30-40GHz Medium Power Amplifier

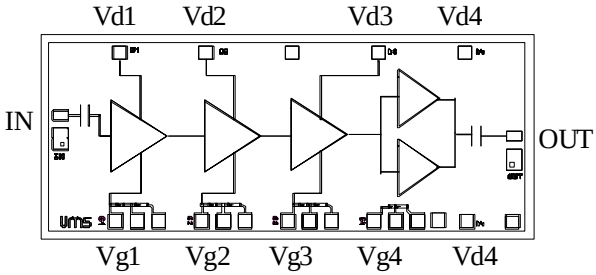
GaAs Monolithic Microwave IC

preliminary

Description

The CHA5294 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 circuit is manufactured with a pHEMT process, 0.15µm gate length.

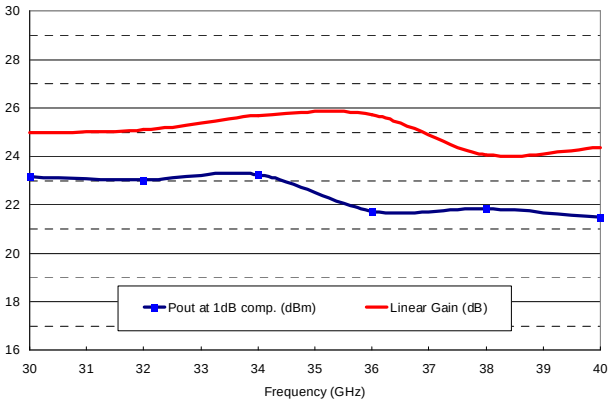


It is available in chip form.

Main Features

- Performances: 30-40GHz
- 22dBm output power @ 1dB comp.
- 24 dB gain
- DC power consumption, 500mA @ 3.5V
- Chip size: 4.10 x 1.42 x 0.07mm

Typical on jig Measurements



Main Characteristics

Tamb. = 25℃

Symbol	Parameter	Min	Typ	Max	Unit
Fop	Operating frequency range	30		40	GHz
G	Small signal gain		24		dB
P1dB	Output power at 1dB gain compression		22		dBm
Id	Bias current		500		mA

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

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Electrical Characteristics on wafer (1)

Tamb = +25℃

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Symbol	Parameter	Min	Typ	Max	Unit
Fop	Operating frequency range	30		40	GHz
G	Small signal gain from 30 to 34GHz from 34 to 40GHz		24.5 23		dB
ΔG	Small signal gain flatness		±1.5		dB
Is	Reverse isolation		40		dB
P1dB	Pulsed output power at 1dB compression from 30 to 34GHz from 34 to 40GHz		23 22		dBm
Psat	Saturated power from 30 to 34GHz from 34 to 40GHz		24.5 23		dBm
IP3	Output Intercept point 3rd order from 30 to 34GHz from 34 to 40GHz		30 28		dBm
VSWRin	Input VSWR		2.0:1		
VSWRout	Output VSWR		4.0:1		
Vd	Drain bias DC voltage		3.5		V
Id	Bias current @ small signal		500	650	mA

(1) These values are representative for pulsed on-wafer measurements that are made without bonding wires at the RF ports.

Absolute Maximum Ratings

Tamb. = 25℃ (1)

Symbol	Parameter	Values	Unit
Vd	Maximum Drain bias voltage with Pin max= -2dBm	+4.0	V
Id	Drain bias current with Vd=3.5V in small signal	700	mA
Vg	Gate bias voltage	-2 to +0.4	V
Pin	Maximum peak input power overdrive with Vd=3.5V (2)	+6.0	dBm
Tch	Maximum channel temperature	+175	℃
Ta	Operating temperature range	-40 to +80	℃
Tstg	Storage temperature range	-55 to +125	℃

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

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Typical on Jig Measurements in CW mode

Bias conditions: Vd=3.5V

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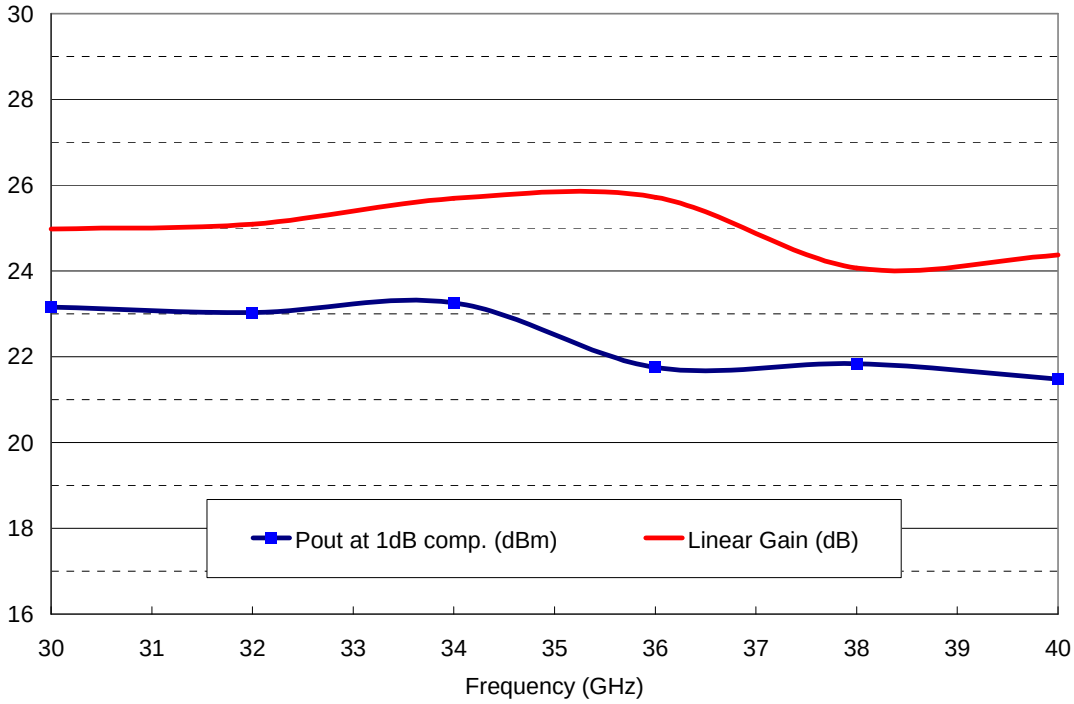
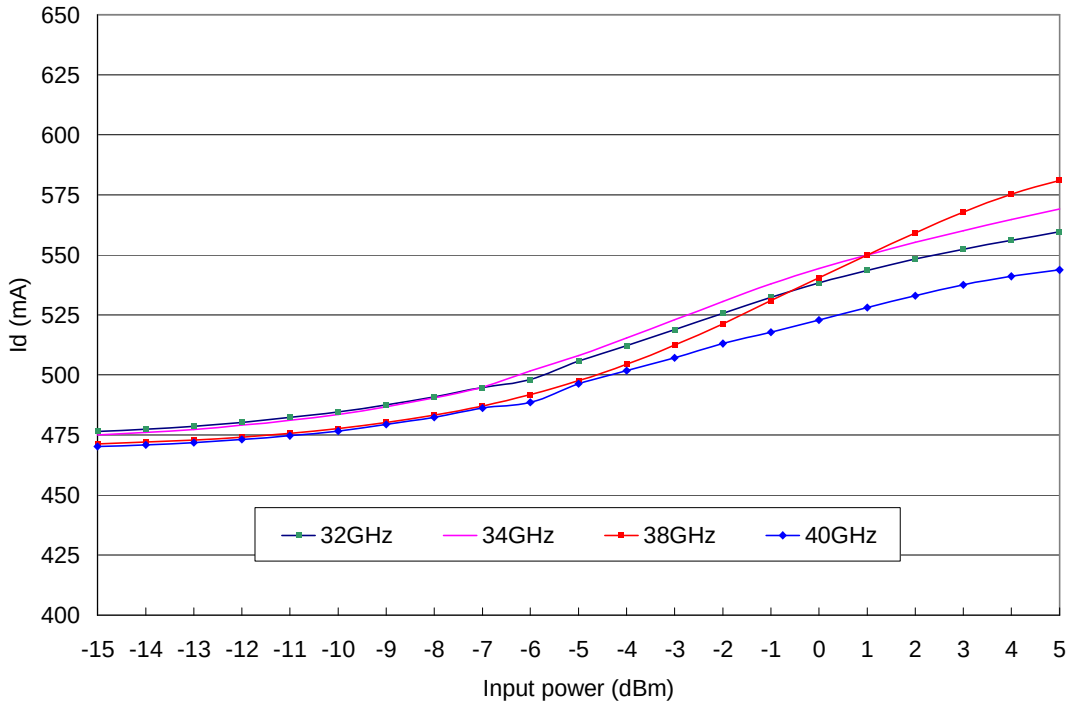
Linear Gain & Output Power at 1dB compression vs frequency



Drain current versus input power



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Chip Assembly and Mechanical Data

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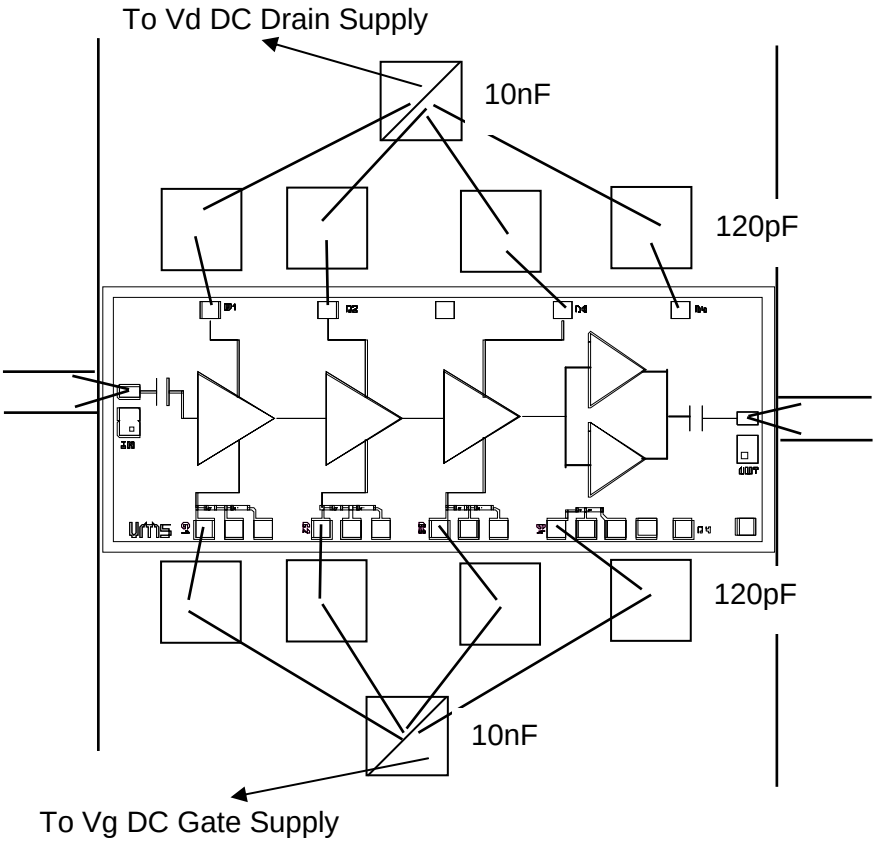

Note: Supply feed should be capacitively bypassed. 25µm diameter gold wire is to be prefered.

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Bonding pad positions

(Chip thickness : 70µm)

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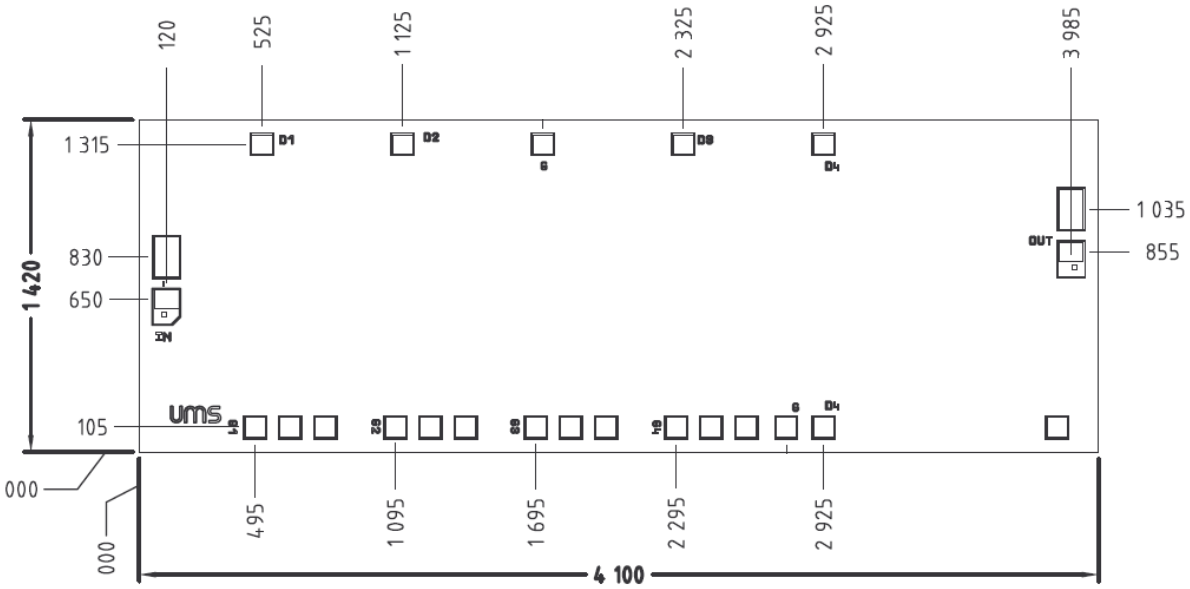

UNITS : µm
Tol : ±35µm

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Application note

Bias operation sequence:

ON: Supply Gate voltage
Supply Drain voltage
OFF: Cut off Drain voltage
Cut off Gate voltage

Due to 70µm thickness, specific care is requested for the handling and assembly.

Ordering Information

Chip form : CHA5294-99F/00

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