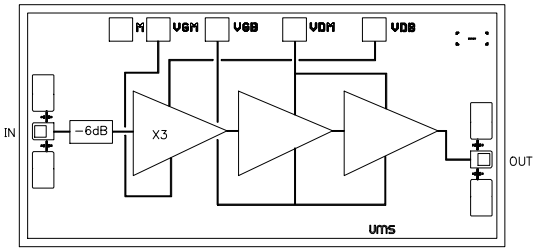
12-36GHz Frequency Multiplier

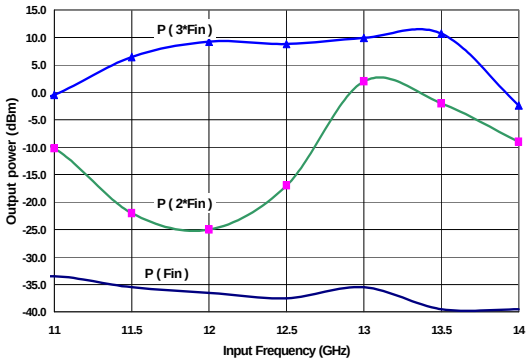
GaAs Monolithic Microwave IC

Description

The CHX1094 is a cascadable frequency multiplier by 3 monolithic circuit.
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 simplify the assembly process.

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





typical measurements

Main Features

- Broadband performances: 12-13.5GHz
- 10dBm output power for +14dBm input power
- DC bias: Vd = 3.5V @ Id=60mA
- Chip size: 2.07 x 1.03 x 0.10mm

Main Characteristics

Tamb. = 25℃

Symbol	Parameter	Min	Typ	Max	Unit
Fin	Input frequency range	12		13.5	GHz
Fout	Output frequency range	36		40.5	GHz
Pin	Input power		14		dBm
Pout	Output power @ Pin= 14dBm		10		dBm

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

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Electrical Characteristics

Tamb = +25℃, Vgm = -1.5V, Vgb = -0.2V

Symbol	Parameter	Min	Typ	Max	Unit	*Typ***
Fin	Input frequency range	12		13.5	GHz	***14***
Fout	Output frequency range	36		40.5	GHz	***42***
Pin	Input power	12	14	16	dBm	***16***
Pout	Output power @ Pin=14dBm	8	10		dBm	***5***
H3/H2	2^{nd} Harmonic rejection (Pin ≤ 14dBm)	8	10		dBc	***5***
H3/H1	Fund. rejection (Pin ≤ 14dBm)	30			dBc	***35***
VSWRin	Input VSWR			2:1		***2:1***
VSWRout	Output VSWR			2.5:1		***2.5:1***
Vd	DC voltage	2.5		3.5	V	***4***
Id	Bias current		60	80	mA	***80***

***** This supplementary column indicates Typical parameters for Vd = 4V***

Absolute Maximum Ratings

Tamb. = 25℃ (1)

Symbol	Parameter	Values	Unit
Vd	Drain bias voltage	4.5	V
Id	Drain bias current	120	mA
Vg	Gate bias voltage	-2 to +0.4	V
Ta	Operating temperature range	-40 to +85	℃
Tstg	Storage temperature range	-55 to +155	℃

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

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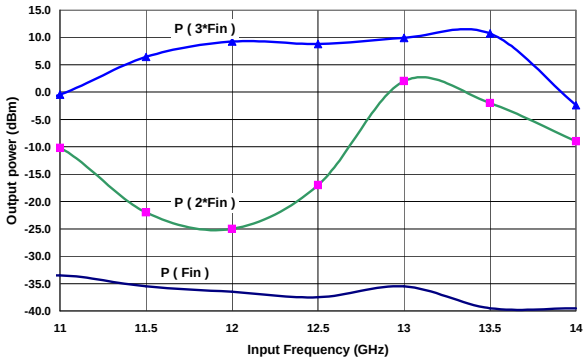
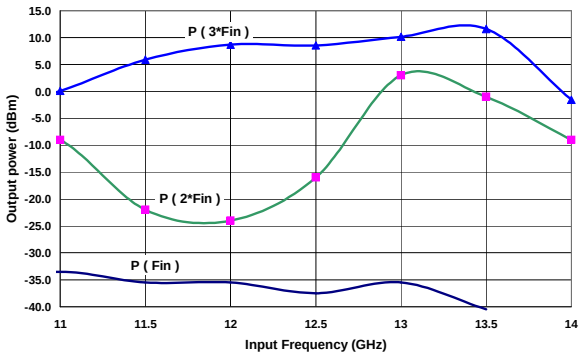
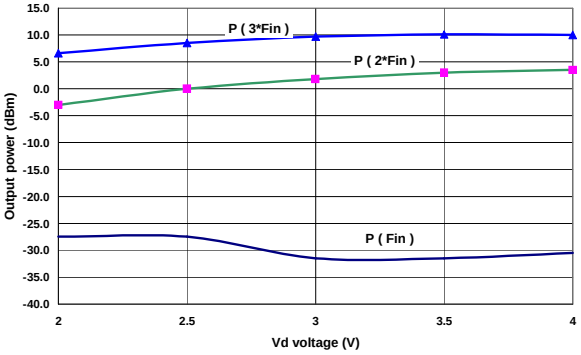
Typical on Jig Measurements



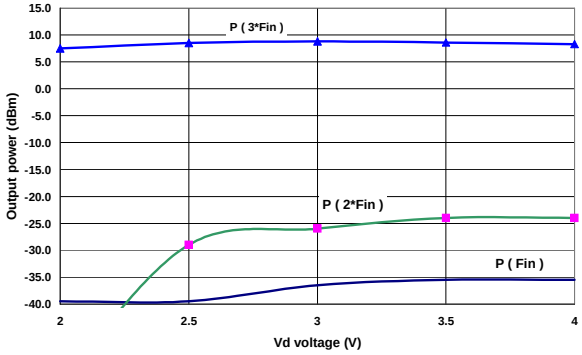
Pout versus Fin @ Pin=14 dBm & Vd=3V



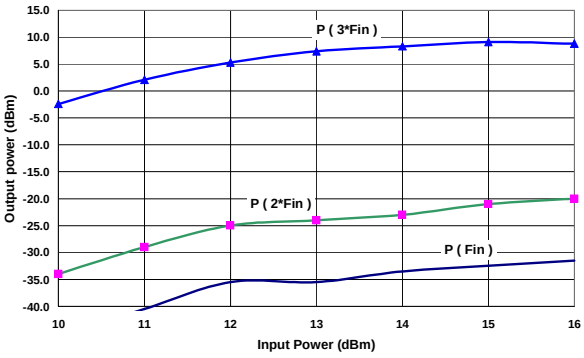
Pout versus Fin @ Pin=14 dBm & Vd=3.5V



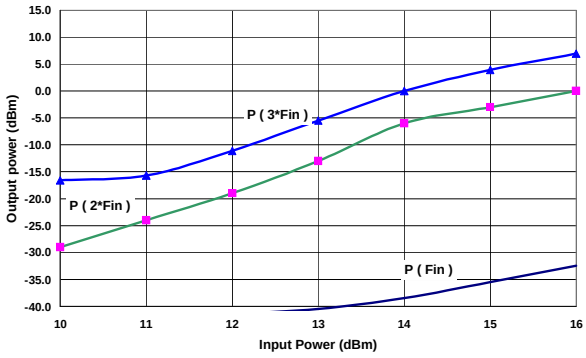
Pout versus Vd @ Pin=14dBm & Fin=13GHz



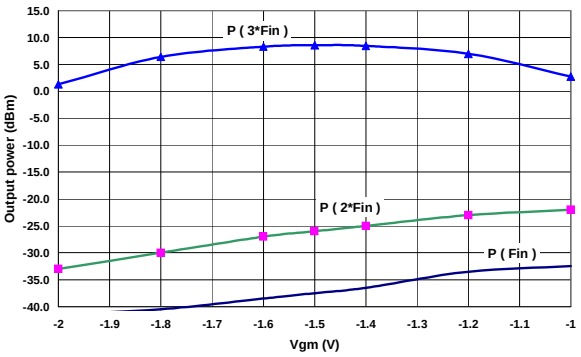
Pout versus Vd @ Pin=14dBm & Fin=12GHz



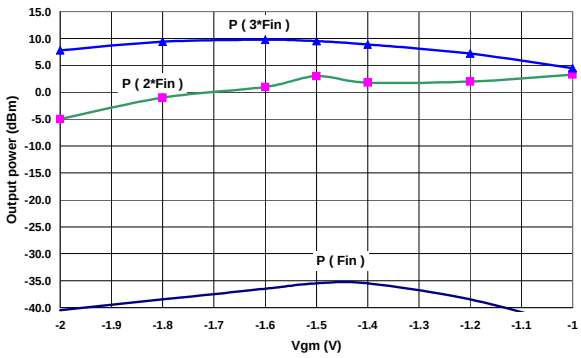
Pout versus Pin @ Fin=12GHz & Vd=3V



Pout versus Pin @ Fin=14GHz & Vd=4V



Pout versus Vgm @Fin=12GHz & Vd=3V



Pout versus Vgm @ Fin=13GHz & Vd=3V

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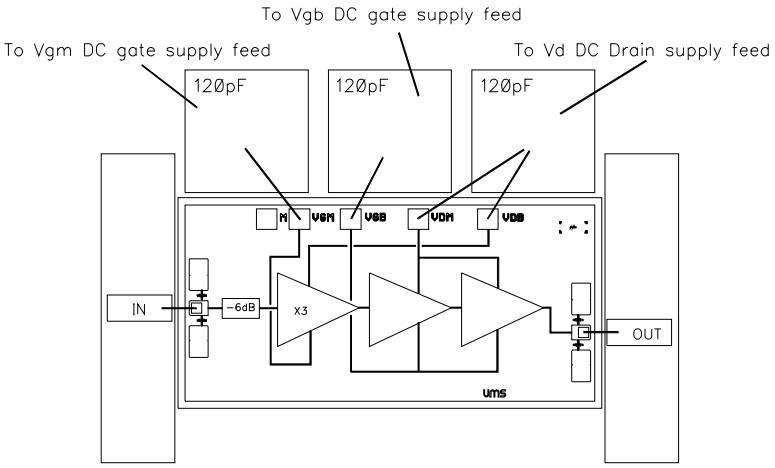
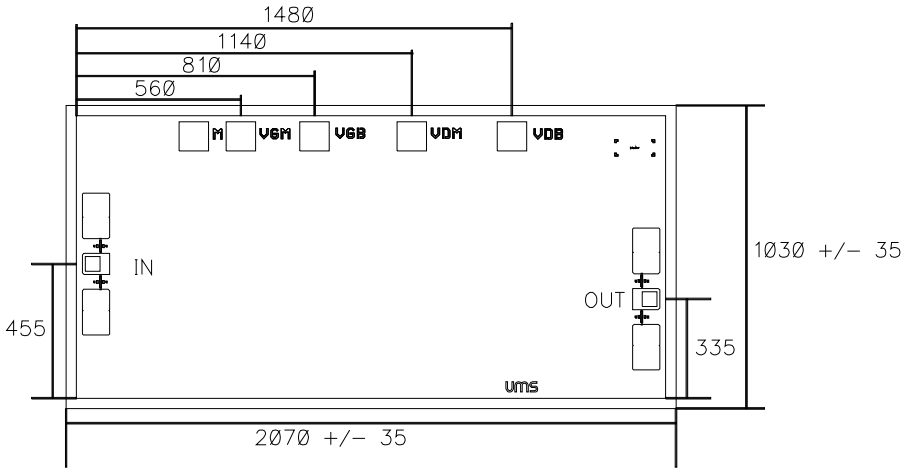
Chip Assembly and Mechanical Data



Note : Supply feed should be capacitively bypassed. 25µm diameter gold wire is to be prefered
Bond Pad: 100 x 100 µm².



Bonding pad positions.
(Chip thickness: 100µm. All dimensions are in micrometers)

Ordering Information

Chip form : CHX1094-99F/00

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