

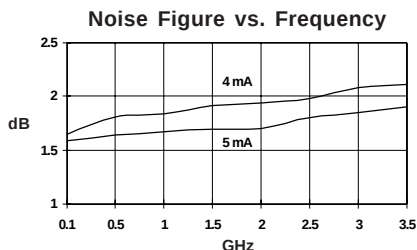
## Product Description

Stanford Microdevices' SLN-286 is a high performance gallium arsenide heterojunction bipolar transistor MMIC housed in a low-cost surface mount plastic package. A Darlington configuration is used for broadband performance from DC-3.5 GHz.

The SLN-286 needs only 2 DC-Blocking capacitors and a bias resistor for operation. Noise figure may be optimized by using 2-element matching at the input to yield <2.0 dB noise figure.

This 50 Ohm LNA requires only a single supply voltage and draws only 5mA. For broadband applications, it may be biased at 4mA with minimal effect on noise figure and gain.

The SLN-286 is available in tape and reel at 1000, 3000 and 5000 devices per reel.



## Electrical Specifications at Ta = 25C

| Symbol           | Parameters: Test Conditions                                |                                            | Units      | Min. | Typ.           | Max. |
|------------------|------------------------------------------------------------|--------------------------------------------|------------|------|----------------|------|
| NF<br>50 Ohm     | Noise Figure in 50 Ohms:<br>Vds = 3.0 V, Ids = 5 mA        | f = DC-1.5 GHz<br>f = 1.5-3.5 GHz          | dB<br>dB   |      | 1.7<br>2.2     | 2.1  |
| S <sub>21</sub>  | 50 Ohm Gain:<br>Vds = 3.0 V, Ids = 5 mA                    | f = DC-1.5 GHz<br>f = 1.5-3.5 GHz          | dB         | 22   | 25<br>23       |      |
| VSWR             | 50 Ohm Match(Input and Output):<br>Vds = 3.0 V, Ids = 5 mA | f = DC-1.5 GHz<br>f = 1.5-3.5 GHz          | -          |      | 1.8:1<br>2.5:1 |      |
| NF<br>50 Ohm     | Noise Figure in 50 Ohms:<br>Vds = 2.8 V, Ids = 4 mA        | f = DC-1.5 GHz<br>f = 1.5-3.5 GHz          | dB<br>dB   |      | 1.9<br>2.4     | 2.3  |
| S <sub>21</sub>  | 50 Ohm Gain:<br>Vds = 2.8 V, Ids = 4 mA                    | f = DC-1.5 GHz<br>f = 1.5-3.5 GHz          | dB         | 19   | 22<br>20       |      |
| VSWR             | 50 Ohm Match(Input and Output):<br>Vds = 2.8 V, Ids = 4 mA | f = DC-1.5 GHz<br>f = 1.5-3.5 GHz          | -          |      | 1.4:1<br>2.0:1 |      |
| P <sub>1dB</sub> | Output Power at 1dB Compression:<br>f = DC-3.5 GHz         | Vd= 3.0V, Id = 5 mA<br>Vd= 2.8V, Id = 4 mA | dBm<br>dBm |      | -12<br>-14     |      |
| IP <sub>3</sub>  | Third Order Intercept Point:<br>f = DC-3.5 GHz             | Vd= 3.0V, Id = 5 mA<br>Vd= 2.8V, Id = 4 mA | dBm        |      | +3<br>+1       |      |

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## SLN-286

### DC-3.5 GHz, 3Volt 50 Ohm LNA MMIC Amplifier



## Product Features

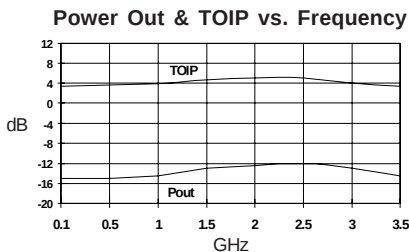
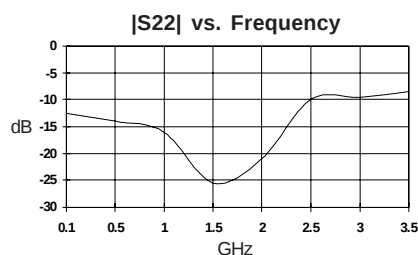
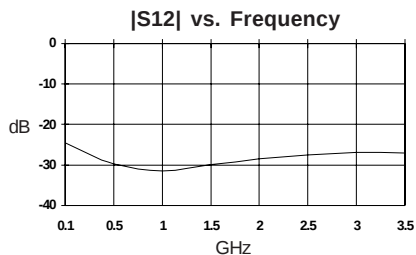
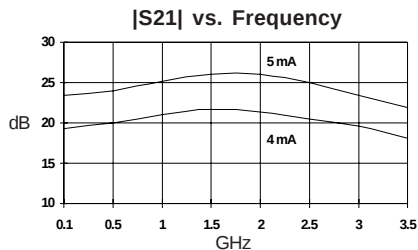
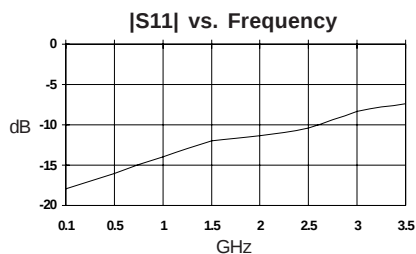
- Patented, Reliable GaAs HBT Technology
- Low Noise Figure: 1.7 dB from 0.1 to 1.5 GHz
- High Associated Gain: 27 dB Typ. at 2.0 GHz
- True 50 Ohm MMIC : No External Matching Required
- Low Current Draw : Only 5 mA at 3V
- Low Cost Surface Mount Plastic Package

## Applications

- AMPS, PCS, DECT, Handsets
- Tri-Band & Broadband Receivers

## SLN-286 DC-3.5 GHz LNA MMIC Amplifier

Typical Performance at 25° C ( $V_{ds} = 3.0V$ ,  $I_{ds} = 5mA$ )



Typical S-Parameters  $V_{ds} = 3.0V$ ,  $I_{ds} = 5mA$

| Freq GHz | S11   | S11 Ang | S21   | S21 Ang | S12  | S12 Ang | S22  | S22 Ang |
|----------|-------|---------|-------|---------|------|---------|------|---------|
| .100     | 0.074 | -124    | 11.02 | -4      | .039 | 13      | .201 | -50     |
| .250     | 0.083 | -113    | 11.12 | -8      | .033 | 9       | .215 | -26     |
| .500     | 0.079 | -98     | 11.45 | -47     | .032 | -17     | .210 | -48     |
| 1.00     | 0.178 | -168    | 12.49 | -100    | .035 | -34     | .153 | -109    |
| 1.50     | 0.290 | 89      | 12.68 | -160    | .033 | -51     | .038 | -175    |
| 2.00     | 0.372 | 22      | 12.91 | 140     | .037 | 80      | .133 | -60     |
| 2.50     | 0.427 | -47     | 11.02 | 73      | .040 | -103    | .255 | -145    |
| 3.00     | 0.437 | -117    | 9.22  | 18      | .045 | -134    | .350 | 141     |
| 3.50     | 0.414 | 180     | 7.45  | -38     | .051 | -158    | .365 | -79     |
| 4.00     | 0.393 | 126     | 5.53  | -84     | .053 | 177     | .377 | 23      |

(S-Parameters include the effects of two 1.0 mil diameter bond wires, each 30 mils long, connected to the gate and drain pads on the die)

## Absolute Maximum Ratings

| Parameter             | Absolute Maximum |
|-----------------------|------------------|
| Device Current        | 50mA             |
| Power Dissipation     | 440mW            |
| RF Input Power        | 100mW            |
| Junction Temperature  | +200C            |
| Operating Temperature | -45C to +85C     |
| Storage Temperature   | -65C to +150C    |

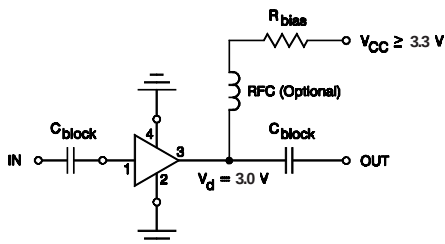
## Notes:

1. Operation of this device above any one of these parameters may cause permanent damage.

## Part Number Ordering Information

| Part Number | Devices Per Reel | Reel Size |
|-------------|------------------|-----------|
| SLN-286-TR1 | 1000             | 7"        |
| SLN-286-TR2 | 3000             | 13"       |
| SLN-286-TR3 | 5000             | 13"       |

| Recommended Bias Resistor Values |      |     |      |      |      |      |      |
|----------------------------------|------|-----|------|------|------|------|------|
| Supply Voltage(Vs)               | 3.3V | 5V  | 7.5V | 9V   | 12V  | 15V  | 20V  |
| Rbias (Ohms)                     | 60   | 400 | 900  | 1200 | 1800 | 2400 | 3400 |



Typical Biasing Configuration

## Device Pinout

| Pin | Function           |
|-----|--------------------|
| 1   | RF Input           |
| 2   | Ground             |
| 3   | RF Output and Bias |
| 4   | Ground             |

## Device Outline

