9-18GHz Frequency Multiplier

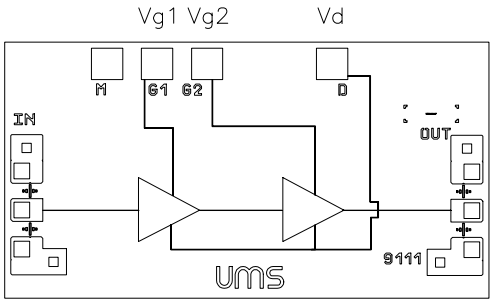
GaAs Monolithic Microwave IC

preliminary

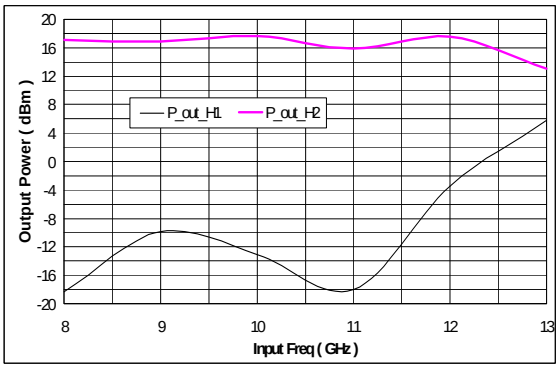
Description

The CHX2089 is a cascadable by 2 frequency multiplier 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 PM-HEMT process, 0.25µm gate length, via holes through the substrate, air bridges and electron beam gate lithography.



typical measurement.



Main Features

- Broadband performances : 8-11.5GHz
- 15dBm output power for +12dBm input power
- DC bias : Vd=3.5Volt@Id=60mA
- Chip size : 1.62 x 0.89 x 0.10 mm

Main Characteristics

Tamb. = 25°C

Symbol	Parameter	Min	Typ	Max	Unit
Fin	Input frequency range	8	9	11.5	GHz
Fout	Output frequency range	16	18	23	GHz
Pin	Input power		12	15	dBm
Pout	Output power for +12dBm input power	11	15		dBm

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

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Electrical Characteristics

Tamb = +25°C, Vd = 3.5V , Vg1 = -0.9V , Vg2 adjusted for Id=50 mA (Vg2 typ.= -0.3V).

Symbol	Parameter	Min	Typ	Max	Unit
Fin	Input frequency range	8	9	11.5	GHz
Fout	Output frequency range	16	18	23	GHz
Pin	Input power		12	15	dBm
Pout	Output power for +12dBm input power	11	15		dBm
Is/Fo	Fin rejection at the output	15	20		dBc
VSWRin	Input VSWR			2.0:1	
VSWRout	Output VSWR			2.5:1	
Id	Bias current without RF		40	70	mA
Id	Bias current with RF (Pin=12 dBm)		60	85	mA

Absolute Maximum Ratings

Tamb. = 25°C (1)

Symbol	Parameter	Values	Unit
Vd	Drain bias voltage	4	V
Id	Drain bias current	90	mA
Vg	Gate bias voltage	-2 to +0.4	V
Pin	Input power	20	dBm
Ta	Operating temperature range	-40 to +85	°C
Tstg	Storage temperature range	-55 to +155	°C

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

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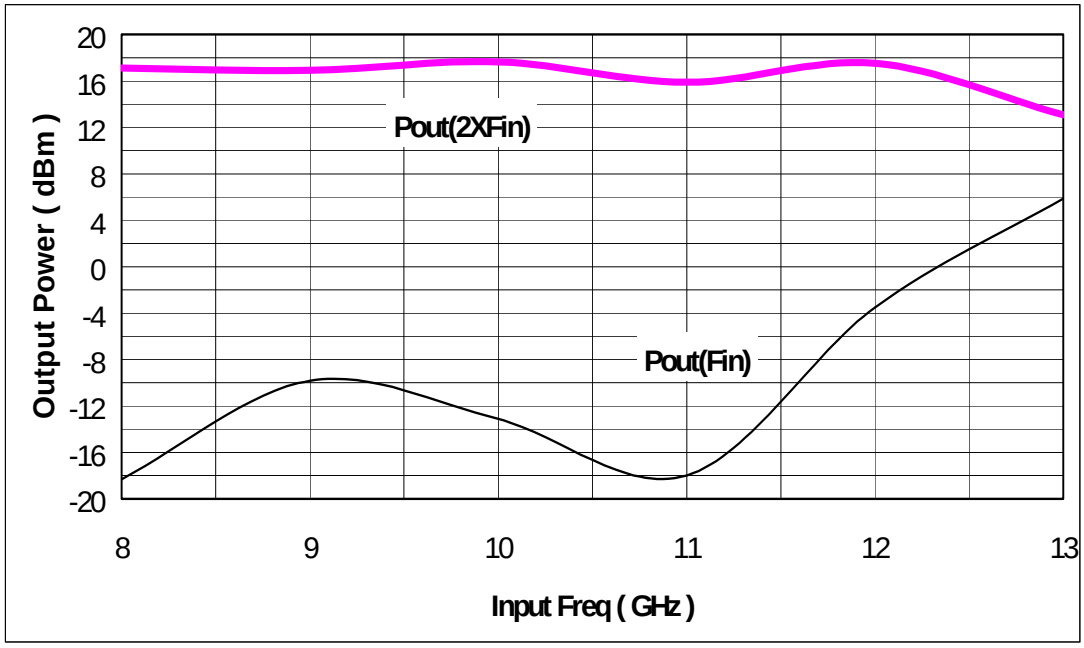
united monolithic semiconductors

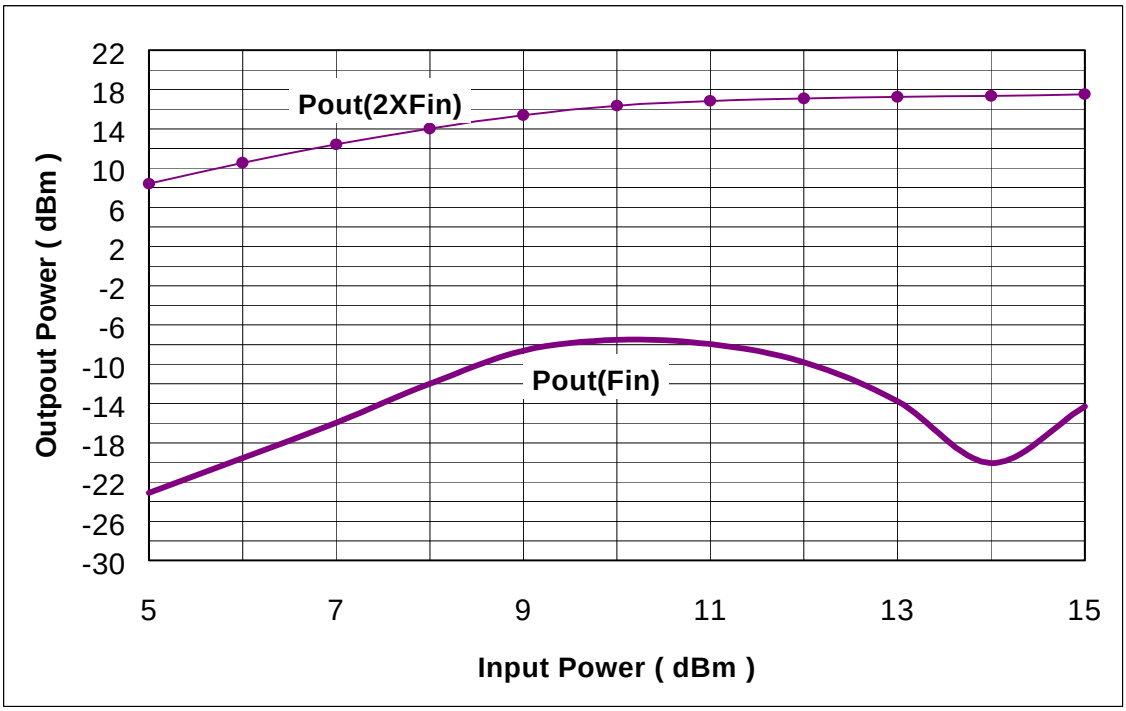
Typical on wafer Measurements.

Bias conditions : Vd = 3.5V , Vg1 = -0.9V , Vg2 = -0.3V.

Pout = f(Fin) for Pin=12 dBm.



Pout = f(Pin) for Fin = 9 GHz.



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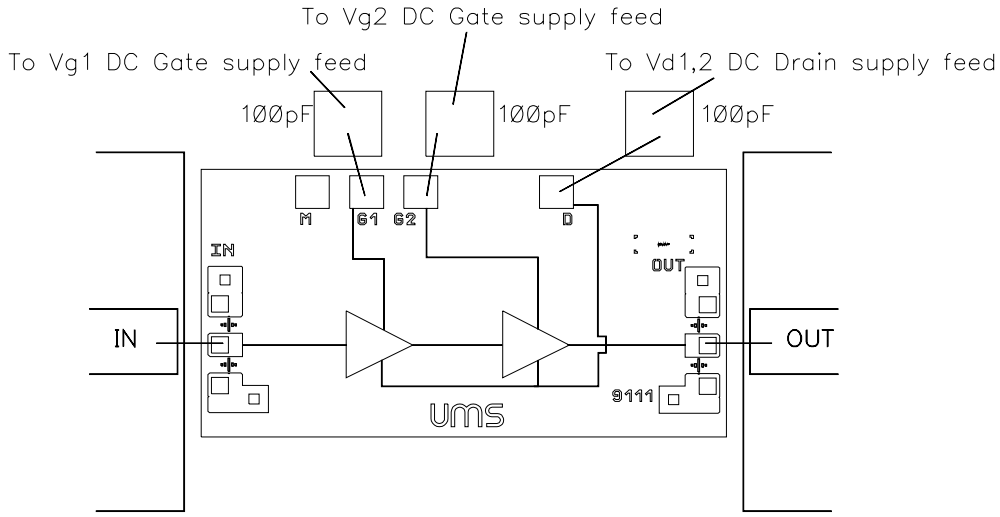
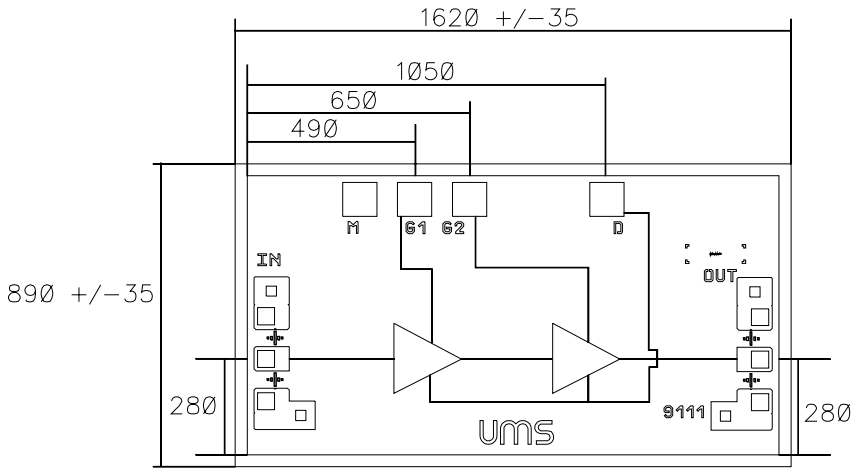
Chip Assembly and Mechanical Data

Vd=3.5V Vg1=-0.9V Vg2=-0.3V.



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)

Ordering Information

Chip form : CHX2089-99F/00

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