



MMIC SURFACE MOUNT

# Low Noise Amplifier **PMA2-162LNA+**

50Ω 700 to 1600 MHz Ultra Low Noise

## THE BIG DEAL

- Noise Figure, Typ 0.5 dB
- Adjustable Gain, Typ. 19.7 dB to 23.5 dB
- Class 1B HBM ESD (500V)
- OIP3, Typ. +30 dBm
- P1dB, Typ +20 dBm
- 2x2mm 8-Lead SMT Package
- May be used as a replacement for MGA-631P8<sup>a,b</sup>

## APPLICATIONS

- Base Station Infrastructure
- Portable Wireless
- LTE
- GPS
- GSM
- Airborn Radar

## PRODUCT OVERVIEW

The PMA2-162LNA+ is an E-pHEMT\* amplifier that operates from 700 to 1600 MHz. The amplifier has a low noise figure of 0.5 dB typical while providing 22.7 dB of gain, +30 dBm OIP3, and +20 dBm P1dB with 18 dB typical return loss with a +4V and 55mA DC power. Gain is adjustable from 19.7 dB to 23.5 dB. The amplifier is housed in an industry standard 2x2mm SMT package, with RF ports internally matched to 50Ω, facilitating easy integration into microwave system PC boards.

## KEY FEATURES

| Feature                                 | Advantages                                                                                                                                                                          |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ultra Low Noise Figure<br>• Typ. 0.5 dB | Excellent noise figure performance.                                                                                                                                                 |
| High OIP3<br>• OIP3, Typ. +30 dBm       | Suitable as a driver amplifier in receiver/transmitter chains.                                                                                                                      |
| Adjustable Gain                         | By changing feedback resistor R1, gain can be changed from 19.7 dB to 23.5 dB.                                                                                                      |
| Max Input Power, +25 dBm                | Ruggedized design operates up to high input power often seen at Receiver inputs eliminating the need for an external limiter.                                                       |
| Class 1B ESD (500V HBM)                 | The PMA2-162LNA+ is a super low noise E-pHEMT based design. Mini-Circuits incorporates ESD protection on die to achieve industry leading ESD performance for a low noise amplifier. |
| 2x2mm 8-Lead SMT package                | Small footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.                                      |

a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, and compatibility with other components and environmental conditions and stresses.

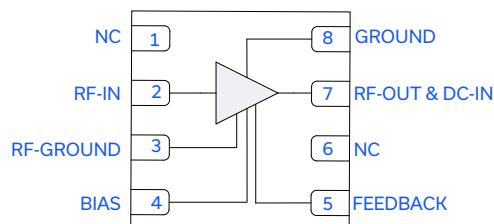
b. The Avago MGA-631P8 part number is used for identification and comparison purposes only.

\*Enhanced mode Pseudomorphic High Electron Mobility Transistor



Generic photo used for illustration purposes only

## FUNCTIONAL DIAGRAM





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## ELECTRICAL SPECIFICATIONS<sup>1,2</sup> AT +25°C, Z<sub>0</sub> = 50Ω, AND V<sub>S</sub> = +4V UNLESS NOTED OTHERWISE

| Parameter                                               | Condition (MHz) | R1 = 267Ω <sup>1</sup> |       |      | R1 = 93Ω <sup>2</sup> |       |      | Units |
|---------------------------------------------------------|-----------------|------------------------|-------|------|-----------------------|-------|------|-------|
|                                                         |                 | Min.                   | Typ.  | Max. | Min.                  | Typ.  | Max. |       |
| Frequency Range                                         |                 | 700                    |       | 1600 | 700                   |       | 1600 | MHz   |
| Gain                                                    | 700             |                        | 24.4  |      |                       | 22.7  |      | dB    |
|                                                         | 800             |                        | 24.1  |      |                       | 22.2  |      |       |
|                                                         | 1000            | 20.9                   | 22.7  | 24.5 | 18.6                  | 20.8  | 23.1 |       |
|                                                         | 1300            |                        | 20.7  |      |                       | 19.1  |      |       |
|                                                         | 1600            |                        | 18.8  |      |                       | 17.7  |      |       |
| Input Return Loss                                       | 700             |                        | 9.5   |      |                       | 11.5  |      | dB    |
|                                                         | 800             |                        | 15.5  |      |                       | 18.8  |      |       |
|                                                         | 1000            |                        | 17.9  |      |                       | 20.0  |      |       |
|                                                         | 1300            |                        | 12.4  |      |                       | 14.5  |      |       |
|                                                         | 1600            |                        | 10.8  |      |                       | 12.4  |      |       |
| Output Return Loss                                      | 700             |                        | 13.6  |      |                       | 21.6  |      | dB    |
|                                                         | 800             |                        | 16.1  |      |                       | 17.8  |      |       |
|                                                         | 1000            |                        | 18.9  |      |                       | 16.0  |      |       |
|                                                         | 1300            |                        | 15.6  |      |                       | 15.1  |      |       |
|                                                         | 1600            |                        | 10.7  |      |                       | 11.6  |      |       |
| Isolation                                               | 700-1600        |                        | 38.2  |      |                       | 34.2  |      | dB    |
| Output Power at 1 dB Compression (P1dB)                 | 700             |                        | +19.5 |      |                       | +18.3 |      | dBm   |
|                                                         | 800             |                        | +19.8 |      |                       | +18.9 |      |       |
|                                                         | 1000            |                        | +19.9 |      |                       | +19.7 |      |       |
|                                                         | 1300            |                        | +19.7 |      |                       | +19.8 |      |       |
|                                                         | 1600            |                        | +18.8 |      |                       | +19.0 |      |       |
| Output Third-Order Intercept Point (Pout = 0 dBm/Tone)  | 700             |                        | +29.1 |      |                       | +28.3 |      | dBm   |
|                                                         | 800             |                        | +30.3 |      |                       | +38.5 |      |       |
|                                                         | 1000            |                        | +30.0 |      |                       | +29.0 |      |       |
|                                                         | 1300            |                        | +30.1 |      |                       | +29.2 |      |       |
|                                                         | 1600            |                        | +29.4 |      |                       | +28.5 |      |       |
| Noise Figure                                            | 700             |                        | 0.55  |      |                       | 0.57  |      | dB    |
|                                                         | 800             |                        | 0.51  |      |                       | 0.54  |      |       |
|                                                         | 1000            |                        | 0.47  |      |                       | 0.48  |      |       |
|                                                         | 1300            |                        | 0.64  |      |                       | 0.65  |      |       |
|                                                         | 1600            |                        | 0.80  |      |                       | 0.81  |      |       |
| Device Operating Voltage (V <sub>S</sub> )              |                 | +3.8                   | +4.0  | +4.2 | +3.8                  | +4.0  | +4.2 | V     |
| Device Operating Current (I <sub>S</sub> ) <sup>3</sup> |                 |                        | 55    |      |                       | 55    |      | mA    |
| Device Current Variation Vs. Temperature <sup>4</sup>   |                 |                        | 2     |      |                       | 2     |      | μA/°C |
| Device Current Variation Vs. Voltage <sup>5</sup>       |                 |                        | 0.018 |      |                       | 0.016 |      | mA/mV |

1. Tested in Mini-Circuits Characterization Test/Evaluation Board TB-PMA2162LNAC+ with R1 = 267Ω. See Figure 2. De-embedded to the device reference plane.

2. Tested in Mini-Circuits Characterization Test/Evaluation Board TB-PMA2162LNAC+ with R1\* = 93Ω. See Figure 2. De-embedded to the device reference plane.

3. Current at P<sub>IN</sub> = -25 dBm. Increases to 95 mA at P1dB.

4. ((Current at T<sub>max</sub>°C - Current at T<sub>min</sub>°C)/(T<sub>max</sub>°C - T<sub>min</sub>°C)

5. (Current at Nominal V +ΔV in mA) - (Current at Nominal V -ΔV mA)/(2ΔV mV)



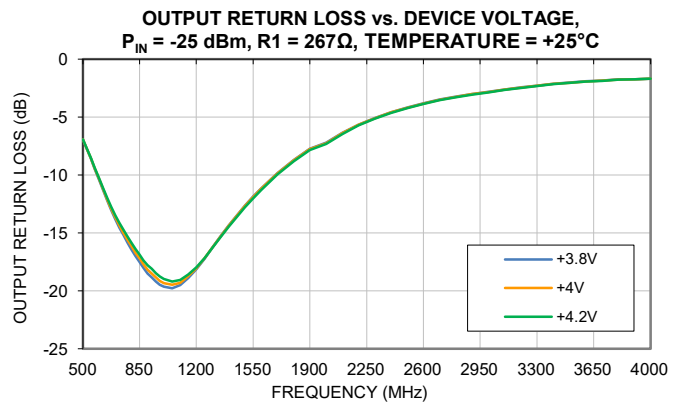
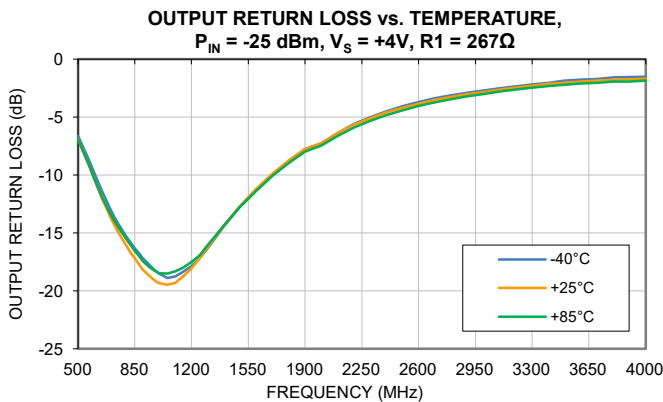
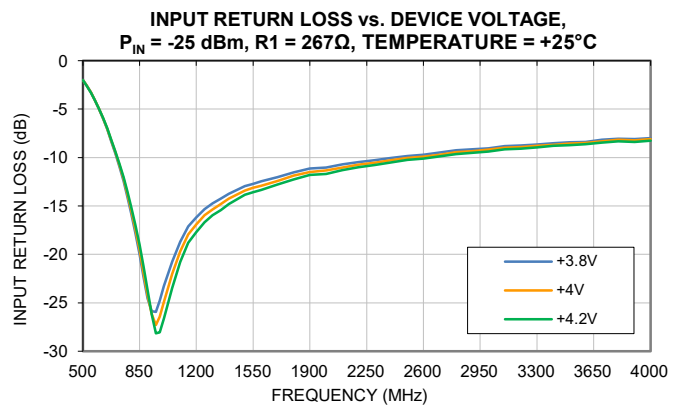
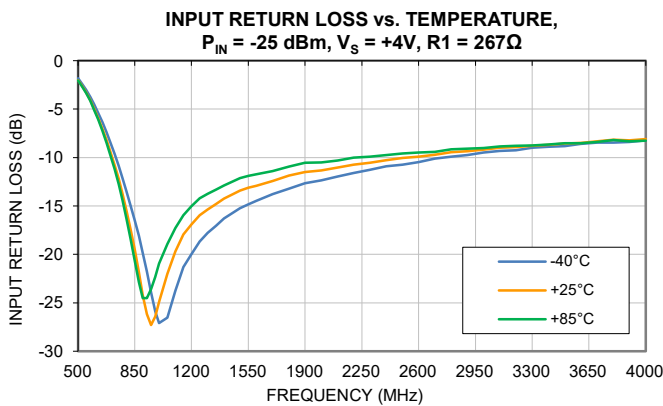
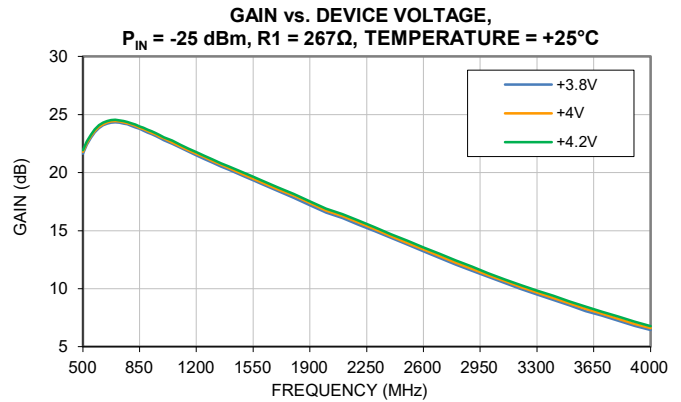
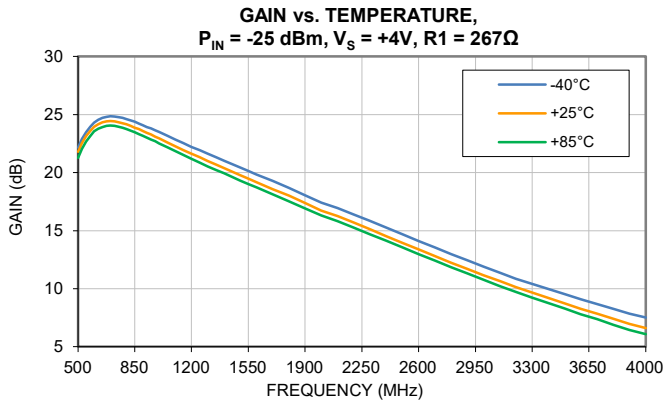


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## TYPICAL PERFORMANCE GRAPHS





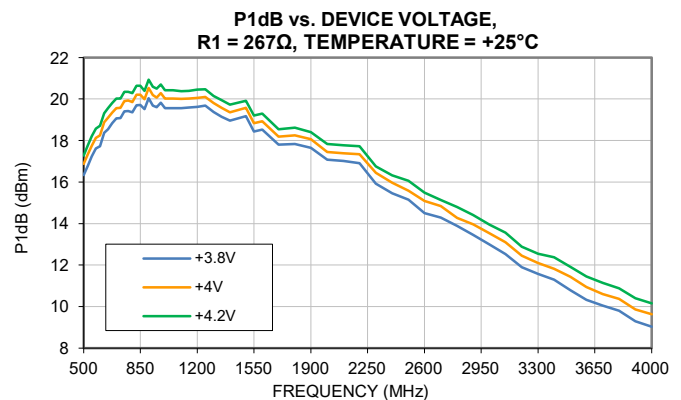
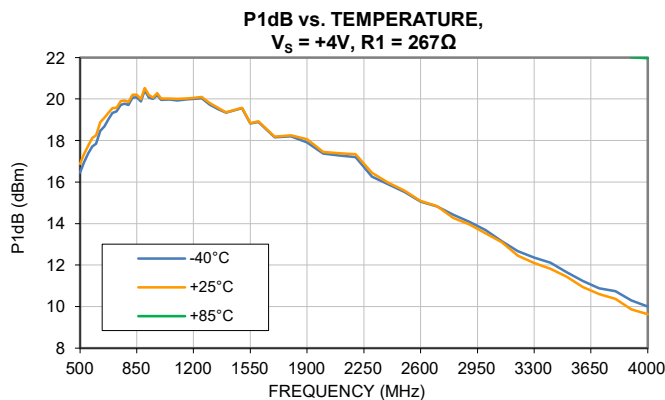
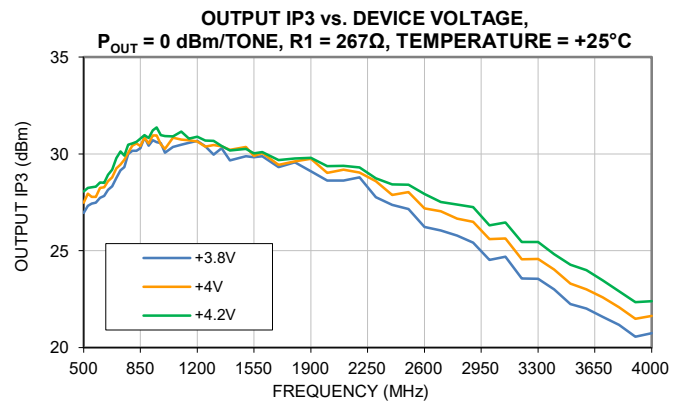
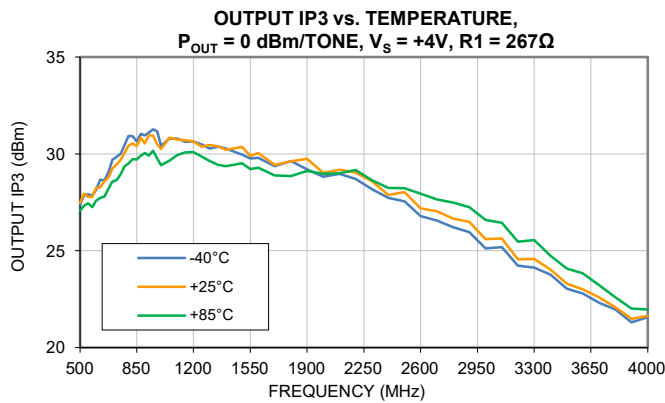
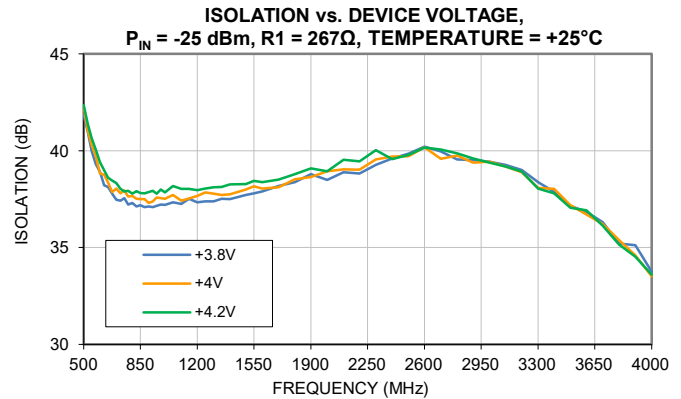
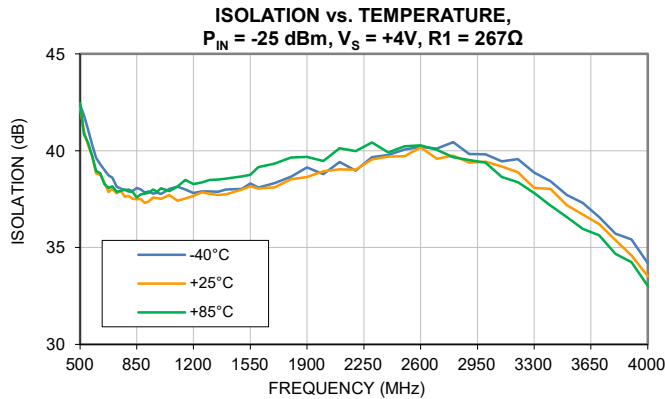
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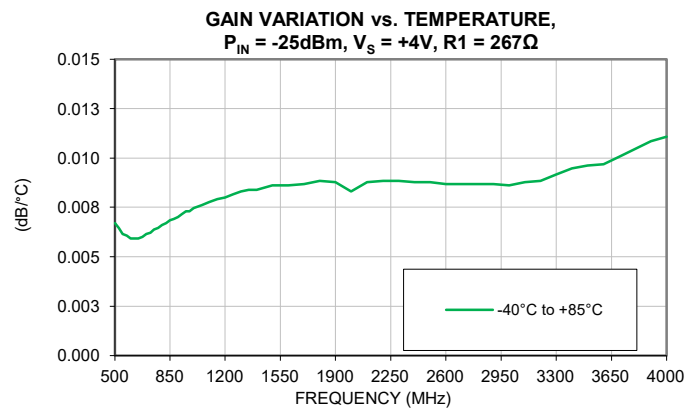
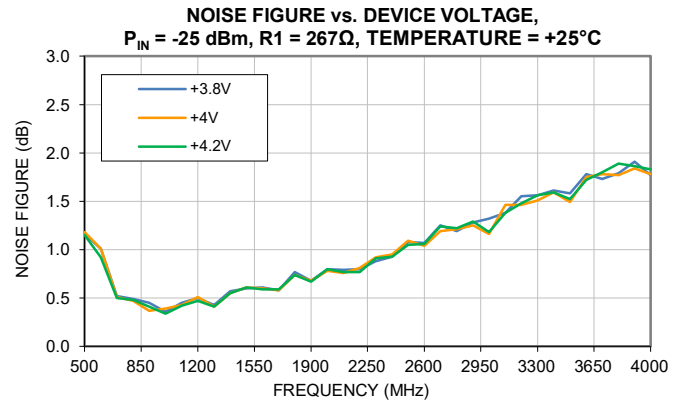
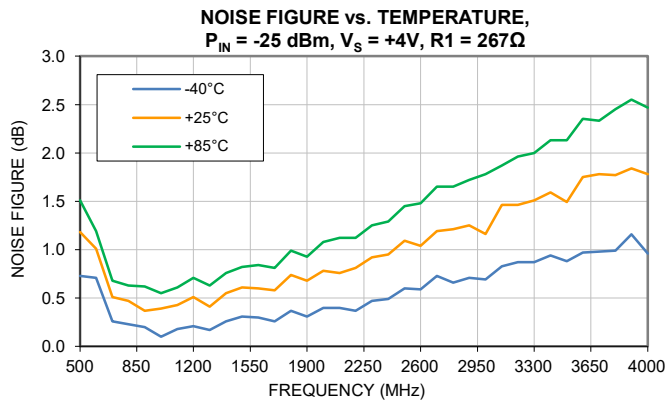


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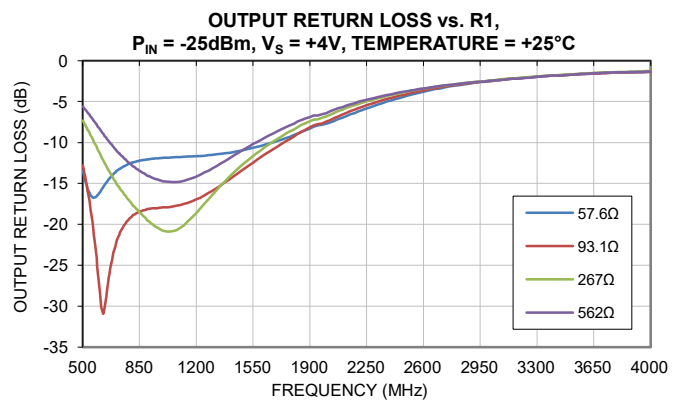
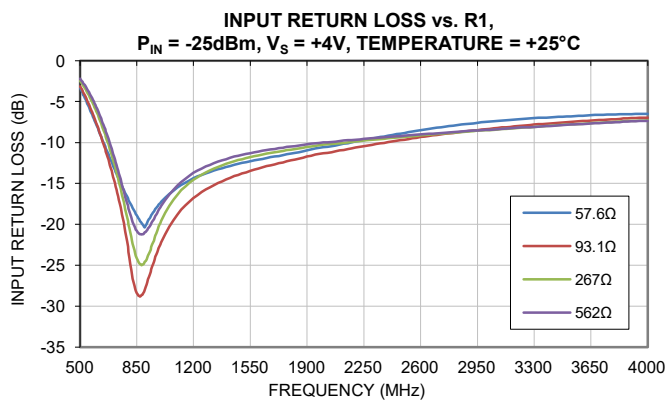
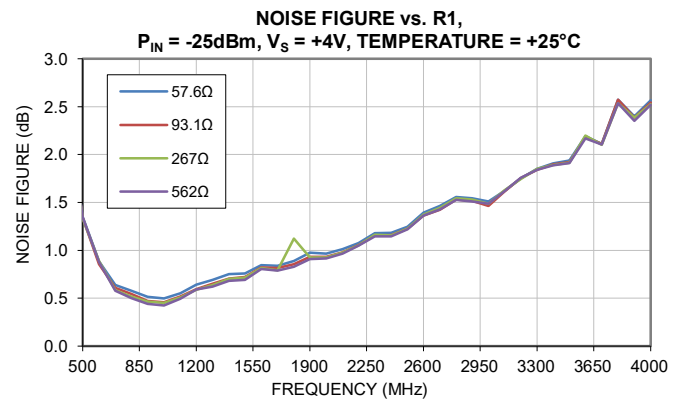
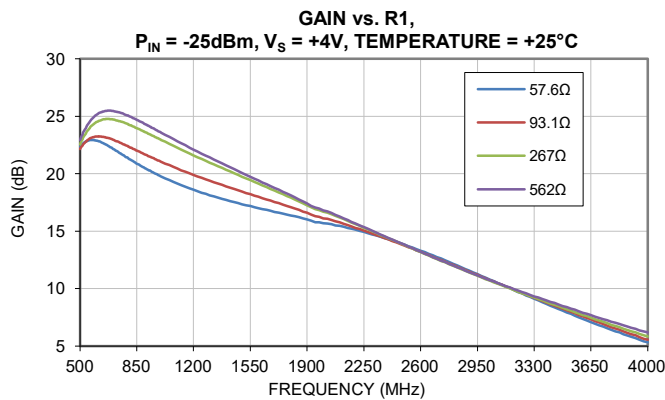
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### ABSOLUTE MAXIMUM RATINGS<sup>6</sup>

| Parameter                         | Ratings         |
|-----------------------------------|-----------------|
| Operating Temperature             | -40°C to +85°C  |
| Storage Temperature               | -65°C to +150°C |
| Total Power Dissipation           | 0.55W           |
| Junction Temperature <sup>7</sup> | +150°C          |
| Input Power (CW), $V_s = +4V$     | +25 dBm         |
| DC Voltage on $V_s$               | +5.5V           |
| Current $I_s$                     | 130mA           |

6. Permanent damage may occur if any of these limits are exceeded. Maximum ratings are not intended for continuous normal operation.

7. Peak temperature on top of Die.

### THERMAL RESISTANCE

| Parameter                                         | Ratings |
|---------------------------------------------------|---------|
| Thermal Resistance ( $\Theta_{jc}$ ) <sup>8</sup> | 53°C/W  |

8.  $\Theta_{jc}$  = (Hot Spot Temperature on Die - Temperature at Ground Lead)/Dissipated Power

### ESD RATING

|                        | Class | Voltage Range  | Reference Standard          |
|------------------------|-------|----------------|-----------------------------|
| Human Body Model (HBM) | 1B    | 500V to <1000V | ANSI/ESDA/JEDEC JS-001-2017 |
| Machine Model (MM)     | M1    | 25V            | JESD22-C101F                |



ESD HANDLING PRECAUTION: This device is designed to be Class 1B for HBM. Static charges may easily produce potentials higher than this with improper handling and can discharge into DUT and damage it. As a preventive measure Industry standard ESD handling precautions should be used at all times to protect the device from ESD damage.

### MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020E/JEDEC J-STD-033C





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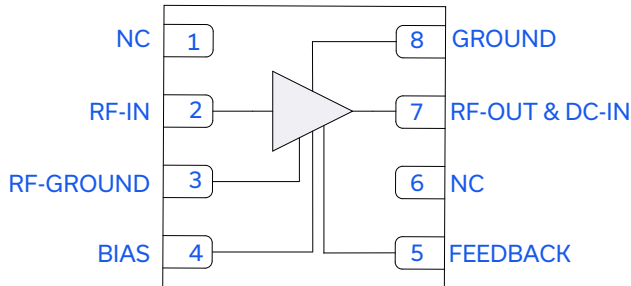
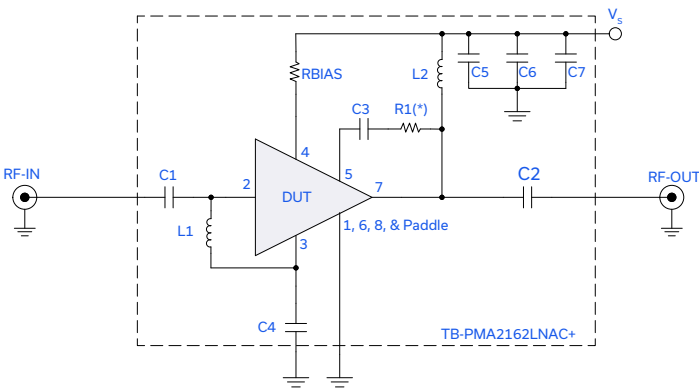


Figure 1. PMA2-162LNA+ Functional Diagram

## PAD DESCRIPTION

| Function       | Pad Number | Description                                                                                                |
|----------------|------------|------------------------------------------------------------------------------------------------------------|
| RF-IN          | 2          | RF-IN Pad connects to RF-Input port.                                                                       |
| RF-OUT & DC-IN | 7          | RF-OUT Pad connects to RF-Output and the voltage input port, DC-IN.                                        |
| BIAS           | 4          | Bias Pad that is used to adjust the bias voltage supplied to the DUT through the use of an RBIAS resistor. |
| FEEDBACK       | 5          | Feedback Pad used to reflect any feedback into the DUT.                                                    |
| RF-GROUND      | 3          | RF-Ground Pad used for grounding.                                                                          |
| GROUND         | 8 & Paddle | Connects to ground.                                                                                        |
| NC             | 1 & 6      | Not used internally. Connected to ground on test board.                                                    |

## CHARACTERIZATION TEST BOARD



Gain, Return Loss, Output Power at 1dB compression (P1dB), Output IP3 (OIP3) and Noise Figure measured using PNA-X N5242A Microwave Network Analyzer.

Conditions:

1. Gain and Return Loss:  $P_{IN} = -25$  dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, 0 dBm/tone at output.
3.  $V_S = +4V$

Figure 2. DUT soldered on Mini-Circuits Characterization Test Board: TB-PMA2162LNAC+

| Component | Vendor                | Vendor P/N          | Value | Size |
|-----------|-----------------------|---------------------|-------|------|
| C1, C6    | AVX CORP              | 04025U9R1CAT2A      | 9.1pF | 0402 |
| C2, C4    | Murata                | GRM15555C1H101JA01D | 100pF | 0402 |
| C3        | Murata                | GJM1555C1H5R6BB01D  | 5.6pF | 0402 |
| C5, C7    | Murata                | GRM155R71C104KA88D  | 0.1μF | 0402 |
| R1        | KOA Speer Electronics | RK73H1ETTP2670F     | 267Ω  | 0402 |
| R1*       | KOA Speer Electronics | RK73H1ETTP930F      | 93Ω   | 0402 |
| Rbias     | KOA Speer Electronics | RK73H1ETTP7500F     | 750Ω  | 0402 |
| L1        | Coilcraft             | 0402CS-6N8XGLW      | 6.8nH | 0402 |
| L2        | Coilcraft             | 0402CS-15NXGLW      | 15nH  | 0402 |



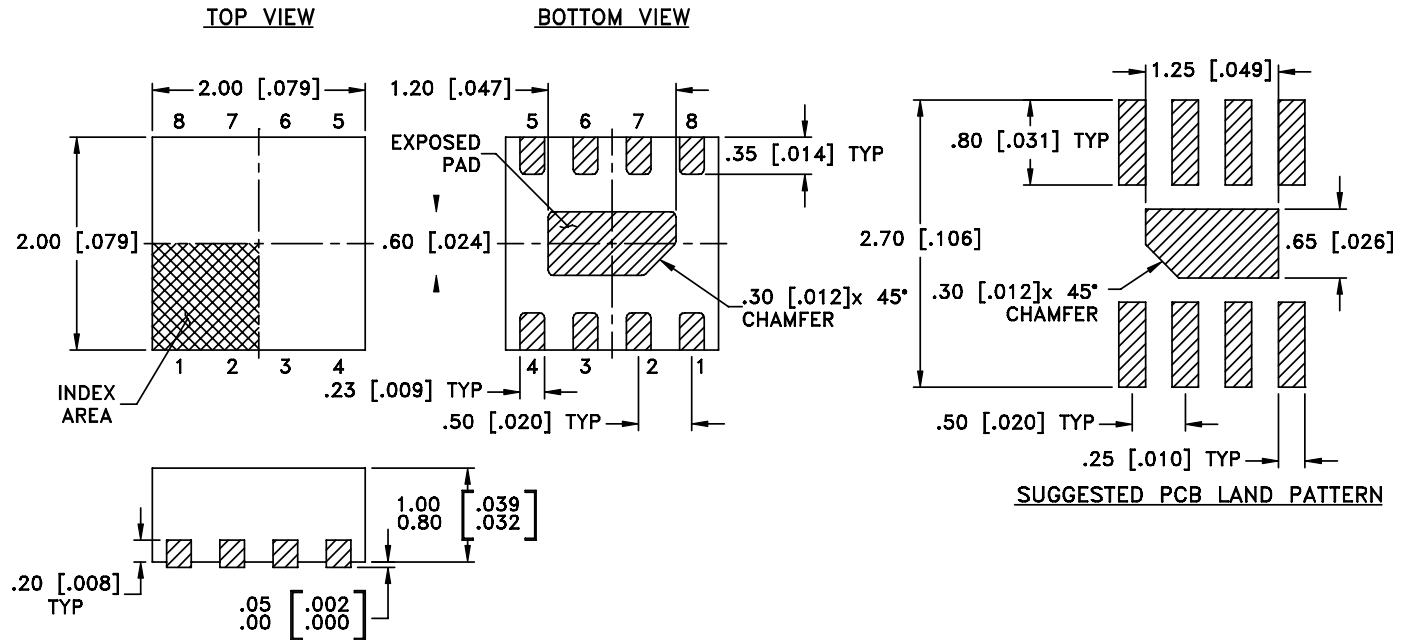


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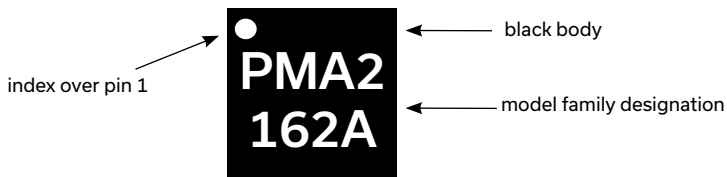
### CASE STYLE DRAWING



Weight: 0.006 grams  
Dimensions are in inches [mm].

Figure 3. MC1631-1 Case Style Drawing

### PRODUCT MARKING



Marking may contain other features or characters for internal lot control

Figure 4. PMA2-162LNA+ Product Marking



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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD [CLICK HERE](#)

|                                       |                                                                   |
|---------------------------------------|-------------------------------------------------------------------|
| Performance Data                      | Data                                                              |
|                                       | Graphs                                                            |
|                                       | S-Parameter (S2P Files) Data Set (.zip file)                      |
| Case Style                            | MC1631-1. Plastic Package, Exposed Paddle, Lead Finish: Matte Tin |
| RoHs Status                           | Compliant                                                         |
| Tape & Reel                           | F66                                                               |
| Standard quantities available on reel | 7" reels with 20, 50, 100, 200, 500, or 1000 devices              |
| Suggested Layout for PCB Design       | PL-737                                                            |
| Evaluation Board                      | TB-PMA2162LNAC+                                                   |
|                                       | Gerber File                                                       |
| Environmental Ratings                 | ENV08T1                                                           |

## NOTES

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



## Typical Performance Data

**NOTE: Use PDF Bookmarks to view DATA at required conditions**

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_S = +4V$ ,  $I_S = 54.09mA$ ,  $R1=267\ \Omega$  @ Temperature = +25°C

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 21.78 | 42.23     | -2.02             | -6.93              | 1.92      | 1.23    | 27.48       | 16.87            | 500.0  | 1.18         |
| 525.0  | 22.53 | 41.02     | -2.59             | -7.73              | 1.89      | 1.21    | 27.95       | 17.34            | 600.0  | 1.01         |
| 550.0  | 23.13 | 40.30     | -3.28             | -8.57              | 1.92      | 1.19    | 27.79       | 17.75            | 700.0  | 0.51         |
| 575.0  | 23.59 | 39.70     | -4.08             | -9.45              | 1.97      | 1.16    | 27.79       | 18.12            | 800.0  | 0.47         |
| 600.0  | 23.94 | 38.83     | -4.97             | -10.31             | 1.94      | 1.12    | 28.24       | 18.25            | 900.0  | 0.37         |
| 625.0  | 24.18 | 38.76     | -5.96             | -11.21             | 2.04      | 1.09    | 28.29       | 18.88            | 1000.0 | 0.39         |
| 650.0  | 24.32 | 38.36     | -7.04             | -12.10             | 2.06      | 1.06    | 28.58       | 19.09            | 1100.0 | 0.43         |
| 675.0  | 24.40 | 37.86     | -8.21             | -12.90             | 2.06      | 1.02    | 28.79       | 19.35            | 1200.0 | 0.51         |
| 700.0  | 24.43 | 38.04     | -9.45             | -13.64             | 2.18      | 1.01    | 29.24       | 19.57            | 1300.0 | 0.41         |
| 725.0  | 24.40 | 37.80     | -10.77            | -14.36             | 2.20      | 0.99    | 29.44       | 19.58            | 1400.0 | 0.55         |
| 750.0  | 24.33 | 37.95     | -12.21            | -15.02             | 2.31      | 0.97    | 29.69       | 19.91            | 1500.0 | 0.61         |
| 775.0  | 24.25 | 37.63     | -13.78            | -15.57             | 2.30      | 0.96    | 30.06       | 19.94            | 1600.0 | 0.60         |
| 800.0  | 24.14 | 37.66     | -15.47            | -16.12             | 2.37      | 0.95    | 30.42       | 19.85            | 1700.0 | 0.58         |
| 825.0  | 24.02 | 37.52     | -17.41            | -16.70             | 2.39      | 0.95    | 30.54       | 20.22            | 1800.0 | 0.74         |
| 850.0  | 23.88 | 37.50     | -19.50            | -17.20             | 2.44      | 0.94    | 30.40       | 20.22            | 1900.0 | 0.68         |
| 875.0  | 23.73 | 37.50     | -21.84            | -17.71             | 2.49      | 0.94    | 30.84       | 19.99            | 2000.0 | 0.78         |
| 900.0  | 23.58 | 37.31     | -24.22            | -18.16             | 2.49      | 0.94    | 30.53       | 20.53            | 2100.0 | 0.76         |
| 925.0  | 23.42 | 37.40     | -26.19            | -18.51             | 2.56      | 0.95    | 30.94       | 20.18            | 2200.0 | 0.81         |
| 950.0  | 23.26 | 37.59     | -27.29            | -18.85             | 2.66      | 0.95    | 30.95       | 20.07            | 2300.0 | 0.92         |
| 975.0  | 23.10 | 37.56     | -26.41            | -19.15             | 2.70      | 0.95    | 30.49       | 20.28            | 2400.0 | 0.95         |
| 1000.0 | 22.93 | 37.52     | -24.92            | -19.33             | 2.74      | 0.96    | 30.25       | 20.02            | 2500.0 | 1.09         |
| 1050.0 | 22.60 | 37.72     | -22.00            | -19.47             | 2.89      | 0.96    | 30.84       | 20.02            | 2600.0 | 1.04         |
| 1100.0 | 22.27 | 37.43     | -19.69            | -19.29             | 2.88      | 0.97    | 30.74       | 20.00            | 2700.0 | 1.19         |
| 1150.0 | 21.94 | 37.53     | -17.93            | -18.72             | 3.00      | 0.98    | 30.71       | 20.02            | 2800.0 | 1.21         |
| 1200.0 | 21.62 | 37.66     | -16.93            | -18.08             | 3.12      | 0.98    | 30.64       | 20.06            | 2900.0 | 1.25         |
| 1250.0 | 21.30 | 37.84     | -15.96            | -17.18             | 3.27      | 0.99    | 30.37       | 20.10            | 3000.0 | 1.16         |
| 1300.0 | 20.99 | 37.78     | -15.35            | -16.24             | 3.32      | 0.99    | 30.44       | 19.81            | 3100.0 | 1.46         |
| 1350.0 | 20.68 | 37.72     | -14.83            | -15.27             | 3.38      | 0.99    | 30.39       | 19.58            | 3200.0 | 1.46         |
| 1400.0 | 20.38 | 37.76     | -14.26            | -14.36             | 3.46      | 0.99    | 30.21       | 19.36            | 3300.0 | 1.51         |
| 1500.0 | 19.78 | 37.99     | -13.41            | -12.69             | 3.69      | 0.99    | 30.35       | 19.58            | 3400.0 | 1.59         |
| 1550.0 | 19.47 | 38.16     | -13.13            | -11.92             | 3.83      | 0.98    | 29.89       | 18.84            | 3500.0 | 1.49         |
| 1600.0 | 19.18 | 38.04     | -12.91            | -11.19             | 3.84      | 0.97    | 30.04       | 18.92            | 3600.0 | 1.75         |
| 1700.0 | 18.59 | 38.11     | -12.40            | -9.85              | 3.98      | 0.95    | 29.43       | 18.19            | 3700.0 | 1.78         |
| 1800.0 | 17.99 | 38.52     | -11.88            | -8.73              | 4.26      | 0.93    | 29.60       | 18.25            | 3800.0 | 1.77         |
| 1900.0 | 17.37 | 38.65     | -11.50            | -7.76              | 4.42      | 0.90    | 29.74       | 18.07            | 3900.0 | 1.84         |
| 2000.0 | 16.73 | 38.95     | -11.33            | -7.25              | 4.78      | 0.88    | 29.02       | 17.45            | 4000.0 | 1.78         |
| 2100.0 | 16.25 | 39.04     | -11.02            | -6.38              | 4.79      | 0.84    | 29.18       | 17.40            |        |              |
| 2200.0 | 15.69 | 39.02     | -10.74            | -5.66              | 4.78      | 0.81    | 29.04       | 17.34            |        |              |
| 2300.0 | 15.12 | 39.54     | -10.55            | -5.10              | 5.11      | 0.77    | 28.59       | 16.44            |        |              |
| 2400.0 | 14.53 | 39.69     | -10.27            | -4.60              | 5.20      | 0.73    | 27.88       | 15.96            |        |              |
| 2500.0 | 13.95 | 39.71     | -10.05            | -4.19              | 5.25      | 0.70    | 28.02       | 15.58            |        |              |
| 2600.0 | 13.38 | 40.18     | -9.92             | -3.83              | 5.58      | 0.66    | 27.18       | 15.10            |        |              |
| 2700.0 | 12.81 | 39.59     | -9.71             | -3.51              | 5.21      | 0.63    | 27.03       | 14.84            |        |              |
| 2800.0 | 12.24 | 39.75     | -9.48             | -3.25              | 5.34      | 0.60    | 26.66       | 14.26            |        |              |
| 2900.0 | 11.70 | 39.38     | -9.36             | -3.02              | 5.15      | 0.58    | 26.49       | 13.97            |        |              |
| 3000.0 | 11.17 | 39.44     | -9.21             | -2.83              | 5.23      | 0.55    | 25.59       | 13.54            |        |              |
| 3100.0 | 10.65 | 39.19     | -9.00             | -2.62              | 5.06      | 0.53    | 25.64       | 13.10            |        |              |
| 3200.0 | 10.14 | 38.88     | -8.93             | -2.46              | 4.91      | 0.51    | 24.56       | 12.46            |        |              |
| 3300.0 | 9.67  | 38.08     | -8.81             | -2.29              | 4.43      | 0.48    | 24.57       | 12.11            |        |              |
| 3400.0 | 9.20  | 38.03     | -8.68             | -2.14              | 4.38      | 0.46    | 24.03       | 11.83            |        |              |
| 3500.0 | 8.74  | 37.19     | -8.56             | -2.02              | 3.97      | 0.44    | 23.31       | 11.43            |        |              |
| 3600.0 | 8.26  | 36.71     | -8.50             | -1.92              | 3.79      | 0.43    | 23.01       | 10.94            |        |              |
| 3700.0 | 7.85  | 36.22     | -8.32             | -1.86              | 3.62      | 0.42    | 22.59       | 10.60            |        |              |
| 3800.0 | 7.41  | 35.38     | -8.17             | -1.75              | 3.23      | 0.40    | 22.07       | 10.37            |        |              |
| 3900.0 | 6.98  | 34.60     | -8.24             | -1.72              | 3.06      | 0.40    | 21.48       | 9.86             |        |              |
| 4000.0 | 6.60  | 33.52     | -8.12             | -1.68              | 2.72      | 0.40    | 21.64       | 9.63             |        |              |

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_S = +3.8V$ ,  $I_S = 50.72mA$ ,  $R1=267\ \Omega$  @ Temperature = +25°C

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 21.62 | 41.85     | -2.00             | -6.93              | 1.87      | 1.23    | 26.95       | 16.34            | 500.0  | 1.16         |
| 525.0  | 22.38 | 40.96     | -2.59             | -7.74              | 1.90      | 1.21    | 27.32       | 16.79            | 600.0  | 1.01         |
| 550.0  | 22.99 | 39.98     | -3.27             | -8.59              | 1.89      | 1.19    | 27.42       | 17.22            | 700.0  | 0.52         |
| 575.0  | 23.46 | 39.30     | -4.08             | -9.49              | 1.92      | 1.15    | 27.48       | 17.62            | 800.0  | 0.49         |
| 600.0  | 23.82 | 38.92     | -4.99             | -10.38             | 1.98      | 1.12    | 27.72       | 17.73            | 900.0  | 0.45         |
| 625.0  | 24.06 | 38.22     | -5.98             | -11.31             | 1.96      | 1.08    | 27.83       | 18.37            | 1000.0 | 0.36         |
| 650.0  | 24.21 | 38.13     | -7.08             | -12.21             | 2.05      | 1.05    | 28.15       | 18.54            | 1100.0 | 0.45         |
| 675.0  | 24.29 | 37.79     | -8.28             | -13.02             | 2.07      | 1.02    | 28.33       | 18.84            | 1200.0 | 0.50         |
| 700.0  | 24.32 | 37.47     | -9.56             | -13.83             | 2.09      | 1.00    | 28.75       | 19.06            | 1300.0 | 0.43         |
| 725.0  | 24.29 | 37.43     | -10.93            | -14.56             | 2.15      | 0.98    | 29.16       | 19.08            | 1400.0 | 0.57         |
| 750.0  | 24.22 | 37.55     | -12.41            | -15.21             | 2.25      | 0.97    | 29.32       | 19.40            | 1500.0 | 0.60         |
| 775.0  | 24.14 | 37.23     | -14.06            | -15.84             | 2.24      | 0.95    | 29.99       | 19.43            | 1600.0 | 0.61         |
| 800.0  | 24.02 | 37.31     | -15.81            | -16.42             | 2.32      | 0.95    | 30.16       | 19.36            | 1700.0 | 0.58         |
| 825.0  | 23.90 | 37.13     | -17.82            | -16.99             | 2.33      | 0.94    | 30.16       | 19.70            | 1800.0 | 0.77         |
| 850.0  | 23.76 | 37.19     | -20.00            | -17.52             | 2.40      | 0.94    | 30.29       | 19.73            | 1900.0 | 0.68         |
| 875.0  | 23.61 | 37.10     | -22.28            | -18.03             | 2.43      | 0.94    | 30.85       | 19.51            | 2000.0 | 0.80         |
| 900.0  | 23.45 | 37.13     | -24.55            | -18.51             | 2.48      | 0.94    | 30.42       | 20.04            | 2100.0 | 0.79         |
| 925.0  | 23.29 | 37.10     | -25.87            | -18.85             | 2.52      | 0.95    | 30.71       | 19.68            | 2200.0 | 0.80         |
| 950.0  | 23.13 | 37.16     | -25.95            | -19.19             | 2.58      | 0.95    | 30.60       | 19.61            | 2300.0 | 0.88         |
| 975.0  | 22.97 | 37.21     | -24.77            | -19.47             | 2.64      | 0.95    | 30.55       | 19.82            | 2400.0 | 0.93         |
| 1000.0 | 22.80 | 37.20     | -23.26            | -19.64             | 2.68      | 0.96    | 30.05       | 19.57            | 2500.0 | 1.08         |
| 1050.0 | 22.47 | 37.33     | -20.74            | -19.78             | 2.80      | 0.97    | 30.35       | 19.57            | 2600.0 | 1.07         |
| 1100.0 | 22.14 | 37.26     | -18.70            | -19.50             | 2.86      | 0.97    | 30.48       | 19.55            | 2700.0 | 1.25         |
| 1150.0 | 21.80 | 37.51     | -17.14            | -18.89             | 3.03      | 0.98    | 30.57       | 19.60            | 2800.0 | 1.19         |
| 1200.0 | 21.48 | 37.34     | -16.20            | -18.14             | 3.05      | 0.99    | 30.68       | 19.62            | 2900.0 | 1.28         |
| 1250.0 | 21.16 | 37.39     | -15.32            | -17.25             | 3.15      | 0.99    | 30.38       | 19.68            | 3000.0 | 1.32         |
| 1300.0 | 20.85 | 37.39     | -14.73            | -16.23             | 3.22      | 0.99    | 29.97       | 19.37            | 3100.0 | 1.38         |
| 1350.0 | 20.53 | 37.51     | -14.25            | -15.26             | 3.34      | 0.99    | 30.28       | 19.15            | 3200.0 | 1.55         |
| 1400.0 | 20.23 | 37.50     | -13.74            | -14.33             | 3.40      | 1.00    | 29.67       | 18.96            | 3300.0 | 1.56         |
| 1500.0 | 19.62 | 37.72     | -12.94            | -12.65             | 3.62      | 0.99    | 29.88       | 19.17            | 3400.0 | 1.61         |
| 1550.0 | 19.32 | 37.80     | -12.70            | -11.86             | 3.72      | 0.98    | 29.83       | 18.43            | 3500.0 | 1.58         |
| 1600.0 | 19.02 | 37.90     | -12.48            | -11.15             | 3.82      | 0.98    | 29.87       | 18.53            | 3600.0 | 1.78         |
| 1700.0 | 18.43 | 38.18     | -12.03            | -9.82              | 4.05      | 0.96    | 29.32       | 17.80            | 3700.0 | 1.73         |
| 1800.0 | 17.83 | 38.38     | -11.53            | -8.70              | 4.24      | 0.93    | 29.56       | 17.83            | 3800.0 | 1.79         |
| 1900.0 | 17.21 | 38.79     | -11.16            | -7.73              | 4.54      | 0.91    | 29.09       | 17.65            | 3900.0 | 1.91         |
| 2000.0 | 16.56 | 38.50     | -11.04            | -7.21              | 4.59      | 0.89    | 28.62       | 17.07            | 4000.0 | 1.77         |
| 2100.0 | 16.09 | 38.88     | -10.71            | -6.35              | 4.75      | 0.85    | 28.62       | 17.01            |        |              |
| 2200.0 | 15.53 | 38.83     | -10.48            | -5.64              | 4.72      | 0.81    | 28.80       | 16.92            |        |              |
| 2300.0 | 14.95 | 39.28     | -10.28            | -5.07              | 5.00      | 0.77    | 27.75       | 15.92            |        |              |
| 2400.0 | 14.37 | 39.60     | -10.04            | -4.56              | 5.20      | 0.73    | 27.36       | 15.46            |        |              |
| 2500.0 | 13.78 | 39.85     | -9.85             | -4.17              | 5.39      | 0.70    | 27.16       | 15.15            |        |              |
| 2600.0 | 13.21 | 40.21     | -9.71             | -3.81              | 5.65      | 0.66    | 26.22       | 14.50            |        |              |
| 2700.0 | 12.64 | 39.97     | -9.51             | -3.49              | 5.50      | 0.63    | 26.05       | 14.30            |        |              |
| 2800.0 | 12.07 | 39.55     | -9.27             | -3.23              | 5.26      | 0.60    | 25.77       | 13.89            |        |              |
| 2900.0 | 11.54 | 39.52     | -9.18             | -3.01              | 5.29      | 0.58    | 25.41       | 13.45            |        |              |
| 3000.0 | 11.00 | 39.44     | -9.04             | -2.81              | 5.27      | 0.55    | 24.53       | 12.99            |        |              |
| 3100.0 | 10.48 | 39.27     | -8.84             | -2.61              | 5.16      | 0.53    | 24.69       | 12.52            |        |              |
| 3200.0 | 9.97  | 39.01     | -8.76             | -2.44              | 5.03      | 0.51    | 23.56       | 11.90            |        |              |
| 3300.0 | 9.50  | 38.38     | -8.65             | -2.27              | 4.63      | 0.48    | 23.54       | 11.57            |        |              |
| 3400.0 | 9.03  | 37.87     | -8.52             | -2.13              | 4.33      | 0.46    | 23.01       | 11.30            |        |              |
| 3500.0 | 8.57  | 37.16     | -8.42             | -2.01              | 3.99      | 0.44    | 22.24       | 10.79            |        |              |
| 3600.0 | 8.08  | 36.84     | -8.37             | -1.90              | 3.87      | 0.43    | 22.01       | 10.32            |        |              |
| 3700.0 | 7.68  | 36.31     | -8.18             | -1.85              | 3.68      | 0.42    | 21.58       | 10.04            |        |              |
| 3800.0 | 7.24  | 35.22     | -8.04             | -1.74              | 3.20      | 0.41    | 21.17       | 9.81             |        |              |
| 3900.0 | 6.81  | 35.13     | -8.08             | -1.73              | 3.33      | 0.40    | 20.56       | 9.30             |        |              |
| 4000.0 | 6.44  | 33.75     | -7.98             | -1.68              | 2.84      | 0.40    | 20.73       | 9.03             |        |              |

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_S = +4.2V$ ,  $I_S = 57.17mA$ ,  $R_1 = 267 \Omega$  @ Temperature = +25°C

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 21.93 | 42.37     | -2.03             | -6.92              | 1.92      | 1.23    | 28.05       | 17.28            | 500.0  | 1.15         |
| 525.0  | 22.67 | 41.37     | -2.61             | -7.72              | 1.93      | 1.21    | 28.24       | 17.78            | 600.0  | 0.92         |
| 550.0  | 23.25 | 40.64     | -3.29             | -8.54              | 1.96      | 1.19    | 28.26       | 18.21            | 700.0  | 0.50         |
| 575.0  | 23.71 | 40.04     | -4.08             | -9.40              | 2.00      | 1.16    | 28.32       | 18.58            | 800.0  | 0.48         |
| 600.0  | 24.06 | 39.41     | -4.96             | -10.26             | 2.02      | 1.12    | 28.52       | 18.72            | 900.0  | 0.41         |
| 625.0  | 24.29 | 38.99     | -5.93             | -11.14             | 2.05      | 1.09    | 28.51       | 19.31            | 1000.0 | 0.34         |
| 650.0  | 24.43 | 38.62     | -6.98             | -11.99             | 2.09      | 1.06    | 28.91       | 19.56            | 1100.0 | 0.42         |
| 675.0  | 24.51 | 38.47     | -8.13             | -12.73             | 2.15      | 1.03    | 29.18       | 19.81            | 1200.0 | 0.47         |
| 700.0  | 24.53 | 38.33     | -9.34             | -13.46             | 2.20      | 1.01    | 29.78       | 20.02            | 1300.0 | 0.41         |
| 725.0  | 24.50 | 38.02     | -10.63            | -14.14             | 2.22      | 0.99    | 30.12       | 20.02            | 1400.0 | 0.55         |
| 750.0  | 24.43 | 37.90     | -12.02            | -14.74             | 2.26      | 0.97    | 29.91       | 20.36            | 1500.0 | 0.61         |
| 775.0  | 24.35 | 37.94     | -13.53            | -15.30             | 2.34      | 0.96    | 30.48       | 20.36            | 1600.0 | 0.59         |
| 800.0  | 24.25 | 37.78     | -15.16            | -15.84             | 2.36      | 0.95    | 30.54       | 20.28            | 1700.0 | 0.59         |
| 825.0  | 24.12 | 37.92     | -16.99            | -16.39             | 2.46      | 0.95    | 30.63       | 20.64            | 1800.0 | 0.74         |
| 850.0  | 23.98 | 37.81     | -18.99            | -16.88             | 2.49      | 0.95    | 30.80       | 20.63            | 1900.0 | 0.67         |
| 875.0  | 23.84 | 37.80     | -21.19            | -17.36             | 2.54      | 0.95    | 30.97       | 20.40            | 2000.0 | 0.80         |
| 900.0  | 23.69 | 37.86     | -23.69            | -17.79             | 2.61      | 0.95    | 30.83       | 20.93            | 2100.0 | 0.77         |
| 925.0  | 23.53 | 37.94     | -26.21            | -18.10             | 2.68      | 0.95    | 31.22       | 20.59            | 2200.0 | 0.77         |
| 950.0  | 23.38 | 37.79     | -28.14            | -18.48             | 2.69      | 0.95    | 31.36       | 20.49            | 2300.0 | 0.91         |
| 975.0  | 23.22 | 37.99     | -28.05            | -18.75             | 2.80      | 0.95    | 30.97       | 20.70            | 2400.0 | 0.93         |
| 1000.0 | 23.05 | 37.85     | -26.63            | -18.98             | 2.80      | 0.96    | 30.92       | 20.42            | 2500.0 | 1.05         |
| 1050.0 | 22.73 | 38.18     | -23.46            | -19.21             | 3.00      | 0.96    | 30.90       | 20.42            | 2600.0 | 1.06         |
| 1100.0 | 22.40 | 38.02     | -20.79            | -19.04             | 3.04      | 0.97    | 31.15       | 20.38            | 2700.0 | 1.24         |
| 1150.0 | 22.07 | 38.02     | -18.82            | -18.61             | 3.13      | 0.98    | 30.78       | 20.40            | 2800.0 | 1.22         |
| 1200.0 | 21.76 | 37.96     | -17.71            | -18.00             | 3.19      | 0.98    | 30.89       | 20.45            | 2900.0 | 1.29         |
| 1250.0 | 21.44 | 38.05     | -16.67            | -17.20             | 3.31      | 0.98    | 30.69       | 20.47            | 3000.0 | 1.18         |
| 1300.0 | 21.13 | 38.12     | -15.97            | -16.25             | 3.42      | 0.99    | 30.68       | 20.15            | 3100.0 | 1.38         |
| 1350.0 | 20.82 | 38.13     | -15.41            | -15.34             | 3.50      | 0.99    | 30.40       | 19.95            | 3200.0 | 1.48         |
| 1400.0 | 20.52 | 38.27     | -14.81            | -14.44             | 3.63      | 0.99    | 30.17       | 19.74            | 3300.0 | 1.56         |
| 1500.0 | 19.92 | 38.29     | -13.87            | -12.78             | 3.78      | 0.98    | 30.25       | 19.92            | 3400.0 | 1.59         |
| 1550.0 | 19.62 | 38.45     | -13.59            | -12.00             | 3.92      | 0.98    | 30.03       | 19.20            | 3500.0 | 1.52         |
| 1600.0 | 19.33 | 38.38     | -13.34            | -11.28             | 3.96      | 0.97    | 30.08       | 19.30            | 3600.0 | 1.72         |
| 1700.0 | 18.74 | 38.51     | -12.81            | -9.94              | 4.13      | 0.95    | 29.68       | 18.55            | 3700.0 | 1.80         |
| 1800.0 | 18.15 | 38.80     | -12.25            | -8.81              | 4.36      | 0.93    | 29.75       | 18.62            | 3800.0 | 1.89         |
| 1900.0 | 17.53 | 39.09     | -11.81            | -7.83              | 4.61      | 0.90    | 29.80       | 18.40            | 3900.0 | 1.86         |
| 2000.0 | 16.88 | 38.95     | -11.68            | -7.31              | 4.74      | 0.88    | 29.36       | 17.83            | 4000.0 | 1.83         |
| 2100.0 | 16.42 | 39.53     | -11.29            | -6.45              | 5.03      | 0.84    | 29.38       | 17.77            |        |              |
| 2200.0 | 15.86 | 39.45     | -11.00            | -5.72              | 4.99      | 0.80    | 29.30       | 17.73            |        |              |
| 2300.0 | 15.29 | 40.02     | -10.78            | -5.15              | 5.36      | 0.77    | 28.73       | 16.76            |        |              |
| 2400.0 | 14.70 | 39.57     | -10.51            | -4.64              | 5.10      | 0.73    | 28.42       | 16.33            |        |              |
| 2500.0 | 14.12 | 39.78     | -10.26            | -4.22              | 5.25      | 0.70    | 28.40       | 16.06            |        |              |
| 2600.0 | 13.55 | 40.16     | -10.13            | -3.87              | 5.53      | 0.66    | 27.92       | 15.48            |        |              |
| 2700.0 | 12.98 | 40.06     | -9.90             | -3.55              | 5.47      | 0.63    | 27.51       | 15.14            |        |              |
| 2800.0 | 12.41 | 39.86     | -9.66             | -3.28              | 5.36      | 0.60    | 27.38       | 14.80            |        |              |
| 2900.0 | 11.88 | 39.60     | -9.54             | -3.05              | 5.24      | 0.58    | 27.24       | 14.40            |        |              |
| 3000.0 | 11.34 | 39.38     | -9.38             | -2.85              | 5.15      | 0.55    | 26.31       | 13.96            |        |              |
| 3100.0 | 10.82 | 39.18     | -9.16             | -2.65              | 5.02      | 0.53    | 26.46       | 13.56            |        |              |
| 3200.0 | 10.31 | 38.93     | -9.09             | -2.48              | 4.91      | 0.51    | 25.45       | 12.89            |        |              |
| 3300.0 | 9.84  | 38.04     | -8.96             | -2.31              | 4.39      | 0.48    | 25.44       | 12.56            |        |              |
| 3400.0 | 9.37  | 37.80     | -8.81             | -2.16              | 4.23      | 0.46    | 24.83       | 12.37            |        |              |
| 3500.0 | 8.91  | 37.05     | -8.72             | -2.04              | 3.87      | 0.45    | 24.28       | 11.91            |        |              |
| 3600.0 | 8.44  | 36.93     | -8.63             | -1.93              | 3.85      | 0.43    | 24.00       | 11.44            |        |              |
| 3700.0 | 8.03  | 36.13     | -8.46             | -1.87              | 3.54      | 0.42    | 23.47       | 11.15            |        |              |
| 3800.0 | 7.59  | 35.16     | -8.31             | -1.76              | 3.12      | 0.41    | 22.90       | 10.89            |        |              |
| 3900.0 | 7.16  | 34.53     | -8.38             | -1.74              | 3.02      | 0.40    | 22.34       | 10.41            |        |              |
| 4000.0 | 6.78  | 33.61     | -8.27             | -1.69              | 2.74      | 0.40    | 22.39       | 10.16            |        |              |

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_S = +4V$ ,  $I_S = 53.52mA$ ,  $R1=267\ \Omega$  @ Temperature = -40°C

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 22.14 | 42.36     | -1.83             | -6.64              | 1.76      | 1.22    | 27.38       | 16.47            | 500.0  | 0.73         |
| 525.0  | 22.88 | 41.83     | -2.37             | -7.39              | 1.86      | 1.22    | 27.85       | 16.94            | 600.0  | 0.71         |
| 550.0  | 23.47 | 41.10     | -2.99             | -8.15              | 1.89      | 1.20    | 27.90       | 17.37            | 700.0  | 0.26         |
| 575.0  | 23.94 | 40.30     | -3.71             | -8.97              | 1.91      | 1.17    | 27.84       | 17.72            | 800.0  | 0.23         |
| 600.0  | 24.30 | 39.63     | -4.52             | -9.78              | 1.92      | 1.13    | 28.14       | 17.85            | 900.0  | 0.20         |
| 625.0  | 24.54 | 39.31     | -5.40             | -10.62             | 1.98      | 1.10    | 28.67       | 18.46            | 1000.0 | 0.10         |
| 650.0  | 24.70 | 39.00     | -6.35             | -11.46             | 2.03      | 1.07    | 28.62       | 18.69            | 1100.0 | 0.18         |
| 675.0  | 24.79 | 38.72     | -7.39             | -12.24             | 2.08      | 1.05    | 29.06       | 19.03            | 1200.0 | 0.21         |
| 700.0  | 24.84 | 38.61     | -8.48             | -12.95             | 2.14      | 1.02    | 29.69       | 19.33            | 1300.0 | 0.17         |
| 725.0  | 24.82 | 38.15     | -9.63             | -13.66             | 2.12      | 1.00    | 29.85       | 19.40            | 1400.0 | 0.26         |
| 750.0  | 24.77 | 38.06     | -10.87            | -14.28             | 2.18      | 0.98    | 30.01       | 19.72            | 1500.0 | 0.31         |
| 775.0  | 24.70 | 37.97     | -12.16            | -14.81             | 2.22      | 0.97    | 30.44       | 19.78            | 1600.0 | 0.30         |
| 800.0  | 24.60 | 37.99     | -13.49            | -15.32             | 2.29      | 0.96    | 30.91       | 19.73            | 1700.0 | 0.26         |
| 825.0  | 24.49 | 37.92     | -14.96            | -15.83             | 2.33      | 0.95    | 30.91       | 20.08            | 1800.0 | 0.37         |
| 850.0  | 24.36 | 38.08     | -16.49            | -16.30             | 2.43      | 0.95    | 30.64       | 20.09            | 1900.0 | 0.31         |
| 875.0  | 24.22 | 37.99     | -18.06            | -16.75             | 2.47      | 0.95    | 31.03       | 19.89            | 2000.0 | 0.40         |
| 900.0  | 24.08 | 37.85     | -19.86            | -17.19             | 2.48      | 0.95    | 30.95       | 20.43            | 2100.0 | 0.40         |
| 925.0  | 23.93 | 37.91     | -21.76            | -17.55             | 2.55      | 0.95    | 31.10       | 20.07            | 2200.0 | 0.37         |
| 950.0  | 23.79 | 37.78     | -23.93            | -17.90             | 2.56      | 0.95    | 31.27       | 20.00            | 2300.0 | 0.47         |
| 975.0  | 23.63 | 37.83     | -25.88            | -18.27             | 2.62      | 0.95    | 31.17       | 20.19            | 2400.0 | 0.49         |
| 1000.0 | 23.48 | 37.77     | -27.10            | -18.50             | 2.65      | 0.95    | 30.40       | 19.96            | 2500.0 | 0.60         |
| 1050.0 | 23.16 | 38.02     | -26.53            | -18.89             | 2.82      | 0.96    | 30.80       | 19.97            | 2600.0 | 0.59         |
| 1100.0 | 22.84 | 38.14     | -23.74            | -18.75             | 2.95      | 0.96    | 30.79       | 19.93            | 2700.0 | 0.73         |
| 1150.0 | 22.53 | 37.99     | -21.32            | -18.34             | 2.98      | 0.97    | 30.61       | 19.97            | 2800.0 | 0.66         |
| 1200.0 | 22.22 | 37.81     | -20.00            | -17.88             | 3.01      | 0.97    | 30.64       | 20.00            | 2900.0 | 0.71         |
| 1250.0 | 21.91 | 37.90     | -18.66            | -17.19             | 3.12      | 0.97    | 30.49       | 20.05            | 3000.0 | 0.69         |
| 1300.0 | 21.61 | 37.90     | -17.77            | -16.32             | 3.19      | 0.97    | 30.26       | 19.74            | 3100.0 | 0.83         |
| 1350.0 | 21.31 | 37.88     | -17.04            | -15.35             | 3.26      | 0.97    | 30.37       | 19.52            | 3200.0 | 0.87         |
| 1400.0 | 21.01 | 37.99     | -16.29            | -14.43             | 3.37      | 0.97    | 30.27       | 19.35            | 3300.0 | 0.87         |
| 1500.0 | 20.43 | 38.03     | -15.24            | -12.75             | 3.52      | 0.97    | 29.96       | 19.55            | 3400.0 | 0.94         |
| 1550.0 | 20.13 | 38.32     | -14.85            | -12.02             | 3.70      | 0.96    | 29.76       | 18.82            | 3500.0 | 0.88         |
| 1600.0 | 19.84 | 38.10     | -14.50            | -11.32             | 3.67      | 0.96    | 29.80       | 18.90            | 3600.0 | 0.97         |
| 1700.0 | 19.27 | 38.33     | -13.80            | -9.94              | 3.86      | 0.94    | 29.37       | 18.15            | 3700.0 | 0.98         |
| 1800.0 | 18.68 | 38.66     | -13.22            | -8.76              | 4.09      | 0.91    | 29.63       | 18.21            | 3800.0 | 0.99         |
| 1900.0 | 18.06 | 39.14     | -12.66            | -7.75              | 4.41      | 0.89    | 29.20       | 17.92            | 3900.0 | 1.16         |
| 2000.0 | 17.39 | 38.79     | -12.36            | -7.26              | 4.43      | 0.87    | 28.83       | 17.37            | 4000.0 | 0.96         |
| 2100.0 | 16.96 | 39.42     | -11.96            | -6.37              | 4.71      | 0.83    | 28.97       | 17.28            |        |              |
| 2200.0 | 16.41 | 38.98     | -11.61            | -5.60              | 4.44      | 0.79    | 28.71       | 17.20            |        |              |
| 2300.0 | 15.84 | 39.66     | -11.26            | -5.02              | 4.80      | 0.75    | 28.17       | 16.26            |        |              |
| 2400.0 | 15.26 | 39.78     | -10.91            | -4.50              | 4.86      | 0.71    | 27.73       | 15.89            |        |              |
| 2500.0 | 14.67 | 40.05     | -10.74            | -4.06              | 5.01      | 0.67    | 27.55       | 15.53            |        |              |
| 2600.0 | 14.10 | 40.20     | -10.48            | -3.68              | 5.09      | 0.64    | 26.80       | 15.06            |        |              |
| 2700.0 | 13.54 | 40.12     | -10.12            | -3.37              | 5.01      | 0.61    | 26.55       | 14.83            |        |              |
| 2800.0 | 12.97 | 40.45     | -9.92             | -3.11              | 5.23      | 0.58    | 26.21       | 14.42            |        |              |
| 2900.0 | 12.43 | 39.83     | -9.77             | -2.88              | 4.87      | 0.55    | 25.97       | 14.08            |        |              |
| 3000.0 | 11.89 | 39.81     | -9.49             | -2.72              | 4.91      | 0.54    | 25.12       | 13.69            |        |              |
| 3100.0 | 11.38 | 39.46     | -9.32             | -2.52              | 4.69      | 0.51    | 25.19       | 13.15            |        |              |
| 3200.0 | 10.87 | 39.58     | -9.25             | -2.35              | 4.77      | 0.49    | 24.23       | 12.66            |        |              |
| 3300.0 | 10.41 | 38.87     | -9.00             | -2.18              | 4.31      | 0.46    | 24.13       | 12.36            |        |              |
| 3400.0 | 9.99  | 38.43     | -8.90             | -2.04              | 4.05      | 0.44    | 23.76       | 12.12            |        |              |
| 3500.0 | 9.54  | 37.71     | -8.84             | -1.86              | 3.61      | 0.41    | 23.03       | 11.66            |        |              |
| 3600.0 | 9.07  | 37.31     | -8.59             | -1.75              | 3.42      | 0.40    | 22.79       | 11.24            |        |              |
| 3700.0 | 8.69  | 36.58     | -8.48             | -1.70              | 3.17      | 0.39    | 22.32       | 10.88            |        |              |
| 3800.0 | 8.27  | 35.72     | -8.47             | -1.58              | 2.79      | 0.37    | 21.97       | 10.74            |        |              |
| 3900.0 | 7.86  | 35.43     | -8.39             | -1.56              | 2.79      | 0.37    | 21.31       | 10.29            |        |              |
| 4000.0 | 7.52  | 34.20     | -8.24             | -1.51              | 2.40      | 0.36    | 21.57       | 10.01            |        |              |

## Typical Performance Data

## Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_S = +3.8V$ ,  $I_S = 50.44mA$ ,  $R1=267\ \Omega$  @ Temperature =  $-40^\circ C$ 

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 21.94 | 41.79     | -1.81             | -6.65              | 1.70      | 1.22    | 26.76       | 15.84            | 500.0  | 0.77         |
| 525.0  | 22.69 | 41.40     | -2.34             | -7.41              | 1.81      | 1.22    | 27.31       | 16.31            | 600.0  | 0.67         |
| 550.0  | 23.30 | 40.44     | -2.97             | -8.18              | 1.82      | 1.19    | 27.26       | 16.68            | 700.0  | 0.28         |
| 575.0  | 23.77 | 40.14     | -3.69             | -9.01              | 1.91      | 1.17    | 27.29       | 17.06            | 800.0  | 0.26         |
| 600.0  | 24.14 | 39.30     | -4.51             | -9.85              | 1.90      | 1.13    | 27.73       | 17.12            | 900.0  | 0.18         |
| 625.0  | 24.39 | 38.84     | -5.39             | -10.71             | 1.92      | 1.10    | 27.81       | 17.80            | 1000.0 | 0.17         |
| 650.0  | 24.56 | 38.70     | -6.37             | -11.59             | 2.01      | 1.07    | 28.29       | 18.00            | 1100.0 | 0.22         |
| 675.0  | 24.66 | 38.26     | -7.44             | -12.39             | 2.02      | 1.04    | 28.42       | 18.37            | 1200.0 | 0.27         |
| 700.0  | 24.71 | 38.15     | -8.55             | -13.16             | 2.08      | 1.02    | 29.06       | 18.61            | 1300.0 | 0.22         |
| 725.0  | 24.69 | 38.01     | -9.75             | -13.88             | 2.13      | 1.00    | 29.48       | 18.74            | 1400.0 | 0.31         |
| 750.0  | 24.64 | 37.73     | -11.02            | -14.53             | 2.15      | 0.98    | 29.31       | 19.07            | 1500.0 | 0.32         |
| 775.0  | 24.57 | 37.63     | -12.37            | -15.08             | 2.19      | 0.97    | 29.94       | 19.16            | 1600.0 | 0.33         |
| 800.0  | 24.46 | 37.64     | -13.76            | -15.65             | 2.25      | 0.96    | 30.24       | 19.13            | 1700.0 | 0.29         |
| 825.0  | 24.36 | 37.69     | -15.29            | -16.19             | 2.32      | 0.95    | 30.32       | 19.50            | 1800.0 | 0.41         |
| 850.0  | 24.22 | 37.56     | -16.87            | -16.64             | 2.35      | 0.95    | 30.33       | 19.53            | 1900.0 | 0.33         |
| 875.0  | 24.08 | 37.60     | -18.53            | -17.13             | 2.41      | 0.94    | 30.54       | 19.32            | 2000.0 | 0.43         |
| 900.0  | 23.94 | 37.47     | -20.34            | -17.57             | 2.43      | 0.94    | 30.28       | 19.84            | 2100.0 | 0.42         |
| 925.0  | 23.79 | 37.58     | -22.26            | -17.89             | 2.50      | 0.94    | 30.73       | 19.52            | 2200.0 | 0.40         |
| 950.0  | 23.64 | 37.52     | -24.30            | -18.28             | 2.53      | 0.94    | 30.68       | 19.46            | 2300.0 | 0.52         |
| 975.0  | 23.49 | 37.50     | -25.65            | -18.65             | 2.58      | 0.95    | 30.44       | 19.63            | 2400.0 | 0.55         |
| 1000.0 | 23.33 | 37.59     | -26.05            | -18.90             | 2.64      | 0.95    | 29.85       | 19.44            | 2500.0 | 0.63         |
| 1050.0 | 23.01 | 37.52     | -24.50            | -19.19             | 2.71      | 0.96    | 30.35       | 19.43            | 2600.0 | 0.64         |
| 1100.0 | 22.69 | 37.48     | -22.00            | -19.02             | 2.78      | 0.96    | 30.31       | 19.44            | 2700.0 | 0.77         |
| 1150.0 | 22.37 | 37.65     | -19.92            | -18.50             | 2.91      | 0.97    | 30.09       | 19.47            | 2800.0 | 0.72         |
| 1200.0 | 22.06 | 37.61     | -18.79            | -17.94             | 2.98      | 0.97    | 30.22       | 19.49            | 2900.0 | 0.72         |
| 1250.0 | 21.75 | 37.61     | -17.61            | -17.21             | 3.06      | 0.98    | 30.18       | 19.55            | 3000.0 | 0.71         |
| 1300.0 | 21.44 | 37.58     | -16.84            | -16.27             | 3.13      | 0.98    | 29.87       | 19.27            | 3100.0 | 0.74         |
| 1350.0 | 21.14 | 37.68     | -16.19            | -15.28             | 3.23      | 0.98    | 30.07       | 19.03            | 3200.0 | 0.91         |
| 1400.0 | 20.84 | 37.76     | -15.52            | -14.35             | 3.33      | 0.98    | 29.41       | 18.84            | 3300.0 | 0.91         |
| 1500.0 | 20.25 | 37.79     | -14.55            | -12.68             | 3.46      | 0.97    | 29.82       | 19.09            | 3400.0 | 1.02         |
| 1550.0 | 19.95 | 37.88     | -14.20            | -11.93             | 3.56      | 0.97    | 29.38       | 18.38            | 3500.0 | 0.91         |
| 1600.0 | 19.66 | 38.10     | -13.87            | -11.23             | 3.71      | 0.96    | 29.46       | 18.45            | 3600.0 | 1.11         |
| 1700.0 | 19.08 | 38.33     | -13.27            | -9.85              | 3.91      | 0.94    | 29.12       | 17.69            | 3700.0 | 1.07         |
| 1800.0 | 18.49 | 38.41     | -12.73            | -8.68              | 4.02      | 0.92    | 29.34       | 17.73            | 3800.0 | 1.03         |
| 1900.0 | 17.87 | 38.52     | -12.22            | -7.69              | 4.15      | 0.89    | 28.88       | 17.52            | 3900.0 | 1.18         |
| 2000.0 | 17.20 | 38.41     | -11.91            | -7.19              | 4.29      | 0.87    | 28.44       | 16.89            | 4000.0 | 0.97         |
| 2100.0 | 16.76 | 38.88     | -11.57            | -6.32              | 4.47      | 0.83    | 28.41       | 16.77            |        |              |
| 2200.0 | 16.21 | 38.77     | -11.25            | -5.54              | 4.38      | 0.79    | 28.45       | 16.62            |        |              |
| 2300.0 | 15.63 | 39.50     | -10.93            | -4.97              | 4.77      | 0.75    | 27.59       | 15.64            |        |              |
| 2400.0 | 15.05 | 39.60     | -10.62            | -4.45              | 4.80      | 0.71    | 27.09       | 15.33            |        |              |
| 2500.0 | 14.47 | 39.73     | -10.46            | -4.02              | 4.88      | 0.67    | 26.96       | 14.99            |        |              |
| 2600.0 | 13.90 | 39.95     | -10.23            | -3.65              | 4.99      | 0.64    | 26.05       | 14.49            |        |              |
| 2700.0 | 13.33 | 39.93     | -9.88             | -3.34              | 4.95      | 0.61    | 25.90       | 14.15            |        |              |
| 2800.0 | 12.76 | 39.81     | -9.69             | -3.07              | 4.89      | 0.58    | 25.59       | 13.86            |        |              |
| 2900.0 | 12.22 | 40.00     | -9.56             | -2.85              | 5.03      | 0.55    | 25.27       | 13.47            |        |              |
| 3000.0 | 11.68 | 40.03     | -9.29             | -2.68              | 5.09      | 0.53    | 24.32       | 13.07            |        |              |
| 3100.0 | 11.17 | 39.88     | -9.13             | -2.50              | 4.99      | 0.51    | 24.54       | 12.59            |        |              |
| 3200.0 | 10.66 | 39.55     | -9.06             | -2.33              | 4.80      | 0.48    | 23.37       | 12.01            |        |              |
| 3300.0 | 10.21 | 39.02     | -8.83             | -2.15              | 4.42      | 0.46    | 23.39       | 11.71            |        |              |
| 3400.0 | 9.78  | 38.58     | -8.73             | -1.99              | 4.12      | 0.44    | 22.95       | 11.46            |        |              |
| 3500.0 | 9.33  | 37.61     | -8.67             | -1.84              | 3.60      | 0.41    | 22.17       | 10.99            |        |              |
| 3600.0 | 8.86  | 37.82     | -8.42             | -1.74              | 3.67      | 0.40    | 21.89       | 10.55            |        |              |
| 3700.0 | 8.47  | 36.90     | -8.32             | -1.68              | 3.32      | 0.39    | 21.46       | 10.20            |        |              |
| 3800.0 | 8.06  | 35.70     | -8.30             | -1.56              | 2.82      | 0.37    | 21.13       | 10.02            |        |              |
| 3900.0 | 7.64  | 35.76     | -8.22             | -1.55              | 2.95      | 0.37    | 20.44       | 9.62             |        |              |
| 4000.0 | 7.30  | 34.39     | -8.07             | -1.50              | 2.49      | 0.36    | 20.81       | 9.24             |        |              |

## Typical Performance Data

## Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_S = +4.2V$ ,  $I_S = 53.41mA$ ,  $R1=267\ \Omega$  @ Temperature =  $-40^\circ C$ 

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 22.17 | 42.83     | -1.83             | -6.61              | 1.81      | 1.23    | 27.53       | 16.93            | 500.0  | 0.76         |
| 525.0  | 22.91 | 42.14     | -2.36             | -7.36              | 1.90      | 1.22    | 28.13       | 17.36            | 600.0  | 0.73         |
| 550.0  | 23.50 | 41.28     | -2.98             | -8.10              | 1.91      | 1.20    | 27.94       | 17.74            | 700.0  | 0.29         |
| 575.0  | 23.96 | 40.40     | -3.69             | -8.89              | 1.92      | 1.16    | 27.95       | 18.10            | 800.0  | 0.26         |
| 600.0  | 24.32 | 40.20     | -4.49             | -9.66              | 2.01      | 1.14    | 28.24       | 18.28            | 900.0  | 0.21         |
| 625.0  | 24.56 | 39.66     | -5.35             | -10.51             | 2.03      | 1.11    | 28.46       | 18.89            | 1000.0 | 0.15         |
| 650.0  | 24.72 | 39.20     | -6.29             | -11.30             | 2.05      | 1.08    | 28.90       | 19.18            | 1100.0 | 0.23         |
| 675.0  | 24.82 | 39.09     | -7.31             | -12.05             | 2.13      | 1.05    | 29.22       | 19.49            | 1200.0 | 0.28         |
| 700.0  | 24.86 | 38.42     | -8.39             | -12.74             | 2.08      | 1.02    | 29.81       | 19.80            | 1300.0 | 0.18         |
| 725.0  | 24.85 | 38.55     | -9.52             | -13.40             | 2.19      | 1.00    | 30.33       | 19.88            | 1400.0 | 0.32         |
| 750.0  | 24.80 | 38.52     | -10.73            | -14.02             | 2.27      | 0.99    | 30.16       | 20.20            | 1500.0 | 0.34         |
| 775.0  | 24.73 | 38.29     | -12.00            | -14.52             | 2.28      | 0.97    | 30.75       | 20.27            | 1600.0 | 0.34         |
| 800.0  | 24.63 | 38.28     | -13.30            | -15.02             | 2.34      | 0.96    | 31.20       | 20.22            | 1700.0 | 0.28         |
| 825.0  | 24.53 | 38.24     | -14.73            | -15.50             | 2.40      | 0.96    | 31.00       | 20.56            | 1800.0 | 0.43         |
| 850.0  | 24.39 | 38.25     | -16.21            | -15.94             | 2.46      | 0.95    | 30.98       | 20.58            | 1900.0 | 0.36         |
| 875.0  | 24.26 | 38.22     | -17.75            | -16.39             | 2.51      | 0.95    | 31.28       | 20.39            | 2000.0 | 0.45         |
| 900.0  | 24.11 | 38.20     | -19.50            | -16.77             | 2.56      | 0.95    | 31.04       | 20.92            | 2100.0 | 0.41         |
| 925.0  | 23.97 | 38.32     | -21.33            | -17.13             | 2.64      | 0.95    | 31.39       | 20.55            | 2200.0 | 0.42         |
| 950.0  | 23.82 | 38.11     | -23.43            | -17.49             | 2.64      | 0.95    | 31.29       | 20.49            | 2300.0 | 0.49         |
| 975.0  | 23.67 | 38.37     | -25.32            | -17.83             | 2.76      | 0.95    | 31.46       | 20.70            | 2400.0 | 0.52         |
| 1000.0 | 23.52 | 38.31     | -26.76            | -18.11             | 2.79      | 0.95    | 30.77       | 20.47            | 2500.0 | 0.62         |
| 1050.0 | 23.20 | 38.26     | -26.85            | -18.46             | 2.87      | 0.96    | 31.06       | 20.43            | 2600.0 | 0.59         |
| 1100.0 | 22.89 | 38.38     | -24.25            | -18.39             | 3.01      | 0.96    | 30.82       | 20.43            | 2700.0 | 0.75         |
| 1150.0 | 22.57 | 38.38     | -21.76            | -18.06             | 3.09      | 0.97    | 30.91       | 20.46            | 2800.0 | 0.67         |
| 1200.0 | 22.27 | 38.25     | -20.35            | -17.65             | 3.14      | 0.97    | 30.99       | 20.48            | 2900.0 | 0.77         |
| 1250.0 | 21.96 | 38.23     | -18.98            | -17.06             | 3.22      | 0.97    | 30.89       | 20.53            | 3000.0 | 0.71         |
| 1300.0 | 21.66 | 38.34     | -18.06            | -16.22             | 3.34      | 0.97    | 30.44       | 20.23            | 3100.0 | 0.80         |
| 1350.0 | 21.35 | 38.45     | -17.28            | -15.30             | 3.46      | 0.97    | 30.49       | 19.99            | 3200.0 | 0.89         |
| 1400.0 | 21.06 | 38.68     | -16.54            | -14.40             | 3.63      | 0.97    | 30.06       | 19.80            | 3300.0 | 0.91         |
| 1500.0 | 20.48 | 38.41     | -15.46            | -12.78             | 3.66      | 0.97    | 30.24       | 20.01            | 3400.0 | 0.97         |
| 1550.0 | 20.18 | 38.35     | -15.04            | -12.04             | 3.70      | 0.96    | 29.71       | 19.27            | 3500.0 | 0.90         |
| 1600.0 | 19.89 | 38.61     | -14.66            | -11.33             | 3.87      | 0.96    | 29.82       | 19.35            | 3600.0 | 1.09         |
| 1700.0 | 19.32 | 38.76     | -13.96            | -9.96              | 4.04      | 0.94    | 29.40       | 18.57            | 3700.0 | 1.10         |
| 1800.0 | 18.74 | 39.00     | -13.37            | -8.79              | 4.24      | 0.91    | 29.77       | 18.62            | 3800.0 | 1.13         |
| 1900.0 | 18.12 | 39.41     | -12.78            | -7.79              | 4.54      | 0.89    | 29.27       | 18.39            | 3900.0 | 1.15         |
| 2000.0 | 17.44 | 39.25     | -12.48            | -7.31              | 4.67      | 0.87    | 28.69       | 17.77            | 4000.0 | 0.98         |
| 2100.0 | 17.01 | 40.02     | -12.08            | -6.41              | 5.04      | 0.83    | 28.78       | 17.70            |        |              |
| 2200.0 | 16.47 | 39.91     | -11.71            | -5.63              | 4.94      | 0.79    | 28.81       | 17.54            |        |              |
| 2300.0 | 15.90 | 40.18     | -11.35            | -5.04              | 5.09      | 0.75    | 28.08       | 16.73            |        |              |
| 2400.0 | 15.32 | 39.84     | -11.01            | -4.53              | 4.88      | 0.71    | 27.67       | 16.33            |        |              |
| 2500.0 | 14.74 | 39.86     | -10.84            | -4.08              | 4.89      | 0.68    | 27.43       | 15.92            |        |              |
| 2600.0 | 14.17 | 40.31     | -10.59            | -3.70              | 5.14      | 0.64    | 26.95       | 15.45            |        |              |
| 2700.0 | 13.61 | 40.01     | -10.22            | -3.39              | 4.95      | 0.61    | 26.60       | 15.27            |        |              |
| 2800.0 | 13.03 | 40.42     | -10.02            | -3.12              | 5.20      | 0.58    | 26.33       | 14.90            |        |              |
| 2900.0 | 12.49 | 39.96     | -9.90             | -2.89              | 4.95      | 0.55    | 26.01       | 14.51            |        |              |
| 3000.0 | 11.96 | 39.66     | -9.62             | -2.73              | 4.82      | 0.54    | 25.27       | 14.15            |        |              |
| 3100.0 | 11.45 | 39.34     | -9.45             | -2.54              | 4.63      | 0.51    | 25.30       | 13.72            |        |              |
| 3200.0 | 10.94 | 39.47     | -9.39             | -2.36              | 4.71      | 0.48    | 24.37       | 13.04            |        |              |
| 3300.0 | 10.49 | 38.96     | -9.13             | -2.19              | 4.36      | 0.46    | 24.29       | 12.74            |        |              |
| 3400.0 | 10.06 | 38.32     | -9.03             | -2.04              | 3.98      | 0.44    | 23.97       | 12.60            |        |              |
| 3500.0 | 9.62  | 37.39     | -8.99             | -1.87              | 3.49      | 0.42    | 23.28       | 12.16            |        |              |
| 3600.0 | 9.15  | 37.33     | -8.71             | -1.77              | 3.43      | 0.40    | 23.01       | 11.74            |        |              |
| 3700.0 | 8.77  | 36.74     | -8.62             | -1.71              | 3.24      | 0.39    | 22.63       | 11.42            |        |              |
| 3800.0 | 8.35  | 35.54     | -8.61             | -1.59              | 2.75      | 0.37    | 22.23       | 11.29            |        |              |
| 3900.0 | 7.94  | 35.20     | -8.54             | -1.57              | 2.73      | 0.37    | 21.66       | 10.77            |        |              |
| 4000.0 | 7.60  | 33.95     | -8.41             | -1.51              | 2.33      | 0.36    | 21.87       | 10.52            |        |              |

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_s = +4V$ ,  $I_s = 53.86mA$ ,  $R1=267\ \Omega$  @ Temperature = +85°C

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 21.27 | 42.46     | -2.05             | -6.95              | 2.08      | 1.23    | 27.07       | 16.50            | 500.0  | 1.51         |
| 525.0  | 22.04 | 40.86     | -2.63             | -7.74              | 1.96      | 1.21    | 27.32       | 16.95            | 600.0  | 1.19         |
| 550.0  | 22.67 | 40.42     | -3.32             | -8.57              | 2.05      | 1.19    | 27.46       | 17.33            | 700.0  | 0.68         |
| 575.0  | 23.15 | 39.72     | -4.15             | -9.43              | 2.07      | 1.16    | 27.25       | 17.80            | 800.0  | 0.63         |
| 600.0  | 23.53 | 38.96     | -5.09             | -10.29             | 2.06      | 1.12    | 27.57       | 17.83            | 900.0  | 0.62         |
| 625.0  | 23.77 | 38.84     | -6.11             | -11.15             | 2.16      | 1.09    | 27.73       | 18.51            | 1000.0 | 0.55         |
| 650.0  | 23.93 | 38.28     | -7.24             | -11.98             | 2.14      | 1.05    | 27.80       | 18.71            | 1100.0 | 0.61         |
| 675.0  | 24.01 | 38.08     | -8.49             | -12.71             | 2.20      | 1.02    | 28.20       | 18.99            | 1200.0 | 0.71         |
| 700.0  | 24.04 | 38.16     | -9.80             | -13.37             | 2.31      | 1.00    | 28.57       | 19.24            | 1300.0 | 0.63         |
| 725.0  | 24.01 | 37.89     | -11.19            | -14.00             | 2.33      | 0.98    | 28.65       | 19.27            | 1400.0 | 0.76         |
| 750.0  | 23.94 | 37.92     | -12.74            | -14.57             | 2.41      | 0.97    | 28.95       | 19.60            | 1500.0 | 0.82         |
| 775.0  | 23.86 | 37.99     | -14.45            | -15.05             | 2.49      | 0.96    | 29.37       | 19.64            | 1600.0 | 0.84         |
| 800.0  | 23.74 | 37.91     | -16.30            | -15.56             | 2.54      | 0.95    | 29.50       | 19.60            | 1700.0 | 0.81         |
| 825.0  | 23.62 | 37.89     | -18.41            | -16.05             | 2.59      | 0.95    | 29.73       | 19.96            | 1800.0 | 0.99         |
| 850.0  | 23.47 | 37.59     | -20.66            | -16.54             | 2.57      | 0.94    | 29.71       | 19.96            | 1900.0 | 0.93         |
| 875.0  | 23.32 | 37.76     | -22.89            | -17.00             | 2.67      | 0.95    | 29.90       | 19.74            | 2000.0 | 1.08         |
| 900.0  | 23.17 | 37.78     | -24.51            | -17.43             | 2.73      | 0.95    | 30.04       | 20.25            | 2100.0 | 1.12         |
| 925.0  | 23.00 | 37.83     | -24.51            | -17.76             | 2.80      | 0.95    | 29.90       | 19.94            | 2200.0 | 1.12         |
| 950.0  | 22.84 | 37.99     | -23.59            | -18.06             | 2.90      | 0.96    | 30.16       | 19.85            | 2300.0 | 1.25         |
| 975.0  | 22.68 | 37.89     | -22.32            | -18.30             | 2.91      | 0.96    | 29.76       | 20.09            | 2400.0 | 1.29         |
| 1000.0 | 22.51 | 38.07     | -20.96            | -18.46             | 3.02      | 0.96    | 29.41       | 19.80            | 2500.0 | 1.45         |
| 1050.0 | 22.17 | 37.92     | -18.95            | -18.50             | 3.07      | 0.97    | 29.65       | 19.85            | 2600.0 | 1.48         |
| 1100.0 | 21.83 | 38.14     | -17.27            | -18.32             | 3.23      | 0.98    | 29.93       | 19.82            | 2700.0 | 1.65         |
| 1150.0 | 21.50 | 38.49     | -15.95            | -18.00             | 3.46      | 0.99    | 30.07       | 19.87            | 2800.0 | 1.65         |
| 1200.0 | 21.18 | 38.29     | -15.03            | -17.52             | 3.47      | 1.00    | 30.09       | 19.93            | 2900.0 | 1.72         |
| 1250.0 | 20.85 | 38.36     | -14.21            | -16.93             | 3.59      | 1.00    | 29.86       | 19.93            | 3000.0 | 1.78         |
| 1300.0 | 20.53 | 38.50     | -13.73            | -16.07             | 3.74      | 1.01    | 29.63       | 19.65            | 3100.0 | 1.87         |
| 1350.0 | 20.22 | 38.51     | -13.31            | -15.18             | 3.82      | 1.01    | 29.42       | 19.44            | 3200.0 | 1.96         |
| 1400.0 | 19.92 | 38.57     | -12.90            | -14.32             | 3.93      | 1.01    | 29.36       | 19.26            | 3300.0 | 2.00         |
| 1500.0 | 19.31 | 38.68     | -12.15            | -12.75             | 4.14      | 1.00    | 29.52       | 19.47            | 3400.0 | 2.13         |
| 1550.0 | 19.01 | 38.77     | -11.90            | -12.03             | 4.26      | 1.00    | 29.22       | 18.73            | 3500.0 | 2.13         |
| 1600.0 | 18.72 | 39.16     | -11.72            | -11.36             | 4.53      | 0.99    | 29.29       | 18.84            | 3600.0 | 2.35         |
| 1700.0 | 18.14 | 39.33     | -11.38            | -10.05             | 4.76      | 0.97    | 28.88       | 18.09            | 3700.0 | 2.33         |
| 1800.0 | 17.53 | 39.65     | -10.93            | -8.94              | 5.06      | 0.95    | 28.86       | 18.17            | 3800.0 | 2.45         |
| 1900.0 | 16.92 | 39.68     | -10.55            | -7.99              | 5.19      | 0.93    | 29.13       | 17.99            | 3900.0 | 2.55         |
| 2000.0 | 16.31 | 39.47     | -10.52            | -7.47              | 5.29      | 0.91    | 28.97       | 17.37            | 4000.0 | 2.47         |
| 2100.0 | 15.82 | 40.14     | -10.30            | -6.63              | 5.72      | 0.87    | 29.00       | 17.33            |        |              |
| 2200.0 | 15.26 | 39.98     | -10.02            | -5.89              | 5.63      | 0.83    | 29.17       | 17.26            |        |              |
| 2300.0 | 14.69 | 40.44     | -9.92             | -5.32              | 6.00      | 0.79    | 28.65       | 16.32            |        |              |
| 2400.0 | 14.12 | 39.92     | -9.78             | -4.83              | 5.69      | 0.76    | 28.24       | 15.91            |        |              |
| 2500.0 | 13.53 | 40.24     | -9.59             | -4.41              | 5.97      | 0.72    | 28.22       | 15.60            |        |              |
| 2600.0 | 12.97 | 40.29     | -9.49             | -4.05              | 6.06      | 0.69    | 27.93       | 15.09            |        |              |
| 2700.0 | 12.41 | 40.04     | -9.40             | -3.72              | 5.93      | 0.66    | 27.65       | 14.83            |        |              |
| 2800.0 | 11.84 | 39.67     | -9.17             | -3.44              | 5.71      | 0.63    | 27.49       | 14.40            |        |              |
| 2900.0 | 11.30 | 39.52     | -9.09             | -3.20              | 5.67      | 0.60    | 27.24       | 13.94            |        |              |
| 3000.0 | 10.77 | 39.39     | -9.03             | -3.00              | 5.67      | 0.58    | 26.58       | 13.47            |        |              |
| 3100.0 | 10.24 | 38.65     | -8.85             | -2.79              | 5.20      | 0.55    | 26.43       | 13.05            |        |              |
| 3200.0 | 9.72  | 38.37     | -8.80             | -2.62              | 5.09      | 0.53    | 25.47       | 12.42            |        |              |
| 3300.0 | 9.22  | 37.82     | -8.75             | -2.45              | 4.79      | 0.51    | 25.54       | 12.03            |        |              |
| 3400.0 | 8.76  | 37.17     | -8.66             | -2.31              | 4.45      | 0.49    | 24.73       | 11.81            |        |              |
| 3500.0 | 8.29  | 36.59     | -8.54             | -2.21              | 4.21      | 0.47    | 24.08       | 11.38            |        |              |
| 3600.0 | 7.81  | 35.97     | -8.52             | -2.10              | 3.96      | 0.46    | 23.83       | 10.94            |        |              |
| 3700.0 | 7.38  | 35.64     | -8.37             | -2.03              | 3.87      | 0.45    | 23.22       | 10.55            |        |              |
| 3800.0 | 6.91  | 34.67     | -8.21             | -1.93              | 3.44      | 0.43    | 22.59       | 10.34            |        |              |
| 3900.0 | 6.45  | 34.25     | -8.32             | -1.93              | 3.49      | 0.43    | 22.01       | 9.78             |        |              |
| 4000.0 | 6.08  | 33.02     | -8.26             | -1.85              | 3.01      | 0.42    | 21.96       | 9.57             |        |              |

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS:  $V_S = +3.8V$ ,  $I_S = 50.72mA$ ,  $R1=267\ \Omega$  @ Temperature = +85°C

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 21.12 | 41.84     | -2.03             | -6.96              | 1.98      | 1.23    | 26.63       | 16.06            | 500.0  | 1.51         |
| 525.0  | 21.89 | 40.90     | -2.61             | -7.77              | 2.00      | 1.22    | 26.95       | 16.51            | 600.0  | 1.20         |
| 550.0  | 22.53 | 40.20     | -3.31             | -8.61              | 2.03      | 1.19    | 27.02       | 16.88            | 700.0  | 0.72         |
| 575.0  | 23.03 | 39.10     | -4.14             | -9.49              | 1.98      | 1.15    | 26.98       | 17.30            | 800.0  | 0.65         |
| 600.0  | 23.41 | 38.87     | -5.09             | -10.39             | 2.07      | 1.12    | 27.10       | 17.39            | 900.0  | 0.59         |
| 625.0  | 23.66 | 38.41     | -6.13             | -11.28             | 2.10      | 1.08    | 27.32       | 18.03            | 1000.0 | 0.56         |
| 650.0  | 23.82 | 38.13     | -7.29             | -12.16             | 2.15      | 1.05    | 27.63       | 18.25            | 1100.0 | 0.64         |
| 675.0  | 23.91 | 37.90     | -8.55             | -12.92             | 2.20      | 1.02    | 27.69       | 18.53            | 1200.0 | 0.69         |
| 700.0  | 23.94 | 37.57     | -9.88             | -13.62             | 2.21      | 0.99    | 28.25       | 18.80            | 1300.0 | 0.61         |
| 725.0  | 23.90 | 37.64     | -11.33            | -14.28             | 2.30      | 0.98    | 28.29       | 18.82            | 1400.0 | 0.75         |
| 750.0  | 23.83 | 37.50     | -12.92            | -14.89             | 2.34      | 0.96    | 28.52       | 19.14            | 1500.0 | 0.84         |
| 775.0  | 23.75 | 37.29     | -14.65            | -15.40             | 2.35      | 0.95    | 28.89       | 19.20            | 1600.0 | 0.83         |
| 800.0  | 23.63 | 37.42     | -16.57            | -15.95             | 2.45      | 0.95    | 29.17       | 19.15            | 1700.0 | 0.84         |
| 825.0  | 23.51 | 37.47     | -18.73            | -16.50             | 2.52      | 0.95    | 29.45       | 19.52            | 1800.0 | 1.00         |
| 850.0  | 23.36 | 37.33     | -20.91            | -16.98             | 2.54      | 0.94    | 29.52       | 19.53            | 1900.0 | 0.95         |
| 875.0  | 23.21 | 37.42     | -22.83            | -17.47             | 2.61      | 0.95    | 29.52       | 19.33            | 2000.0 | 1.11         |
| 900.0  | 23.05 | 37.39     | -23.85            | -17.90             | 2.66      | 0.95    | 29.66       | 19.83            | 2100.0 | 1.09         |
| 925.0  | 22.88 | 37.17     | -23.39            | -18.24             | 2.64      | 0.95    | 29.68       | 19.52            | 2200.0 | 1.14         |
| 950.0  | 22.72 | 37.46     | -22.26            | -18.54             | 2.77      | 0.96    | 29.80       | 19.44            | 2300.0 | 1.22         |
| 975.0  | 22.55 | 37.56     | -21.09            | -18.77             | 2.85      | 0.96    | 29.68       | 19.66            | 2400.0 | 1.30         |
| 1000.0 | 22.38 | 37.45     | -19.86            | -18.86             | 2.86      | 0.96    | 29.08       | 19.40            | 2500.0 | 1.46         |
| 1050.0 | 22.03 | 37.83     | -18.04            | -18.89             | 3.08      | 0.98    | 29.66       | 19.45            | 2600.0 | 1.45         |
| 1100.0 | 21.69 | 37.63     | -16.53            | -18.58             | 3.10      | 0.98    | 29.73       | 19.44            | 2700.0 | 1.65         |
| 1150.0 | 21.35 | 37.81     | -15.28            | -18.14             | 3.24      | 0.99    | 29.60       | 19.48            | 2800.0 | 1.62         |
| 1200.0 | 21.03 | 37.71     | -14.45            | -17.58             | 3.29      | 1.00    | 29.79       | 19.52            | 2900.0 | 1.70         |
| 1250.0 | 20.69 | 38.00     | -13.69            | -16.89             | 3.48      | 1.01    | 29.58       | 19.58            | 3000.0 | 1.70         |
| 1300.0 | 20.38 | 38.13     | -13.24            | -15.98             | 3.62      | 1.01    | 29.34       | 19.27            | 3100.0 | 1.84         |
| 1350.0 | 20.07 | 38.11     | -12.86            | -15.06             | 3.70      | 1.01    | 29.21       | 19.06            | 3200.0 | 1.96         |
| 1400.0 | 19.76 | 38.20     | -12.46            | -14.18             | 3.81      | 1.01    | 29.00       | 18.88            | 3300.0 | 1.96         |
| 1500.0 | 19.15 | 38.44     | -11.77            | -12.59             | 4.06      | 1.01    | 29.06       | 19.12            | 3400.0 | 2.09         |
| 1550.0 | 18.84 | 38.54     | -11.54            | -11.88             | 4.19      | 1.00    | 29.02       | 18.36            | 3500.0 | 2.09         |
| 1600.0 | 18.55 | 38.62     | -11.36            | -11.21             | 4.30      | 1.00    | 28.92       | 18.47            | 3600.0 | 2.31         |
| 1700.0 | 17.96 | 38.78     | -11.05            | -9.90              | 4.50      | 0.98    | 28.81       | 17.71            | 3700.0 | 2.36         |
| 1800.0 | 17.35 | 38.96     | -10.63            | -8.80              | 4.71      | 0.95    | 28.77       | 17.79            | 3800.0 | 2.39         |
| 1900.0 | 16.73 | 39.20     | -10.28            | -7.86              | 4.95      | 0.93    | 28.87       | 17.58            | 3900.0 | 2.61         |
| 2000.0 | 16.12 | 38.96     | -10.27            | -7.34              | 5.03      | 0.91    | 28.53       | 16.98            | 4000.0 | 2.50         |
| 2100.0 | 15.62 | 39.73     | -10.06            | -6.51              | 5.50      | 0.87    | 28.58       | 16.93            |        |              |
| 2200.0 | 15.06 | 39.37     | -9.79             | -5.79              | 5.27      | 0.83    | 28.46       | 16.92            |        |              |
| 2300.0 | 14.49 | 40.17     | -9.70             | -5.23              | 5.86      | 0.79    | 27.92       | 15.89            |        |              |
| 2400.0 | 13.91 | 40.13     | -9.56             | -4.73              | 5.87      | 0.75    | 27.60       | 15.43            |        |              |
| 2500.0 | 13.32 | 40.22     | -9.38             | -4.34              | 5.99      | 0.72    | 27.34       | 15.26            |        |              |
| 2600.0 | 12.76 | 40.48     | -9.31             | -3.98              | 6.24      | 0.69    | 26.97       | 14.57            |        |              |
| 2700.0 | 12.20 | 39.89     | -9.21             | -3.66              | 5.87      | 0.65    | 26.66       | 14.31            |        |              |
| 2800.0 | 11.62 | 39.69     | -9.00             | -3.38              | 5.76      | 0.63    | 26.29       | 13.86            |        |              |
| 2900.0 | 11.08 | 39.65     | -8.92             | -3.15              | 5.80      | 0.60    | 26.11       | 13.42            |        |              |
| 3000.0 | 10.55 | 39.00     | -8.86             | -2.95              | 5.45      | 0.58    | 25.22       | 12.95            |        |              |
| 3100.0 | 10.02 | 38.63     | -8.68             | -2.75              | 5.22      | 0.55    | 25.21       | 12.49            |        |              |
| 3200.0 | 9.49  | 38.56     | -8.64             | -2.58              | 5.25      | 0.53    | 24.17       | 11.89            |        |              |
| 3300.0 | 9.00  | 37.80     | -8.59             | -2.42              | 4.82      | 0.50    | 24.20       | 11.46            |        |              |
| 3400.0 | 8.53  | 37.41     | -8.49             | -2.28              | 4.62      | 0.48    | 23.52       | 11.25            |        |              |
| 3500.0 | 8.06  | 36.70     | -8.37             | -2.17              | 4.28      | 0.47    | 22.90       | 10.82            |        |              |
| 3600.0 | 7.58  | 36.20     | -8.35             | -2.06              | 4.09      | 0.45    | 22.57       | 10.34            |        |              |
| 3700.0 | 7.15  | 35.88     | -8.20             | -2.00              | 4.01      | 0.44    | 22.01       | 9.99             |        |              |
| 3800.0 | 6.68  | 34.74     | -8.06             | -1.91              | 3.52      | 0.43    | 21.46       | 9.81             |        |              |
| 3900.0 | 6.22  | 34.36     | -8.16             | -1.90              | 3.57      | 0.43    | 20.90       | 9.20             |        |              |
| 4000.0 | 5.85  | 33.16     | -8.09             | -1.83              | 3.09      | 0.42    | 20.94       | 8.98             |        |              |

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

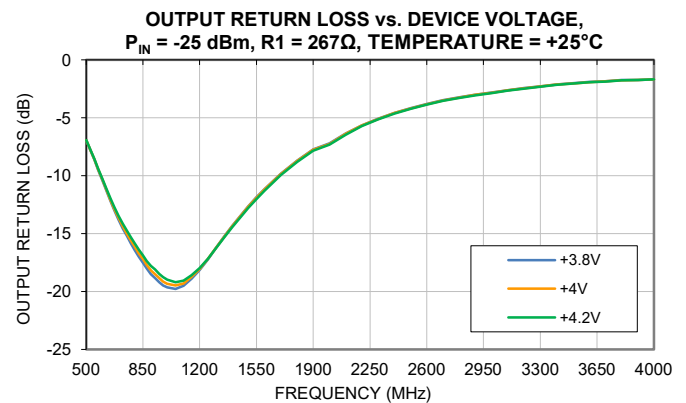
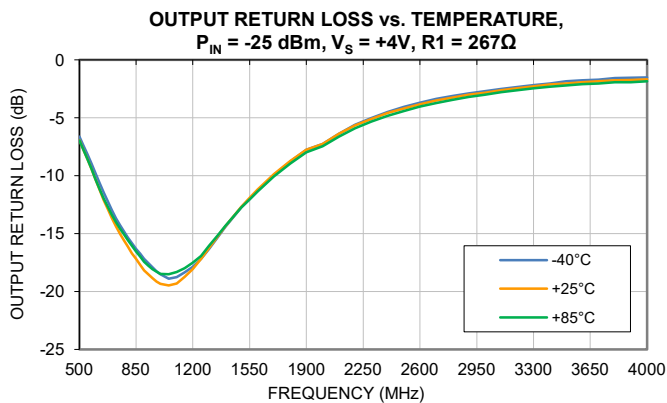
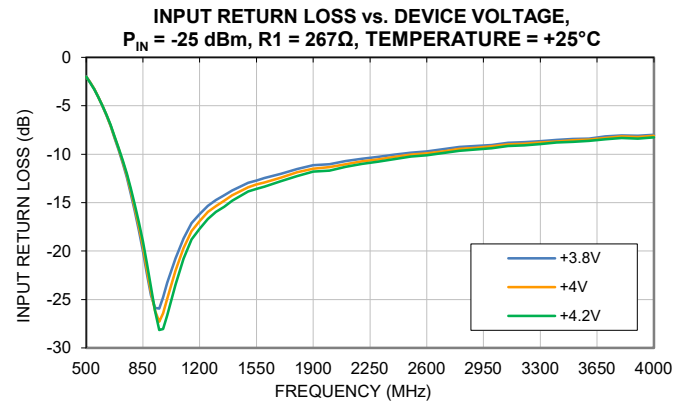
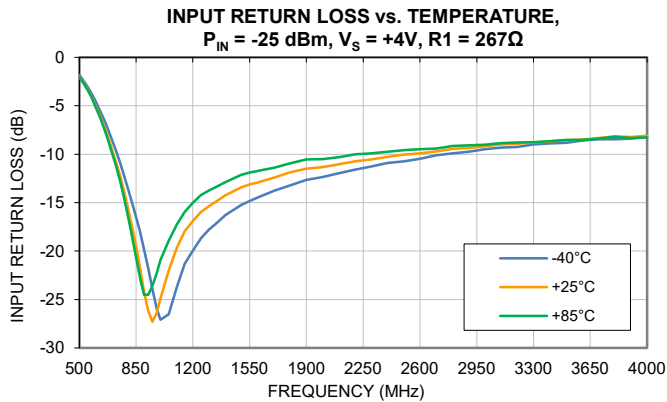
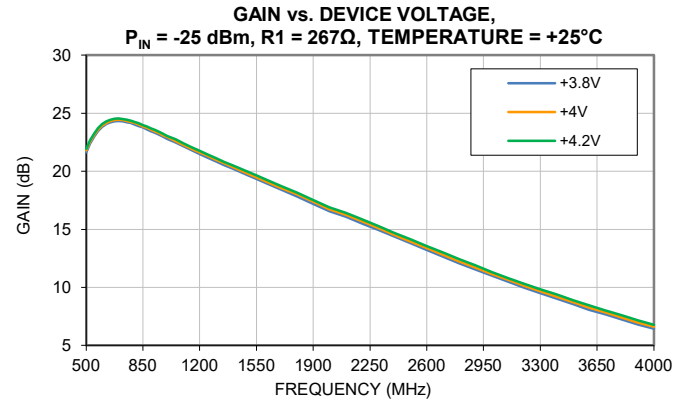
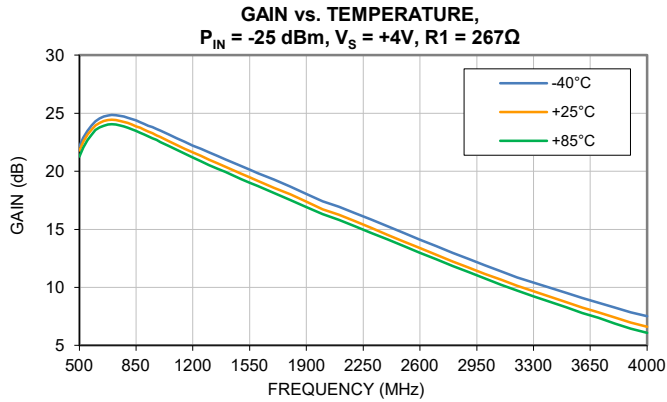
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

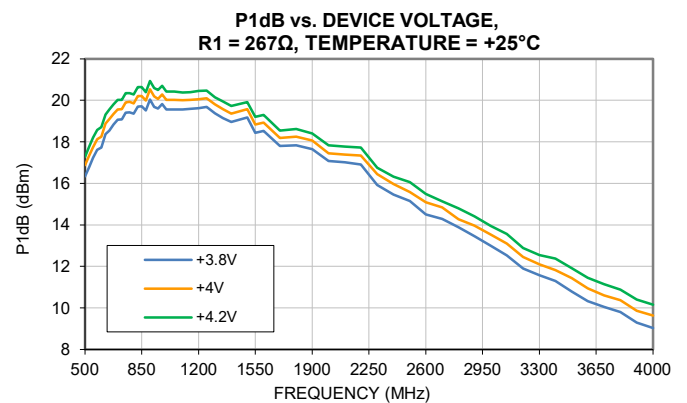
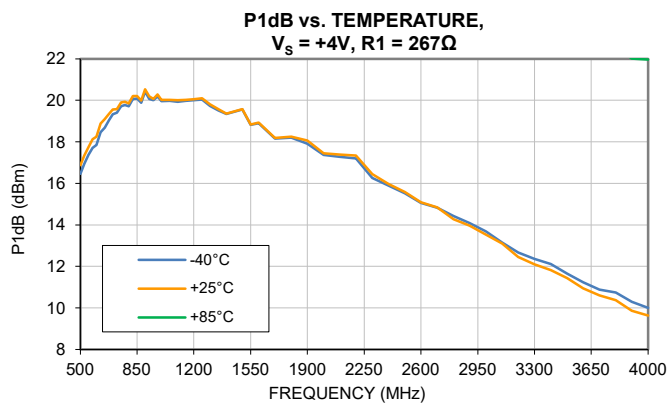
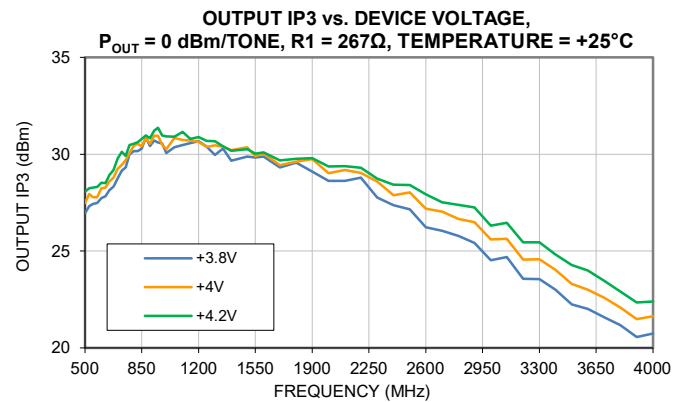
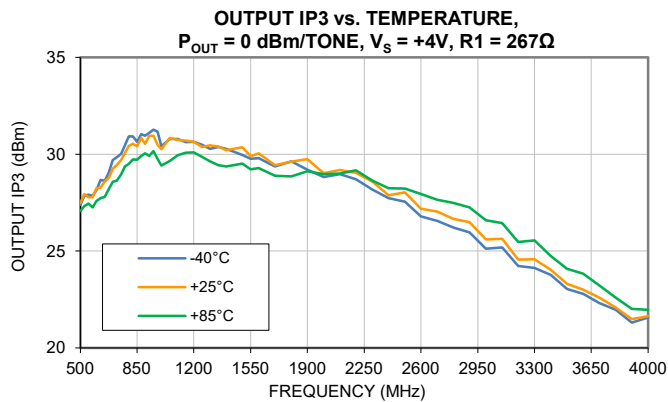
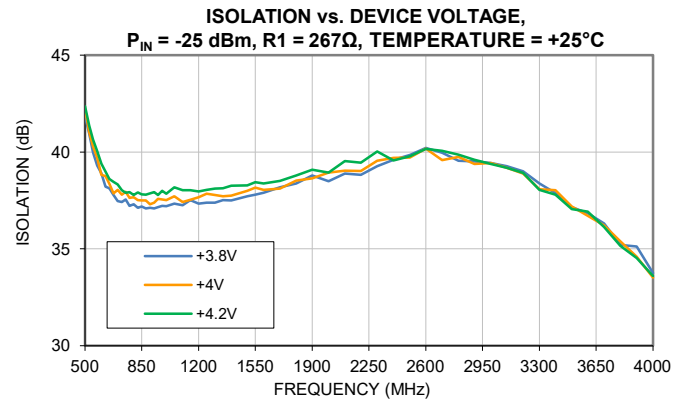
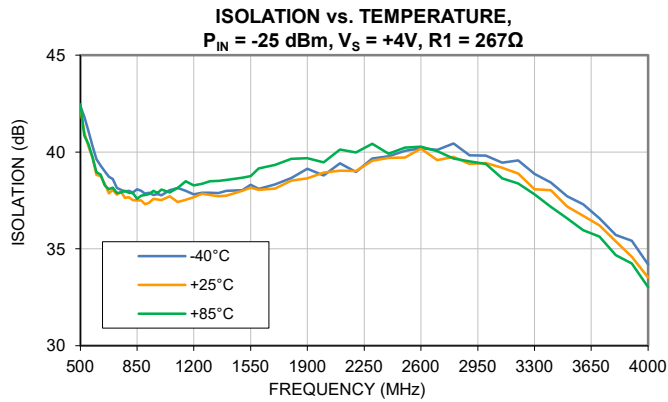
TEST CONDITIONS:  $V_S = +4.2V$ ,  $I_S = 57.08mA$ ,  $R1 = 267 \Omega$  @ Temperature = +85°C

| FREQ   | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | FREQ   | Noise Figure |
|--------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------|--------------|
| (MHz)  | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (MHz)  | (dB)         |
| 500.0  | 21.42 | 42.37     | -2.07             | -6.94              | 2.03      | 1.23    | 27.46       | 16.88            | 500.0  | 1.47         |
| 525.0  | 22.18 | 41.77     | -2.65             | -7.72              | 2.11      | 1.22    | 27.75       | 17.37            | 600.0  | 1.18         |
| 550.0  | 22.80 | 40.60     | -3.34             | -8.54              | 2.06      | 1.19    | 27.82       | 17.75            | 700.0  | 0.70         |
| 575.0  | 23.28 | 39.81     | -4.16             | -9.39              | 2.07      | 1.15    | 27.71       | 18.14            | 800.0  | 0.64         |
| 600.0  | 23.64 | 39.43     | -5.09             | -10.22             | 2.13      | 1.12    | 27.94       | 18.27            | 900.0  | 0.57         |
| 625.0  | 23.88 | 39.15     | -6.10             | -11.07             | 2.19      | 1.09    | 28.20       | 18.88            | 1000.0 | 0.56         |
| 650.0  | 24.04 | 38.88     | -7.22             | -11.86             | 2.25      | 1.05    | 28.38       | 19.06            | 1100.0 | 0.61         |
| 675.0  | 24.12 | 38.50     | -8.45             | -12.58             | 2.27      | 1.02    | 28.62       | 19.38            | 1200.0 | 0.69         |
| 700.0  | 24.14 | 38.50     | -9.74             | -13.20             | 2.36      | 1.00    | 28.97       | 19.62            | 1300.0 | 0.61         |
| 725.0  | 24.11 | 38.46     | -11.11            | -13.82             | 2.43      | 0.98    | 29.00       | 19.64            | 1400.0 | 0.74         |
| 750.0  | 24.04 | 38.27     | -12.61            | -14.34             | 2.46      | 0.97    | 29.22       | 19.99            | 1500.0 | 0.83         |
| 775.0  | 23.96 | 38.27     | -14.27            | -14.83             | 2.53      | 0.96    | 29.67       | 20.01            | 1600.0 | 0.85         |
| 800.0  | 23.85 | 38.15     | -16.09            | -15.31             | 2.57      | 0.95    | 29.80       | 19.96            | 1700.0 | 0.82         |
| 825.0  | 23.73 | 38.19     | -18.15            | -15.79             | 2.64      | 0.95    | 29.96       | 20.32            | 1800.0 | 0.99         |
| 850.0  | 23.58 | 38.36     | -20.45            | -16.23             | 2.75      | 0.95    | 30.27       | 20.32            | 1900.0 | 0.95         |
| 875.0  | 23.43 | 38.06     | -22.82            | -16.70             | 2.73      | 0.95    | 30.24       | 20.10            | 2000.0 | 1.09         |
| 900.0  | 23.28 | 38.19     | -24.86            | -17.12             | 2.82      | 0.95    | 30.41       | 20.61            | 2100.0 | 1.06         |
| 925.0  | 23.11 | 38.21     | -25.57            | -17.47             | 2.88      | 0.95    | 30.39       | 20.29            | 2200.0 | 1.11         |
| 950.0  | 22.96 | 38.17     | -24.86            | -17.74             | 2.92      | 0.95    | 30.43       | 20.22            | 2300.0 | 1.20         |
| 975.0  | 22.79 | 38.13     | -23.53            | -17.99             | 2.96      | 0.96    | 30.20       | 20.45            | 2400.0 | 1.27         |
| 1000.0 | 22.62 | 38.22     | -22.01            | -18.11             | 3.03      | 0.96    | 29.97       | 20.15            | 2500.0 | 1.44         |
| 1050.0 | 22.29 | 38.43     | -19.81            | -18.25             | 3.20      | 0.97    | 30.30       | 20.21            | 2600.0 | 1.43         |
| 1100.0 | 21.95 | 38.42     | -18.00            | -18.12             | 3.30      | 0.98    | 30.41       | 20.17            | 2700.0 | 1.59         |
| 1150.0 | 21.62 | 38.69     | -16.52            | -17.83             | 3.49      | 0.99    | 30.70       | 20.23            | 2800.0 | 1.58         |
| 1200.0 | 21.30 | 38.72     | -15.58            | -17.39             | 3.60      | 0.99    | 30.64       | 20.26            | 2900.0 | 1.70         |
| 1250.0 | 20.97 | 38.77     | -14.71            | -16.87             | 3.72      | 1.00    | 30.65       | 20.30            | 3000.0 | 1.66         |
| 1300.0 | 20.66 | 38.73     | -14.18            | -16.01             | 3.79      | 1.00    | 30.20       | 19.99            | 3100.0 | 1.81         |
| 1350.0 | 20.35 | 38.89     | -13.74            | -15.16             | 3.96      | 1.00    | 29.76       | 19.78            | 3200.0 | 1.99         |
| 1400.0 | 20.05 | 38.95     | -13.31            | -14.33             | 4.07      | 1.00    | 29.70       | 19.60            | 3300.0 | 1.99         |
| 1500.0 | 19.45 | 39.22     | -12.51            | -12.77             | 4.36      | 1.00    | 29.93       | 19.82            | 3400.0 | 2.09         |
| 1550.0 | 19.14 | 39.30     | -12.26            | -12.07             | 4.48      | 0.99    | 29.30       | 19.08            | 3500.0 | 2.04         |
| 1600.0 | 18.85 | 39.31     | -12.05            | -11.40             | 4.57      | 0.99    | 29.36       | 19.20            | 3600.0 | 2.24         |
| 1700.0 | 18.27 | 39.50     | -11.70            | -10.09             | 4.81      | 0.97    | 29.18       | 18.44            | 3700.0 | 2.33         |
| 1800.0 | 17.67 | 39.82     | -11.21            | -8.98              | 5.11      | 0.95    | 29.37       | 18.53            | 3800.0 | 2.42         |
| 1900.0 | 17.06 | 40.28     | -10.81            | -8.02              | 5.52      | 0.92    | 29.67       | 18.36            | 3900.0 | 2.49         |
| 2000.0 | 16.45 | 39.79     | -10.79            | -7.52              | 5.46      | 0.90    | 29.39       | 17.74            | 4000.0 | 2.34         |
| 2100.0 | 15.96 | 40.48     | -10.56            | -6.66              | 5.91      | 0.87    | 29.61       | 17.70            |        |              |
| 2200.0 | 15.40 | 40.09     | -10.25            | -5.92              | 5.66      | 0.83    | 29.40       | 17.65            |        |              |
| 2300.0 | 14.83 | 40.18     | -10.15            | -5.35              | 5.79      | 0.79    | 29.02       | 16.76            |        |              |
| 2400.0 | 14.26 | 40.38     | -9.99             | -4.85              | 5.97      | 0.76    | 28.76       | 16.35            |        |              |
| 2500.0 | 13.68 | 40.72     | -9.78             | -4.44              | 6.27      | 0.72    | 28.93       | 16.08            |        |              |
| 2600.0 | 13.12 | 40.64     | -9.70             | -4.07              | 6.28      | 0.69    | 28.85       | 15.53            |        |              |
| 2700.0 | 12.56 | 40.41     | -9.59             | -3.75              | 6.16      | 0.66    | 28.59       | 15.32            |        |              |
| 2800.0 | 11.98 | 39.72     | -9.36             | -3.45              | 5.71      | 0.63    | 28.26       | 14.84            |        |              |
| 2900.0 | 11.44 | 39.57     | -9.27             | -3.22              | 5.68      | 0.60    | 28.26       | 14.42            |        |              |
| 3000.0 | 10.91 | 39.11     | -9.20             | -3.02              | 5.45      | 0.58    | 27.59       | 13.94            |        |              |
| 3100.0 | 10.39 | 38.62     | -9.02             | -2.81              | 5.15      | 0.55    | 27.46       | 13.52            |        |              |
| 3200.0 | 9.86  | 38.35     | -8.96             | -2.64              | 5.05      | 0.53    | 26.63       | 12.90            |        |              |
| 3300.0 | 9.37  | 37.61     | -8.92             | -2.47              | 4.64      | 0.51    | 26.72       | 12.56            |        |              |
| 3400.0 | 8.91  | 37.09     | -8.81             | -2.33              | 4.38      | 0.49    | 25.83       | 12.40            |        |              |
| 3500.0 | 8.44  | 36.63     | -8.69             | -2.22              | 4.19      | 0.47    | 25.27       | 11.91            |        |              |
| 3600.0 | 7.96  | 36.20     | -8.68             | -2.11              | 4.05      | 0.46    | 24.97       | 11.43            |        |              |
| 3700.0 | 7.53  | 35.27     | -8.52             | -2.04              | 3.68      | 0.45    | 24.28       | 11.14            |        |              |
| 3800.0 | 7.06  | 34.56     | -8.36             | -1.93              | 3.38      | 0.43    | 23.61       | 10.84            |        |              |
| 3900.0 | 6.60  | 34.13     | -8.48             | -1.93              | 3.40      | 0.43    | 23.05       | 10.36            |        |              |
| 4000.0 | 6.23  | 33.09     | -8.43             | -1.85              | 3.02      | 0.42    | 22.86       | 10.11            |        |              |

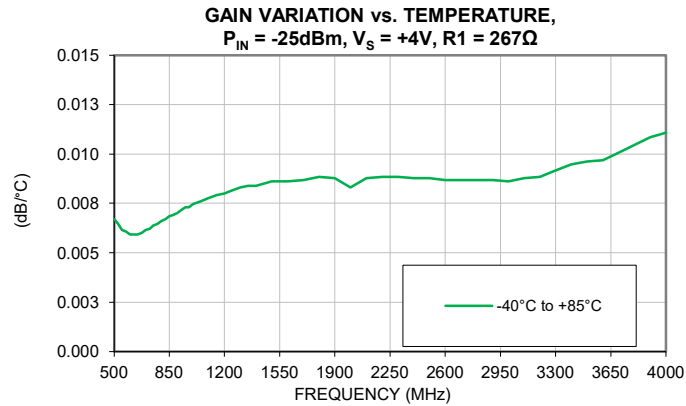
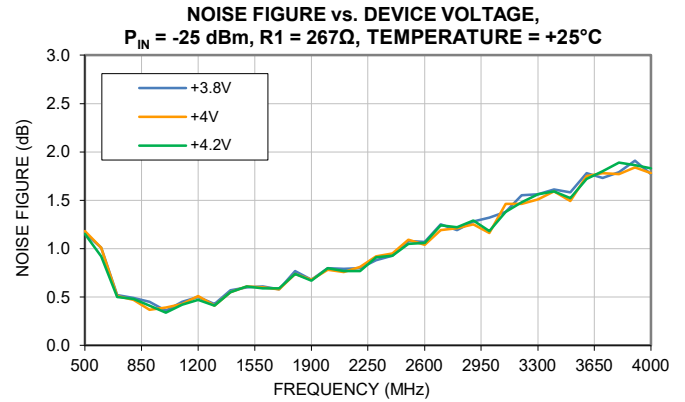
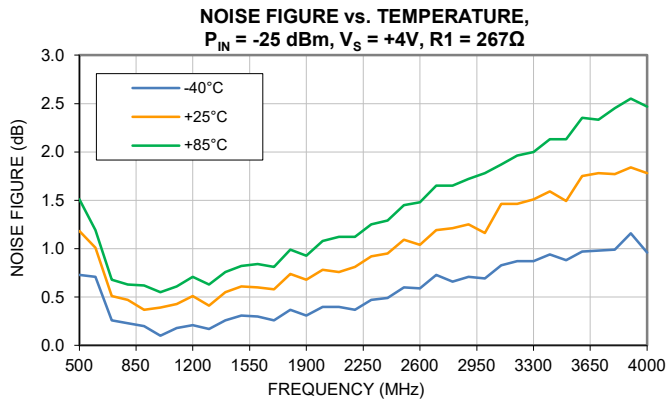
## Typical Performance Curves



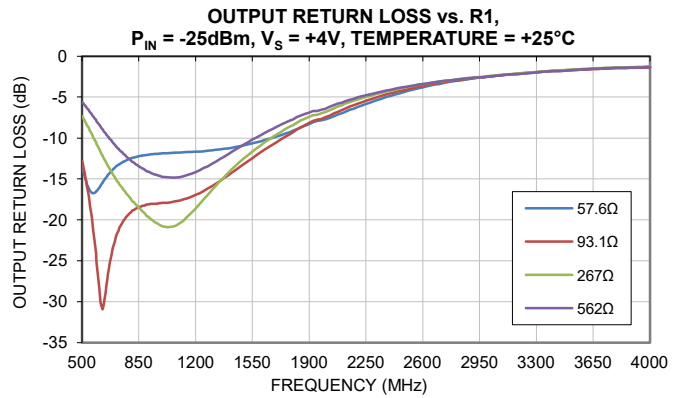
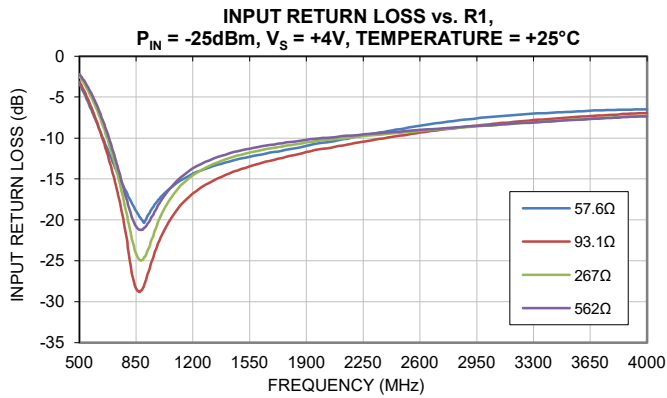
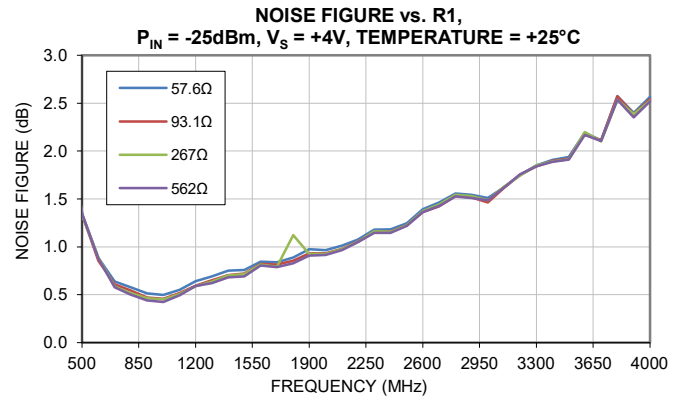
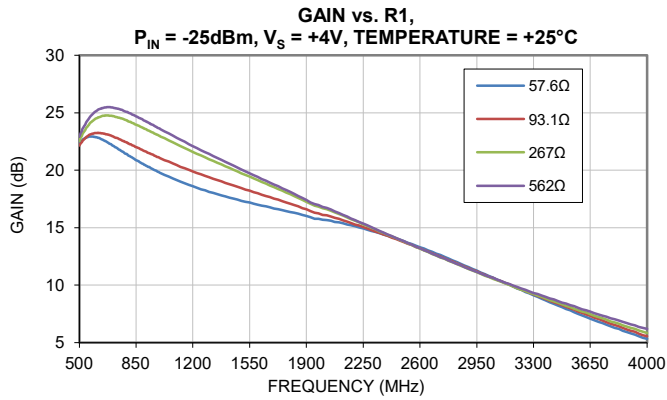
## Typical Performance Curves



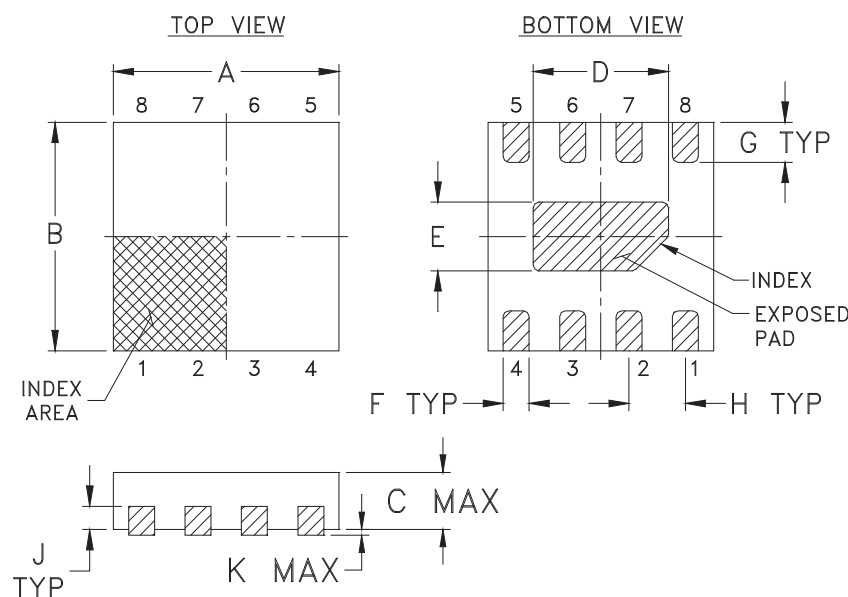
## Typical Performance Curves



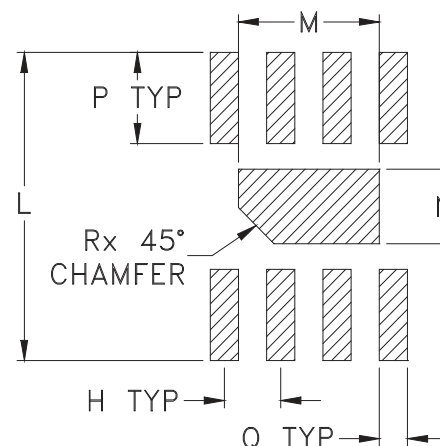
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

| SE #.    | A              | B              | C              | D              | E             | F             | G             | H             | J             | K             | L              | M              | N             | P             |
|----------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|---------------|---------------|
| MC1631-1 | .079<br>(2.00) | .079<br>(2.00) | .039<br>(1.00) | .047<br>(1.20) | .024<br>(.60) | .009<br>(.23) | .014<br>(.35) | .020<br>(.50) | .008<br>(.20) | .002<br>(.05) | .106<br>(2.70) | .049<br>(1.25) | .026<br>(.65) | .031<br>(.80) |

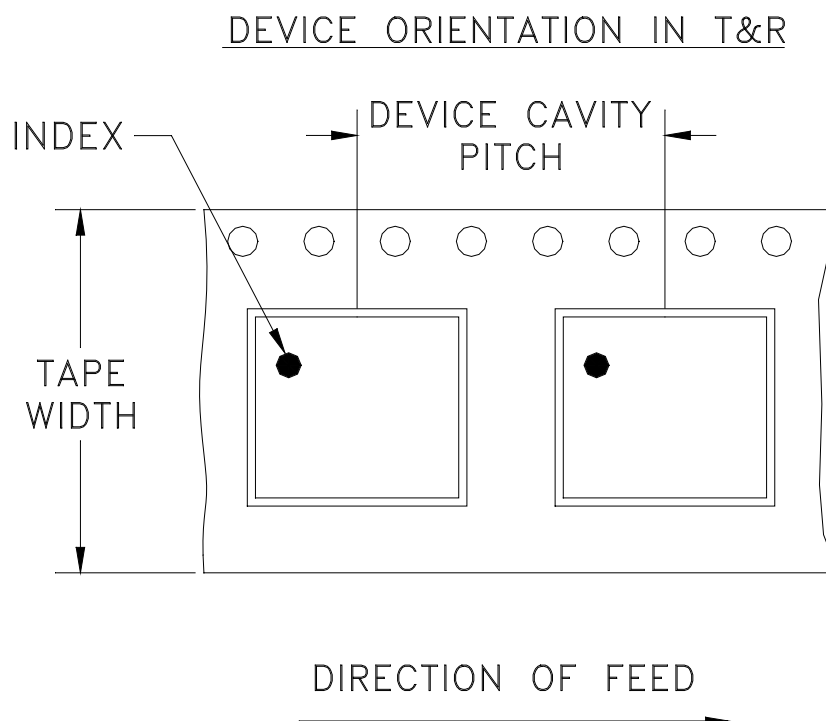
| CASE #.  | Q             | R             | WT, GRAM |
|----------|---------------|---------------|----------|
| MC1631-1 | .010<br>(.25) | .012<br>(.30) | .006     |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .01$ ; 3 Pl.  $\pm .005$

#### Notes:

- Case material: Plastic.
- Termination finish:  
For RoHS Case Styles: Tin-Silver over Nickel plated or Matte-Tin Plated (See Data sheet).  
All models, (+) suffix.
- Lead #1 identifier shall be located in the cross-hatched area shown.  
Identifier may be either a molded or marked feature.

# Tape & Reel Packaging TR-F66



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel<br>see note  |                  |
|-------------------|----------------------------|----------------------|-------------------------------|------------------|
| 8                 | 4                          | 7                    | Small<br>quantity<br>standard | 20               |
|                   |                            |                      |                               | 50               |
|                   |                            |                      |                               | 100              |
|                   |                            |                      |                               | 200              |
|                   |                            |                      |                               | 500              |
|                   |                            | 7                    | Standard                      | 1000, 2000, 3000 |

Note: Please consult individual model data sheet to determine device per reel availability.

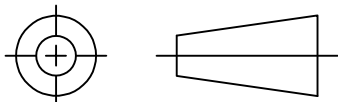
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



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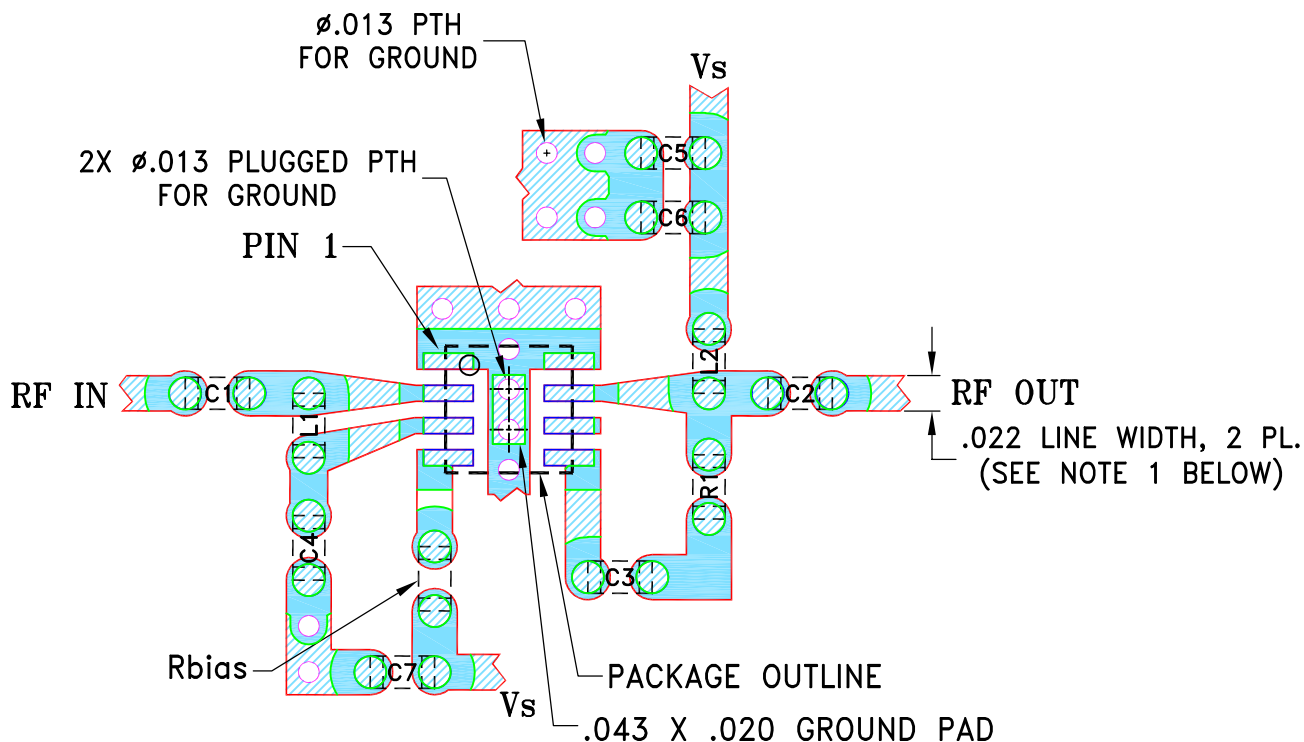
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No.    | DESCRIPTION                 | DATE     | DR  | AUTH |
|-----|------------|-----------------------------|----------|-----|------|
| OR  | ECO-014708 | NEW RELEASE                 | 08/26/22 | ITG | IL   |
| A   | ECO-017341 | UPDATED THE REFERENCE OF TB | 03/30/23 | ITG | IL   |
|     |            |                             |          |     |      |
|     |            |                             |          |     |      |

## SUGGESTED MOUNTING CONFIGURATION FOR MC1631-1 CASE STYLE

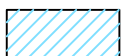


## NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.010 \pm .001$ "; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. UNIT FOOT PRINT FOR GROUND PAD IS OPTIMIZED FOR PERFORMANCE AND IS DIFFERENT FROM CASE STYLE MC1631-1 RECOMMENDATIONS.
3. 0402 SIZE COMPONENTS FOOT PRINTS SHOWN FOR REFERENCE, FOR COMPONENT VALUE REFER TO TB-PMA2162LNAC+.
4. BOTTOM SIDE OF THIS PATTERN OF PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES

TOLERANCES ON:  
 2 PL DECIMALS  $\pm$   
 3 PL DECIMALS  $\pm$  .005  
 ANGLES  $\pm$   
 FRACTIONS  $\pm$

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ASHEETA1.DWG REV:A DATE:01/12/95



# Mini-Circuits®

13 Neptune Avenue  
Brooklyn NY 11235

## PL,MC1631-1,TB-PMA2162LNAC+

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-737

REV:

A

FILE:

98PL737

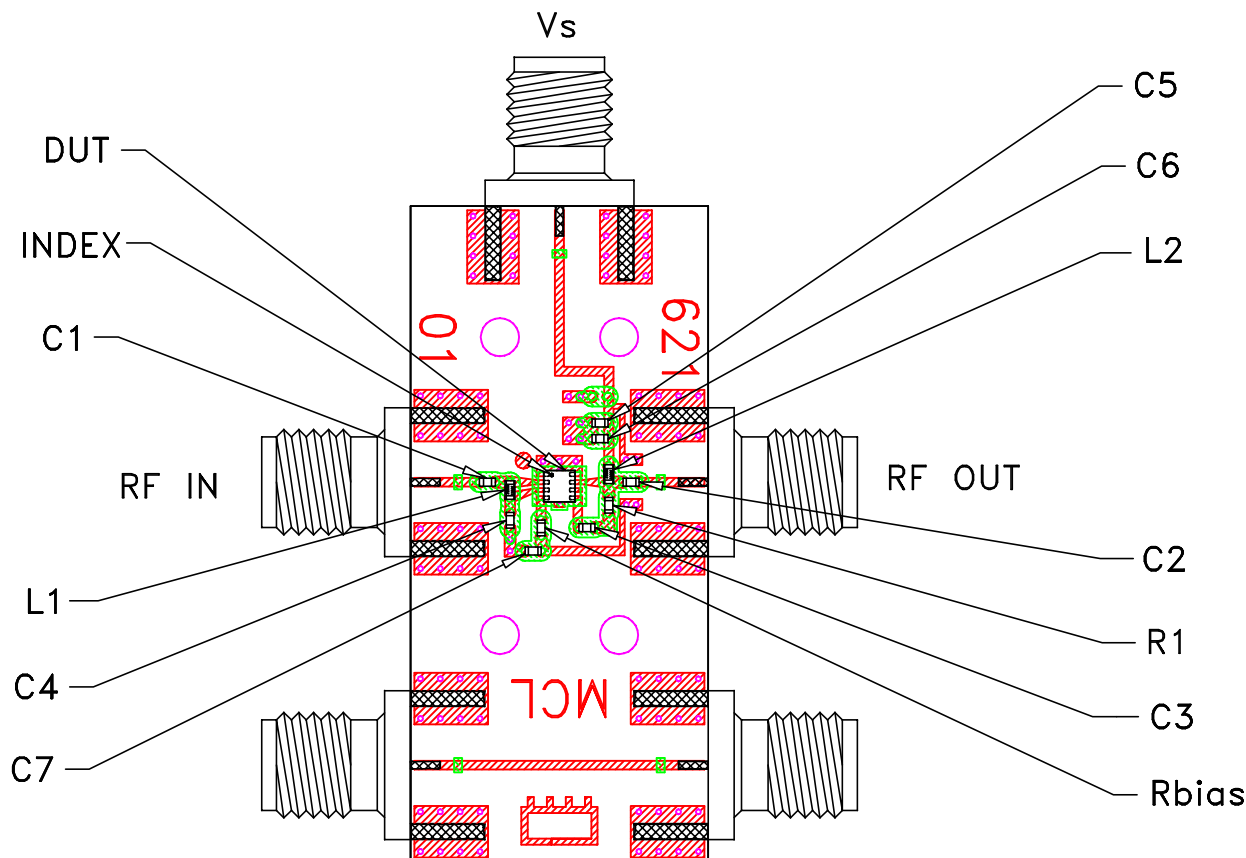
SCALE:

8:1

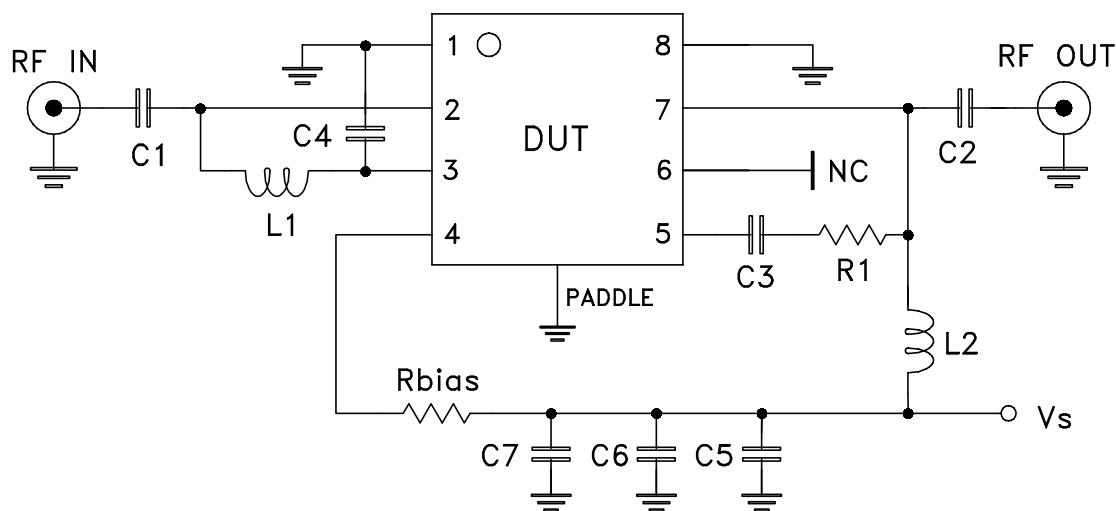
SHEET:

1 OF 1

# Evaluation Board and Circuit



TB-PMA2162LNAC+



Schematic Diagram

## NOTES:

1. SMA Female connectors.
2. PCB material: Rogers RO4350 or equivalent, dielectric constant=3.5, dielectric thickness=.010 inch.

| ITEM   | DESCRIPTION  |
|--------|--------------|
| C1, C6 | CAP, 9.1pF   |
| C2, C4 | CAP, 100pF   |
| C3     | CAP, 5.6pF   |
| C5, C7 | CAP, 0.1uF   |
| R1     | RES, 267 Ohm |
| Rbias  | RES, 750 Ohm |
| L1     | IND, 6.8nH   |
| L2     | IND, 15nH    |
| DUT    | PMA2-162LNA+ |

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                  | Test/Inspection Condition                                                                                                      | Reference/Spec                                                  |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Operating Temperature          | -40° to 85°C or -45° to 85°C<br>Ambient Environment                                                                            | Individual Model Data Sheet                                     |
| Storage Temperature            | -55° to 100° C or -65° to 150°<br>Ambient Environment                                                                          | Individual Model Data Sheet                                     |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                      | MIL-STD-202, Method 107, Condition A-3, except +100°C           |
| Mechanical Shock               | 1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only                                                                               | MIL-STD-883, Method 2002, Condition B, except Y1 direction only |
| Vibration (Variable Frequency) | 50g peak                                                                                                                       | MIL-STD-883, Method 2007, Condition B                           |
| Autoclave                      | 15 psig, 100% RH, 121°C, 96 hours                                                                                              | JESD22-A102, Condition C                                        |
| HAST                           | 130°C, 85% RH, 96 hours                                                                                                        | JESD22-A110                                                     |
| Solderability                  | 10X Magnification                                                                                                              | J-STD-002, Para 4.2.5, Test S, 95% Coverage                     |
| Solder Reflow Heat             | Sn-Pb Eutetic Process: 240°C peak<br>Pb-Free Process: 260°C peak                                                               | J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1                   |
| Moisture Sensitivity: Level 1  | Bake at 125°C for 24 hours<br>Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak                                 | J-STD-020                                                       |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + | MIL-STD-202, Method 215                                         |



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| Specification | Test/Inspection Condition        | Reference/Spec |
|---------------|----------------------------------|----------------|
|               | monoethanolamine at 63°C to 70°C |                |