

20-40GHz Frequency Multiplier

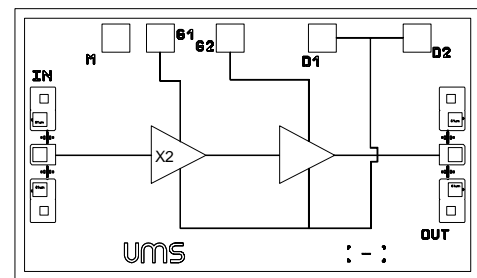
GaAs Monolithic Microwave IC

Description

The CHX2091 is a cascaded by 2 frequency multiplier monolithic circuit.

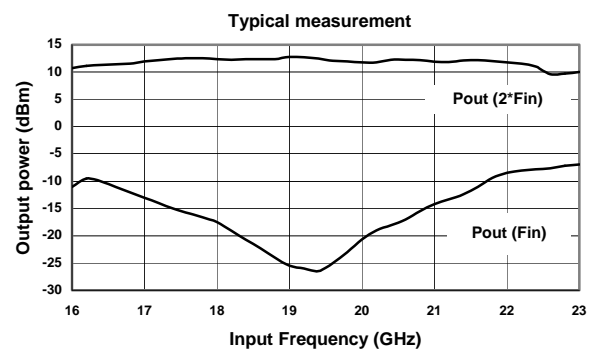
It is designed for a wide range of applications, from military to commercial communication systems. The backside of the chip is both RF and DC grounds. This helps simplify the assembly process.

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



Main Features

- Broadband performances :Fin 17-20GHz
- 12dBm output power for +12dBm input power
- DC bias : Vd=3.5Volt@Id=50mA
- Chip size : 1.67 x 0.97 x 0.10 mm



Main Characteristics

Tamb. = 25°C

| Symbol | Parameter | Min | Typ | Max | Unit |
|--------|-------------------------------------|-----|-----|-----|------|
| Fin | Input frequency range | 17 | | 20 | GHz |
| Fout | Output frequency range | 34 | | 40 | GHz |
| Pin | Input power | | 12 | | dBm |
| Pout | Output power for +12dBm input power | 10 | 12 | | dBm |

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

Electrical Characteristics

Tamb = +25°C, Vdd = 3.5V Vg1 = -0.9V Vg2 tuned for Id=50mA (# -0.4V) Pin = +12dBm

| Symbol | Parameter | Min | Typ | Max | Unit |
|---------|---|-----|-----|-------|------|
| Fin | Input frequency range | 17 | | 20 | GHz |
| Fout | Output frequency range | 34 | | 40 | GHz |
| Pin | Input power | | 12 | 15 | dBm |
| Pout | Output power for +12dBm input power | 10 | 12 | | dBm |
| Is/Fo | Fin rejection at the output (18 < Fin < 20GHz) | | 25 | | dBc |
| VSWRin | Input VSWR | | | 2.5:1 | |
| VSWRout | Output VSWR | | | 2.5:1 | |
| Id | Bias current with RF , Pin=+12dBm | | 50 | 70 | mA |

Absolute Maximum Ratings

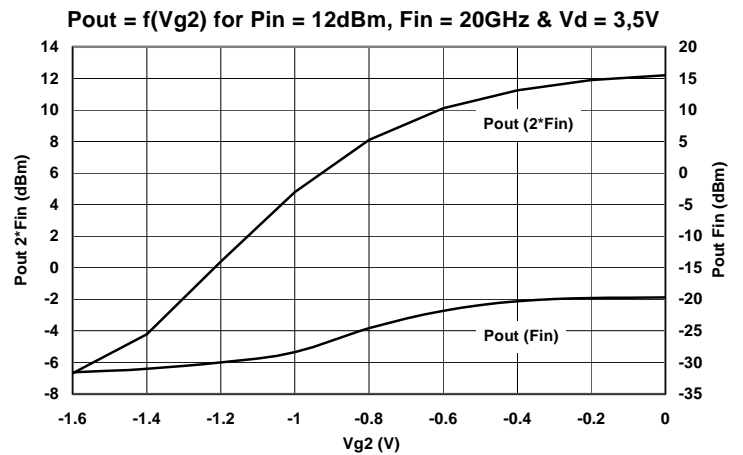
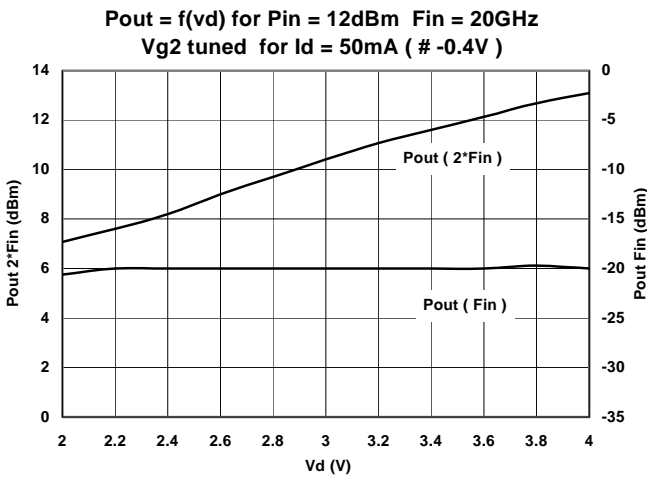
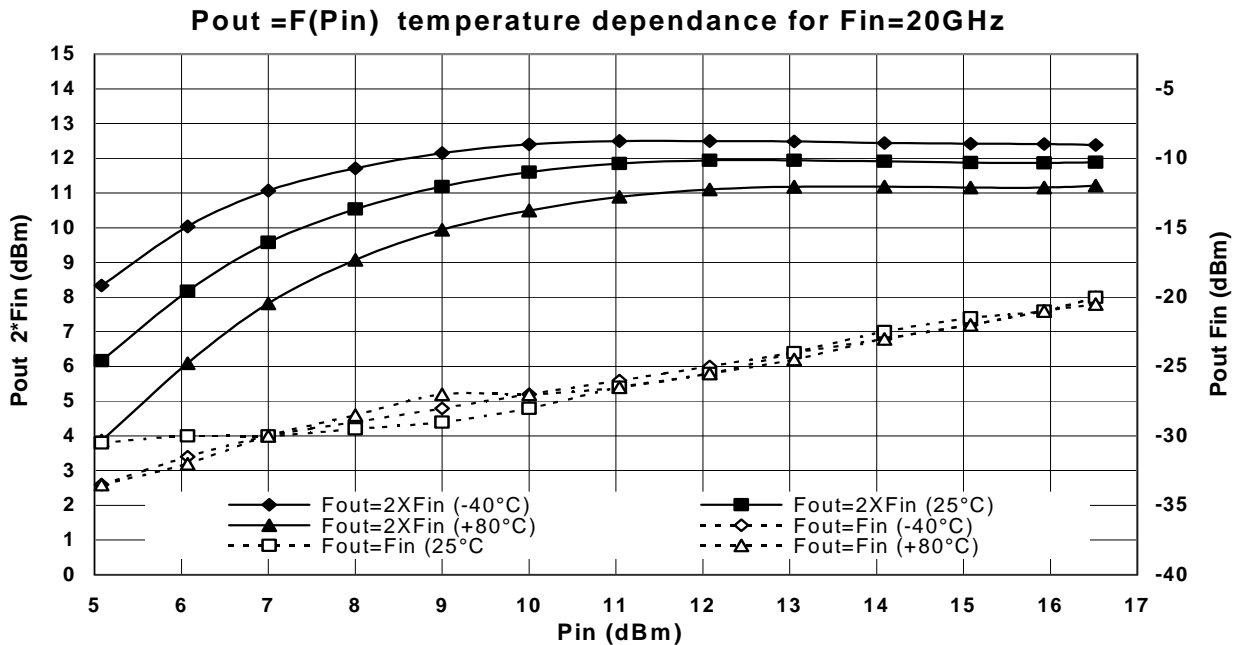
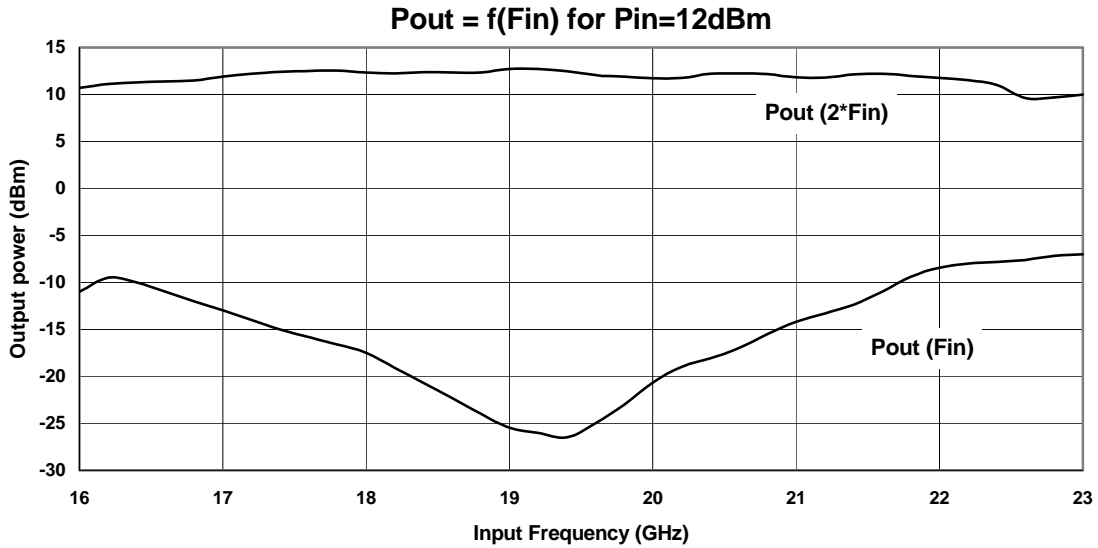
Tamb = +25°C

| Symbol | Parameter | Values | Unit |
|--------|-----------------------------|-------------|------|
| Vd | Drain bias voltage | 5 | V |
| Id | Drain bias current | 120 | mA |
| Vg | Gate bias voltage | -2 to +0.4 | V |
| Pin | Input Power | 17 | dBm |
| Ta | Operating temperature range | -40 to +85 | °C |
| Tstg | Storage temperature range | -55 to +155 | °C |

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

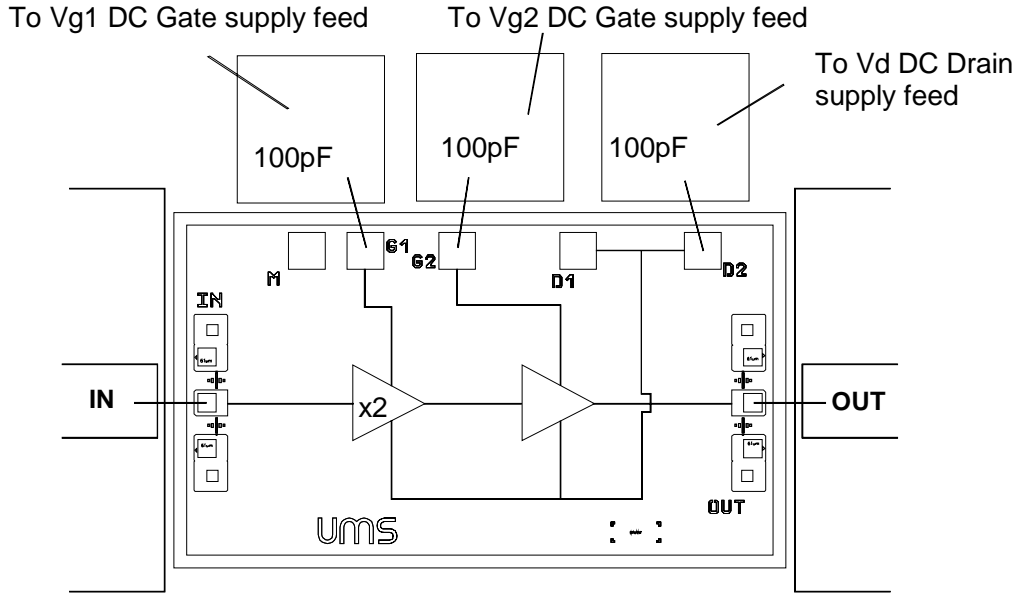
Typical on jig Measurements

Bias conditions : $v_d = 3.5V$, $V_{g1} = -0.9V$, V_{g2} tuned for $I_d = 50mA$ (# -0.4V)

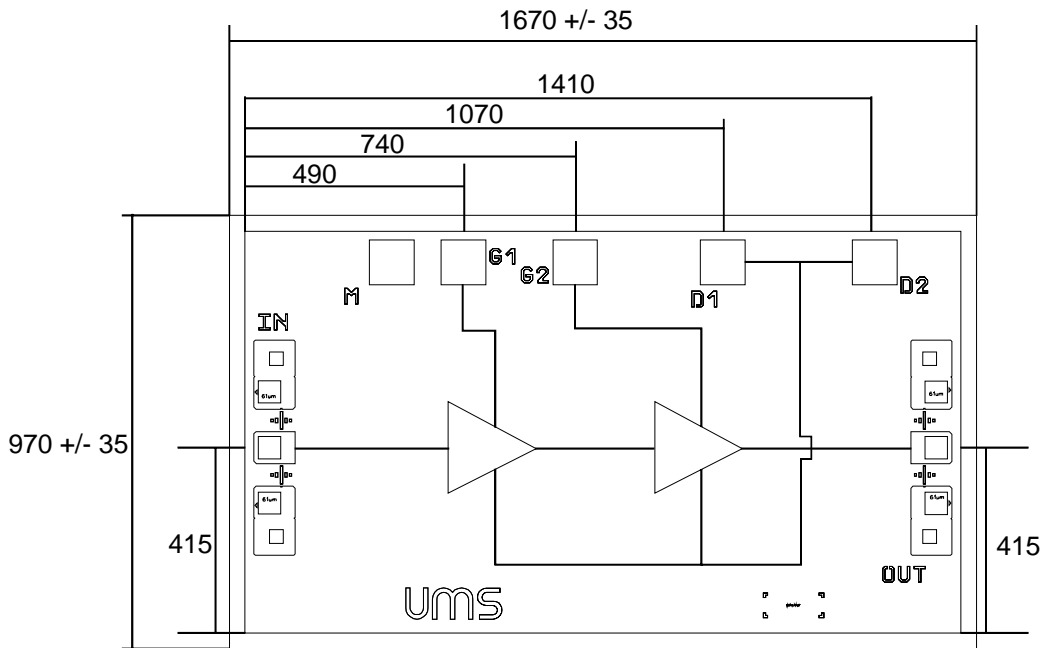


Chip Assembly and Mechanical Data

Vd = 3.5V Vg1 = -0.9V Vg2 tuned for Id = 50mA (# -0.4V)



Note : Supply feed should be capacitively bypassed. 25µm diameter gold wire is to be preferred.
Pad Size : 100 x 100µm



Bonding pad positions.

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

Ordering Information

Chip form : CHX2091-99F/00

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