

# 9-18GHz Frequency Multiplier

## GaAs Monolithic Microwave IC

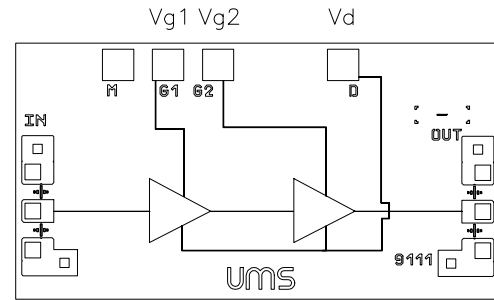
*preliminary*

### Description

The CHX2089 is a cascaded 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.

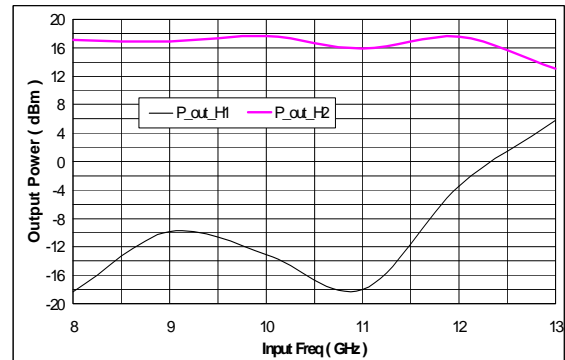
The circuit is manufactured with a PM-HEMT process, 0.25µm gate length, via holes through the substrate, air bridges and electron beam gate lithography.



*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 !

## 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)

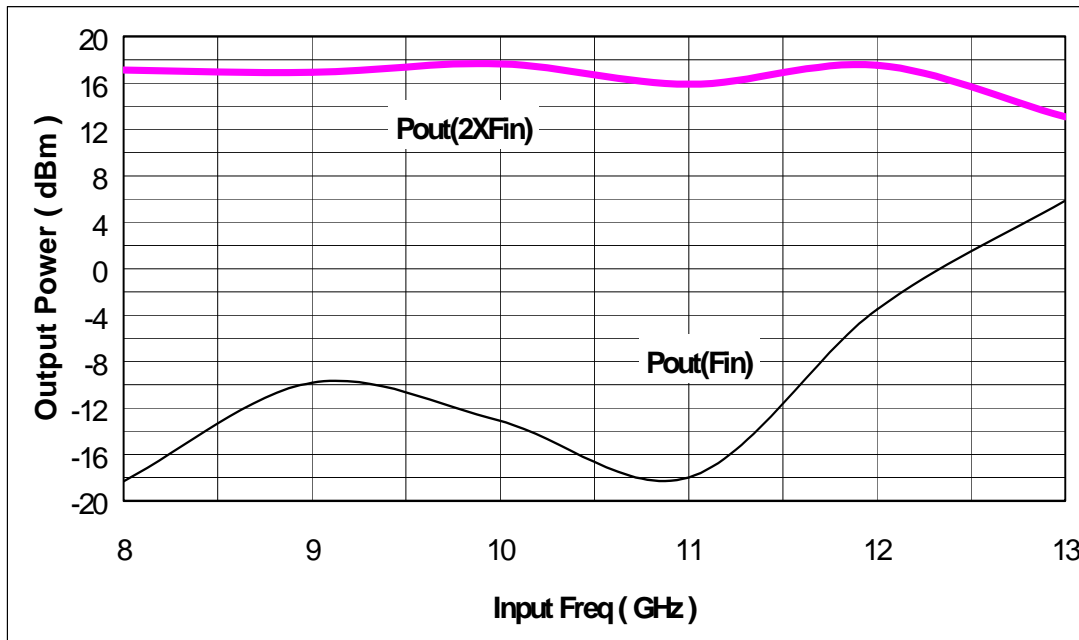
| Symbol | Parameter                   | Values      | Unit |
|--------|-----------------------------|-------------|------|
| Vd     | Drain bias voltage          | 4           | V    |
| Id     | Drain bias current          | 90          | mA   |
| Vg     | Gate bias voltage           | -2 to +0.4  | 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 any one of these parameters may cause permanent damage.

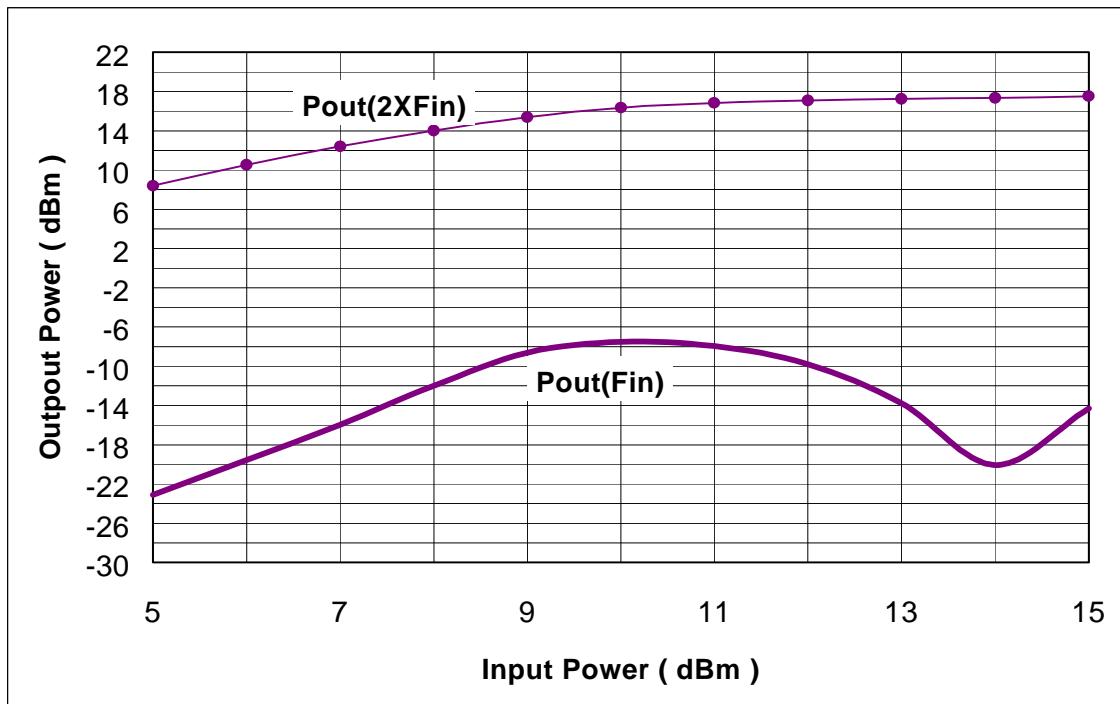
**Typical on wafer Measurements.**

Bias conditions :  $V_d = 3.5V$  ,  $V_{g1} = -0.9V$  ,  $V_{g2} = -0.3V$ .

**$P_{out} = f(F_{in})$  for  $P_{in}=12\text{ dBm}$ .**

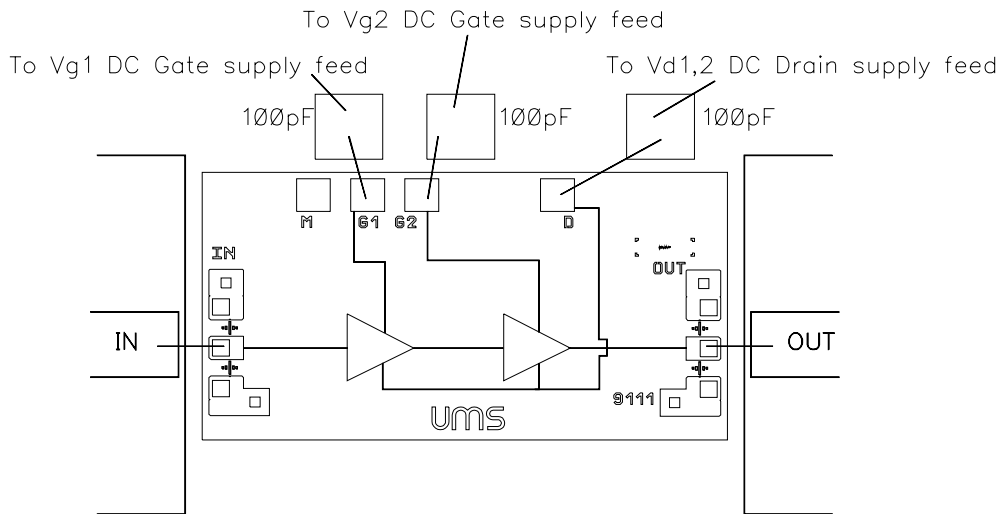


**$P_{out} = f(P_{in})$  for  $F_{in} = 9\text{ GHz}$ .**

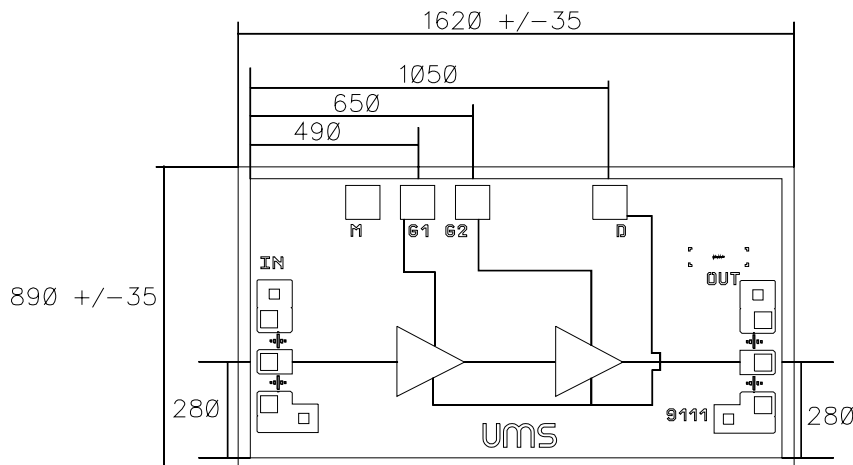


## Chip Assembly and Mechanical Data

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



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



### Bonding pad positions.

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

## Ordering Information

Chip form : CHX2089-99F/00

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