

21-26.5GHz Medium Power Amplifier

GaAs Monolithic Microwave IC

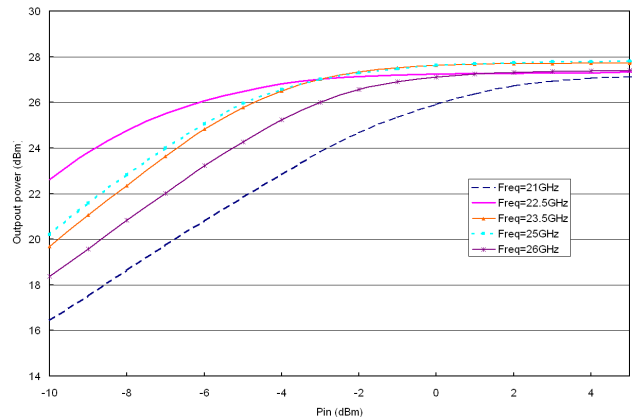
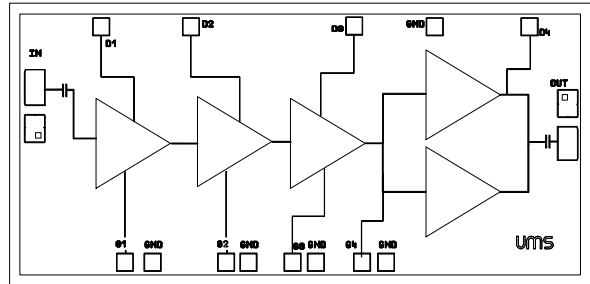
Preliminary

Description

The CHA5197a is a high gain four-stage monolithic medium power amplifier. It is designed for a wide range of applications, from military to commercial communication systems. The backside of the chip is both RF and DC grounds. This helps to simplify the assembly process.

The circuit is manufactured with a Power pHEMT process, 0.25µm gate length, via holes through the substrate, air bridges and electron beam gate lithography.

It is available in chip form.



Typical on jig Measurements

Main Features

- Performances: 21-26.5GHz
- 27.5dBm saturated output power
- 28 dB gain
- DC power consumption, 550mA @ 6V
- Chip size: 3.35x1.41x 0.07 mm
- BCB Layer protection

Main Characteristics

Tamb. = 25°C

Symbol	Parameter	Min	Typ	Max	Unit
Fop	Operating frequency range	21		26.5	GHz
G	Small signal gain		28		dB
P_sat	Saturated Output power		27.5		dBm
Id	Bias current		550		mA

ESD Protection : Electrostatic discharge sensitive device. Observe handling precautions !

Electrical Characteristics

Tamb=+25°C, Vd=6V Id=550mA

These values are representative of on jig measurements.

Preliminary

Symbol	Parameter	Min	Typ	Max	Unit
Fop	Operating frequency range	21		26.5	GHz
G	Small signal gain		28		dB
ΔG	Small signal gain flatness		±2		dB
Is	Reverse isolation		40		dB
P_sat_1	Saturated output power (21-23 GHz)		27		dBm
P_sat_2	Saturated output power (23-26.5 GHz)		27.5		dBm
PAE	Power added efficiency in saturation mode		17		%
NF	Noise Figure		8		dB
VSWRin	Input VSWR		3:1		
VSWRout	Output VSWR		3:1		
Id	Power Supply @small signal (1)		550		mA
Id_sat	Power Supply @saturation mode		600		mA
Vd	Positive drain bias voltage		6		V
Vg	Negative gate bias voltage (2)		-0.4		V

(1) This parameter is fixed by gate voltage Vg

(2) Vg tuned to obtain Id=550mA @Vd=6V and small signal

Absolute Maximum Ratings

Tamb.=25°C (1)

Symbol	Parameter	Values	Unit
Vd	Maximum drain bias voltage without RF	8.0	V
Id	Maximum drain bias current	700	mA
Vg	Gate bias voltage	-2.5 to +0.0	V
Pin	Maximum input power overdrive (2)	10	dBm
Tch	Maximum channel temperature	175	°C
Ta	Operating temperature range	-40 to +80	°C
Tstg	Storage temperature range	-55 to +125	°C

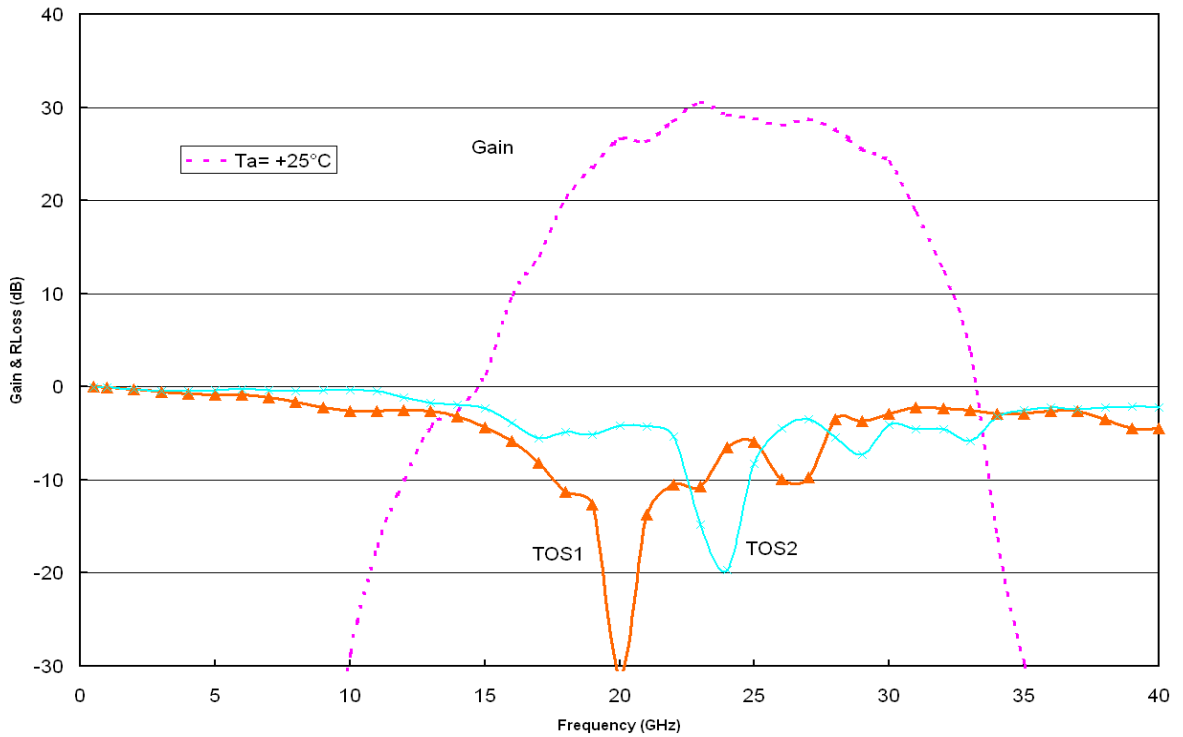
(1) Operation of this device above anyone of these parameters may cause permanent damage.

(2) Duration < 1s.

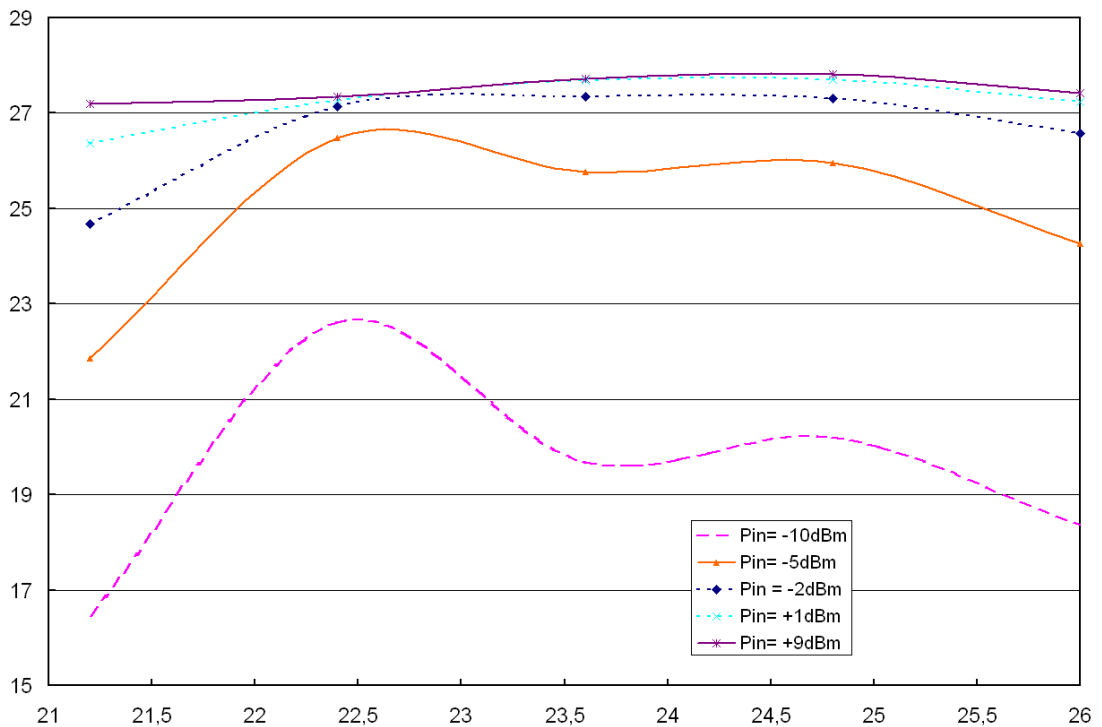
Typical on Jig Measurements

Bias conditions: $V_d=5V$, V_g tuned for $I_d=500mA$

Preliminary



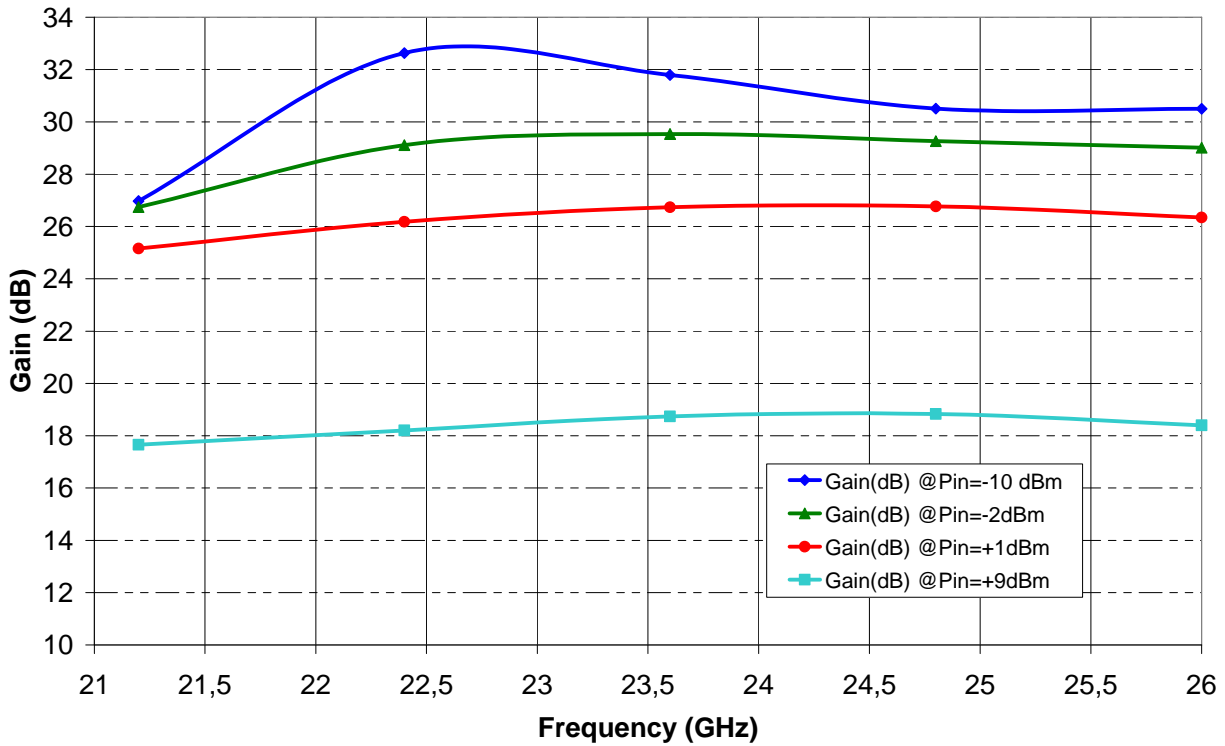
Gain and Return Losses versus frequency



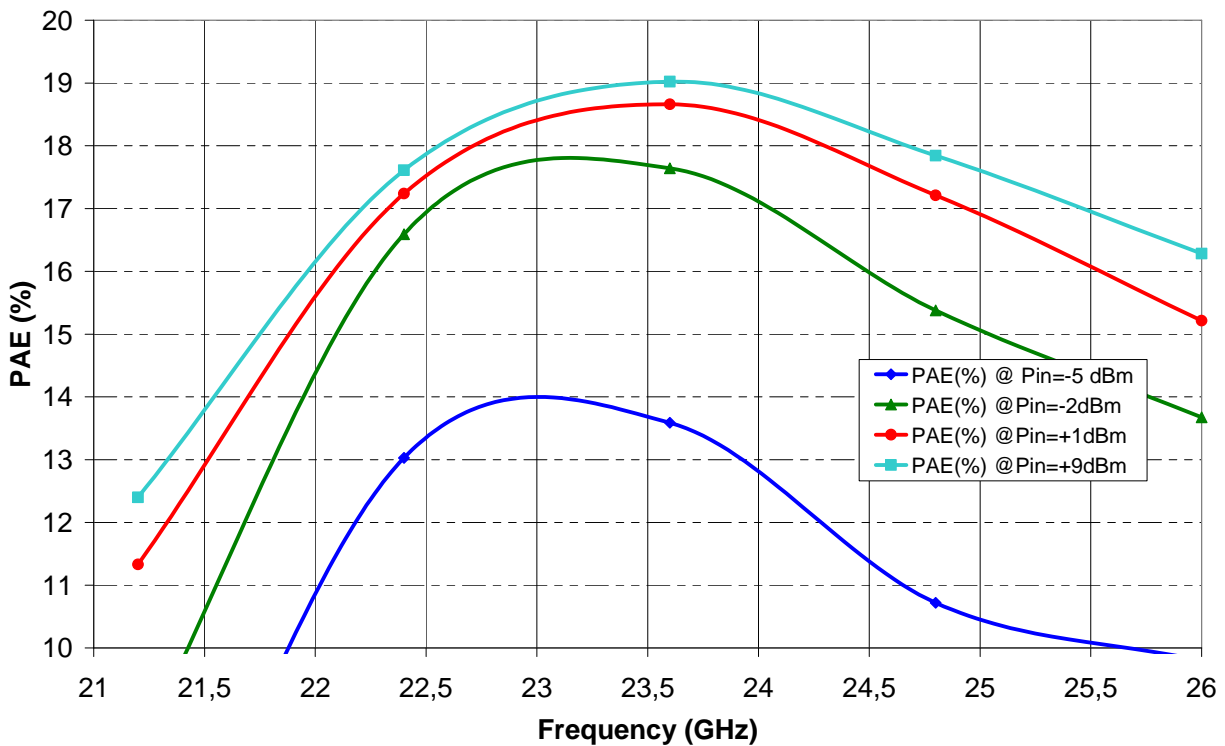
Output Power versus Frequency and Pin

Preliminary

Gain (dB) @ Pin=[-10;-2;+1;+9 dBm]



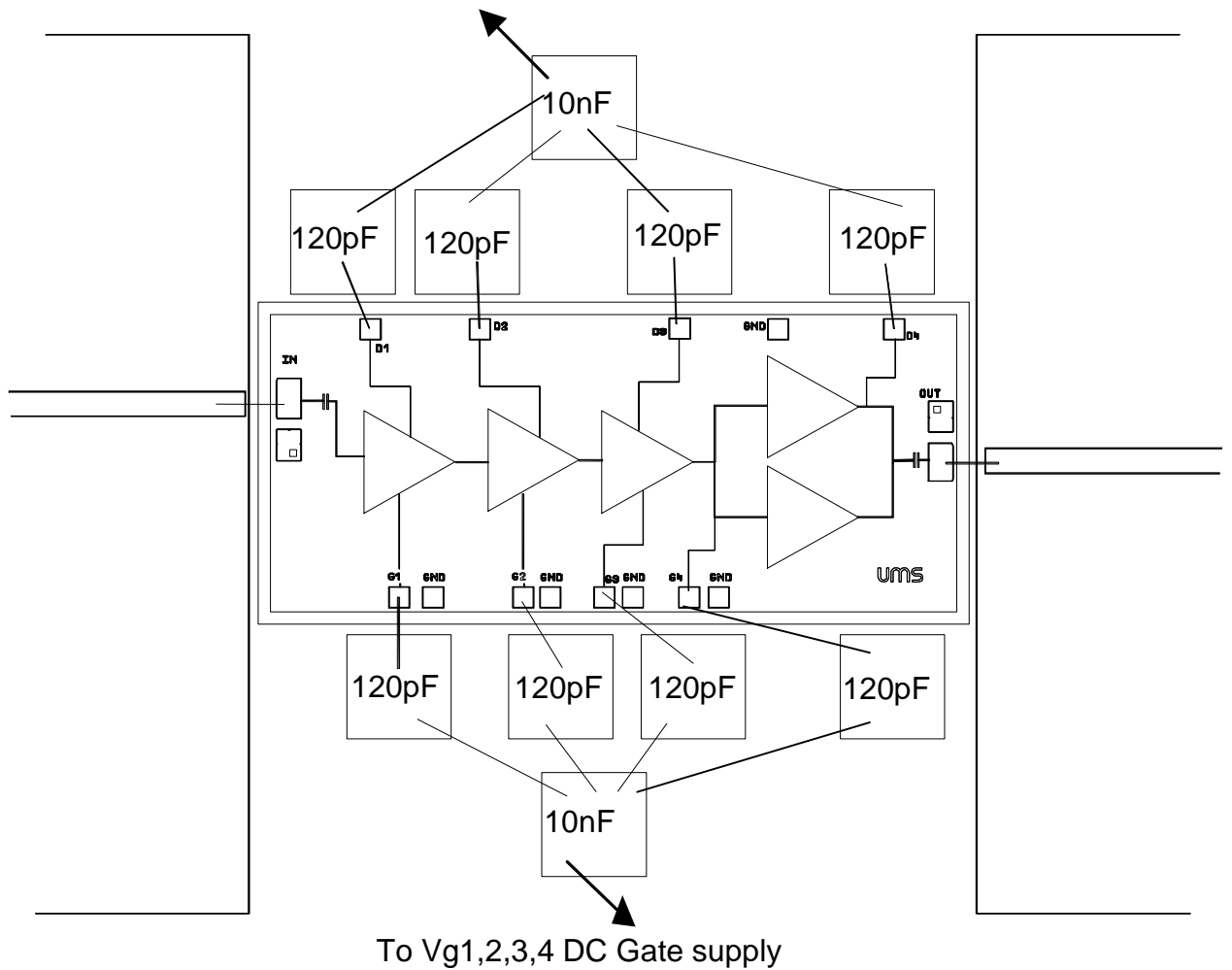
Power Added efficiency (%) @ Pin=[-5;-2;+1;+9 dBm]



Chip Assembly and Mechanical Data

Preliminary

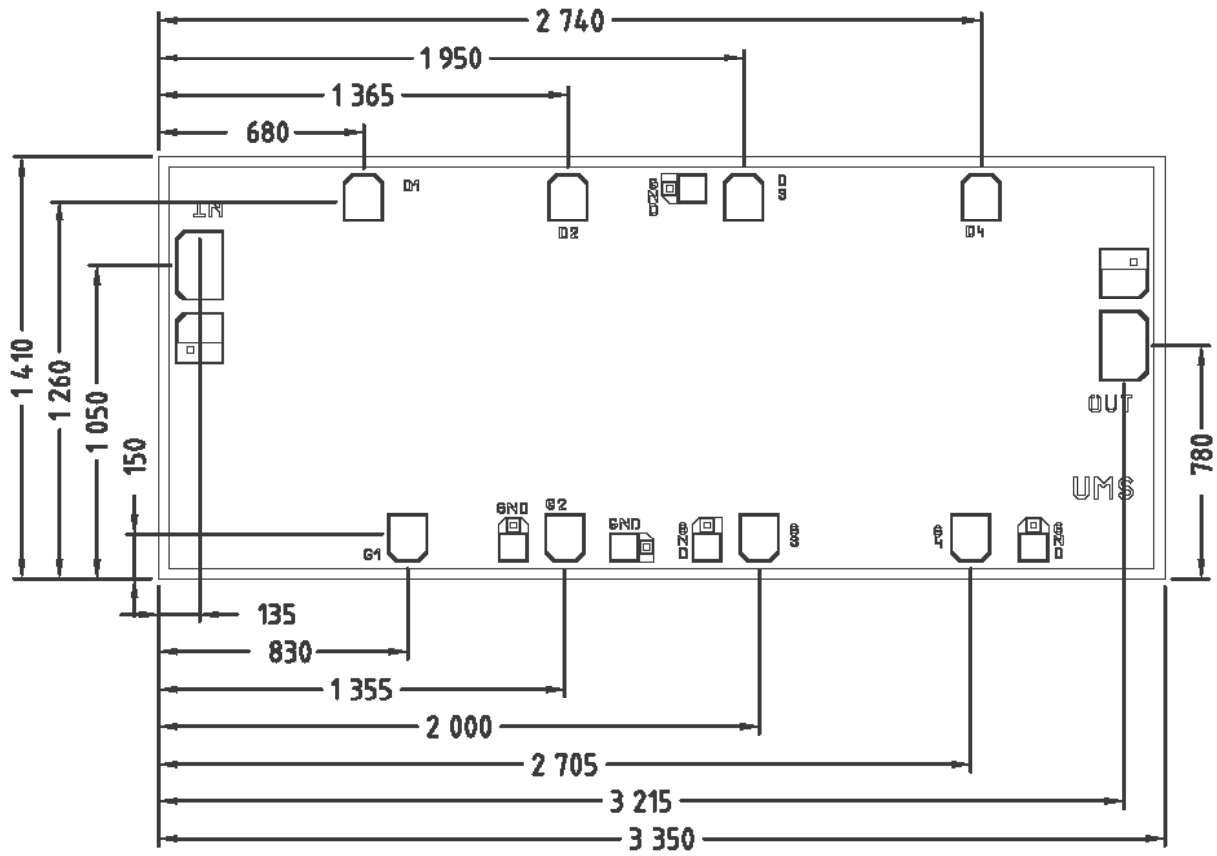
To Vd1,2,3,4 DC Drain supply feed



Note: Supply feed should be capacitively bypassed. 25µm diameter gold wire is to be preferred.

Bonding pad positions.
 (Chip thickness : 70µm. All dimensions are in micrometers)

Preliminary



*UNITS : µm
 Tol : ±35µm*

Ordering Information

Chip form : CHA5197a98F/00

Information furnished is believed to be accurate and reliable. However **United Monolithic Semiconductors S.A.S.** assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of **United Monolithic Semiconductors S.A.S.**. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. **United Monolithic Semiconductors S.A.S.** products are not authorised for use as critical components in life support devices or systems without express written approval from **United Monolithic Semiconductors S.A.S.**