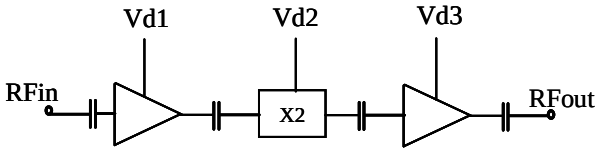
21-42GHz Frequency Multiplier

GaAs Monolithic Microwave IC

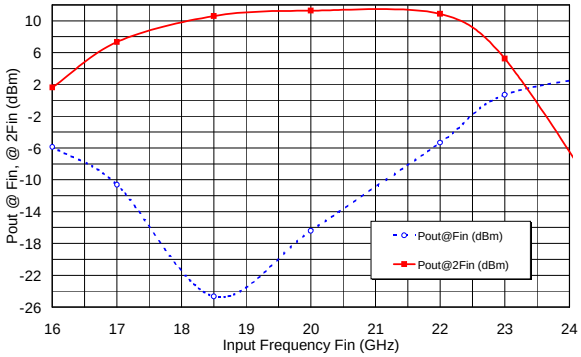
Description

The CHX2191 is a frequency doubler 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 grounded. This helps to 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.



2Fin & Fin output power



Main Features

- Broadband performance: 17-21GHz
- Self biased
- 11dBm output power
- DC power consumption, 70mA @ 4.25V (with RF)
- Chip size: 1.63x0.95x0.10mm

Main Characteristics

Tamb. = 25℃

Symbol	Parameter	Min	Typ	Max	Unit
Fin	Input frequency range	17		21	GHz
Fout	Output frequency range	34		42	GHz
Pin	Input power		0		dBm
Pout	Output power for +0dBm input power		11		dBm

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

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Electrical Characteristics

Tamb = +25℃, Vd = 4.25V Id = 70mA under RF Pin=0dB m

Symbol	Parameter	Min	Typ	Max	Unit
Fin	Input frequency range	17		21	GHz
Fout	Output frequency range	34		42	GHz
Pin	Input power		0		dBm
Pout	Output power for +0 dBm input power		11		dBm
Is/Fo	Fin level at the output (17 < Fin < 20GHz), for 0dBm input power		-15		dBm
VSWRin	Input VSWR		2.0:1		
VSWRout	Output VSWR		2.5:1		
Id	Bias current (with RF)		70		mA

A wire bond of typically 0.1 to 0.15nH will improve the input and output matching.

Absolute Maximum Ratings (1)

Tamb = +25℃

Symbol	Parameter	Values	Unit
Vd	Drain bias voltage	4.5	V
Id	Drain bias current	100	mA
Pin	Maximum input power	5	dBm
Ta	Operating temperature range	-40 to +85	℃
Tstg	Storage temperature range	-55 to +125	℃

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

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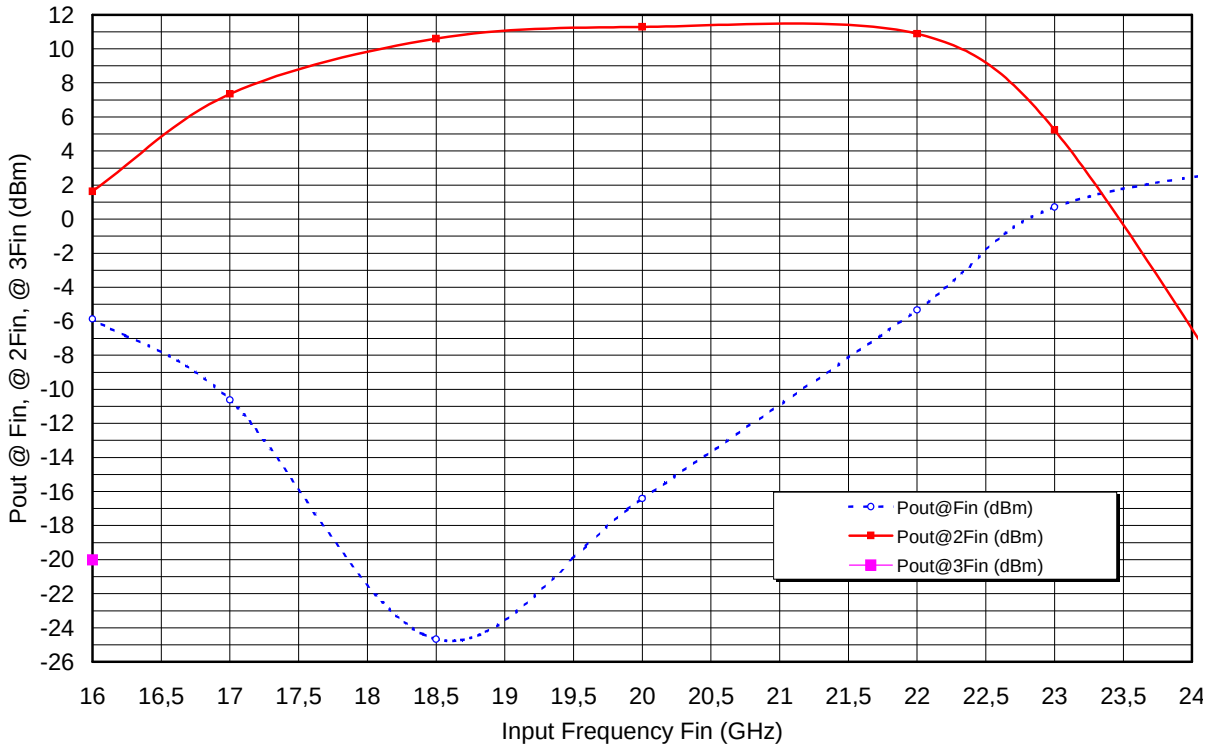
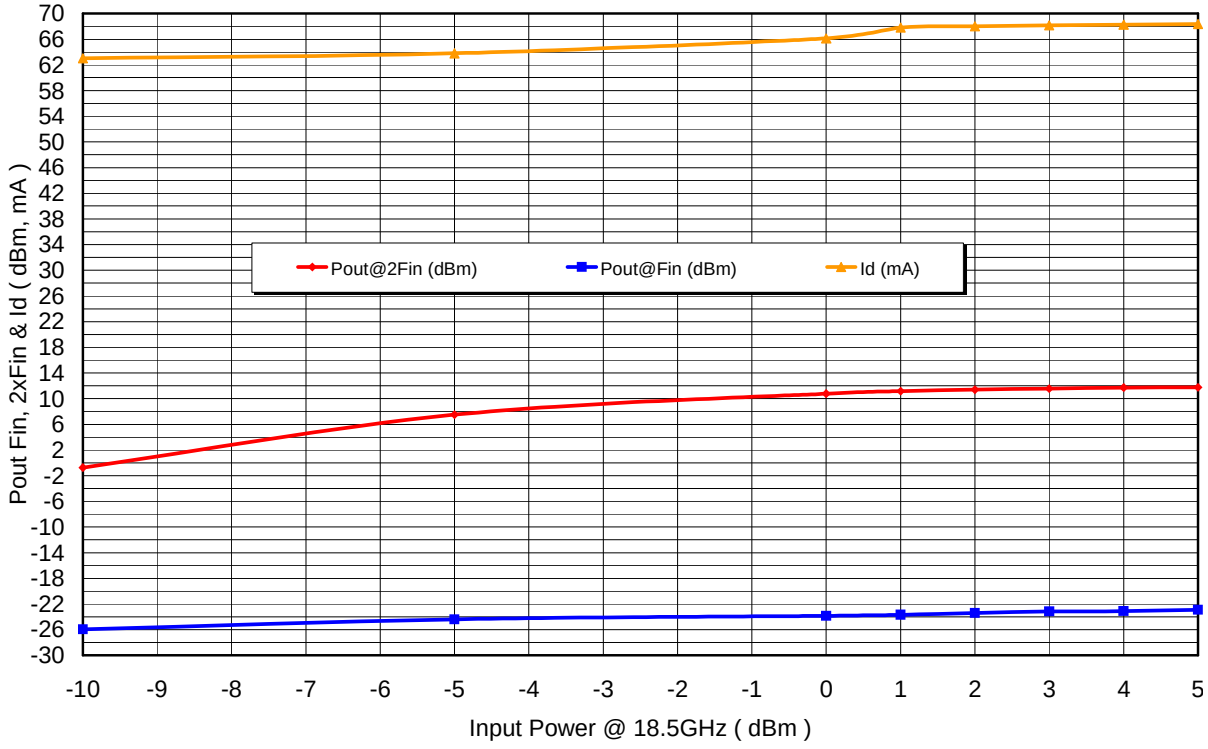
Typical on Wafer Measurements

Bias conditions: Tamb = +25℃, Vd1= Vd2=Vd3= 4.25V

Harmonic Output power versus Input frequency @ Pin=0dBm



Harmonic Output power & Drain current versus Input power @ Fin=18.5GHz



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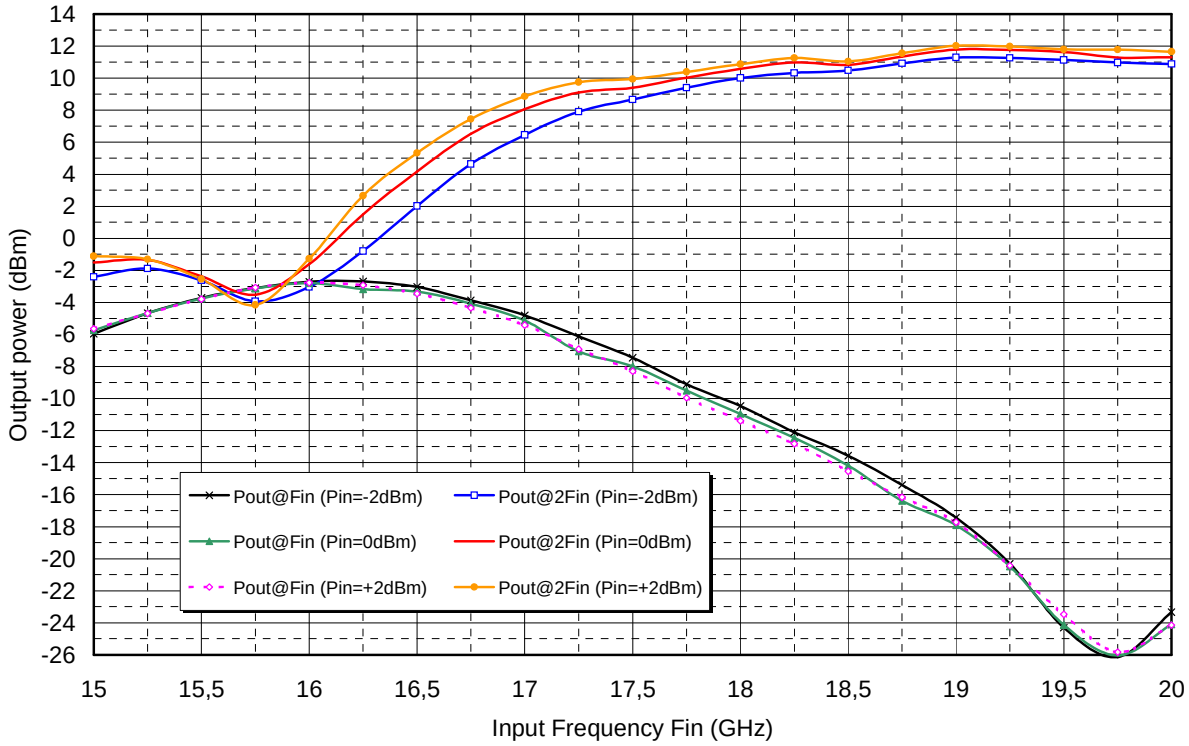
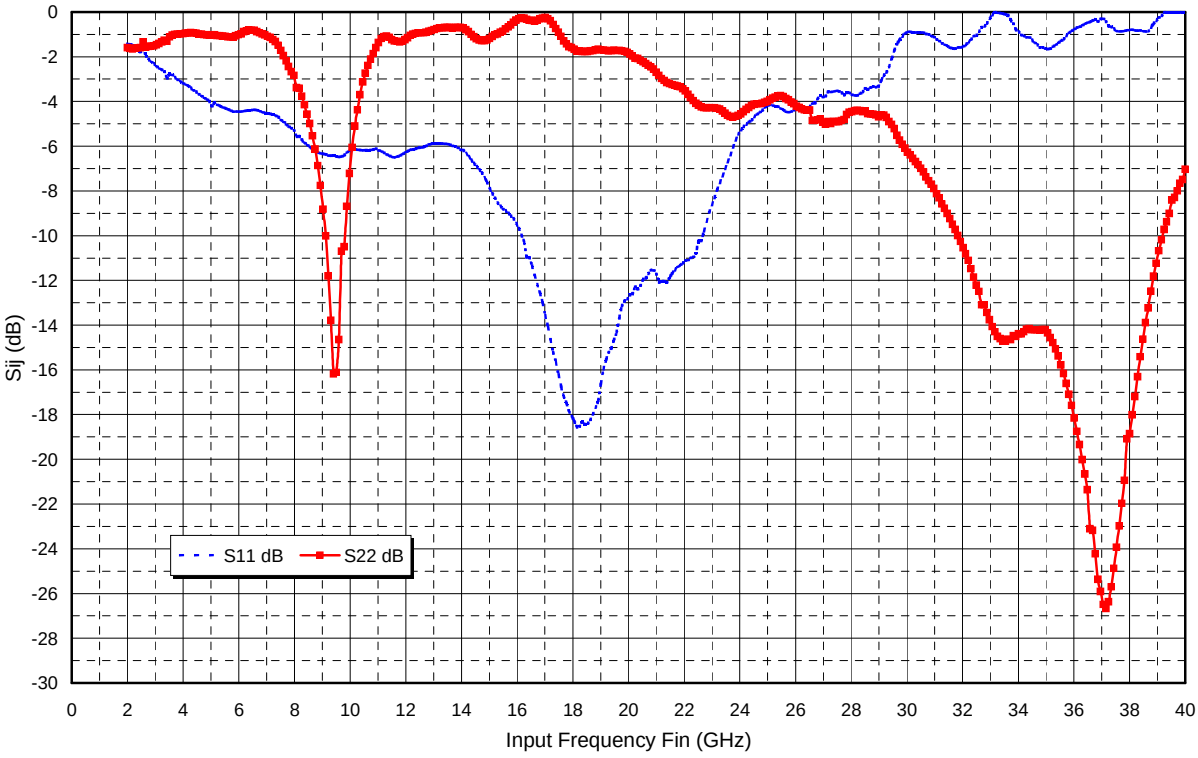
Fin & 2Fin Output Power versus Input Power & Input Frequency



Return losses @ Pin=0dBm



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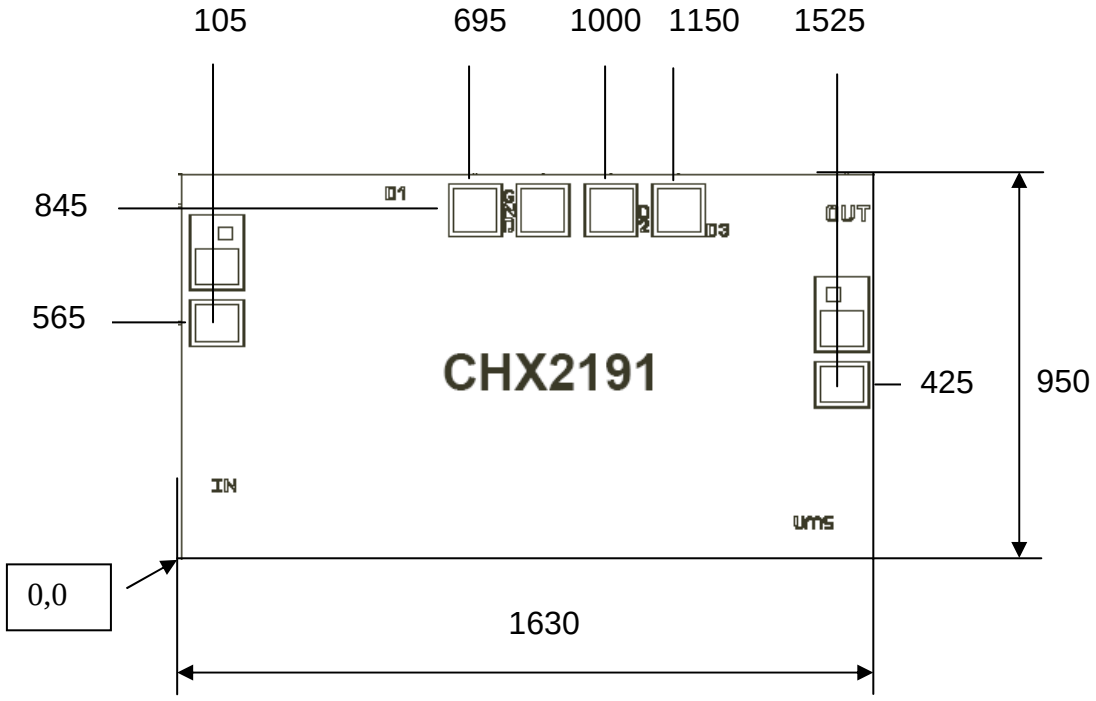
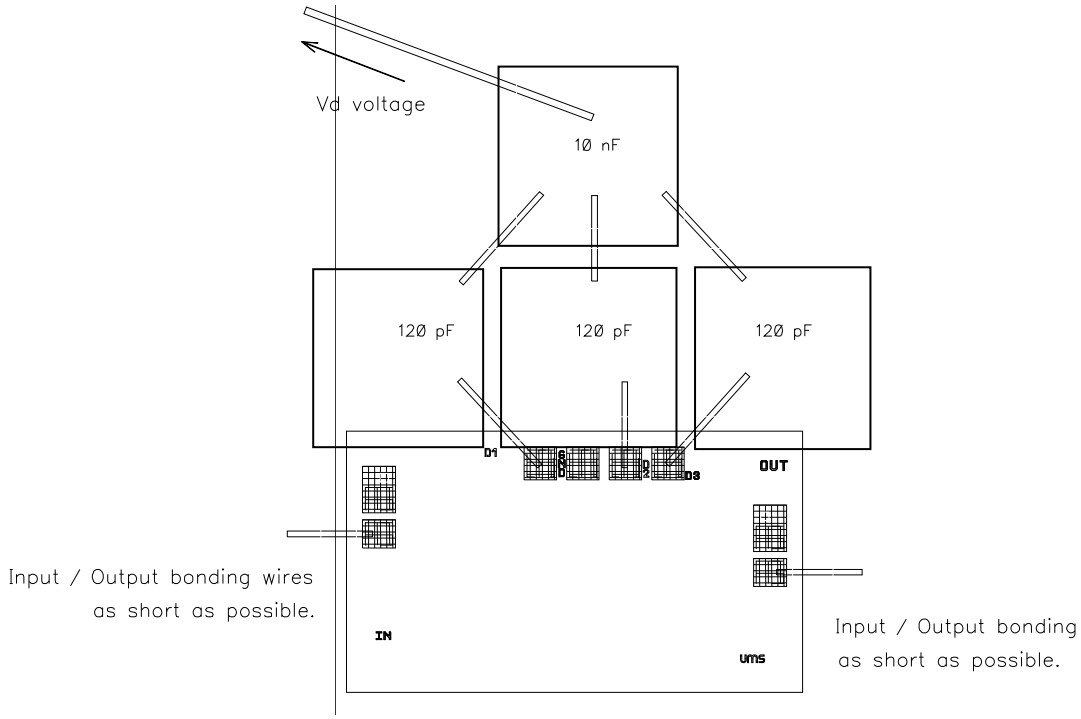
Chip Assembly and Mechanical Data



UNITS: µm Tol: ± 35µm



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Recommended ESD management

Refer to the application note AN0020 available at http://www.ums-gaas.com for ESD sensitivity and handling recommendations for the UMS products.

Ordering Information

Chip form: CHX2191-98F/00

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