

## 30-60GHz Frequency Multiplier

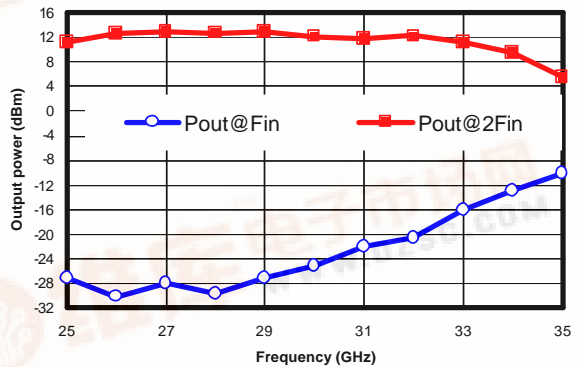
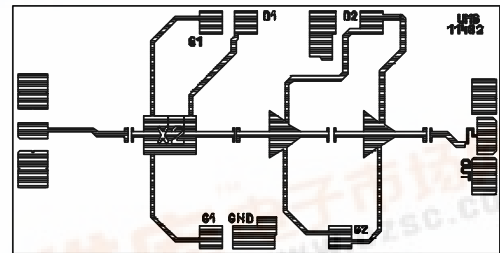
### GaAs Monolithic Microwave IC

*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 !



*preliminary*

## 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

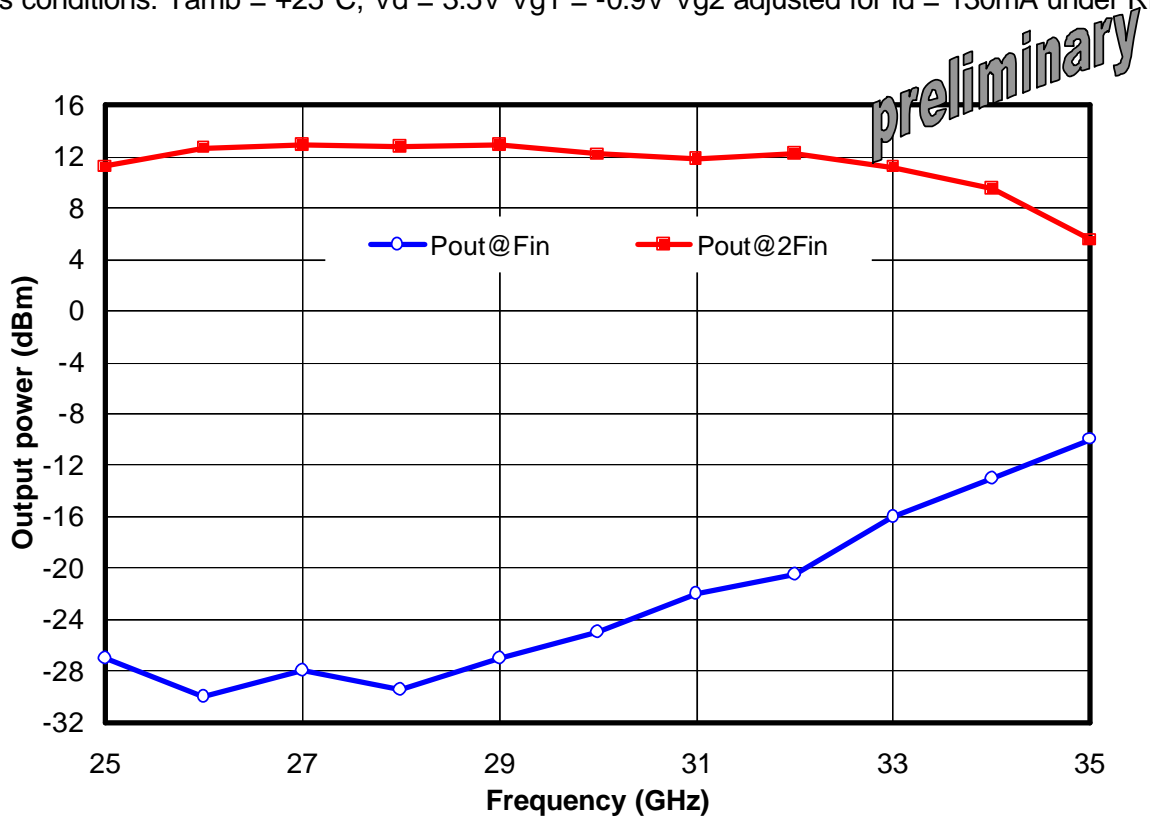
Tamb = +25°C

| 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.

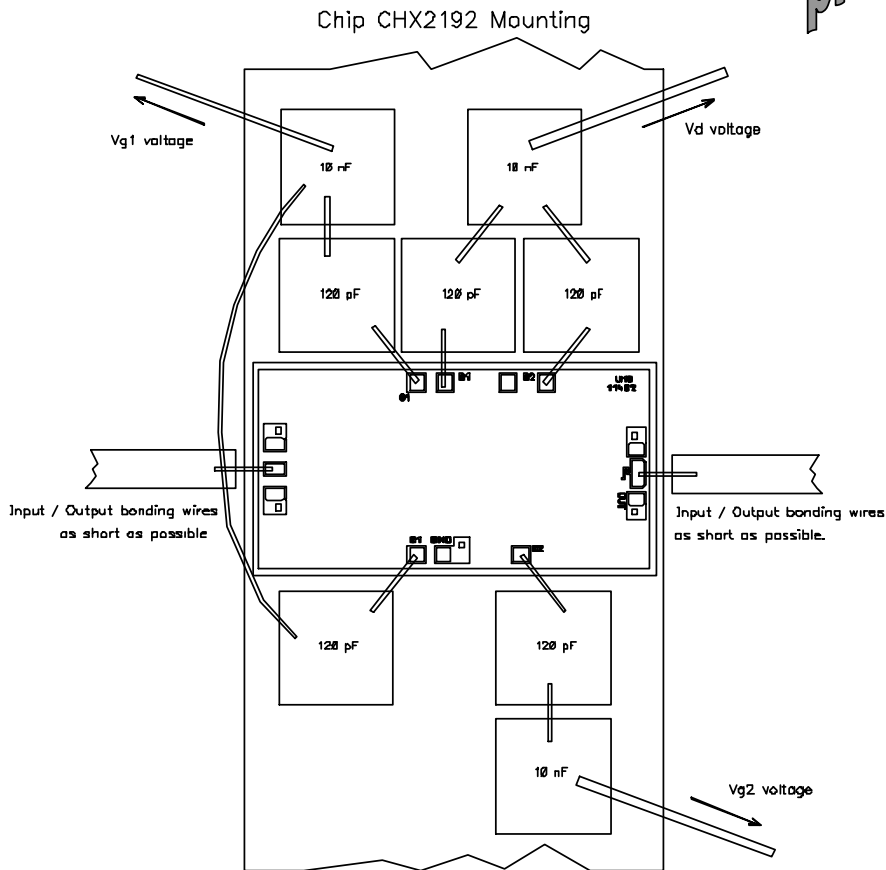
**Typical on Wafer Measurements**

Bias conditions:  $T_{amb} = +25^{\circ}C$ ,  $V_d = 3.5V$   $V_{g1} = -0.9V$   $V_{g2}$  adjusted for  $I_d = 130mA$  under RF

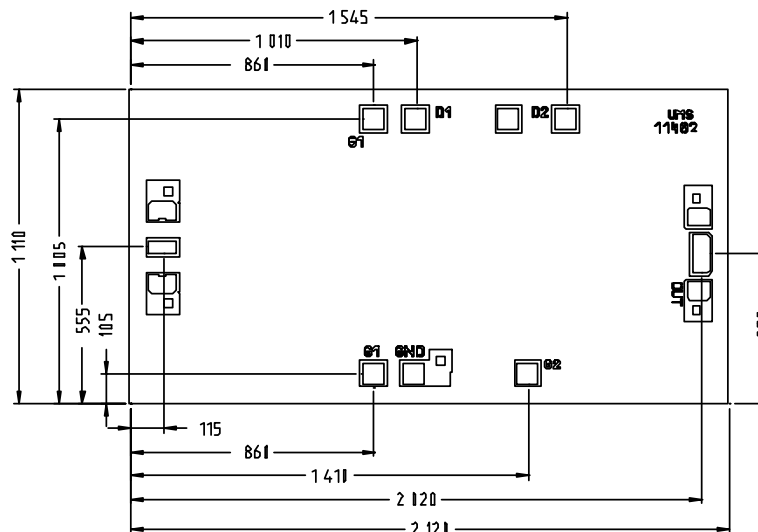


## Chip Assembly and Mechanical Data

*preliminary*



Note : Supply feed should be capacitively bypassed. 25 $\mu$ m diameter gold wire is to be preferred.



### Bonding pad positions.

( Chip thickness : 100 $\mu$ m. All dimensions are in micrometers )



*preliminary*

## Ordering Information

Chip form : CHX2192-99F/00

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