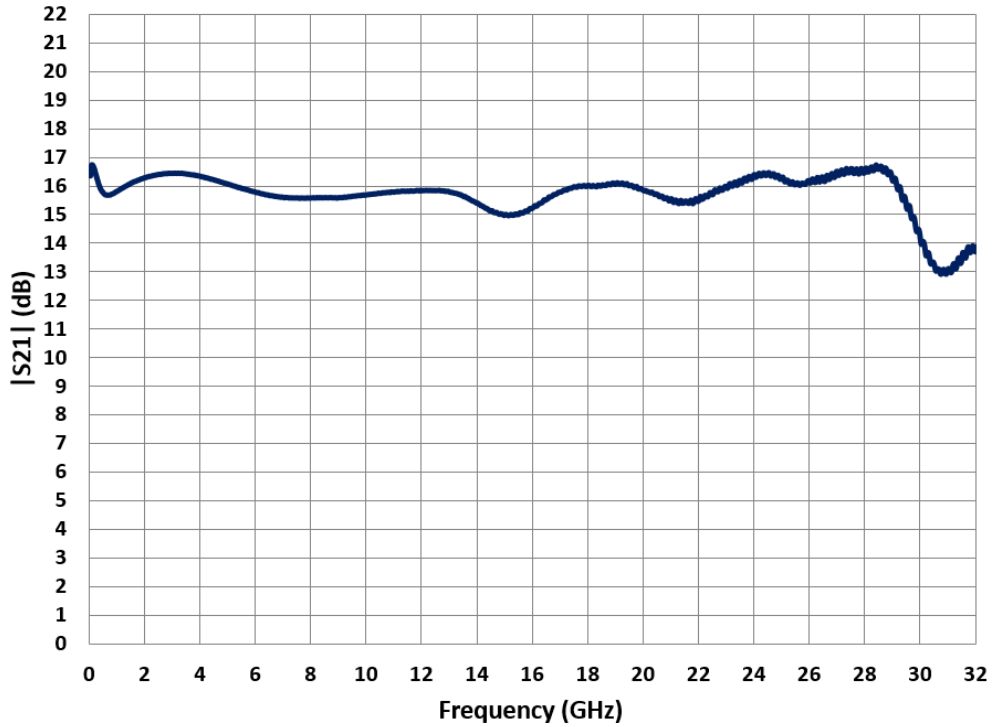
Pin number	Name	Description	Electrical interface
4	HF_AMP_INPUT	HF Amplifier input, This access is DC coupled and internally matched to 500ohms.	
23	VG2	Gate control input access for second stage distributed amplifier structure. Apply +2V for nominal biasing conditions.	
10	VG1	Gate control input access for first stage distributed amplifier structure. Apply 0V for nominal biasing conditions.	
20	VDLoad	Drain termination load decoupling access.	
15	HF_AMP_OUTPUT	HF Amplifier output, This access is DC coupled and internally matched to 500ohms. It is also used to feed the drain current (ID), by using a wide bandwidth external Bias-T structure.	
Exposed PAD	GND	Ground paddle must be connected to HF and DC Ground	
3, 5, 14, 16	GND	This PINS must be connected to HF and DC Ground	

Typical performances characteristics

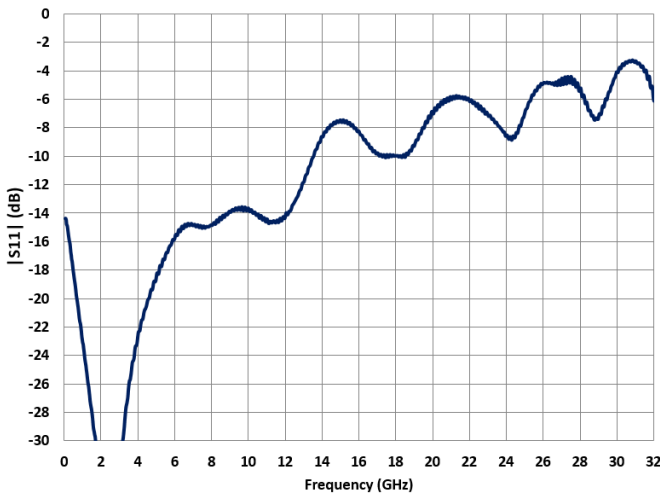
Biasing conditions: $V_D=+9V$, $V_{G2}=+2V$, $I_D=200mA$, $T=25^\circ C$.

Measurements including QFN connections access on PCB.

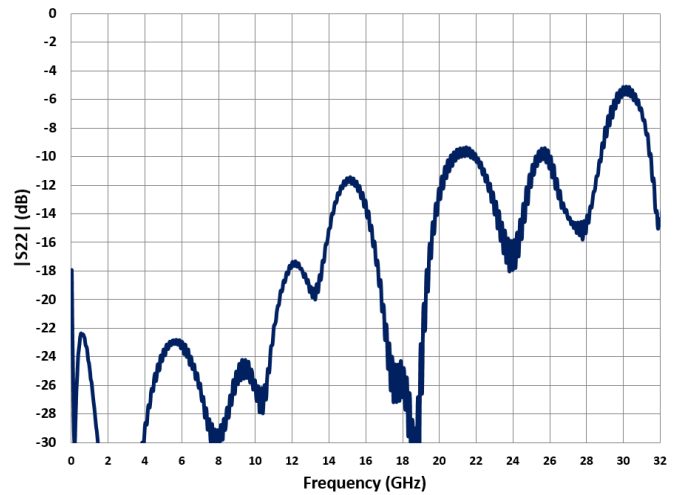
|S21| (dB)



|S11| (dB):



|S22| (dB):



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 **CDC281721P** device.

