30-60GHz Frequency Multiplier

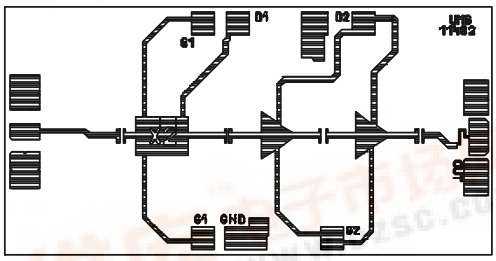
GaAs Monolithic Microwave IC

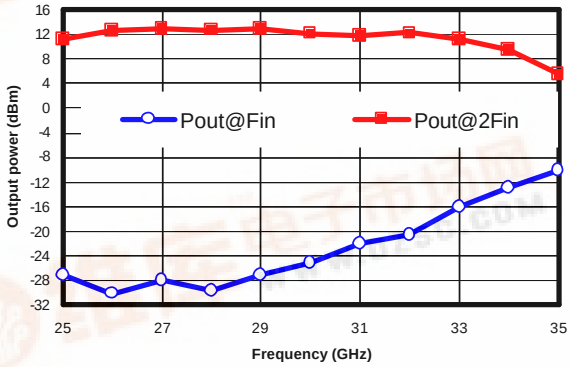
preliminary

Description

The CHX2192 is a balanced frequency multiplier by 2 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 simplifies the assembly process.

The circuit is manufactured with a PM-HEMT process, 0.15µm gate length, via holes through the substrate, air bridges and electron beam gate lithography.
It is available in chip form.





Main Features

¦ Broadband performance : 27 - 33 GHz
¦ 11dBm output power for +12dBm input power
¦ DC power consumption, 130mA @ 3.5V (with RF)
¦ Chip size : 2.12 x 1.11 x 0.10 mm

Main Characteristics

Tamb. = 25°C

Symbol	Parameter	Min	Typ	Max	Unit
Fin	Input frequency range	27		33	GHz
Fout	Output frequency range	54		66	GHz
Pin	Input power		12		dBm
Pout	Output power for +12dBm input power	8	11	13	dBm

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

United Monolithic Semiconductors S.A.S.
Route Départementale 128 - B.P.46 - 91401 Orsay Cedex France
Tel. : +33 (0)1 69 33 03 08 - Fax : +33 (0)1 69 33 03 09

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Electrical Characteristics

Tamb = +25°C, Vd = 3.5V Vg1 = -0.9V Vg2 adjusted for Id = 130mA under RF

Symbol	Parameter	Min	Typ	Max	Unit
Fin	Input frequency range	27		33	GHz
Fout	Output frequency range	54		66	GHz
Pin	Input power		12		dBm
Pout	Output power for +12 dBm input power	8	11	13	dBm
Is/Fo	Fin level at the output (27 < Fin < 33GHz), for +12dBm input power	-30	-15	-10	dBm
VSWRin	Input VSWR		2.5:1		
VSWRout	Output VSWR		2.5:1		
Id	Bias current		130		mA

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

Absolute Maximum Ratings

Tamb = +25°C

Symbol	Parameter	Values	Unit
Vd	Drain bias voltage	*4.0*	V
Id	Drain bias current	*150*	mA
Ta	Operating temperature range	*-40 to +85*	°C
Tstg	Storage temperature range	*-55 to +125*	°C

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

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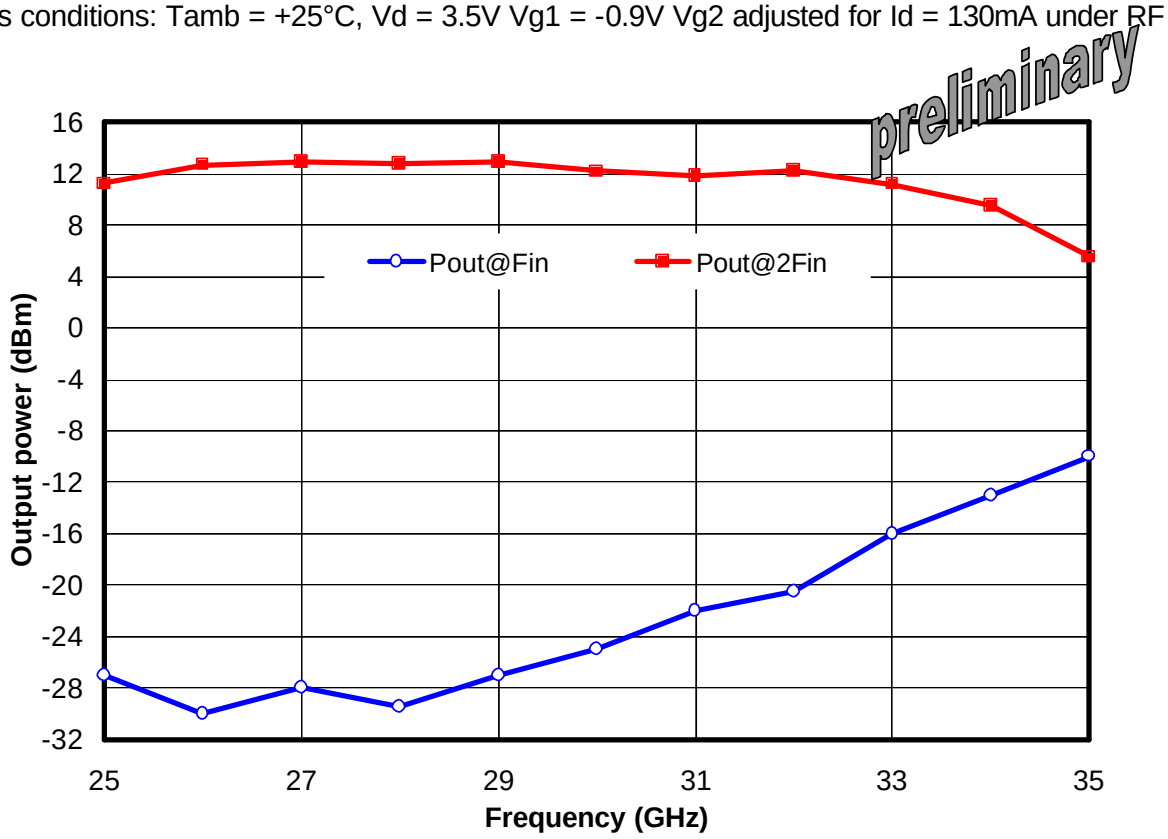
Typical on Wafer Measurements

Bias conditions: Tamb = +25°C, Vd = 3.5V Vg1 = -0.9V Vg2 adjusted for Id = 130mA under RF



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Chip Assembly and Mechanical Data

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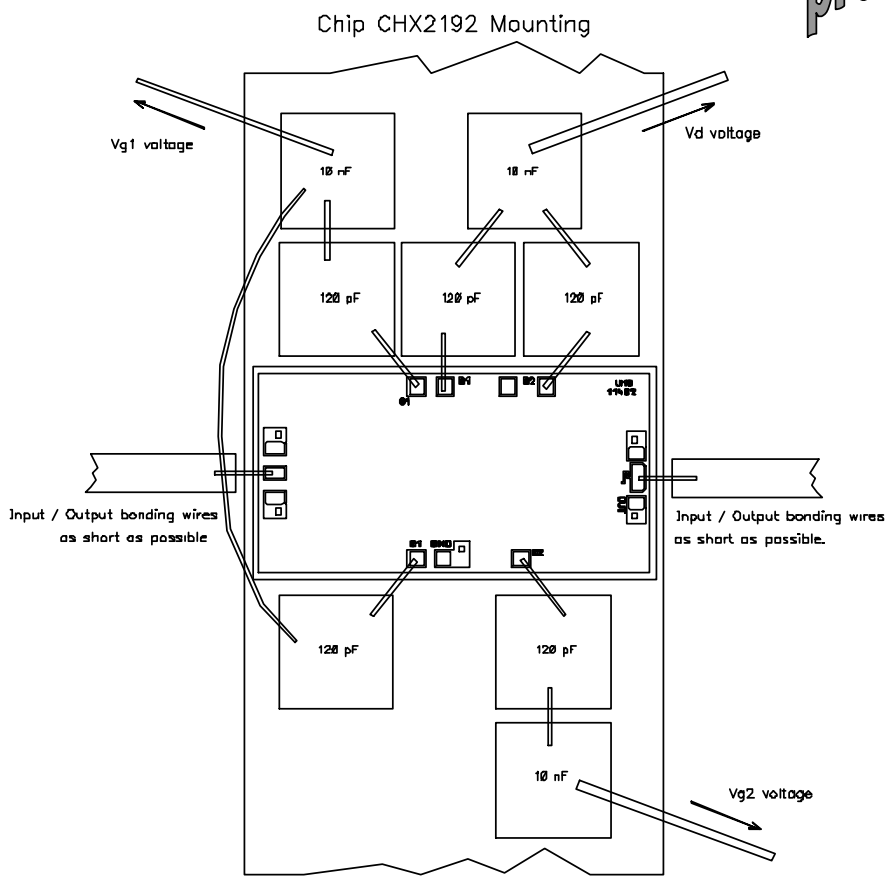
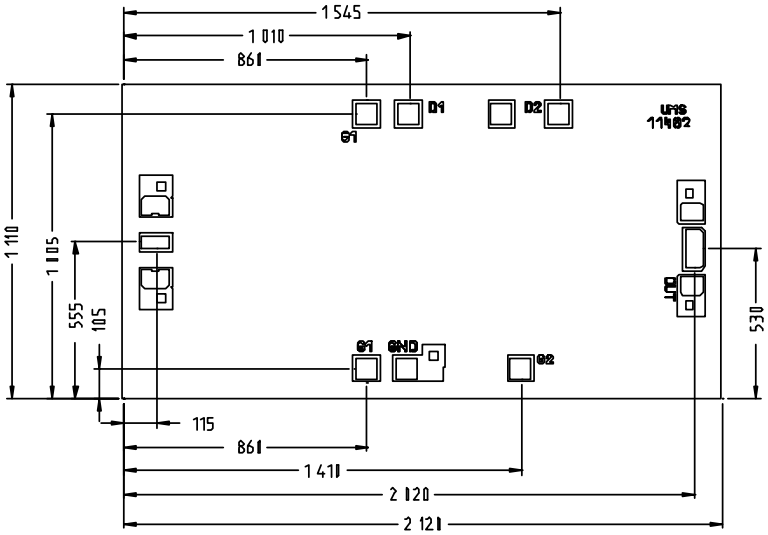


Note : Supply feed should be capacitively bypassed. 25µm diameter gold wire is to be prefered.



Bonding pad positions.

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

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Ordering Information

Chip form : CHX2192-99F/00

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