

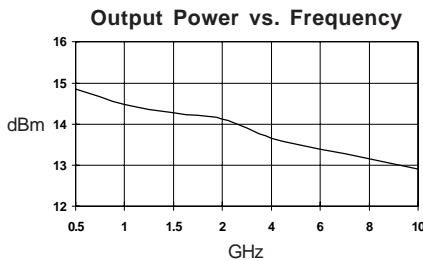
## Product Description

Stanford Microdevices' SNA-276 is a GaAs monolithic broadband amplifier (MMIC) housed in a low-cost surface mountable stripline package. This amplifier provides 16dB of gain when biased at 50mA and 4V.

External DC decoupling capacitors determine low frequency response. The use of an external resistor allows for bias flexibility and stability.

These unconditionally stable amplifiers are designed for use as general purpose 50 ohm gain blocks. Also available in chip form (SNA-200), its small size (0.33mm x 0.33mm) and gold metallization, make it an ideal choice for use in hybrid circuits.

The SNA-276 is available in tape and reel at 1000, 3000 and 5000 devices per reel.



## Electrical Specifications at Ta = 25° C

| Symbol | Parameters: Test Conditions:<br>Id = 50 mA, Z0 = 50 Ohms | Units   | Min.    | Typ.                 | Max.                 |
|--------|--|---|---------|----------------------|----------------------|
| Gp     | Small Signal Power Gain                                  | f = 0.1-2.0 GHz<br>f = 2.0-4.0 GHz<br>f = 4.0-6.5 GHz | dB      | 15.0<br>14.0<br>13.0 | 16.0<br>15.0<br>14.0 |
| Gf     | Gain Flatness  | f = 0.1-4.0 GHz                                       | dB      |                      | +/-1.0               |
| BW 3dB | 3dB Bandwidth  |   | GHz     |                      | 6.5                  |
| P1dB   | Output Power at 1dB Compression                          | f = 2.0 GHz   | dBm     |                      | 14.0                 |
| NF     | Noise Figure   | f = 2.0 GHz   | dB      |                      | 5.5 6.0              |
| VSWR   | Input/Output   | f = 0.1-6.5 GHz                                       | -       |                      | 1.5:1                |
| IP3    | Third Order Intercept Point                              | f = 2.0 GHz   | dBm     |                      | 27.0                 |
| Td     | Group Delay  | f = 2.0 GHz   | psec    |                      | 100                  |
| ISOL   | Reverse Isolation  | f = 0.1-6.5 GHz                                       | dB      |                      | 20                   |
| Vd     | Device Voltage   |   | V       | 3.5                  | 4.0 4.5              |
| dG/dT  | Device Gain Temperature Coefficient                      |   | dB/degC |                      | -0.0018              |
| dV/dT  | Device Voltage Temperature Coefficient                   |   | mV/degC |                      | -4.0                 |

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## SNA-276

### DC-6.5 GHz, Cascadable GaAs MMIC Amplifier



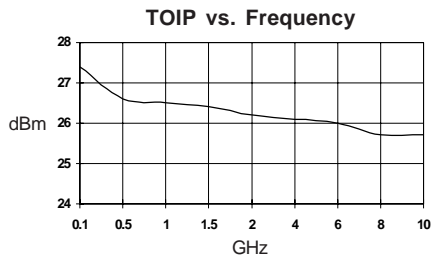
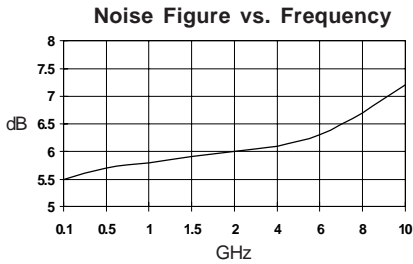
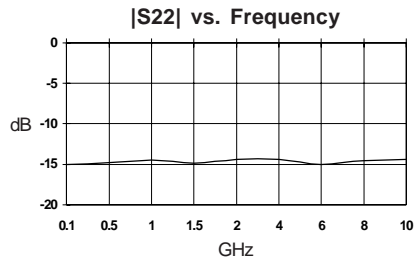
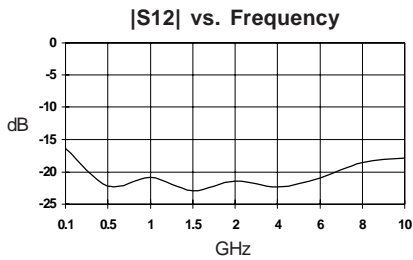
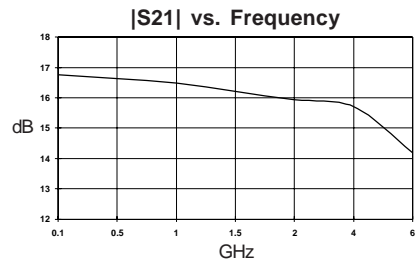
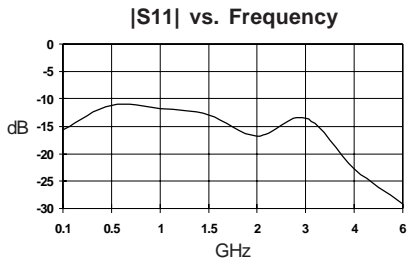
### Product Features

- Cascadable 50 Ohm Gain Block
- 16dB Gain, +14dBm P1dB
- 1.5:1 Input and Output VSWR
- Operates From Single Supply
- Low Cost Stripline Mount Ceramic Package
- Hermetically Sealed

### Applications

- Narrow and Broadband Linear Amplifiers
- Commercial and Industrial Applications

## SNA-276 DC-6.5 GHz Cascadable MMIC Amplifier



Typical S-Parameters  $V_{ds} = 4.0V$ ,  $I_{ds} = 50mA$

| Freq GHz | S11   | S11 Ang | S21   | S21 Ang | S12   | S12 Ang | S22   | S22 Ang |
|----------|-------|---------|-------|---------|-------|---------|-------|---------|
| .100     | 0.114 | 157     | 6.885 | 166     | 0.082 | -7      | 0.083 | 145     |
| .250     | 0.145 | 135     | 6.785 | 142     | 0.098 | -14     | 0.095 | 126     |
| .500     | 0.152 | 114     | 6.659 | 139     | 0.106 | -28     | 0.117 | 115     |
| 1.00     | 0.171 | 57      | 6.467 | 101     | 0.106 | -53     | 0.141 | 62      |
| 1.50     | 0.182 | 1       | 6.259 | 60      | 0.106 | -83     | 0.166 | 5       |
| 2.00     | 0.170 | -50     | 6.103 | 22      | 0.108 | -109    | 0.173 | -46     |
| 4.00     | 0.087 | 38      | 5.130 | -132    | 0.114 | 132     | 0.146 | 73      |
| 6.00     | 0.130 | -76     | 4.107 | 81      | 0.111 | 12      | 0.260 | -108    |
| 8.00     | 0.208 | -132    | 3.688 | -72     | 0.108 | -119    | 0.103 | -22     |
| 10.00    | 0.391 | -149    | 2.962 | 118     | 0.081 | 99      | 0.346 | 177     |

(S-Parameters include the effects of two 1.0 mil diameter bond wires, each 20 mils long, connected to the gate and drain pads on the die)

## Absolute Maximum Ratings

| Parameter             | Absolute Maximum |
|-----------------------|------------------|
| Device Current        | 70mA             |
| Power Dissipation     | 320mW            |
| 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.

## MTTF vs. Temperature @ Id = 50mA

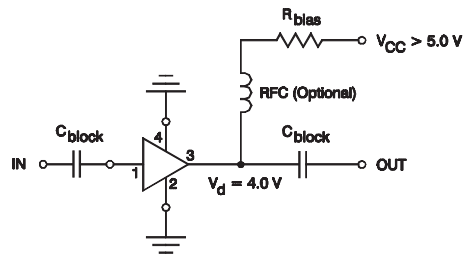
| Lead Temperature | Junction Temperature | MTTF (hrs) |
|------------------|----------------------|------------|
| +45C             | +155C                | 1000000    |
| +80C             | +190C                | 100000     |
| +110C            | +220C                | 10000      |

Thermal Resistance (Lead-Junction): 556° C/W

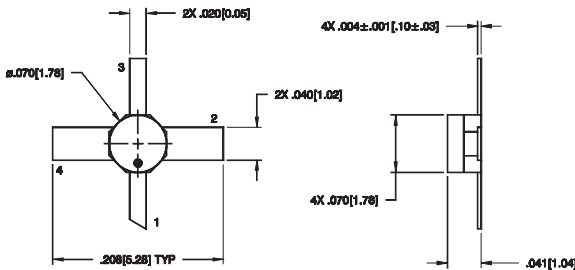
## Part Number Ordering Information

| Part Number | Devices Per Reel | Reel Size |
|-------------|------------------|-----------|
| SNA-276-TR1 | 1000             | 7"        |
| SNA-276-TR2 | 3000             | 13"       |
| SNA-276-TR3 | 5000             | 13"       |

| Recommended Bias Resistor Values |    |      |     |     |     |     |
|----------------------------------|----|------|-----|-----|-----|-----|
| Supply Voltage(Vs)               | 5V | 7.5V | 9V  | 12V | 15V | 20V |
| Rbias (Ohms)                     | 20 | 70   | 100 | 160 | 220 | 320 |

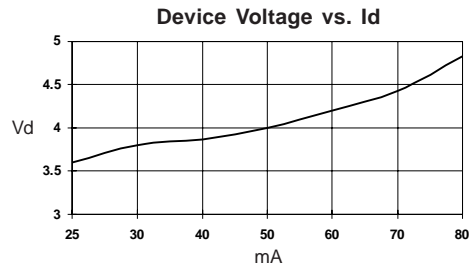
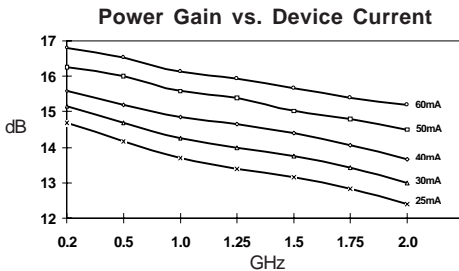


Typical Biasing Configuration



| Pin Designation |                 |
|-----------------|-----------------|
| 1               | RF in           |
| 2               | GND             |
| 3               | RF out and Bias |
| 4               | GND             |

## Typical Performance at 25° C



50 Ohm Gain Blocks