

- Low Noise 1.3 dB N.F.
- High Gain 22 dB Gain
- Frequency Range : 9 - 12 GHz
- 50  $\Omega$  Zin / Zout
- 10 dB Input / Output Return Loss
- 8 dBm Output Power at 1dB gain compression
- Chip size : 1.4 mm X 0.9 mm
- Substrate Thickness : 75  $\mu$ m
- Bond Pad dimensions 100  $\mu$ m x 100  $\mu$ m

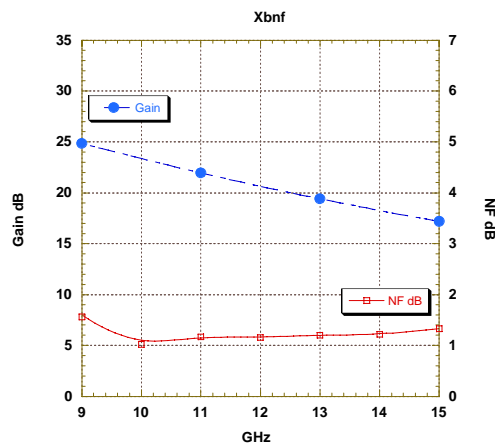
**Description**

The Rockwell XLNA2S.02 is a PHEMT low noise amplifier that operates from 9 to 12 GHz .This 2 stage amplifier has 22 dB nominal gain with 1.3 dB nominal noise figure and 8 dBm P1dB compression output power. This MMIC is unconditionally stable.

**Absolute Maximum Ratings**

| Symbol               | Parameters/Conditions          | Min  | Max  | Units |
|----------------------|--------------------------------|------|------|-------|
| V <sub>d</sub> 1 2   | Drain Supply Voltage           |      | 5    | Volts |
| V <sub>g</sub> 1 2   | Gate Supply Voltage            | -0.6 | 0.4  | Volts |
| I <sub>d</sub> total | Total drain current            |      | 60   | mA    |
| I <sub>g</sub> total | Total gate current             |      | 0.1  | mA    |
| P <sub>in</sub>      | RF input power                 |      | 30   | dBm   |
| T <sub>ch</sub>      | Operating channel temperature  |      | 150  | ° C   |
| T <sub>max</sub>     | Max assembly temperature       |      | 300* | ° C   |
| T <sub>stg</sub>     | Max storage temperature        | - 65 | 165  | ° C   |
| T <sub>base</sub>    | Maximum base plate temperature |      | 140  | ° C   |

\* 30 minute maximum



**Sample Gain and Noise Figure Characteristics**

**RF and Electrical Specifications**  
**Conditions T base = 25 ° C, Z source = Z load 50 +/- 5 Ω**

| Symbol             | Parameters/Conditions                        | Min  | Typ  | Max | Units  |
|--------------------|--|------|------|-----|--------|
| V <sub>d</sub> 1 2 | Drain Supply Voltage                         | 2.5  | 3    | 5   | Volts  |
| V <sub>g</sub> 1 2 | Gate Supply Voltage                          | -0.6 | -0.2 | 0.2 | Volts  |
| ID total           | Total drain current (@ typ V <sub>gs</sub> ) | 10   | 35   | 60  | mA     |
| Frequency          | Specified Bandwidth edges                    | 9    |      | 12  | GHz    |
| Gain**             | Small signal                                 | 20   | 22   | 24  | dB     |
| Δ Gain             | Small signal gain flatness                   |      | <2   |     | dB/GHz |
| P1dB               | Power output at 1dB gain compression         | 8    | 10   |     | dBm    |
| RL in              | Input port return loss                       | 8    | 10   |     | dB     |
| RL out             | Output port return loss                      | 8    | 10   |     | dB     |
| Isolation          | Reverse isolation                            | 30   | 40   |     | dB     |
| NF                 | Noise figure                                 |      | 1.3  | 1.7 | dB     |

- Each die is fully DC tested and RF S-parameters are measured. A representative sample of dice are tested for noise figure on each wafer. For a nominal charge full 2-port S-parameter data on individual die will be supplied.
- All die will pass visual inspection as dictated by the rules contained in Section A of the General Notes on Rockwell PHEMT Products.
- Every die has a unique identifier number on-chip for complete trace-ability.
- A conductive epoxy or a flux-less solder die attach is recommended . The die should be attached to an electrically conductive surface to complete DC and RF ground paths .The ground path inductance should be minimized (<10 pH) to assure stability .
- The front side metal is compatible with thermo-sonic 1 mil wire bonding. The backside metal is compatible with die attach methods not exceeding Tmax .
- GaAs MMICs are ESD sensitive. Proper precautions should be used when handling these devices. Front and backside metal is Gold.
- In the event of performance verification, die will be mounted and tested in a standard Rockwell approved test fixture for X band. (See Section B of the General Notes on Rockwell PHEMT Products)

\*\* Within the temperature range -35° C to +85° C, Small Signal Gain shall not vary by more than +/- 2.0 dB and shall remain within the range 18 dB to 26 dB . Under the same conditions the Noise Figure shall not exceed 2.0 dB.

\*\*\* Rockwell Science Center reserves the right to make improvements in this device, while maintaining all specifications. The General Notes on Rockwell PHEMT Products will be supplied upon user's request . In addition to inspection criteria it will contain descriptions, biasing instructions, reliability data and lists of other MMICs.