

## 20-42GHz Frequency Multiplier

GaAs Monolithic Microwave IC

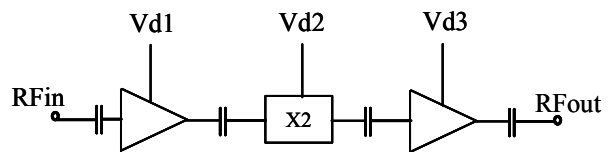
*preliminary*

### Description

The CHX2191 is a frequency doubler monolithic circuit.

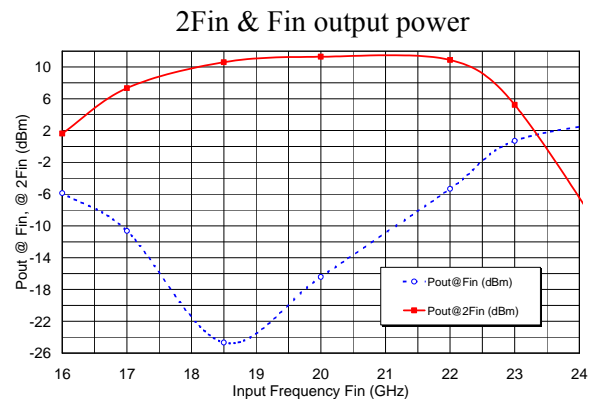
It is designed for a wide range of applications, from military to commercial communication systems. The backside of the chip is both RF and DC grounded. This helps to simplify the assembly process.

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



### Main Features

- Broadband performance: 17-21 GHz
- Self biased
- 11dBm output power
- DC power consumption, 70mA @ 4.25V (with RF)
- Chip size: 1.63 x 0.95 x 0.10 mm



### Main Characteristics

Tamb. = 25°C

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!

*preliminary***Electrical Characteristics**T<sub>amb</sub> = +25°C, V<sub>d</sub> = 4.25V I<sub>d</sub> = 70mA under RF Pin=0dB m

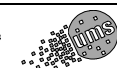
Symbol	Parameter	Min	Typ	Max	Unit
F <sub>in</sub>	Input frequency range	17		21	GHz
F <sub>out</sub>	Output frequency range	34		42	GHz
P <sub>in</sub>	Input power		0		dBm
P <sub>out</sub>	Output power for +0 dBm input power		11		dBm
I <sub>s</sub> /F <sub>o</sub>	F <sub>in</sub> level at the output ( 17 < F <sub>in</sub> < 20GHz ), for 0dBm input power		-15		dBm
VSWR <sub>in</sub>	Input VSWR		2.0:1		
VSWR <sub>out</sub>	Output VSWR		2.5:1		
I <sub>d</sub>	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**T<sub>amb</sub> = +25°C

Symbol	Parameter	Values	Unit
V <sub>d</sub>	Drain bias voltage	4.5	V
I <sub>d</sub>	Drain bias current	100	mA
P <sub>in</sub>	Maximum input power	5	dBm
T <sub>a</sub>	Operating temperature range	-40 to +85	°C
T <sub>stg</sub>	Storage temperature range	-55 to +125	°C

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

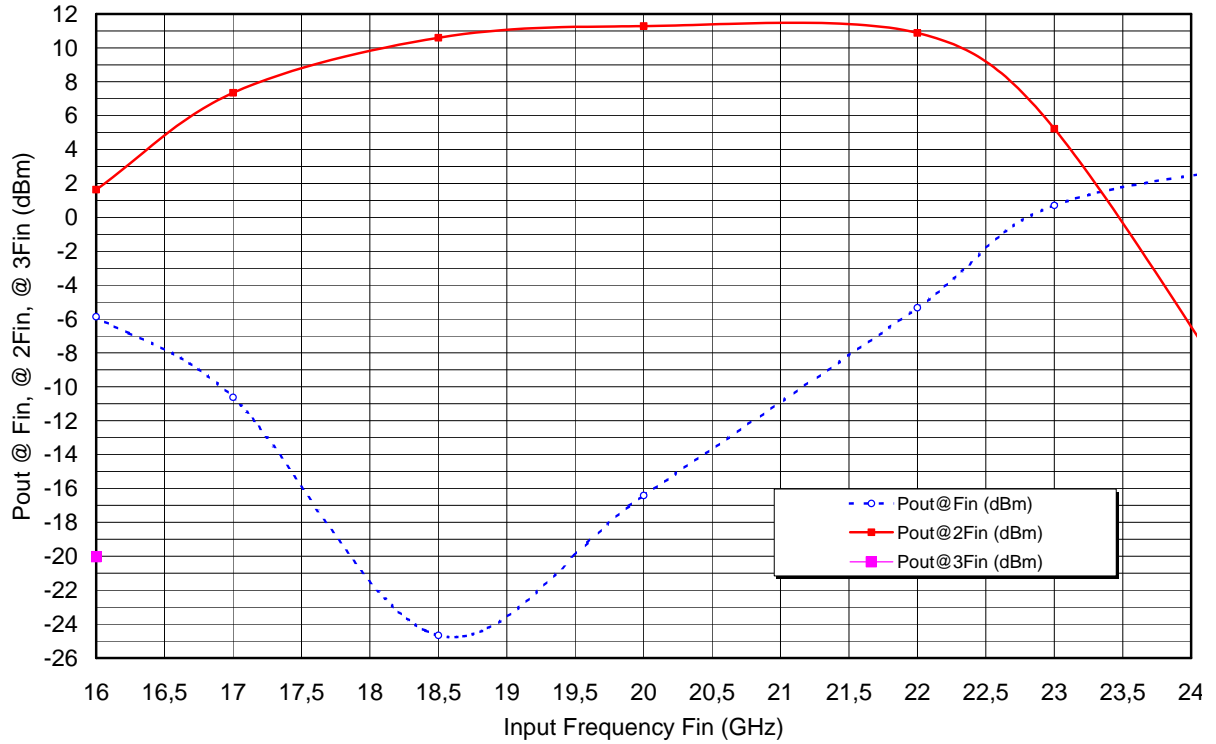


Typical on Wafer Measurements

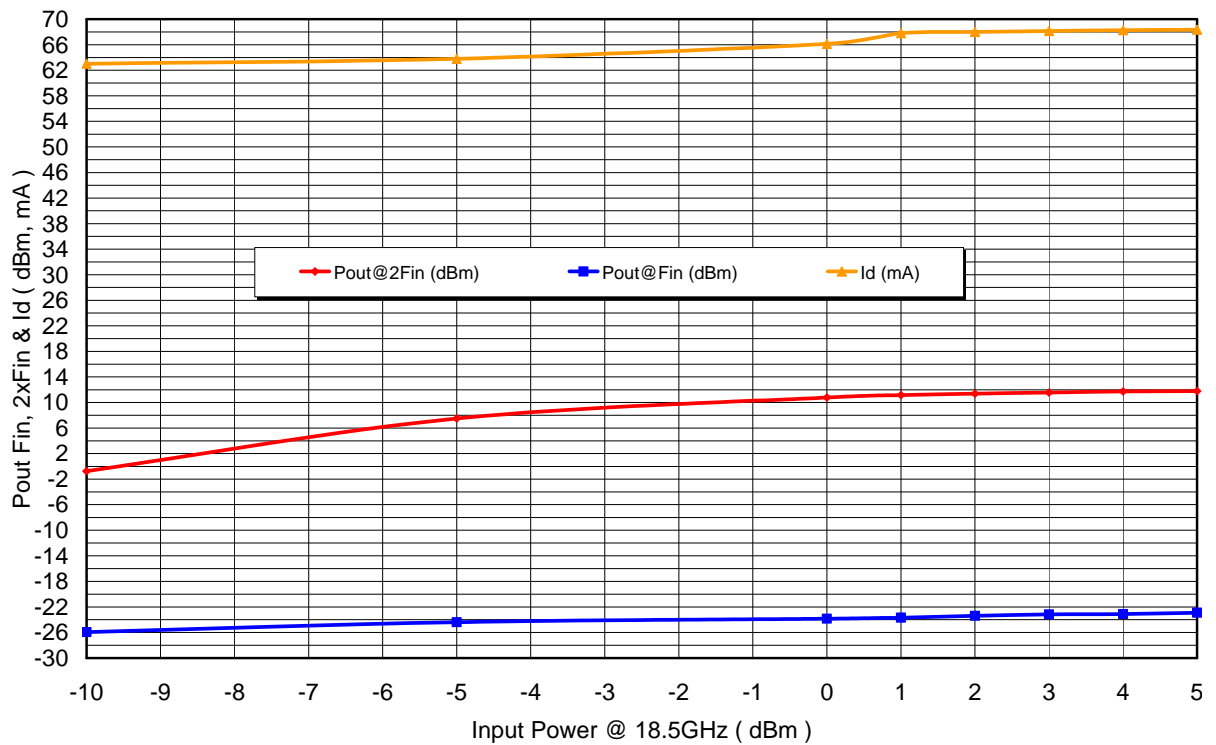
Bias conditions:  $T_{amb} = +25^{\circ}C$ ,  $V_{d1} = V_{d2} = V_{d3} = 4.25V$

*preliminary*

Harmonic Output power versus Input frequency @  $P_{in} = 0dBm$



Harmonic Output power & Drain current versus Input power @  $F_{in} = 18.5GHz$

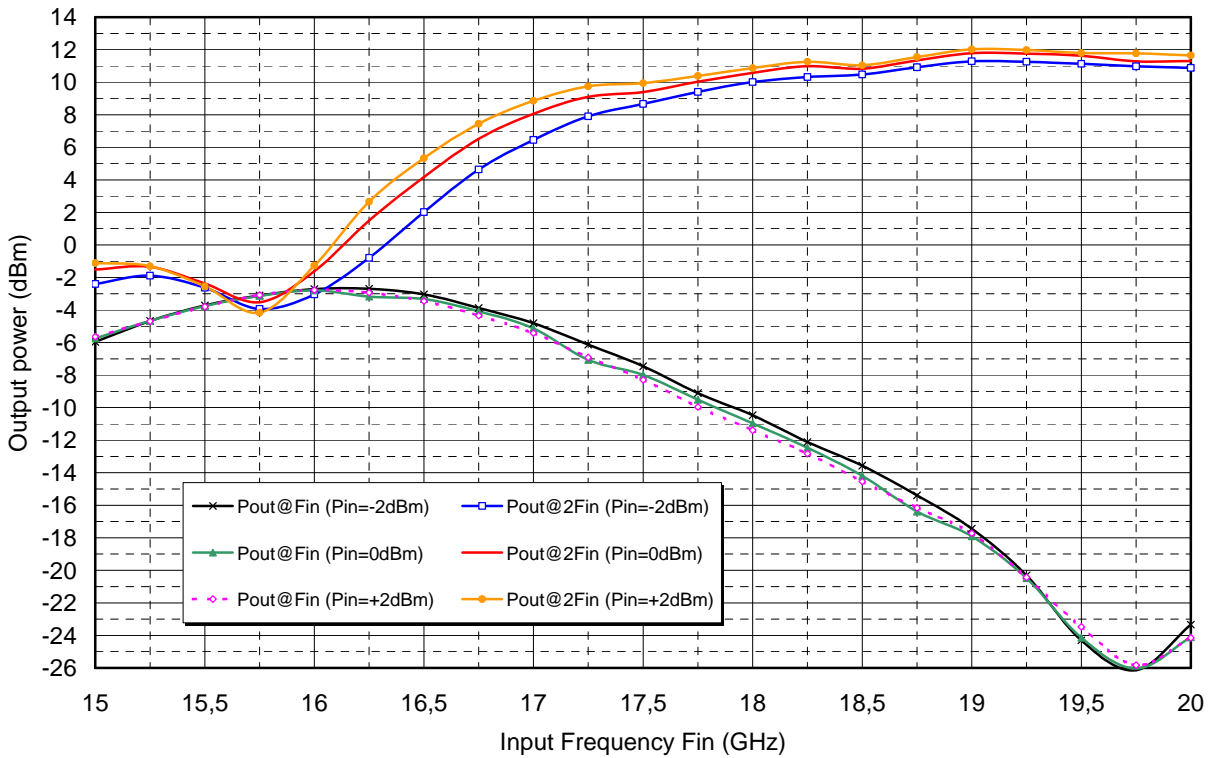


## Typical on jig Measurements

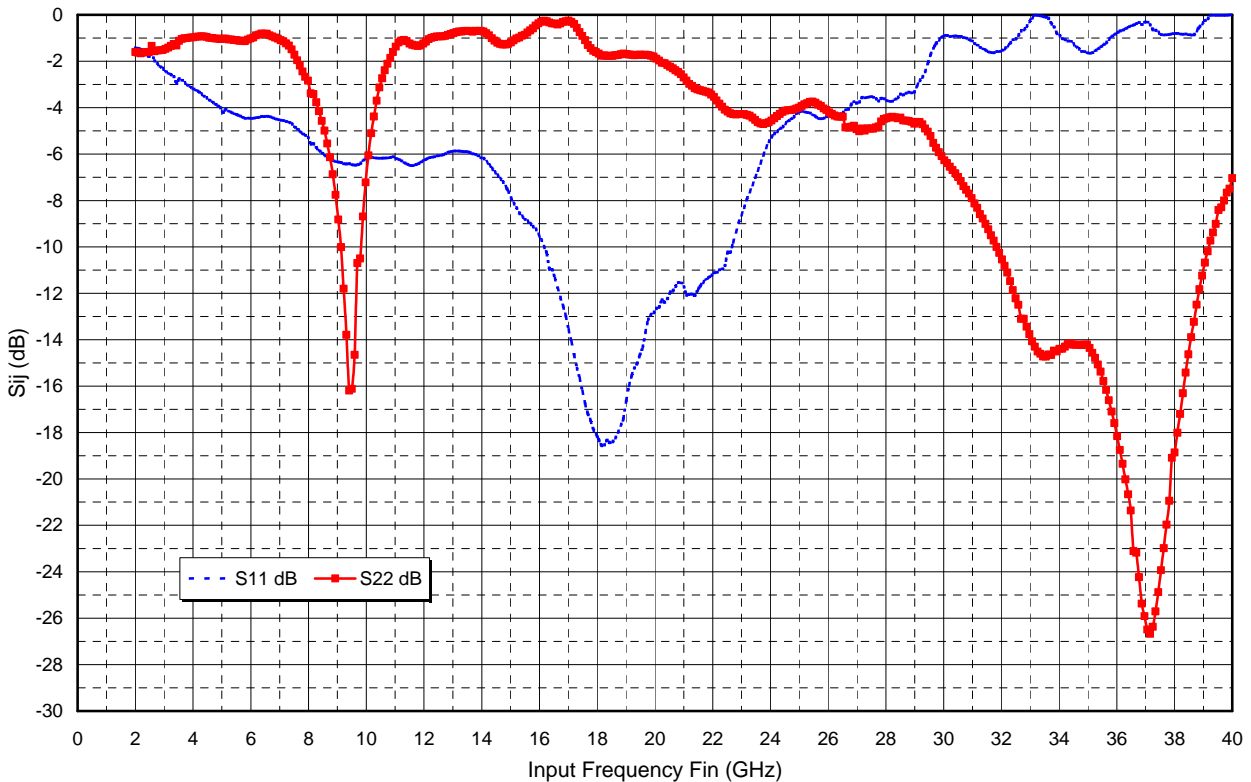
Bias conditions:  $T_{amb} = +25^{\circ}\text{C}$ ,  $V_{d1} = V_{d2} = V_{d3} = 4.25\text{V}$

*preliminary*

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

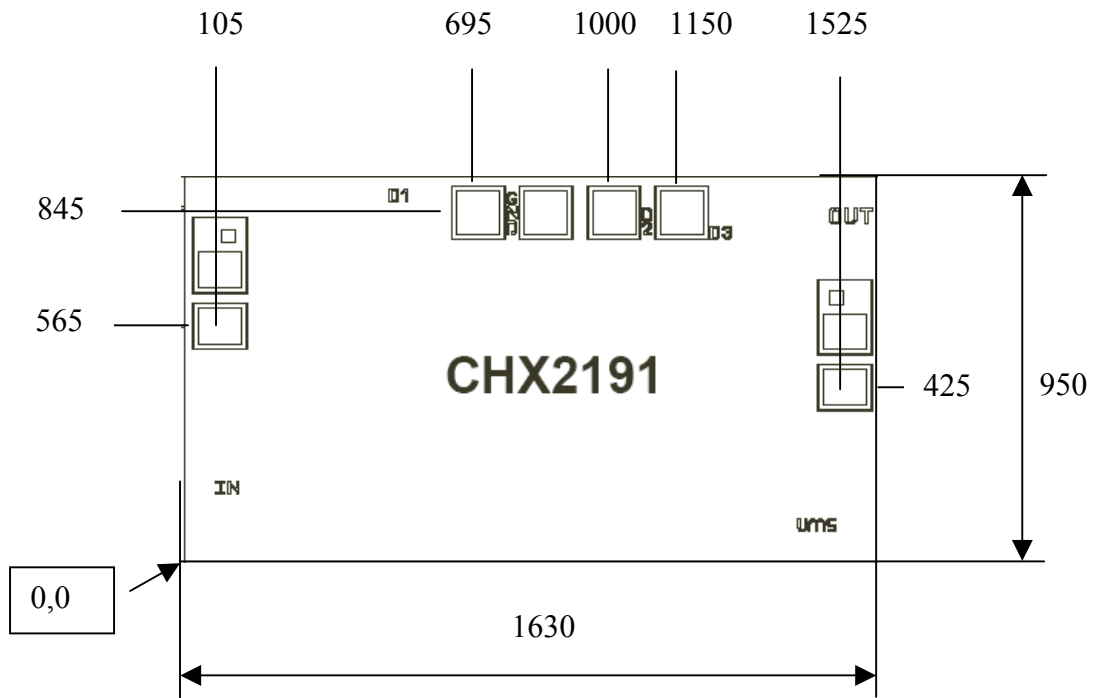


Return losses @ Pin=0dBm

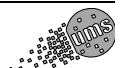
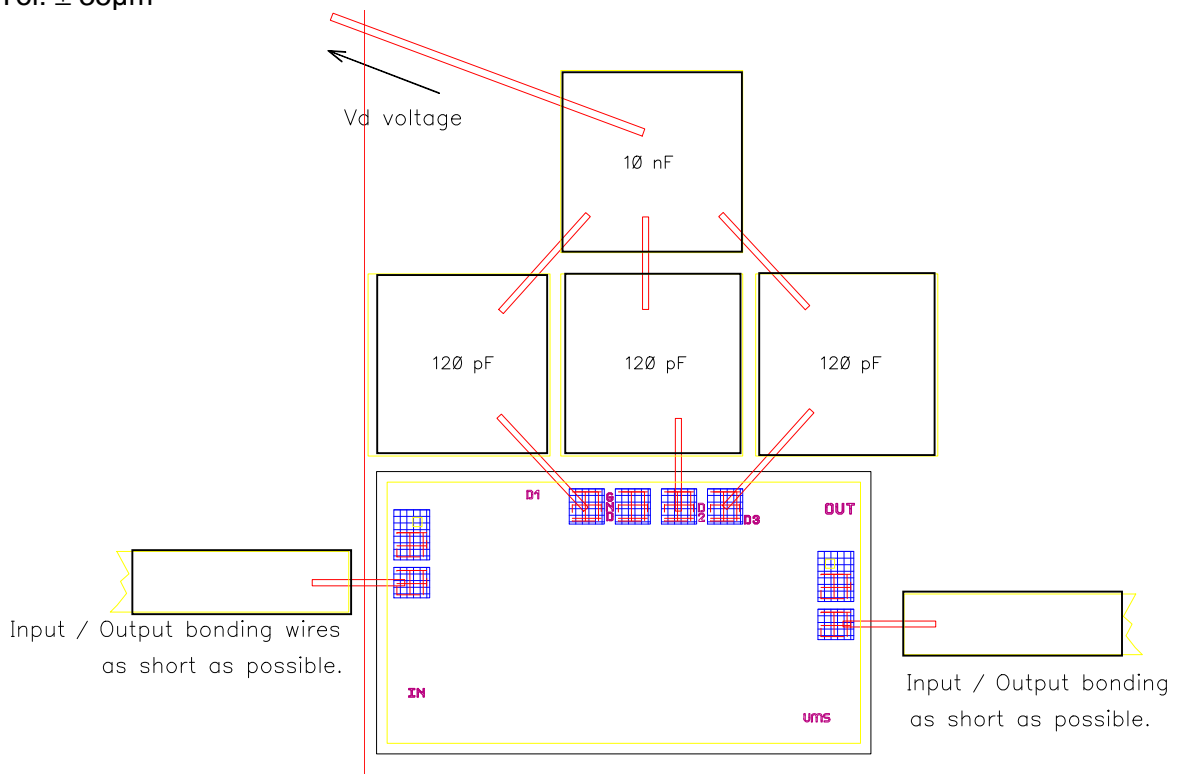


Chip Assembly and Mechanical Data

*preliminary*



UNITS:  $\mu\text{m}$   
Tol:  $\pm 35\mu\text{m}$



*preliminary*

## Ordering Information

Chip form : CHX2191-98F/00

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