23–34GHz High Power Amplifier

GaAs Monolithic Microwave IC

Target

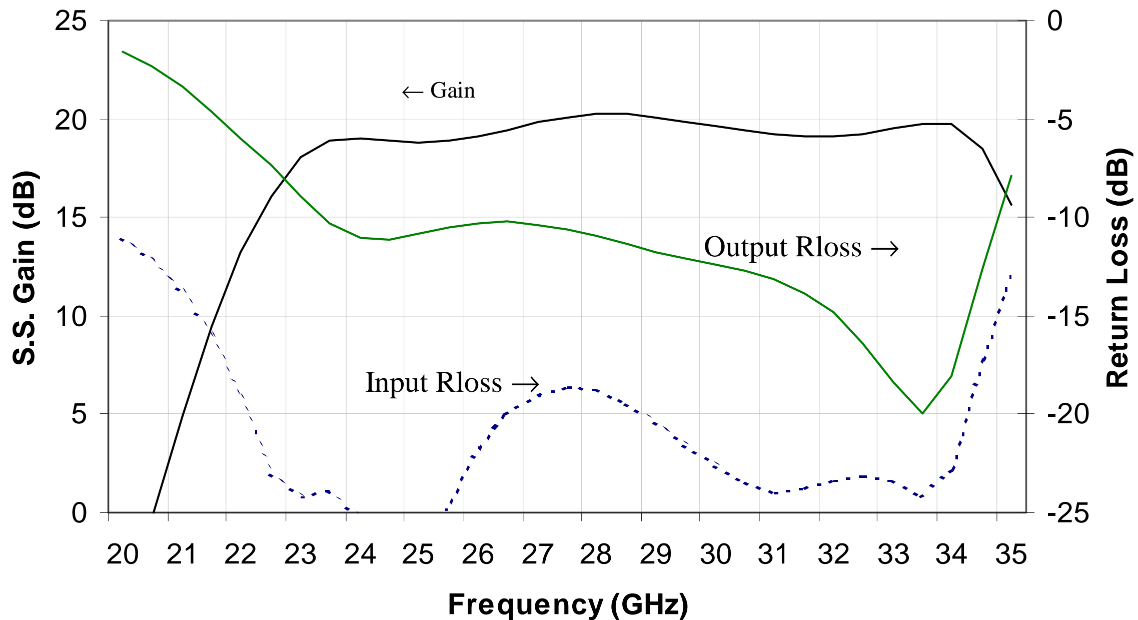
Description

The CHA4042 is a three-stage pHEMT HPA MMIC designed for point-to-point and multi-point radio, and other Ka-band applications. The CHA4042 provides 25dBm nominal output power at 1dB gain compression over the 23-34GHz frequency range, and 20dB small signal gain. This product will be available in chip form.

Main Features

- Frequency Range: 23-34GHz
- Gain: 20dB
- Output Power (P-1dB): 25dBm
- Output TOI: 33dBm
- Input Return Loss: 18dB
- Output Return Loss: 11dB
- Bias: 6V, 300mA
- Dimensions: 1.93 x 1.09 x 0.07mm

Predicted Gain & Return Loss



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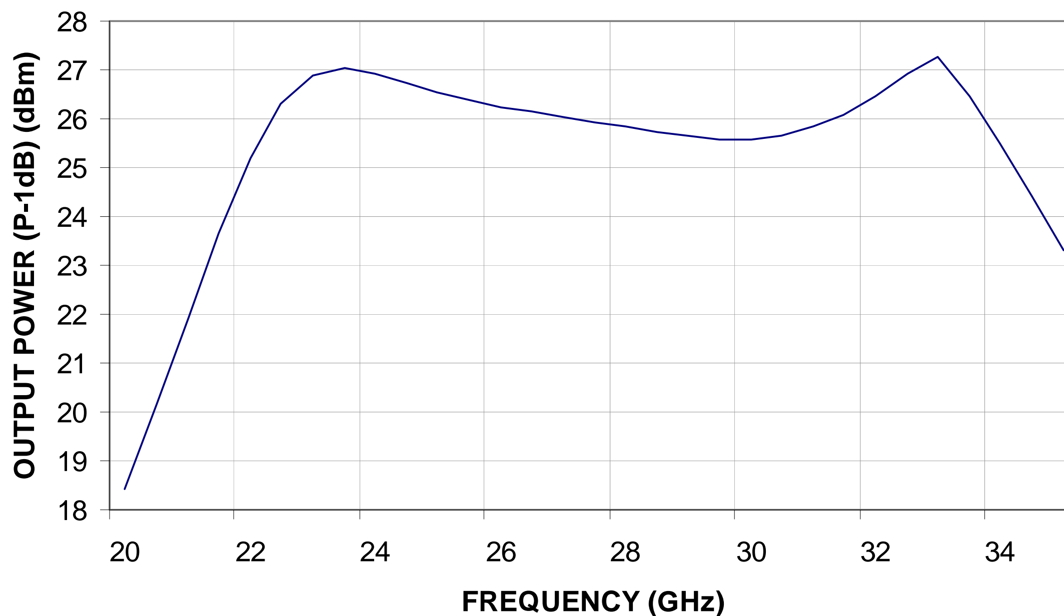

Absolute Maximum Ratings

T_{amb} = 25 °C (1)

Symbol	Parameter	Values	Unit
Vds	Drain bias voltage_small signal	6.25	V
Ids	Drain bias current_small signal	450	mA
Vgs	Gate bias voltage	-2 to +0.4	V
Vdg	Maximum Drain Gate voltage (Vd-Vg)	+8	V
Pin	Maximum peak input power overdrive (2)	+15	dBm
Ta	Operating Temperature Range (3)	-45 to +80	C
Tstg	Storage Temperature Range	-55 to +125	C

- Operation of this device above any one of these parameters may cause permanent damage.
- Duration < 1 s
- AuSn solder mount to CuW or CuMo carrier assumed

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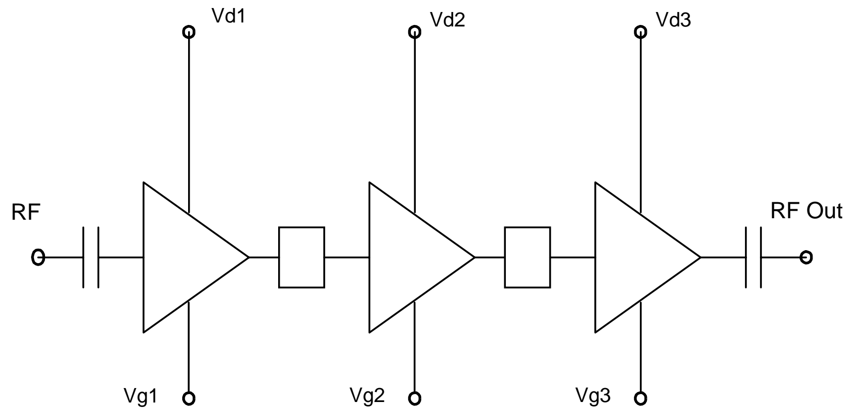
Schematic



Typical Bias Conditions

Tamb. = 25 °C

Symbol	Parameter	Values	Unit
Vd 1, 2, 3	Drain bias voltage	6.0	V
Vg 1, 2, 3	Gate bias voltage	-0.5	V
Idd	Total drain current	300	mA

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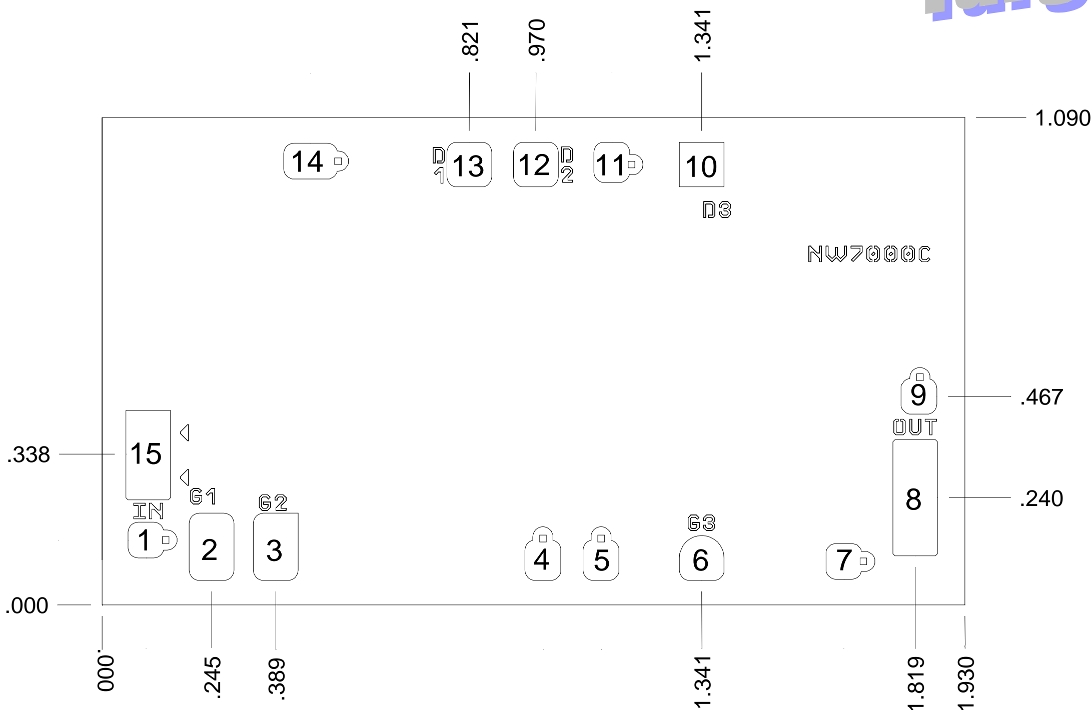
MMIC Outline & Bond Pads

Not to scale, dimensions are in millimeters



Bond Pad #1, 7, 9:	GND	(0.080 x 0.080)
Bond Pad #4, 5, 11:	GND	(0.080 x 0.090)
Bond Pad #14:	GND	(0.122 x 0.080)
Bond Pad #2:	VG1	(0.100 x 0.150)
Bond Pad #3:	VG2	(0.100 x 0.150)
Bond Pad #6:	VG3	(0.100 x 0.100)
Bond Pad #8:	RF OUT	(0.100 x 0.260)
Bond Pad #10:	VD3	(0.100 x 0.100)
Bond Pad #12:	VD2	(0.100 x 0.100)
Bond Pad #13:	VD1	(0.100 x 0.100)
Bond Pad #15:	RF IN	(0.100 x 0.200)

Units: millimeters
Thickness: 0.070

Chip size : 1930µm +/-35µm x 1090µm +/- 35µm

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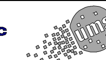

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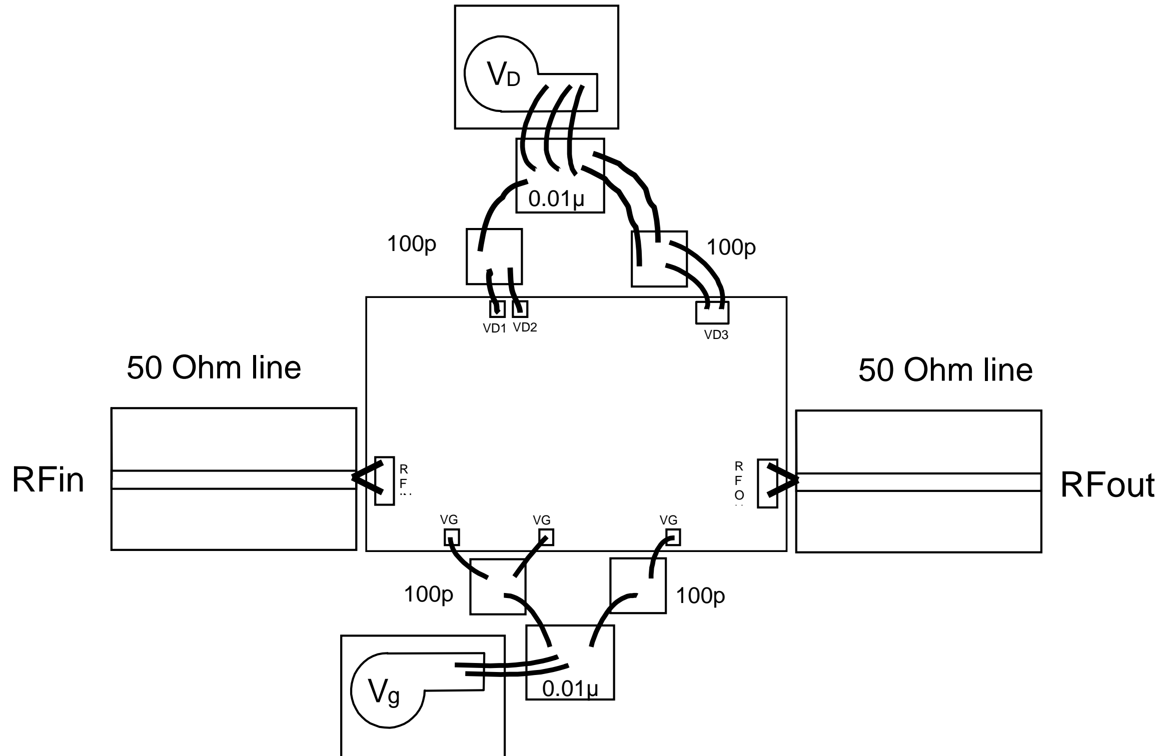
MMIC Assembly and Bonding Diagram (not to scale)



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Ordering Information

Chip form : CHA4042-99F/00

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