



MMIC SURFACE MOUNT

# Wideband Amplifier

**PMA3-83LP+**

Mini-Circuits

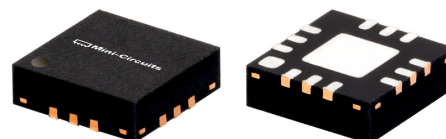
50Ω 0.4 to 8 GHz +6V Supply

## THE BIG DEAL

- Output P1dB, Typ. +25dBm
- Output IP3, Typ. +34dBm
- Low Noise Figure, Typ. 2.8dB
- Adjustable Supply Current
- 3x3mm 12-Lead QFN-style Package
- Patent Pending

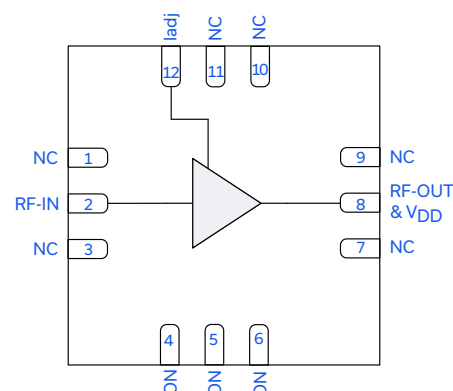
## APPLICATIONS

- Wi-Fi 6
- 5G MIMO Radio Systems
- L, S, and C-band Radar
- SATCOM



Generic photo used for illustration purposes only

## FUNCTIONAL DIAGRAM



## PRODUCT OVERVIEW

The PMA3-83LP+ is a GaAs pHEMT based wideband, low noise, MMIC amplifier with a unique combination of low noise figure, high OIP3, and high output power. This makes it ideal for sensitive, high-dynamic range receiver applications. The PMA3-83LP+ design operates on a single supply voltage of +6V, is well matched for 50Ω, and comes in a low-profile package (3x3mm 12-Lead), which can accommodate dense circuit board layouts.

## KEY FEATURES

| Feature                                                                                                                                                                                | Advantages                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low Noise Figure, 2.8dB Typ                                                                                                                                                            | Enables lower system noise figure performance.                                                                                                                                                                                            |
| High IP3: <ul style="list-style-type: none"> <li>• +41dBm at 0.4GHz</li> <li>• +34dBm at 2GHz</li> <li>• +34dBm at 4GHz</li> <li>• +34dBm at 6GHz</li> <li>• +34dBm at 8GHz</li> </ul> | Combination of low noise figure and high IP3 makes this MMIC amplifier ideal for use in low noise receiver front end (RFE), as it gives the user advantages of sensitivity and two-tone IM performance at both ends of the dynamic range. |
| Output Power at 1dB Compression, +25dBm                                                                                                                                                | Enables usage as a pre-driver or driver amplifier in a variety of transmit and receive applications in commercial, industrial, and defense systems. Adjustable supply current to optimize power efficiency.                               |
| 3x3mm 12-lead QFN-style package                                                                                                                                                        | Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.                                                                                             |
| Wide bandwidth with flat gain <ul style="list-style-type: none"> <li>• ±1.5dB over 4 to 8GHz</li> </ul>                                                                                | Enables a single amplifier to be used in many wideband applications including defense, instrumentation, and more.                                                                                                                         |

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50Ω 0.4 to 8 GHz +6V Supply

ELECTRICAL SPECIFICATIONS<sup>1</sup> AT 25°C,  $V_{DD}$  = +6V, UNLESS NOTED OTHERWISE

| Parameter                                                       | Condition (MHz) | Min. | Typ.  | Max. | Units |
|-----------------------------------------------------------------|-----------------|------|-------|------|-------|
| Frequency Range                                                 |                 | 400  |       | 8000 | MHz   |
| Gain                                                            | 400             | 20.6 | 21.3  |      | dB    |
|                                                                 | 2000            | 19.9 | 20.5  |      |       |
|                                                                 | 4000            | 18.6 | 19.6  |      |       |
|                                                                 | 6000            | 17.8 | 18.8  |      |       |
|                                                                 | 8000            | 16.0 | 17.3  |      |       |
| Output Power at 1dB Compression (P1dB)                          | 400             |      | +25.0 |      | dBm   |
|                                                                 | 2000            |      | +25.4 |      |       |
|                                                                 | 4000            |      | +25.7 |      |       |
|                                                                 | 6000            |      | +24.3 |      |       |
|                                                                 | 8000            |      | +22.9 |      |       |
| Output Third-Order Intercept ( $P_{OUT} = +12\text{dBm/Tone}$ ) | 400             |      | +41   |      | dBm   |
|                                                                 | 2000            |      | +34   |      |       |
|                                                                 | 4000            |      | +34   |      |       |
|                                                                 | 6000            |      | +34   |      |       |
|                                                                 | 8000            |      | +34   |      |       |
| Input Return Loss                                               | 400             |      | 12    |      | dB    |
|                                                                 | 2000            |      | 12    |      |       |
|                                                                 | 4000            |      | 12    |      |       |
|                                                                 | 6000            |      | 15    |      |       |
|                                                                 | 8000            |      | 12    |      |       |
| Output Return Loss                                              | 400             |      | 8     |      | dB    |
|                                                                 | 2000            |      | 13    |      |       |
|                                                                 | 4000            |      | 17    |      |       |
|                                                                 | 6000            |      | 11    |      |       |
|                                                                 | 8000            |      | 9     |      |       |
| Isolation                                                       | 400-8000        |      | 28    |      | dB    |
| Noise Figure                                                    | 400             |      | 3.3   |      | dB    |
|                                                                 | 2000            |      | 3.0   |      |       |
|                                                                 | 4000            |      | 2.6   |      |       |
|                                                                 | 6000            |      | 2.4   |      |       |
|                                                                 | 8000            |      | 2.7   |      |       |
| Device Operating Voltage ( $V_{DD}$ )                           |                 | +5.5 | +6    | +6.5 | V     |
| Device Operating Current ( $I_{DD}$ ) <sup>2</sup>              |                 |      | 150   |      | mA    |
| Voltage at Iadj pin ( $V_{Iadj}$ )                              |                 |      | 3.35  |      | V     |
| Current at Iadj pin ( $I_{adj}$ )                               |                 |      | 1.21  |      | mA    |
| DC Current Variation vs. Temperature <sup>3</sup>               |                 |      | -0.28 |      | μA/°C |
| DC Current Variation vs. Voltage <sup>4</sup>                   |                 |      | 44    |      | mA/mV |

1. Tested on Mini-Circuits Characterization Evaluation Board TB-PMA3-83LPC+. See Figure 2. Board loss de-embedded to the device.

2. Current at  $P_{IN} = -25\text{dBm}$ . Increases to 178mA at P1dB at room temperature.3.  $((\text{Current at } 85^\circ\text{C} - \text{Current at } -45^\circ\text{C})) / (130^\circ\text{C})$ 4.  $((\text{Current at } +6.5\text{V in mA}) - (\text{Current at } +5.5\text{V in mA})) / ((+6.5\text{V}) - (+5.5\text{V}) * 1000\text{mA/mV})$ 



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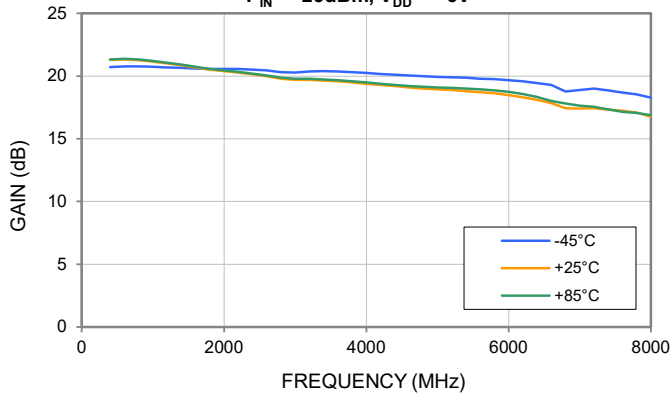
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Mini-Circuits

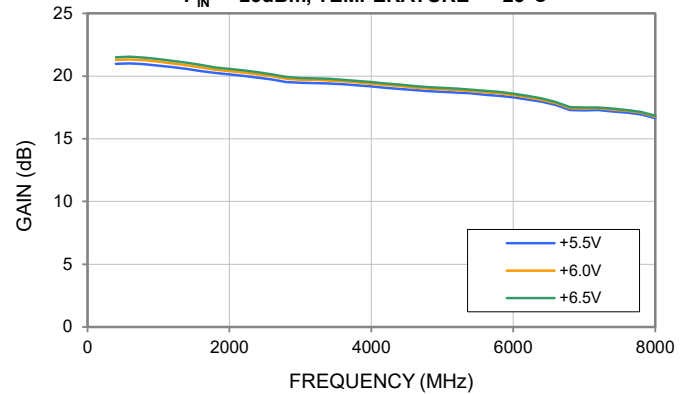
50Ω 0.4 to 8 GHz +6V Supply

## TYPICAL PERFORMANCE GRAPHS

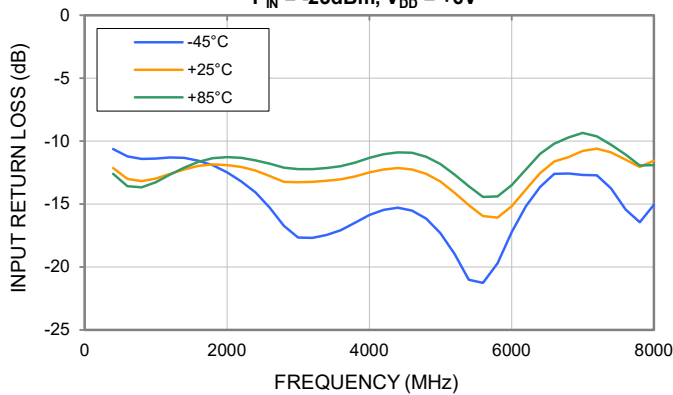
**GAIN vs. TEMPERATURE,**  
 $P_{IN} = -25\text{dBm}$ ,  $V_{DD} = +6\text{V}$



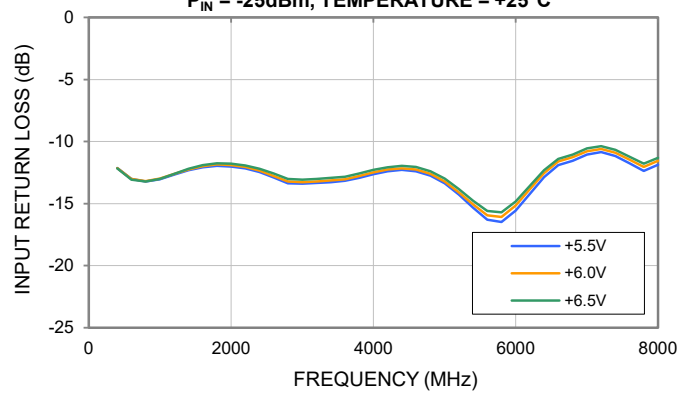
**GAIN vs. DEVICE VOLTAGE,**  
 $P_{IN} = -25\text{dBm}$ , TEMPERATURE = +25°C



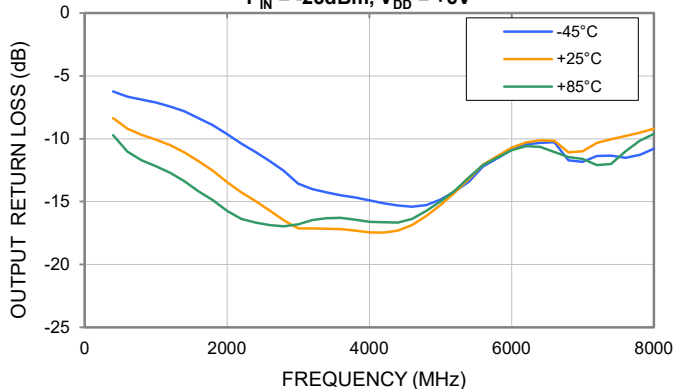
**INPUT RETURN LOSS vs. TEMPERATURE,**  
 $P_{IN} = -25\text{dBm}$ ,  $V_{DD} = +6\text{V}$



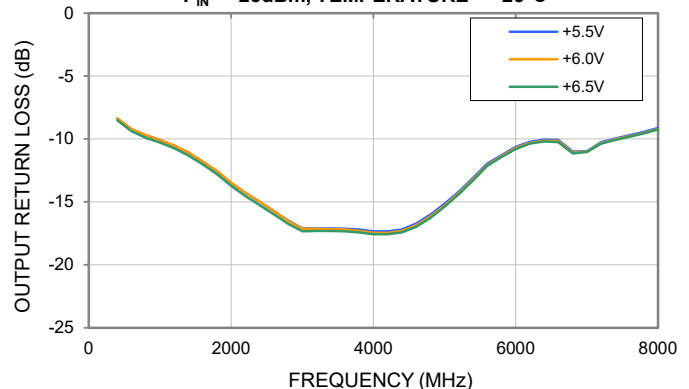
**INPUT RETURN LOSS vs. DEVICE VOLTAGE,**  
 $P_{IN} = -25\text{dBm}$ , TEMPERATURE = +25°C



**OUTPUT RETURN LOSS vs. TEMPERATURE,**  
 $P_{IN} = -25\text{dBm}$ ,  $V_{DD} = +6\text{V}$



**OUTPUT RETURN LOSS vs. DEVICE VOLTAGE,**  
 $P_{IN} = -25\text{dBm}$ , TEMPERATURE = +25°C





MMIC SURFACE MOUNT

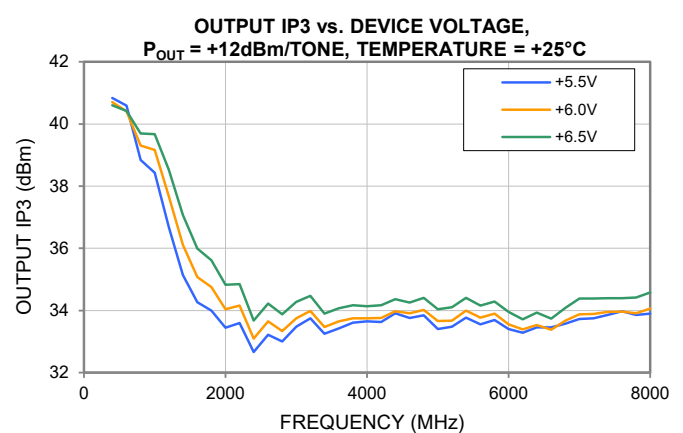
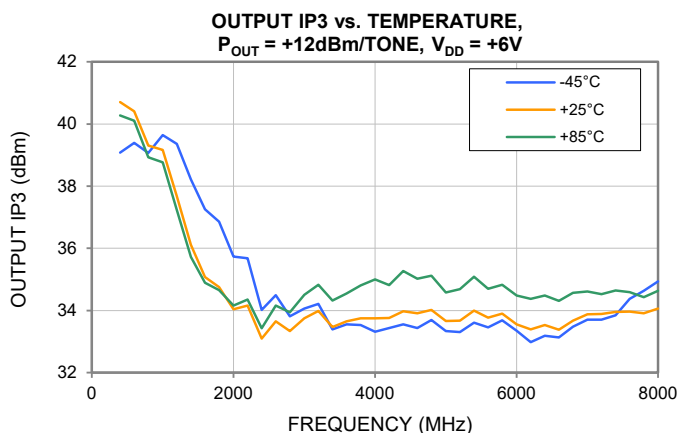
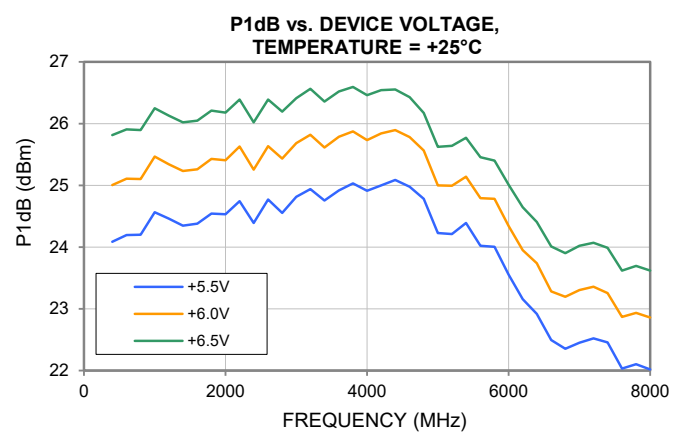
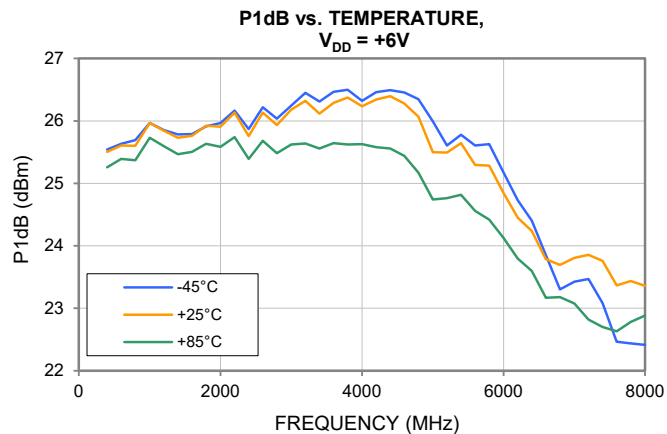
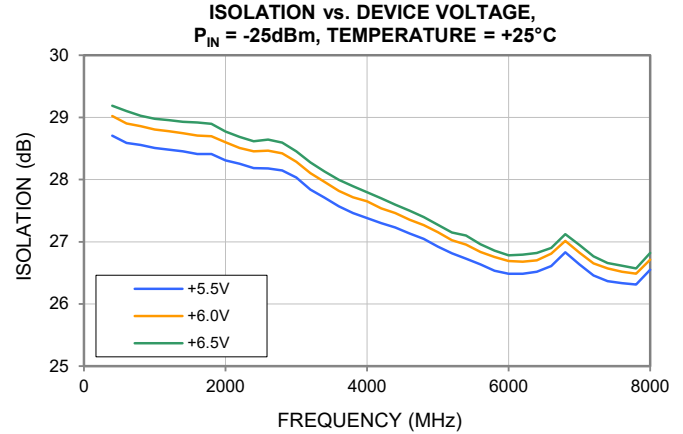
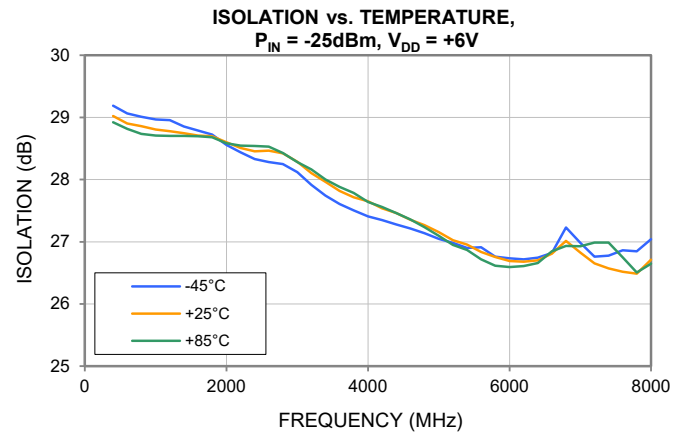
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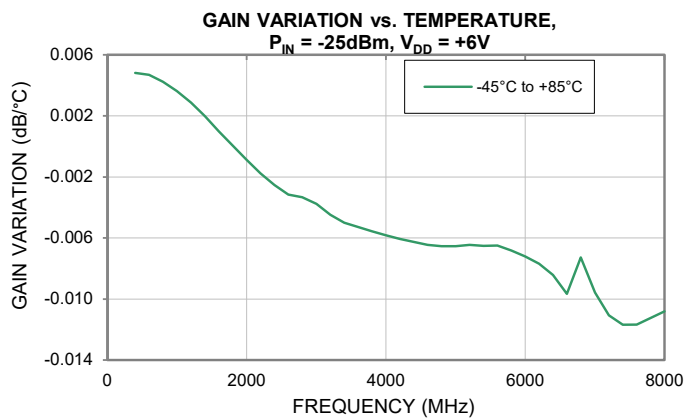
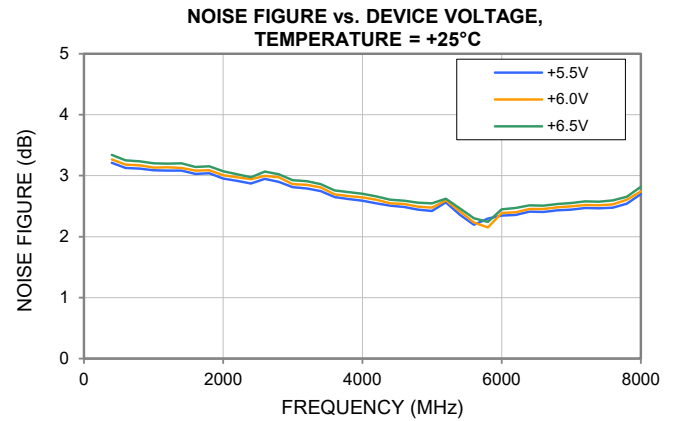
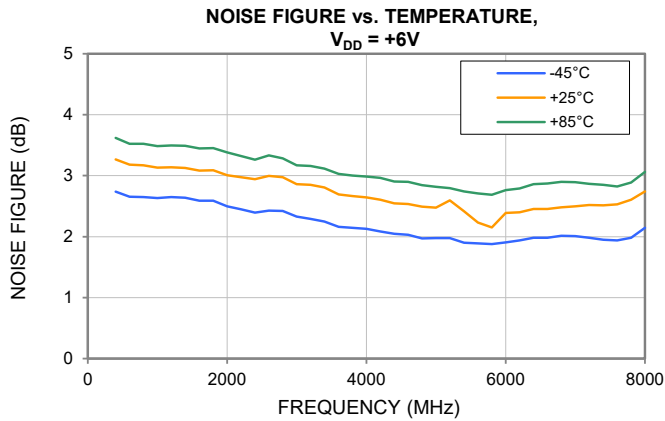
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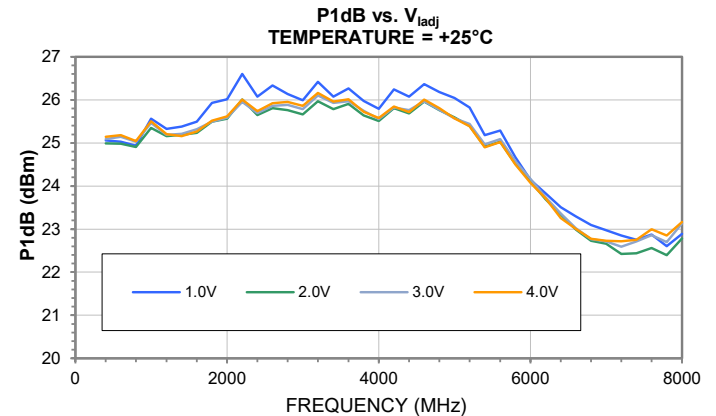
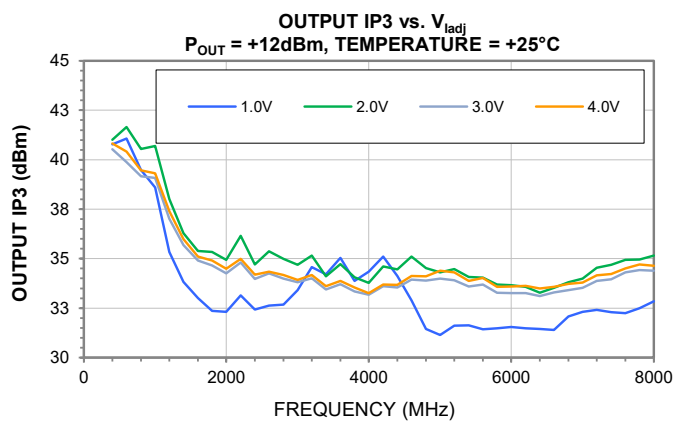
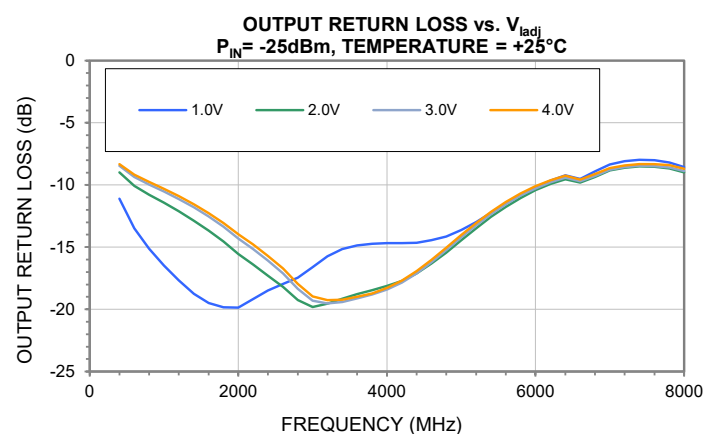
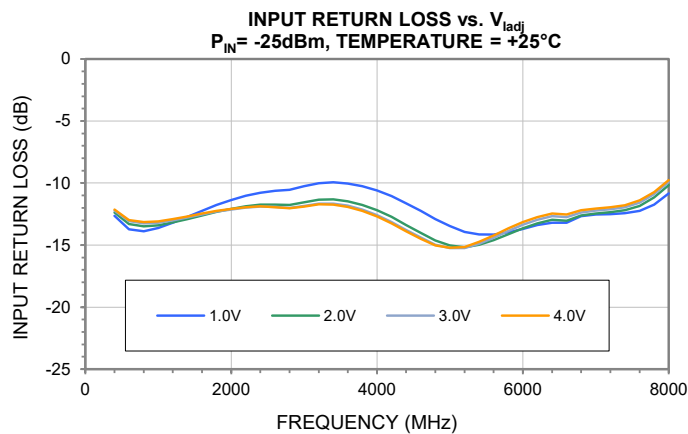
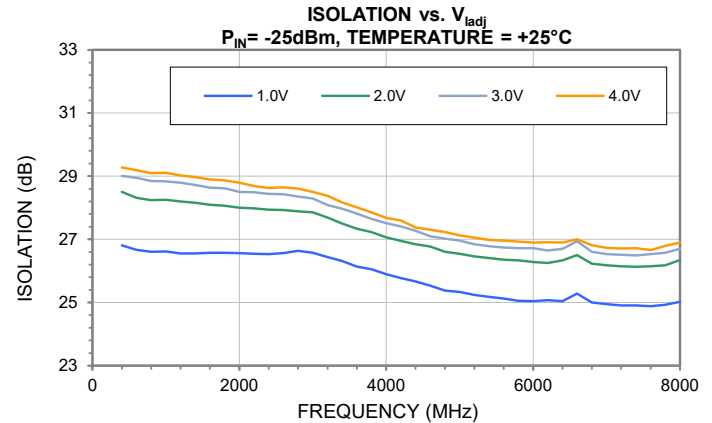
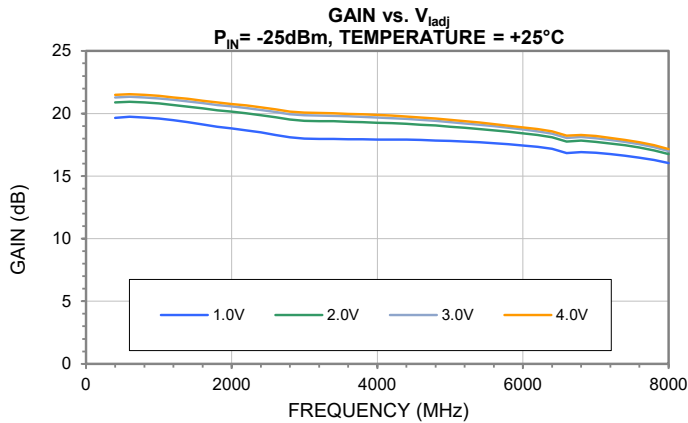
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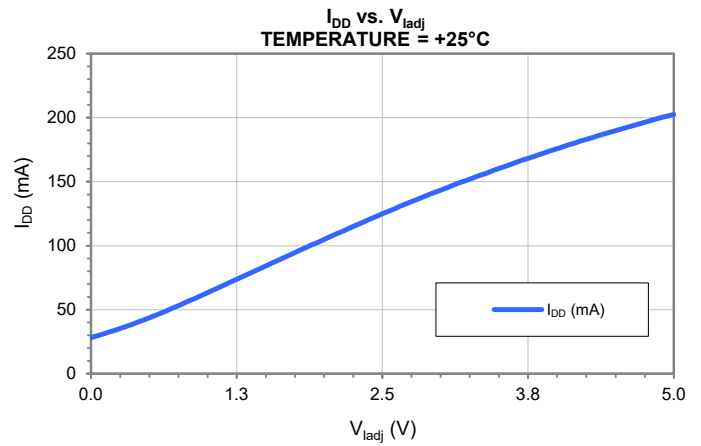
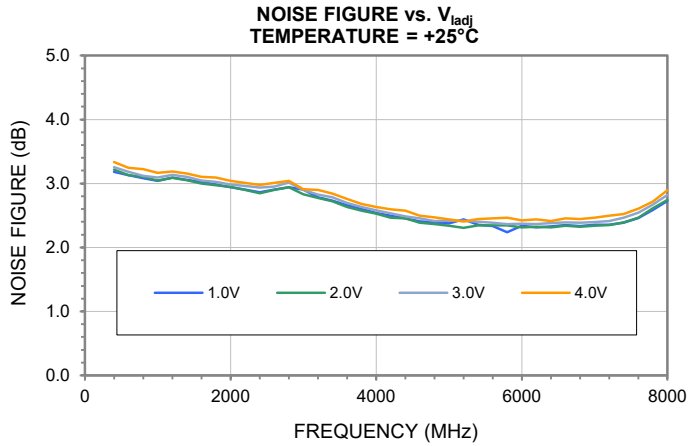
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50 $\Omega$  0.4 to 8 GHz +6V Supply

## TYPICAL PERFORMANCE GRAPHS





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## ABSOLUTE MAXIMUM RATINGS<sup>5</sup>

| Parameter                           | Ratings         |
|-------------------------------------|-----------------|
| Operating Temperature (ground lead) | -45°C to +85°C  |
| Storage Temperature                 | -65°C to +150°C |
| Junction Temperature <sup>6</sup>   | +150°C          |
| Total Power Dissipation             | 1.4W            |
| Input Power (CW)                    | +23dBm          |
| DC Voltage at V <sub>DD</sub>       | +9V             |
| DC Voltage at V <sub>Iadj</sub>     | +6V             |

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

6. Peak temperature on top of Die.

## THERMAL RESISTANCE

| Parameter                                         | Ratings  |
|---------------------------------------------------|----------|
| Thermal Resistance ( $\Theta_{jc}$ ) <sup>7</sup> | 46.3°C/W |

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

## ESD RATING

|                        | Class | Voltage Range | Reference Standard          |
|------------------------|-------|---------------|-----------------------------|
| Human Body Model (HBM) | 1A    | 250V to <500V | ANSI/ESDA/JEDEC JS-001-2017 |



ESD HANDLING PRECAUTION: This device is designed to be Class 1A 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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## FUNCTIONAL DIAGRAM

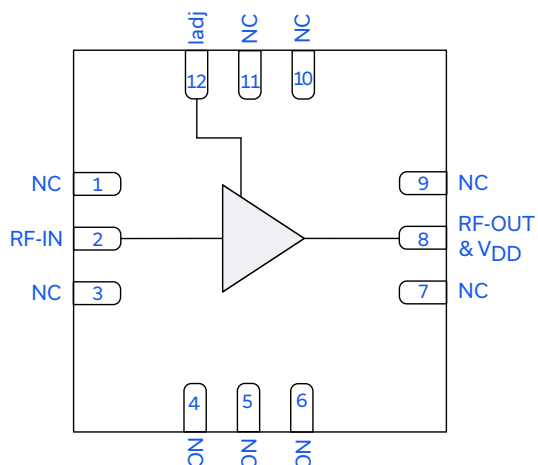


Figure 1. PMA3-83LP+ Functional Diagram

## PAD DESCRIPTION

| Function                 | Pad Number    | Description (Refer to Figure 2)                                                  |
|--------------------------|---------------|----------------------------------------------------------------------------------|
| RF-IN                    | 2             | Connects to RF Input Pad via C1.                                                 |
| RF-OUT & V <sub>DD</sub> | 8             | Connects to RF Output Pad via C2 and connects to V <sub>DD</sub> via L1.         |
| ladj                     | 12            | Connects to Current Adjust Pad. Connects to V <sub>DD</sub> via R1.              |
| NC                       | 1, 3-7, 9-11  | Not used internally. Connected to ground on Test Board.                          |
| GND                      | Paddle, Index | Paddle connected to ground on Test Board. (Paddle & Index connected internally.) |

## CHARACTERIZATION TEST BOARD

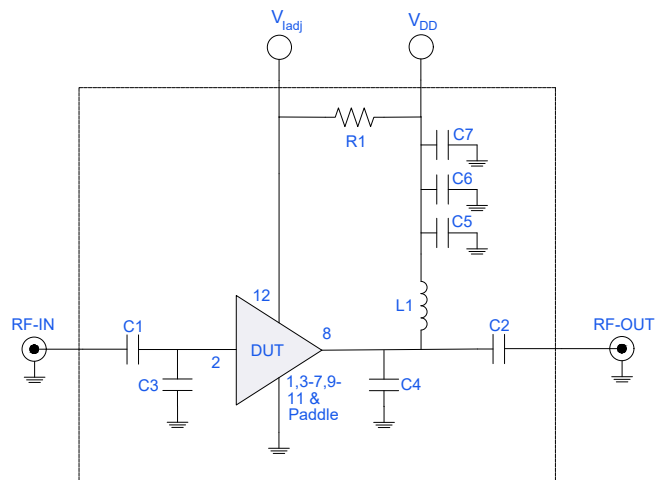


Figure 2. DUT soldered on Mini-Circuits Characterization Test Board: TB-PMA3-83LPC+. If V<sub>ladj</sub> is used independently of V<sub>DD</sub> then R1 needs to be removed from the circuit.

### Electrical Parameters and Conditions

Gain, Return Loss, Output Power at 1dB Compression (P<sub>1dB</sub>), Output IP<sub>3</sub> (OIP<sub>3</sub>), and Noise Figure measured using N5242A PNA-X microwave network analyzer.

Conditions:

1. Gain and Return Loss: P<sub>IN</sub> = -25dBm
2. Output IP<sub>3</sub> (OIP<sub>3</sub>): Two tones, spaced 1MHz apart, +12dBm/tone at output.
3. V<sub>DD</sub> = +6V

| Component | Vendor    | Vendor P/N         | Value | Size |
|-----------|-----------|--------------------|-------|------|
| C1, C2    | Murata    | GRM1555C1H101JA01D | 100pF | 0402 |
| C3        | Murata    | GJM1555C1HR40WB01D | 0.4pF | 0402 |
| C4        | Murata    | GJM1555C1HR10WB01D | 0.1pF | 0402 |
| C5        | Murata    | GRM1555C1H100JA01D | 10pF  | 0402 |
| C6        | Murata    | GRM155C71A105KE11D | 1uF   | 0402 |
| C7        | Murata    | GRM188D71A106MA73J | 10uF  | 0603 |
| L1        | Coilcraft | 0603CS-33NXJEW     | 33nH  | 0603 |
| R1        | KOA Speer | RK73H1ETTP2201F    | 2.2kΩ | 0402 |



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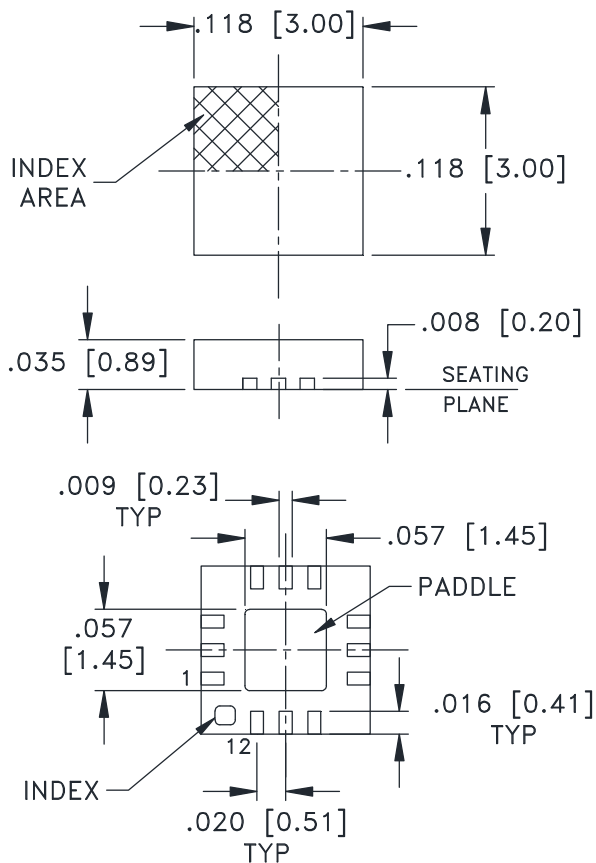
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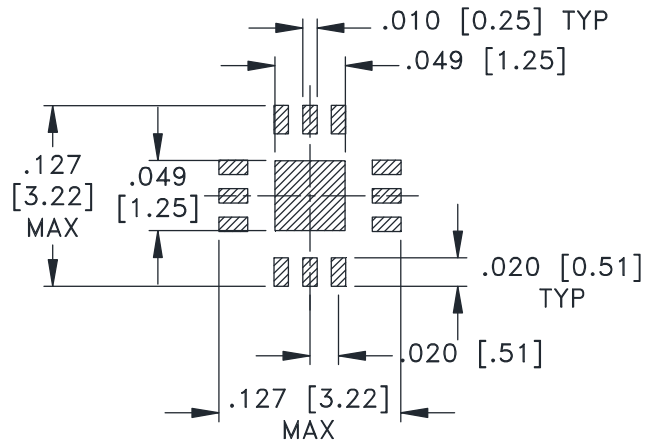
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## CASE STYLE DRAWING



## PCB Land Pattern

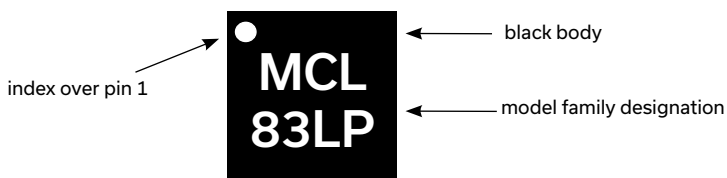


SUGGESTED LAYOUT,  
TOLERANCE TO BE WITHIN  $\pm 0.002$

Weight: .02 Grams

Dimensions are in inches [mm]. 2 Pl.  $\pm 0.01$ ; 3 Pl.  $\pm 0.004$

## PRODUCT MARKING



Marking may contain other features or characters for internal lot control





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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                            | DQ1225 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, 1K or 2K devices          |
| Suggested Layout for PCB Design       | PL-757                                                         |
| Evaluation Board                      | TB-PMA3-83LPC+                                                 |
|                                       | Gerber File                                                    |
| Environmental Ratings                 | ENV08T1                                                        |

## NOTES

- A. 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.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. 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)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +6.00\text{ V}$ ,  $I_{DD} = 148\text{mA}$  @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |         | IP-3<br>Output | 1dB<br>Comp.<br>Output | Noise<br>Figure |
|-------|------|-----------|-------------------------|--------------------------|-----------|---------|----------------|------------------------|-----------------|
| (GHz) | (dB) | (dB)      | (dB)                    | (dB)                     | K         | Measure | (dBm)          | (dBm)                  | (dB)            |
| 400   | 21.3 | 29.0      | -12.1                   | -8.4                     | 1.3       | 0.7     | 40.7           | 25.0                   | 3.3             |
| 600   | 21.3 | 28.9      | -13.0                   | -9.2                     | 1.3       | 0.7     | 40.4           | 25.1                   | 3.2             |
| 800   | 21.3 | 28.9      | -13.2                   | -9.7                     | 1.3       | 0.7     | 39.3           | 25.1                   | 3.2             |
| 1000  | 21.1 | 28.8      | -13.0                   | -10.1                    | 1.3       | 0.7     | 39.2           | 25.5                   | 3.1             |
| 1200  | 21.0 | 28.8      | -12.6                   | -10.5                    | 1.3       | 0.8     | 37.7           | 25.3                   | 3.1             |
| 1400  | 20.9 | 28.7      | -12.2                   | -11.1                    | 1.3       | 0.8     | 36.1           | 25.2                   | 3.1             |
| 1600  | 20.7 | 28.7      | -12.0                   | -11.8                    | 1.3       | 0.8     | 35.1           | 25.3                   | 3.1             |
| 1800  | 20.5 | 28.7      | -11.9                   | -12.5                    | 1.3       | 0.8     | 34.7           | 25.4                   | 3.1             |
| 2000  | 20.4 | 28.6      | -11.9                   | -13.4                    | 1.3       | 0.9     | 34.0           | 25.4                   | 3.0             |
| 2200  | 20.3 | 28.5      | -12.1                   | -14.3                    | 1.3       | 0.9     | 34.2           | 25.6                   | 3.0             |
| 2400  | 20.1 | 28.5      | -12.3                   | -15.0                    | 1.4       | 0.9     | 33.1           | 25.3                   | 2.9             |
| 2600  | 20.0 | 28.5      | -12.8                   | -15.7                    | 1.4       | 0.9     | 33.6           | 25.6                   | 3.0             |
| 2800  | 19.8 | 28.4      | -13.2                   | -16.5                    | 1.4       | 0.9     | 33.3           | 25.4                   | 3.0             |
| 3000  | 19.7 | 28.3      | -13.3                   | -17.1                    | 1.4       | 0.9     | 33.7           | 25.7                   | 2.9             |
| 3200  | 19.7 | 28.1      | -13.2                   | -17.1                    | 1.4       | 0.9     | 34.0           | 25.8                   | 2.8             |
| 3400  | 19.6 | 28.0      | -13.1                   | -17.2                    | 1.4       | 0.9     | 33.5           | 25.6                   | 2.8             |
| 3600  | 19.6 | 27.8      | -13.0                   | -17.2                    | 1.4       | 0.9     | 33.6           | 25.8                   | 2.7             |
| 3800  | 19.5 | 27.7      | -12.8                   | -17.3                    | 1.4       | 0.9     | 33.7           | 25.9                   | 2.7             |
| 4000  | 19.4 | 27.7      | -12.5                   | -17.5                    | 1.4       | 0.9     | 33.8           | 25.7                   | 2.6             |
| 4200  | 19.3 | 27.5      | -12.3                   | -17.5                    | 1.4       | 0.9     | 33.8           | 25.8                   | 2.6             |
| 4400  | 19.2 | 27.5      | -12.2                   | -17.3                    | 1.3       | 0.9     | 34.0           | 25.9                   | 2.5             |
| 4600  | 19.1 | 27.4      | -12.3                   | -16.9                    | 1.4       | 0.9     | 33.9           | 25.8                   | 2.5             |
| 4800  | 19.0 | 27.3      | -12.6                   | -16.1                    | 1.3       | 0.9     | 34.0           | 25.6                   | 2.5             |
| 5000  | 18.9 | 27.2      | -13.2                   | -15.3                    | 1.3       | 0.9     | 33.7           | 25.0                   | 2.5             |
| 5200  | 18.9 | 27.0      | -14.1                   | -14.3                    | 1.3       | 0.9     | 33.7           | 25.0                   | 2.6             |
| 5400  | 18.8 | 27.0      | -15.1                   | -13.2                    | 1.3       | 0.8     | 34.0           | 25.1                   | 2.4             |
| 5600  | 18.7 | 26.8      | -16.0                   | -12.1                    | 1.3       | 0.8     | 33.8           | 24.8                   | 2.2             |
| 5800  | 18.6 | 26.8      | -16.1                   | -11.4                    | 1.3       | 0.8     | 33.9           | 24.8                   | 2.2             |
| 6000  | 18.5 | 26.7      | -15.2                   | -10.7                    | 1.3       | 0.8     | 33.6           | 24.3                   | 2.4             |
| 6200  | 18.3 | 26.7      | -13.8                   | -10.3                    | 1.3       | 0.8     | 33.4           | 24.0                   | 2.4             |
| 6400  | 18.1 | 26.7      | -12.6                   | -10.1                    | 1.3       | 0.9     | 33.5           | 23.7                   | 2.5             |
| 6600  | 17.8 | 26.8      | -11.6                   | -10.2                    | 1.3       | 0.9     | 33.4           | 23.3                   | 2.5             |
| 6800  | 17.4 | 27.0      | -11.3                   | -11.1                    | 1.4       | 0.9     | 33.7           | 23.2                   | 2.5             |
| 7000  | 17.4 | 26.8      | -10.8                   | -11.0                    | 1.5       | 1.0     | 33.9           | 23.3                   | 2.5             |
| 7200  | 17.4 | 26.7      | -10.6                   | -10.3                    | 1.5       | 1.0     | 33.9           | 23.4                   | 2.5             |
| 7400  | 17.3 | 26.6      | -10.9                   | -10.0                    | 1.6       | 1.0     | 34.0           | 23.3                   | 2.5             |
| 7600  | 17.2 | 26.5      | -11.5                   | -9.8                     | 1.7       | 0.9     | 34.0           | 22.9                   | 2.5             |
| 7800  | 17.1 | 26.5      | -12.1                   | -9.5                     | 1.7       | 0.9     | 33.9           | 22.9                   | 2.6             |
| 8000  | 16.8 | 26.7      | -11.6                   | -9.2                     | 1.7       | 0.9     | 34.1           | 22.9                   | 2.7             |

*Typical Performance Data***Definitions:**

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +5.50\text{ V}$ ,  $I_{DD} = 128\text{mA}$  @ Temperature =  $+25^{\circ}\text{C}$ 

| FREQ  | Gain | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |         | IP-3<br>Output | 1dB<br>Comp.<br>Output | Noise<br>Figure |
|-------|------|-----------|-------------------------|--------------------------|-----------|---------|----------------|------------------------|-----------------|
| (GHz) | (dB) | (dB)      | (dB)                    | (dB)                     | K         | Measure | (dBm)          | (dBm)                  | (dB)            |
| 400   | 21.0 | 28.7      | -12.1                   | -8.4                     | 1.3       | 0.7     | 40.8           | 24.1                   | 3.2             |
| 600   | 21.0 | 28.6      | -13.0                   | -9.2                     | 1.3       | 0.7     | 40.6           | 24.2                   | 3.1             |
| 800   | 20.9 | 28.6      | -13.2                   | -9.7                     | 1.3       | 0.7     | 38.8           | 24.2                   | 3.1             |
| 1000  | 20.8 | 28.5      | -13.0                   | -10.1                    | 1.3       | 0.7     | 38.4           | 24.6                   | 3.1             |
| 1200  | 20.7 | 28.5      | -12.7                   | -10.5                    | 1.3       | 0.8     | 36.7           | 24.5                   | 3.1             |
| 1400  | 20.6 | 28.5      | -12.3                   | -11.1                    | 1.3       | 0.8     | 35.1           | 24.3                   | 3.1             |
| 1600  | 20.4 | 28.4      | -12.1                   | -11.8                    | 1.3       | 0.8     | 34.3           | 24.4                   | 3.0             |
| 1800  | 20.2 | 28.4      | -12.0                   | -12.6                    | 1.3       | 0.8     | 34.0           | 24.5                   | 3.0             |
| 2000  | 20.1 | 28.3      | -12.0                   | -13.5                    | 1.3       | 0.9     | 33.4           | 24.5                   | 3.0             |
| 2200  | 20.0 | 28.3      | -12.2                   | -14.3                    | 1.3       | 0.9     | 33.6           | 24.7                   | 2.9             |
| 2400  | 19.9 | 28.2      | -12.5                   | -15.0                    | 1.4       | 0.9     | 32.7           | 24.4                   | 2.9             |
| 2600  | 19.7 | 28.2      | -12.9                   | -15.7                    | 1.4       | 0.9     | 33.2           | 24.8                   | 2.9             |
| 2800  | 19.5 | 28.1      | -13.4                   | -16.5                    | 1.4       | 0.9     | 33.0           | 24.6                   | 2.9             |
| 3000  | 19.5 | 28.0      | -13.4                   | -17.1                    | 1.4       | 0.9     | 33.5           | 24.8                   | 2.8             |
| 3200  | 19.4 | 27.8      | -13.3                   | -17.1                    | 1.4       | 0.9     | 33.7           | 24.9                   | 2.8             |
| 3400  | 19.4 | 27.7      | -13.3                   | -17.1                    | 1.4       | 0.9     | 33.2           | 24.8                   | 2.7             |
| 3600  | 19.3 | 27.6      | -13.2                   | -17.1                    | 1.4       | 0.9     | 33.4           | 24.9                   | 2.6             |
| 3800  | 19.3 | 27.5      | -12.9                   | -17.2                    | 1.4       | 0.9     | 33.6           | 25.0                   | 2.6             |
| 4000  | 19.2 | 27.4      | -12.6                   | -17.3                    | 1.4       | 0.9     | 33.6           | 24.9                   | 2.6             |
| 4200  | 19.1 | 27.3      | -12.4                   | -17.3                    | 1.4       | 0.9     | 33.6           | 25.0                   | 2.5             |
| 4400  | 19.0 | 27.2      | -12.3                   | -17.2                    | 1.4       | 0.9     | 33.9           | 25.1                   | 2.5             |
| 4600  | 18.9 | 27.1      | -12.4                   | -16.7                    | 1.3       | 0.9     | 33.8           | 25.0                   | 2.5             |
| 4800  | 18.8 | 27.0      | -12.8                   | -16.0                    | 1.3       | 0.9     | 33.8           | 24.8                   | 2.4             |
| 5000  | 18.7 | 26.9      | -13.4                   | -15.1                    | 1.3       | 0.9     | 33.4           | 24.2                   | 2.4             |
| 5200  | 18.7 | 26.8      | -14.3                   | -14.2                    | 1.3       | 0.9     | 33.5           | 24.2                   | 2.6             |
| 5400  | 18.6 | 26.7      | -15.3                   | -13.1                    | 1.3       | 0.8     | 33.8           | 24.4                   | 2.4             |
| 5600  | 18.5 | 26.6      | -16.3                   | -12.0                    | 1.3       | 0.8     | 33.6           | 24.0                   | 2.2             |
| 5800  | 18.4 | 26.5      | -16.5                   | -11.3                    | 1.3       | 0.8     | 33.7           | 24.0                   | 2.3             |
| 6000  | 18.3 | 26.5      | -15.6                   | -10.6                    | 1.3       | 0.8     | 33.4           | 23.6                   | 2.3             |
| 6200  | 18.1 | 26.5      | -14.2                   | -10.2                    | 1.3       | 0.8     | 33.3           | 23.2                   | 2.4             |
| 6400  | 18.0 | 26.5      | -12.9                   | -10.0                    | 1.3       | 0.9     | 33.5           | 22.9                   | 2.4             |
| 6600  | 17.7 | 26.6      | -11.9                   | -10.1                    | 1.3       | 0.9     | 33.5           | 22.5                   | 2.4             |
| 6800  | 17.3 | 26.8      | -11.6                   | -11.0                    | 1.4       | 0.9     | 33.6           | 22.4                   | 2.4             |
| 7000  | 17.3 | 26.6      | -11.1                   | -11.0                    | 1.5       | 1.0     | 33.7           | 22.4                   | 2.4             |
| 7200  | 17.3 | 26.5      | -10.8                   | -10.3                    | 1.5       | 1.0     | 33.7           | 22.5                   | 2.5             |
| 7400  | 17.2 | 26.4      | -11.2                   | -10.0                    | 1.6       | 1.0     | 33.8           | 22.5                   | 2.5             |
| 7600  | 17.1 | 26.3      | -11.8                   | -9.7                     | 1.7       | 0.9     | 34.0           | 22.0                   | 2.5             |
| 7800  | 17.0 | 26.3      | -12.4                   | -9.4                     | 1.7       | 0.9     | 33.9           | 22.1                   | 2.5             |
| 8000  | 16.6 | 26.5      | -11.9                   | -9.1                     | 1.7       | 0.9     | 33.9           | 22.0                   | 2.7             |

## Typical Performance Data

### Definitions:

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +6.50\text{ V}$ ,  $I_{DD} = 170\text{mA}$  @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | Noise Figure |
|-------|------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------------|
| (GHz) | (dB) | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (dB)         |
| 400   | 21.5 | 29.2      | -12.2             | -8.5               | 1.3       | 0.7     | 40.6        | 25.8             | 3.3          |
| 600   | 21.5 | 29.1      | -13.1             | -9.4               | 1.3       | 0.7     | 40.4        | 25.9             | 3.3          |
| 800   | 21.5 | 29.0      | -13.2             | -9.9               | 1.3       | 0.7     | 39.7        | 25.9             | 3.2          |
| 1000  | 21.4 | 29.0      | -13.0             | -10.3              | 1.3       | 0.7     | 39.7        | 26.2             | 3.2          |
| 1200  | 21.2 | 29.0      | -12.6             | -10.7              | 1.3       | 0.8     | 38.5        | 26.1             | 3.2          |
| 1400  | 21.0 | 28.9      | -12.2             | -11.3              | 1.3       | 0.8     | 37.1        | 26.0             | 3.2          |
| 1600  | 20.9 | 28.9      | -11.9             | -12.0              | 1.3       | 0.8     | 36.0        | 26.0             | 3.1          |
| 1800  | 20.7 | 28.9      | -11.8             | -12.8              | 1.3       | 0.8     | 35.6        | 26.2             | 3.2          |
| 2000  | 20.6 | 28.8      | -11.8             | -13.7              | 1.3       | 0.9     | 34.8        | 26.2             | 3.1          |
| 2200  | 20.4 | 28.7      | -11.9             | -14.5              | 1.3       | 0.9     | 34.8        | 26.4             | 3.0          |
| 2400  | 20.3 | 28.6      | -12.2             | -15.2              | 1.4       | 0.9     | 33.7        | 26.0             | 3.0          |
| 2600  | 20.1 | 28.6      | -12.6             | -16.0              | 1.4       | 0.9     | 34.2        | 26.4             | 3.1          |
| 2800  | 19.9 | 28.6      | -13.0             | -16.7              | 1.4       | 0.9     | 33.9        | 26.2             | 3.0          |
| 3000  | 19.9 | 28.5      | -13.1             | -17.3              | 1.4       | 0.9     | 34.3        | 26.4             | 2.9          |
| 3200  | 19.8 | 28.3      | -13.0             | -17.3              | 1.4       | 0.9     | 34.5        | 26.6             | 2.9          |
| 3400  | 19.8 | 28.1      | -12.9             | -17.3              | 1.4       | 0.9     | 33.9        | 26.4             | 2.9          |
| 3600  | 19.7 | 28.0      | -12.8             | -17.3              | 1.4       | 0.9     | 34.1        | 26.5             | 2.8          |
| 3800  | 19.6 | 27.9      | -12.6             | -17.4              | 1.4       | 0.9     | 34.2        | 26.6             | 2.7          |
| 4000  | 19.5 | 27.8      | -12.3             | -17.6              | 1.4       | 0.9     | 34.1        | 26.5             | 2.7          |
| 4200  | 19.4 | 27.7      | -12.1             | -17.6              | 1.4       | 0.9     | 34.2        | 26.5             | 2.7          |
| 4400  | 19.3 | 27.6      | -11.9             | -17.4              | 1.3       | 0.9     | 34.4        | 26.6             | 2.6          |
| 4600  | 19.2 | 27.5      | -12.1             | -17.0              | 1.3       | 0.9     | 34.3        | 26.4             | 2.6          |
| 4800  | 19.1 | 27.4      | -12.4             | -16.2              | 1.3       | 0.9     | 34.4        | 26.2             | 2.6          |
| 5000  | 19.1 | 27.3      | -13.0             | -15.4              | 1.3       | 0.9     | 34.0        | 25.6             | 2.5          |
| 5200  | 19.0 | 27.2      | -13.8             | -14.4              | 1.3       | 0.9     | 34.1        | 25.6             | 2.6          |
| 5400  | 18.9 | 27.1      | -14.8             | -13.3              | 1.3       | 0.9     | 34.4        | 25.8             | 2.5          |
| 5600  | 18.8 | 27.0      | -15.6             | -12.1              | 1.3       | 0.8     | 34.2        | 25.5             | 2.3          |
| 5800  | 18.7 | 26.9      | -15.7             | -11.4              | 1.3       | 0.8     | 34.3        | 25.4             | 2.2          |
| 6000  | 18.6 | 26.8      | -14.8             | -10.8              | 1.3       | 0.8     | 33.9        | 25.0             | 2.4          |
| 6200  | 18.4 | 26.8      | -13.6             | -10.4              | 1.3       | 0.8     | 33.7        | 24.6             | 2.5          |
| 6400  | 18.2 | 26.8      | -12.3             | -10.2              | 1.3       | 0.9     | 33.9        | 24.4             | 2.5          |
| 6600  | 17.9 | 26.9      | -11.4             | -10.2              | 1.3       | 0.9     | 33.7        | 24.0             | 2.5          |
| 6800  | 17.5 | 27.1      | -11.0             | -11.1              | 1.4       | 0.9     | 34.1        | 23.9             | 2.5          |
| 7000  | 17.5 | 27.0      | -10.6             | -11.0              | 1.5       | 1.0     | 34.4        | 24.0             | 2.6          |
| 7200  | 17.5 | 26.8      | -10.4             | -10.4              | 1.5       | 1.0     | 34.4        | 24.1             | 2.6          |
| 7400  | 17.4 | 26.7      | -10.7             | -10.1              | 1.6       | 1.0     | 34.4        | 24.0             | 2.6          |
| 7600  | 17.3 | 26.6      | -11.2             | -9.8               | 1.7       | 0.9     | 34.4        | 23.6             | 2.6          |
| 7800  | 17.2 | 26.6      | -11.8             | -9.6               | 1.7       | 0.9     | 34.4        | 23.7             | 2.7          |
| 8000  | 16.8 | 26.8      | -11.3             | -9.2               | 1.7       | 0.9     | 34.6        | 23.6             | 2.8          |

## Typical Performance Data

### Definitions:

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +6.00\text{ V}$ ,  $I_{DD} = 171\text{mA}$  @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | Noise Figure |
|-------|------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------------|
| (GHz) | (dB) | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (dB)         |
| 400   | 20.7 | 29.2      | -10.6             | -6.2               | 1.3       | 0.6     | 39.1        | 25.0             | 2.7          |
| 600   | 20.8 | 29.1      | -11.2             | -6.6               | 1.3       | 0.6     | 39.4        | 25.1             | 2.7          |
| 800   | 20.8 | 29.0      | -11.4             | -6.9               | 1.3       | 0.6     | 39.1        | 25.2             | 2.6          |
| 1000  | 20.7 | 29.0      | -11.4             | -7.1               | 1.3       | 0.6     | 39.6        | 25.5             | 2.6          |
| 1200  | 20.7 | 29.0      | -11.3             | -7.4               | 1.3       | 0.7     | 39.4        | 25.4             | 2.6          |
| 1400  | 20.6 | 28.9      | -11.3             | -7.8               | 1.3       | 0.7     | 38.2        | 25.3             | 2.6          |
| 1600  | 20.6 | 28.8      | -11.5             | -8.4               | 1.3       | 0.7     | 37.3        | 25.3             | 2.6          |
| 1800  | 20.6 | 28.7      | -11.9             | -8.9               | 1.3       | 0.7     | 36.9        | 25.4             | 2.6          |
| 2000  | 20.6 | 28.6      | -12.5             | -9.6               | 1.3       | 0.8     | 35.7        | 25.5             | 2.5          |
| 2200  | 20.6 | 28.4      | -13.2             | -10.4              | 1.3       | 0.8     | 35.7        | 25.7             | 2.4          |
| 2400  | 20.5 | 28.3      | -14.1             | -11.1              | 1.3       | 0.8     | 34.0        | 25.4             | 2.4          |
| 2600  | 20.5 | 28.3      | -15.3             | -11.8              | 1.3       | 0.8     | 34.5        | 25.7             | 2.4          |
| 2800  | 20.3 | 28.3      | -16.7             | -12.6              | 1.4       | 0.8     | 33.8        | 25.5             | 2.4          |
| 3000  | 20.3 | 28.1      | -17.7             | -13.6              | 1.4       | 0.8     | 34.1        | 25.7             | 2.3          |
| 3200  | 20.4 | 27.9      | -17.7             | -14.0              | 1.3       | 0.8     | 34.2        | 25.9             | 2.3          |
| 3400  | 20.4 | 27.7      | -17.4             | -14.3              | 1.3       | 0.8     | 33.4        | 25.8             | 2.2          |
| 3600  | 20.4 | 27.6      | -17.1             | -14.5              | 1.3       | 0.8     | 33.6        | 26.0             | 2.2          |
| 3800  | 20.3 | 27.5      | -16.5             | -14.7              | 1.3       | 0.8     | 33.5        | 26.0             | 2.1          |
| 4000  | 20.2 | 27.4      | -15.9             | -14.9              | 1.3       | 0.8     | 33.3        | 25.8             | 2.1          |
| 4200  | 20.2 | 27.3      | -15.5             | -15.1              | 1.3       | 0.8     | 33.4        | 26.0             | 2.1          |
| 4400  | 20.1 | 27.3      | -15.3             | -15.3              | 1.3       | 0.8     | 33.5        | 26.0             | 2.0          |
| 4600  | 20.0 | 27.2      | -15.5             | -15.4              | 1.3       | 0.8     | 33.4        | 26.0             | 2.0          |
| 4800  | 20.0 | 27.1      | -16.2             | -15.3              | 1.3       | 0.8     | 33.7        | 25.8             | 2.0          |
| 5000  | 19.9 | 27.0      | -17.3             | -14.8              | 1.3       | 0.8     | 33.3        | 25.5             | 2.0          |
| 5200  | 19.9 | 27.0      | -19.0             | -14.2              | 1.3       | 0.8     | 33.3        | 25.1             | 2.0          |
| 5400  | 19.9 | 26.9      | -21.0             | -13.4              | 1.3       | 0.8     | 33.6        | 25.3             | 1.9          |
| 5600  | 19.8 | 26.9      | -21.3             | -12.2              | 1.3       | 0.8     | 33.5        | 25.1             | 1.9          |
| 5800  | 19.7 | 26.8      | -19.7             | -11.6              | 1.3       | 0.8     | 33.7        | 25.1             | 1.9          |
| 6000  | 19.7 | 26.7      | -17.2             | -10.9              | 1.3       | 0.8     | 33.3        | 24.7             | 1.9          |
| 6200  | 19.6 | 26.7      | -15.2             | -10.4              | 1.3       | 0.8     | 33.0        | 24.2             | 1.9          |
| 6400  | 19.4 | 26.7      | -13.6             | -10.3              | 1.3       | 0.8     | 33.2        | 23.9             | 2.0          |
| 6600  | 19.3 | 26.8      | -12.6             | -10.3              | 1.3       | 0.8     | 33.1        | 23.3             | 2.0          |
| 6800  | 18.8 | 27.2      | -12.6             | -11.7              | 1.3       | 0.8     | 33.5        | 22.8             | 2.0          |
| 7000  | 18.9 | 27.0      | -12.7             | -11.8              | 1.5       | 0.9     | 33.7        | 22.9             | 2.0          |
| 7200  | 19.0 | 26.8      | -12.7             | -11.4              | 1.4       | 0.9     | 33.7        | 23.0             | 2.0          |
| 7400  | 18.9 | 26.8      | -13.7             | -11.3              | 1.4       | 0.9     | 33.8        | 22.6             | 2.0          |
| 7600  | 18.7 | 26.9      | -15.4             | -11.5              | 1.5       | 0.9     | 34.4        | 22.0             | 1.9          |
| 7800  | 18.5 | 26.8      | -16.5             | -11.3              | 1.6       | 0.9     | 34.6        | 21.9             | 2.0          |
| 8000  | 18.3 | 27.0      | -15.0             | -10.8              | 1.6       | 0.9     | 34.9        | 21.9             | 2.1          |

*Typical Performance Data***Definitions:**

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +5.50$  V,  $I_{DD} = 147$ mA @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |         | IP-3<br>Output | 1dB<br>Comp.<br>Output | Noise<br>Figure |
|-------|------|-----------|-------------------------|--------------------------|-----------|---------|----------------|------------------------|-----------------|
| (GHz) | (dB) | (dB)      | (dB)                    | (dB)                     | K         | Measure | (dBm)          | (dBm)                  | (dB)            |
| 400   | 20.4 | 29.0      | -10.6                   | -6.2                     | 1.3       | 0.6     | 40.3           | 24.0                   | 2.7             |
| 600   | 20.5 | 28.8      | -11.2                   | -6.6                     | 1.3       | 0.6     | 40.9           | 24.1                   | 2.6             |
| 800   | 20.5 | 28.8      | -11.4                   | -6.8                     | 1.3       | 0.6     | 40.5           | 24.2                   | 2.6             |
| 1000  | 20.5 | 28.7      | -11.4                   | -7.1                     | 1.3       | 0.6     | 40.7           | 24.4                   | 2.6             |
| 1200  | 20.4 | 28.7      | -11.3                   | -7.4                     | 1.3       | 0.7     | 39.7           | 24.3                   | 2.6             |
| 1400  | 20.4 | 28.6      | -11.4                   | -7.7                     | 1.3       | 0.7     | 37.7           | 24.3                   | 2.6             |
| 1600  | 20.4 | 28.6      | -11.6                   | -8.3                     | 1.3       | 0.7     | 36.6           | 24.3                   | 2.5             |
| 1800  | 20.4 | 28.5      | -12.0                   | -8.8                     | 1.3       | 0.7     | 36.2           | 24.4                   | 2.5             |
| 2000  | 20.4 | 28.4      | -12.6                   | -9.5                     | 1.3       | 0.8     | 35.1           | 24.5                   | 2.4             |
| 2200  | 20.4 | 28.2      | -13.4                   | -10.3                    | 1.3       | 0.8     | 35.1           | 24.6                   | 2.4             |
| 2400  | 20.3 | 28.1      | -14.3                   | -11.0                    | 1.3       | 0.8     | 33.6           | 24.4                   | 2.3             |
| 2600  | 20.3 | 28.1      | -15.6                   | -11.7                    | 1.3       | 0.8     | 34.0           | 24.7                   | 2.4             |
| 2800  | 20.1 | 28.0      | -17.2                   | -12.5                    | 1.4       | 0.8     | 33.5           | 24.5                   | 2.4             |
| 3000  | 20.1 | 27.9      | -18.2                   | -13.5                    | 1.4       | 0.8     | 33.7           | 24.7                   | 2.3             |
| 3200  | 20.2 | 27.7      | -18.3                   | -13.9                    | 1.3       | 0.8     | 33.9           | 24.9                   | 2.3             |
| 3400  | 20.2 | 27.5      | -18.1                   | -14.2                    | 1.3       | 0.8     | 33.2           | 24.8                   | 2.2             |
| 3600  | 20.2 | 27.4      | -17.8                   | -14.4                    | 1.3       | 0.8     | 33.4           | 24.9                   | 2.1             |
| 3800  | 20.2 | 27.3      | -17.1                   | -14.6                    | 1.3       | 0.8     | 33.4           | 25.0                   | 2.1             |
| 4000  | 20.1 | 27.3      | -16.5                   | -14.8                    | 1.3       | 0.8     | 33.2           | 24.8                   | 2.1             |
| 4200  | 20.1 | 27.2      | -16.1                   | -15.1                    | 1.3       | 0.8     | 33.4           | 25.0                   | 2.0             |
| 4400  | 20.0 | 27.1      | -16.0                   | -15.3                    | 1.3       | 0.8     | 33.6           | 25.0                   | 2.0             |
| 4600  | 19.9 | 27.0      | -16.2                   | -15.4                    | 1.3       | 0.8     | 33.5           | 25.0                   | 2.0             |
| 4800  | 19.9 | 27.0      | -16.9                   | -15.3                    | 1.3       | 0.8     | 33.8           | 24.9                   | 1.9             |
| 5000  | 19.8 | 26.9      | -18.2                   | -14.8                    | 1.3       | 0.8     | 33.5           | 24.5                   | 1.9             |
| 5200  | 19.8 | 26.8      | -20.1                   | -14.2                    | 1.3       | 0.8     | 33.5           | 24.1                   | 2.0             |
| 5400  | 19.8 | 26.8      | -22.6                   | -13.4                    | 1.3       | 0.8     | 33.8           | 24.3                   | 1.9             |
| 5600  | 19.7 | 26.8      | -22.9                   | -12.2                    | 1.3       | 0.8     | 33.6           | 24.1                   | 1.8             |
| 5800  | 19.7 | 26.6      | -20.9                   | -11.6                    | 1.3       | 0.8     | 33.7           | 24.1                   | 1.8             |
| 6000  | 19.6 | 26.6      | -18.0                   | -10.9                    | 1.3       | 0.7     | 33.5           | 23.6                   | 1.9             |
| 6200  | 19.5 | 26.6      | -15.8                   | -10.5                    | 1.3       | 0.7     | 33.3           | 23.2                   | 1.9             |
| 6400  | 19.4 | 26.6      | -14.3                   | -10.3                    | 1.3       | 0.8     | 33.6           | 22.8                   | 1.9             |
| 6600  | 19.3 | 26.7      | -13.2                   | -10.3                    | 1.3       | 0.8     | 33.8           | 22.4                   | 1.9             |
| 6800  | 18.8 | 27.1      | -13.2                   | -11.7                    | 1.3       | 0.8     | 34.2           | 21.8                   | 2.0             |
| 7000  | 18.9 | 26.9      | -13.5                   | -11.8                    | 1.5       | 0.9     | 34.6           | 21.9                   | 2.0             |
| 7200  | 19.0 | 26.6      | -13.5                   | -11.4                    | 1.4       | 0.8     | 34.4           | 22.0                   | 1.9             |
| 7400  | 18.9 | 26.7      | -14.7                   | -11.3                    | 1.4       | 0.8     | 34.6           | 21.7                   | 1.9             |
| 7600  | 18.7 | 26.8      | -16.5                   | -11.5                    | 1.5       | 0.9     | 35.4           | 21.0                   | 1.9             |
| 7800  | 18.5 | 26.7      | -17.7                   | -11.3                    | 1.6       | 0.8     | 36.0           | 21.0                   | 1.9             |
| 8000  | 18.3 | 27.0      | -16.0                   | -10.8                    | 1.6       | 0.9     | 36.5           | 21.0                   | 2.1             |



*Typical Performance Data***Definitions:**

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +6.50\text{ V}$ ,  $I_{DD} = 195\text{mA}$  @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |         | IP-3<br>Output | 1dB<br>Comp.<br>Output | Noise<br>Figure |
|-------|------|-----------|-------------------------|--------------------------|-----------|---------|----------------|------------------------|-----------------|
| (GHz) | (dB) | (dB)      | (dB)                    | (dB)                     | K         | Measure | (dBm)          | (dBm)                  | (dB)            |
| 400   | 20.9 | 29.3      | -10.7                   | -6.4                     | 1.2       | 0.6     | 36.8           | 25.9                   | 2.8             |
| 600   | 21.0 | 29.2      | -11.3                   | -6.8                     | 1.3       | 0.6     | 39.1           | 26.0                   | 2.7             |
| 800   | 21.0 | 29.1      | -11.5                   | -7.1                     | 1.3       | 0.6     | 38.8           | 26.1                   | 2.7             |
| 1000  | 20.9 | 29.1      | -11.5                   | -7.3                     | 1.3       | 0.6     | 38.4           | 26.4                   | 2.7             |
| 1200  | 20.9 | 29.1      | -11.3                   | -7.6                     | 1.3       | 0.7     | 37.1           | 26.2                   | 2.7             |
| 1400  | 20.8 | 29.0      | -11.4                   | -8.0                     | 1.3       | 0.7     | 38.3           | 26.2                   | 2.7             |
| 1600  | 20.8 | 28.9      | -11.5                   | -8.6                     | 1.3       | 0.7     | 35.4           | 26.2                   | 2.6             |
| 1800  | 20.7 | 28.9      | -11.9                   | -9.2                     | 1.3       | 0.7     | 34.2           | 26.3                   | 2.7             |
| 2000  | 20.7 | 28.7      | -12.4                   | -9.9                     | 1.3       | 0.8     | 36.3           | 26.3                   | 2.6             |
| 2200  | 20.7 | 28.6      | -13.0                   | -10.7                    | 1.3       | 0.8     | 36.2           | 26.5                   | 2.5             |
| 2400  | 20.6 | 28.5      | -13.9                   | -11.4                    | 1.3       | 0.8     | 34.5           | 26.2                   | 2.4             |
| 2600  | 20.6 | 28.4      | -15.0                   | -12.1                    | 1.3       | 0.8     | 35.0           | 26.6                   | 2.5             |
| 2800  | 20.4 | 28.4      | -16.4                   | -12.9                    | 1.4       | 0.8     | 34.2           | 26.4                   | 2.5             |
| 3000  | 20.4 | 28.2      | -17.2                   | -13.9                    | 1.4       | 0.8     | 34.5           | 26.6                   | 2.4             |
| 3200  | 20.5 | 28.0      | -17.1                   | -14.3                    | 1.3       | 0.8     | 34.6           | 26.9                   | 2.4             |
| 3400  | 20.5 | 27.9      | -16.9                   | -14.6                    | 1.3       | 0.8     | 33.7           | 26.7                   | 2.3             |
| 3600  | 20.4 | 27.7      | -16.5                   | -14.8                    | 1.3       | 0.8     | 33.8           | 26.9                   | 2.2             |
| 3800  | 20.4 | 27.6      | -15.9                   | -15.0                    | 1.3       | 0.8     | 33.8           | 26.9                   | 2.2             |
| 4000  | 20.3 | 27.5      | -15.3                   | -15.2                    | 1.3       | 0.8     | 33.5           | 26.7                   | 2.2             |
| 4200  | 20.2 | 27.5      | -14.9                   | -15.5                    | 1.3       | 0.8     | 33.6           | 26.8                   | 2.1             |
| 4400  | 20.2 | 27.4      | -14.7                   | -15.6                    | 1.3       | 0.8     | 33.7           | 26.8                   | 2.1             |
| 4600  | 20.1 | 27.3      | -14.9                   | -15.7                    | 1.3       | 0.8     | 33.5           | 26.8                   | 2.1             |
| 4800  | 20.0 | 27.2      | -15.5                   | -15.5                    | 1.3       | 0.8     | 33.8           | 26.7                   | 2.0             |
| 5000  | 20.0 | 27.2      | -16.5                   | -15.0                    | 1.3       | 0.8     | 33.4           | 26.3                   | 2.0             |
| 5200  | 19.9 | 27.1      | -18.0                   | -14.3                    | 1.3       | 0.8     | 33.4           | 26.0                   | 2.0             |
| 5400  | 19.9 | 27.0      | -19.8                   | -13.5                    | 1.3       | 0.8     | 33.7           | 26.2                   | 2.0             |
| 5600  | 19.8 | 27.0      | -20.1                   | -12.3                    | 1.3       | 0.8     | 33.5           | 26.0                   | 1.9             |
| 5800  | 19.8 | 26.9      | -18.9                   | -11.6                    | 1.3       | 0.8     | 33.7           | 26.0                   | 1.9             |
| 6000  | 19.7 | 26.8      | -16.7                   | -10.9                    | 1.3       | 0.8     | 33.3           | 25.5                   | 1.9             |
| 6200  | 19.6 | 26.8      | -14.7                   | -10.5                    | 1.3       | 0.8     | 33.0           | 25.1                   | 2.0             |
| 6400  | 19.5 | 26.8      | -13.2                   | -10.4                    | 1.3       | 0.8     | 33.1           | 24.8                   | 2.0             |
| 6600  | 19.3 | 26.9      | -12.2                   | -10.3                    | 1.3       | 0.8     | 33.0           | 24.3                   | 2.0             |
| 6800  | 18.8 | 27.3      | -12.1                   | -11.8                    | 1.3       | 0.8     | 33.2           | 23.8                   | 2.1             |
| 7000  | 18.9 | 27.1      | -12.1                   | -11.9                    | 1.5       | 0.9     | 33.4           | 23.9                   | 2.0             |
| 7200  | 19.0 | 26.8      | -12.1                   | -11.4                    | 1.4       | 0.9     | 33.5           | 23.9                   | 2.0             |
| 7400  | 18.8 | 26.8      | -13.1                   | -11.4                    | 1.4       | 0.9     | 33.5           | 23.5                   | 2.0             |
| 7600  | 18.6 | 26.9      | -14.6                   | -11.6                    | 1.6       | 0.9     | 33.6           | 22.8                   | 2.0             |
| 7800  | 18.5 | 26.9      | -15.6                   | -11.3                    | 1.6       | 0.9     | 33.8           | 22.8                   | 2.0             |
| 8000  | 18.2 | 27.1      | -14.4                   | -10.8                    | 1.6       | 0.9     | 34.0           | 22.8                   | 2.2             |

*Typical Performance Data***Definitions:**

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +6.00\text{ V}$ ,  $I_{DD} = 142\text{mA}$  @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |         | IP-3<br>Output | 1dB<br>Comp.<br>Output | Noise<br>Figure |
|-------|------|-----------|-------------------------|--------------------------|-----------|---------|----------------|------------------------|-----------------|
| (GHz) | (dB) | (dB)      | (dB)                    | (dB)                     | K         | Measure | (dBm)          | (dBm)                  | (dB)            |
| 400   | 21.3 | 28.9      | -12.6                   | -9.7                     | 1.3       | 0.7     | 40.3           | 24.8                   | 3.6             |
| 600   | 21.4 | 28.8      | -13.6                   | -11.0                    | 1.3       | 0.7     | 40.1           | 24.9                   | 3.5             |
| 800   | 21.3 | 28.7      | -13.7                   | -11.7                    | 1.3       | 0.8     | 38.9           | 24.9                   | 3.5             |
| 1000  | 21.2 | 28.7      | -13.3                   | -12.2                    | 1.3       | 0.8     | 38.8           | 25.2                   | 3.5             |
| 1200  | 21.1 | 28.7      | -12.7                   | -12.7                    | 1.3       | 0.8     | 37.2           | 25.1                   | 3.5             |
| 1400  | 20.9 | 28.7      | -12.1                   | -13.4                    | 1.3       | 0.8     | 35.7           | 25.0                   | 3.5             |
| 1600  | 20.7 | 28.7      | -11.6                   | -14.2                    | 1.3       | 0.9     | 34.9           | 25.0                   | 3.4             |
| 1800  | 20.6 | 28.7      | -11.4                   | -14.9                    | 1.3       | 0.9     | 34.7           | 25.1                   | 3.5             |
| 2000  | 20.5 | 28.6      | -11.3                   | -15.7                    | 1.3       | 0.9     | 34.2           | 25.1                   | 3.4             |
| 2200  | 20.3 | 28.5      | -11.3                   | -16.4                    | 1.4       | 0.9     | 34.4           | 25.2                   | 3.3             |
| 2400  | 20.2 | 28.5      | -11.5                   | -16.7                    | 1.4       | 0.9     | 33.4           | 24.9                   | 3.3             |
| 2600  | 20.0 | 28.5      | -11.8                   | -16.9                    | 1.4       | 0.9     | 34.2           | 25.2                   | 3.3             |
| 2800  | 19.9 | 28.4      | -12.1                   | -17.0                    | 1.4       | 0.9     | 33.9           | 25.0                   | 3.3             |
| 3000  | 19.8 | 28.3      | -12.2                   | -16.8                    | 1.4       | 0.9     | 34.5           | 25.1                   | 3.2             |
| 3200  | 19.8 | 28.2      | -12.2                   | -16.5                    | 1.4       | 0.9     | 34.8           | 25.1                   | 3.2             |
| 3400  | 19.7 | 28.0      | -12.1                   | -16.3                    | 1.4       | 0.9     | 34.3           | 25.1                   | 3.1             |
| 3600  | 19.7 | 27.9      | -12.0                   | -16.3                    | 1.4       | 0.9     | 34.5           | 25.1                   | 3.0             |
| 3800  | 19.6 | 27.8      | -11.7                   | -16.4                    | 1.4       | 0.9     | 34.8           | 25.1                   | 3.0             |
| 4000  | 19.5 | 27.6      | -11.3                   | -16.6                    | 1.4       | 0.9     | 35.0           | 25.1                   | 3.0             |
| 4200  | 19.4 | 27.6      | -11.1                   | -16.6                    | 1.4       | 0.9     | 34.8           | 25.1                   | 3.0             |
| 4400  | 19.3 | 27.5      | -10.9                   | -16.7                    | 1.4       | 0.9     | 35.3           | 25.1                   | 2.9             |
| 4600  | 19.2 | 27.4      | -10.9                   | -16.4                    | 1.4       | 0.9     | 35.0           | 24.9                   | 2.9             |
| 4800  | 19.1 | 27.2      | -11.2                   | -15.7                    | 1.4       | 0.9     | 35.1           | 24.7                   | 2.8             |
| 5000  | 19.1 | 27.1      | -11.8                   | -15.0                    | 1.4       | 0.9     | 34.6           | 24.2                   | 2.8             |
| 5200  | 19.1 | 26.9      | -12.6                   | -14.1                    | 1.4       | 0.9     | 34.7           | 24.3                   | 2.8             |
| 5400  | 19.0 | 26.9      | -13.6                   | -13.1                    | 1.4       | 0.9     | 35.1           | 24.3                   | 2.7             |
| 5600  | 18.9 | 26.7      | -14.4                   | -12.1                    | 1.3       | 0.9     | 34.7           | 24.1                   | 2.7             |
| 5800  | 18.9 | 26.6      | -14.4                   | -11.5                    | 1.3       | 0.9     | 34.8           | 23.9                   | 2.7             |
| 6000  | 18.7 | 26.6      | -13.5                   | -10.9                    | 1.3       | 0.9     | 34.5           | 23.6                   | 2.8             |
| 6200  | 18.6 | 26.6      | -12.3                   | -10.6                    | 1.3       | 0.9     | 34.4           | 23.3                   | 2.8             |
| 6400  | 18.3 | 26.7      | -11.0                   | -10.6                    | 1.3       | 0.9     | 34.5           | 23.1                   | 2.9             |
| 6600  | 18.0 | 26.8      | -10.2                   | -11.1                    | 1.4       | 1.0     | 34.3           | 22.7                   | 2.9             |
| 6800  | 17.8 | 26.9      | -9.7                    | -11.5                    | 1.5       | 1.0     | 34.6           | 22.7                   | 2.9             |
| 7000  | 17.6 | 26.9      | -9.3                    | -11.6                    | 1.5       | 1.0     | 34.6           | 22.6                   | 2.9             |
| 7200  | 17.6 | 27.0      | -9.6                    | -12.1                    | 1.7       | 1.0     | 34.5           | 22.3                   | 2.9             |
| 7400  | 17.3 | 27.0      | -10.3                   | -12.0                    | 1.8       | 1.0     | 34.6           | 22.2                   | 2.9             |
| 7600  | 17.2 | 26.7      | -11.1                   | -11.0                    | 1.7       | 1.0     | 34.6           | 22.1                   | 2.8             |
| 7800  | 17.1 | 26.5      | -11.9                   | -10.2                    | 1.6       | 0.9     | 34.4           | 22.3                   | 2.9             |
| 8000  | 16.9 | 26.6      | -11.9                   | -9.6                     | 1.6       | 0.9     | 34.6           | 22.4                   | 3.1             |

## Typical Performance Data

### Definitions:

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +5.50\text{ V}$ ,  $I_{DD} = 123\text{mA}$  @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | Noise Figure |
|-------|------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------------|
| (GHz) | (dB) | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (dB)         |
| 400   | 21.1 | 28.6      | -12.6             | -9.8               | 1.3       | 0.7     | 40.4        | 23.9             | 3.6          |
| 600   | 21.1 | 28.5      | -13.6             | -11.1              | 1.3       | 0.7     | 39.9        | 24.0             | 3.5          |
| 800   | 21.1 | 28.5      | -13.7             | -11.8              | 1.3       | 0.8     | 38.1        | 24.0             | 3.5          |
| 1000  | 20.9 | 28.5      | -13.3             | -12.3              | 1.3       | 0.8     | 37.8        | 24.3             | 3.4          |
| 1200  | 20.8 | 28.4      | -12.7             | -12.8              | 1.3       | 0.8     | 36.1        | 24.2             | 3.5          |
| 1400  | 20.7 | 28.5      | -12.1             | -13.5              | 1.3       | 0.8     | 34.8        | 24.1             | 3.5          |
| 1600  | 20.5 | 28.4      | -11.7             | -14.3              | 1.3       | 0.9     | 34.1        | 24.1             | 3.4          |
| 1800  | 20.3 | 28.4      | -11.4             | -15.0              | 1.3       | 0.9     | 34.0        | 24.3             | 3.4          |
| 2000  | 20.2 | 28.4      | -11.3             | -15.8              | 1.3       | 0.9     | 33.6        | 24.2             | 3.3          |
| 2200  | 20.1 | 28.3      | -11.3             | -16.4              | 1.4       | 0.9     | 33.9        | 24.4             | 3.3          |
| 2400  | 19.9 | 28.3      | -11.5             | -16.7              | 1.4       | 0.9     | 33.0        | 24.0             | 3.3          |
| 2600  | 19.8 | 28.2      | -11.8             | -16.8              | 1.4       | 0.9     | 33.8        | 24.4             | 3.3          |
| 2800  | 19.6 | 28.2      | -12.1             | -16.8              | 1.4       | 0.9     | 33.6        | 24.1             | 3.2          |
| 3000  | 19.6 | 28.1      | -12.2             | -16.6              | 1.4       | 0.9     | 34.3        | 24.3             | 3.1          |
| 3200  | 19.5 | 27.9      | -12.2             | -16.3              | 1.4       | 0.9     | 34.6        | 24.4             | 3.1          |
| 3400  | 19.5 | 27.8      | -12.1             | -16.1              | 1.4       | 0.9     | 34.2        | 24.2             | 3.1          |
| 3600  | 19.4 | 27.6      | -12.0             | -16.1              | 1.4       | 0.9     | 34.4        | 24.3             | 3.0          |
| 3800  | 19.4 | 27.5      | -11.7             | -16.2              | 1.4       | 0.9     | 34.7        | 24.4             | 3.0          |
| 4000  | 19.3 | 27.4      | -11.3             | -16.4              | 1.4       | 0.9     | 34.9        | 24.3             | 3.0          |
| 4200  | 19.2 | 27.4      | -11.0             | -16.4              | 1.4       | 0.9     | 34.7        | 24.4             | 2.9          |
| 4400  | 19.1 | 27.3      | -10.9             | -16.4              | 1.4       | 0.9     | 35.1        | 24.3             | 2.9          |
| 4600  | 19.0 | 27.2      | -10.9             | -16.1              | 1.4       | 0.9     | 34.8        | 24.2             | 2.9          |
| 4800  | 18.9 | 27.0      | -11.3             | -15.5              | 1.4       | 0.9     | 34.9        | 24.0             | 2.8          |
| 5000  | 18.9 | 26.9      | -11.8             | -14.8              | 1.4       | 0.9     | 34.3        | 23.5             | 2.8          |
| 5200  | 18.9 | 26.7      | -12.7             | -13.9              | 1.3       | 0.9     | 34.4        | 23.6             | 2.7          |
| 5400  | 18.8 | 26.7      | -13.6             | -12.9              | 1.4       | 0.9     | 34.7        | 23.6             | 2.7          |
| 5600  | 18.7 | 26.5      | -14.5             | -11.9              | 1.3       | 0.9     | 34.4        | 23.3             | 2.7          |
| 5800  | 18.7 | 26.5      | -14.5             | -11.3              | 1.3       | 0.9     | 34.4        | 23.2             | 2.6          |
| 6000  | 18.5 | 26.4      | -13.6             | -10.8              | 1.3       | 0.9     | 34.2        | 22.9             | 2.7          |
| 6200  | 18.4 | 26.4      | -12.4             | -10.5              | 1.3       | 0.9     | 34.2        | 22.5             | 2.8          |
| 6400  | 18.2 | 26.5      | -11.1             | -10.5              | 1.3       | 0.9     | 34.3        | 22.3             | 2.8          |
| 6600  | 17.8 | 26.7      | -10.3             | -10.9              | 1.4       | 1.0     | 34.4        | 21.9             | 2.8          |
| 6800  | 17.6 | 26.8      | -9.8              | -11.3              | 1.5       | 1.0     | 34.3        | 21.9             | 2.9          |
| 7000  | 17.4 | 26.8      | -9.5              | -11.5              | 1.5       | 1.0     | 34.3        | 21.9             | 2.9          |
| 7200  | 17.4 | 26.8      | -9.7              | -12.0              | 1.7       | 1.0     | 34.6        | 21.6             | 2.8          |
| 7400  | 17.2 | 26.8      | -10.4             | -11.8              | 1.8       | 1.0     | 34.5        | 21.5             | 2.8          |
| 7600  | 17.0 | 26.6      | -11.2             | -10.8              | 1.7       | 1.0     | 34.5        | 21.4             | 2.8          |
| 7800  | 16.9 | 26.4      | -12.1             | -10.0              | 1.6       | 0.9     | 34.2        | 21.6             | 2.9          |
| 8000  | 16.7 | 26.5      | -12.1             | -9.5               | 1.6       | 0.9     | 34.1        | 21.7             | 3.0          |

*Typical Performance Data***Definitions:**

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = +6.50\text{ V}$ ,  $I_{DD} = 159\text{ mA}$  @ Temperature = +25°C

| FREQ  | Gain | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |         | IP-3<br>Output | 1dB<br>Comp.<br>Output | Noise<br>Figure |
|-------|------|-----------|-------------------------|--------------------------|-----------|---------|----------------|------------------------|-----------------|
| (GHz) | (dB) | (dB)      | (dB)                    | (dB)                     | K         | Measure | (dBm)          | (dBm)                  | (dB)            |
| 400   | 21.5 | 29.0      | -12.6                   | -9.8                     | 1.3       | 0.7     | 39.6           | 25.5                   | 3.7             |
| 600   | 21.6 | 28.9      | -13.6                   | -11.2                    | 1.3       | 0.7     | 40.5           | 25.7                   | 3.6             |
| 800   | 21.5 | 28.9      | -13.7                   | -11.9                    | 1.3       | 0.8     | 39.6           | 25.7                   | 3.5             |
| 1000  | 21.4 | 28.9      | -13.2                   | -12.3                    | 1.3       | 0.8     | 37.9           | 26.0                   | 3.5             |
| 1200  | 21.2 | 28.9      | -12.6                   | -12.9                    | 1.3       | 0.8     | 36.7           | 25.9                   | 3.5             |
| 1400  | 21.1 | 28.8      | -12.1                   | -13.5                    | 1.3       | 0.8     | 36.8           | 25.7                   | 3.5             |
| 1600  | 20.9 | 28.8      | -11.6                   | -14.4                    | 1.3       | 0.9     | 34.9           | 25.8                   | 3.5             |
| 1800  | 20.7 | 28.8      | -11.3                   | -15.1                    | 1.3       | 0.9     | 34.6           | 25.9                   | 3.5             |
| 2000  | 20.6 | 28.7      | -11.2                   | -15.9                    | 1.3       | 0.9     | 34.9           | 25.8                   | 3.4             |
| 2200  | 20.5 | 28.7      | -11.3                   | -16.6                    | 1.4       | 0.9     | 35.1           | 25.9                   | 3.4             |
| 2400  | 20.3 | 28.6      | -11.5                   | -16.8                    | 1.4       | 0.9     | 34.1           | 25.7                   | 3.3             |
| 2600  | 20.2 | 28.7      | -11.7                   | -17.0                    | 1.4       | 0.9     | 34.7           | 25.9                   | 3.4             |
| 2800  | 20.0 | 28.6      | -12.0                   | -17.1                    | 1.4       | 0.9     | 34.5           | 25.7                   | 3.3             |
| 3000  | 19.9 | 28.4      | -12.1                   | -16.9                    | 1.4       | 0.9     | 35.1           | 25.8                   | 3.2             |
| 3200  | 19.9 | 28.3      | -12.1                   | -16.5                    | 1.4       | 0.9     | 35.4           | 25.7                   | 3.2             |
| 3400  | 19.9 | 28.2      | -12.1                   | -16.4                    | 1.4       | 0.9     | 34.8           | 25.7                   | 3.2             |
| 3600  | 19.8 | 28.0      | -11.9                   | -16.4                    | 1.4       | 0.9     | 35.0           | 25.8                   | 3.1             |
| 3800  | 19.7 | 27.9      | -11.6                   | -16.5                    | 1.4       | 0.9     | 35.3           | 25.7                   | 3.0             |
| 4000  | 19.6 | 27.8      | -11.2                   | -16.7                    | 1.4       | 0.9     | 35.5           | 25.8                   | 3.0             |
| 4200  | 19.5 | 27.7      | -11.0                   | -16.7                    | 1.4       | 0.9     | 35.2           | 25.7                   | 3.0             |
| 4400  | 19.4 | 27.6      | -10.8                   | -16.7                    | 1.4       | 0.9     | 35.8           | 25.6                   | 3.0             |
| 4600  | 19.3 | 27.5      | -10.9                   | -16.5                    | 1.4       | 0.9     | 35.5           | 25.5                   | 2.9             |
| 4800  | 19.3 | 27.3      | -11.2                   | -15.8                    | 1.4       | 0.9     | 35.6           | 25.2                   | 2.9             |
| 5000  | 19.2 | 27.2      | -11.7                   | -15.1                    | 1.4       | 0.9     | 35.2           | 24.9                   | 2.9             |
| 5200  | 19.2 | 27.1      | -12.5                   | -14.2                    | 1.4       | 0.9     | 35.3           | 24.8                   | 2.8             |
| 5400  | 19.1 | 27.0      | -13.4                   | -13.2                    | 1.4       | 0.9     | 35.7           | 24.9                   | 2.8             |
| 5600  | 19.1 | 26.9      | -14.3                   | -12.2                    | 1.3       | 0.9     | 35.3           | 24.6                   | 2.7             |
| 5800  | 19.0 | 26.7      | -14.2                   | -11.6                    | 1.3       | 0.9     | 35.4           | 24.5                   | 2.7             |
| 6000  | 18.9 | 26.7      | -13.3                   | -11.0                    | 1.3       | 0.9     | 35.2           | 24.2                   | 2.8             |
| 6200  | 18.7 | 26.7      | -12.1                   | -10.7                    | 1.3       | 0.9     | 34.9           | 23.9                   | 2.8             |
| 6400  | 18.5 | 26.8      | -10.9                   | -10.7                    | 1.3       | 0.9     | 35.2           | 23.7                   | 2.9             |
| 6600  | 18.1 | 27.0      | -10.1                   | -11.2                    | 1.4       | 1.0     | 34.9           | 23.3                   | 2.9             |
| 6800  | 17.9 | 27.1      | -9.6                    | -11.6                    | 1.5       | 1.0     | 35.4           | 23.3                   | 2.9             |
| 7000  | 17.7 | 27.0      | -9.2                    | -11.7                    | 1.5       | 1.0     | 35.5           | 23.2                   | 2.9             |
| 7200  | 17.7 | 27.1      | -9.5                    | -12.2                    | 1.7       | 1.0     | 35.3           | 22.9                   | 2.9             |
| 7400  | 17.5 | 27.1      | -10.2                   | -12.1                    | 1.8       | 1.0     | 35.5           | 22.8                   | 2.9             |
| 7600  | 17.3 | 26.8      | -10.9                   | -11.1                    | 1.7       | 1.0     | 35.4           | 22.7                   | 2.9             |
| 7800  | 17.2 | 26.6      | -11.8                   | -10.3                    | 1.6       | 0.9     | 35.3           | 22.9                   | 2.9             |
| 8000  | 17.0 | 26.7      | -11.7                   | -9.7                     | 1.6       | 0.9     | 35.5           | 22.9                   | 3.1             |

*Typical Performance Data***Definitions:**

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = 6.00V$ ,  $V_{adj} = 1.0V$ ,  $I_{DD} = 65mA$  @ Temperature = +25°C

| FREQ  | Gain  | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |         | IP-3<br>Output | 1dB<br>Comp.<br>Output | Noise<br>Figure |
|-------|-------|-----------|-------------------------|--------------------------|-----------|---------|----------------|------------------------|-----------------|
| (MHz) | (dB)  | (dB)      | (dB)                    | (dB)                     | K         | Measure | (dBm)          | (dBm)                  | (dB)            |
| 400   | 19.66 | 26.81     | -12.63                  | -11.12                   | 1.27      | 0.73    | 40.78          | 25.06                  | 3.18            |
| 600   | 19.74 | 26.67     | -13.73                  | -13.49                   | 1.27      | 0.77    | 41.07          | 25.03                  | 3.13            |
| 800   | 19.69 | 26.61     | -13.87                  | -15.12                   | 1.28      | 0.80    | 39.48          | 24.94                  | 3.08            |
| 1000  | 19.59 | 26.62     | -13.63                  | -16.47                   | 1.28      | 0.82    | 38.60          | 25.57                  | 3.04            |
| 1200  | 19.45 | 26.55     | -13.20                  | -17.67                   | 1.28      | 0.85    | 35.35          | 25.33                  | 3.09            |
| 1400  | 19.30 | 26.55     | -12.72                  | -18.74                   | 1.29      | 0.87    | 33.83          | 25.38                  | 3.06            |
| 1600  | 19.13 | 26.57     | -12.23                  | -19.50                   | 1.30      | 0.89    | 33.02          | 25.50                  | 3.02            |
| 1800  | 18.95 | 26.58     | -11.76                  | -19.84                   | 1.31      | 0.91    | 32.36          | 25.93                  | 2.98            |
| 2000  | 18.80 | 26.57     | -11.36                  | -19.86                   | 1.31      | 0.92    | 32.31          | 26.01                  | 2.94            |
| 2200  | 18.65 | 26.54     | -11.02                  | -19.18                   | 1.32      | 0.93    | 33.14          | 26.60                  | 2.90            |
| 2400  | 18.49 | 26.53     | -10.77                  | -18.49                   | 1.33      | 0.94    | 32.42          | 26.07                  | 2.86            |
| 2600  | 18.30 | 26.56     | -10.63                  | -17.95                   | 1.36      | 0.94    | 32.63          | 26.33                  | 2.91            |
| 2800  | 18.10 | 26.64     | -10.53                  | -17.45                   | 1.39      | 0.95    | 32.67          | 26.14                  | 2.94            |
| 3000  | 17.99 | 26.57     | -10.26                  | -16.60                   | 1.39      | 0.95    | 33.41          | 25.99                  | 2.90            |
| 3200  | 17.97 | 26.43     | -10.01                  | -15.73                   | 1.37      | 0.94    | 34.57          | 26.42                  | 2.79            |
| 3400  | 17.96 | 26.31     | -9.93                   | -15.15                   | 1.35      | 0.93    | 34.20          | 26.07                  | 2.73            |
| 3600  | 17.94 | 26.13     | -10.03                  | -14.87                   | 1.33      | 0.92    | 35.03          | 26.27                  | 2.66            |
| 3800  | 17.94 | 26.05     | -10.25                  | -14.72                   | 1.33      | 0.92    | 33.87          | 25.98                  | 2.60            |
| 4000  | 17.93 | 25.90     | -10.60                  | -14.69                   | 1.32      | 0.91    | 34.34          | 25.79                  | 2.54            |
| 4200  | 17.92 | 25.77     | -11.05                  | -14.68                   | 1.31      | 0.90    | 35.11          | 26.25                  | 2.50            |
| 4400  | 17.90 | 25.66     | -11.63                  | -14.66                   | 1.31      | 0.89    | 34.13          | 26.08                  | 2.45            |
| 4600  | 17.88 | 25.53     | -12.24                  | -14.45                   | 1.30      | 0.88    | 32.90          | 26.36                  | 2.41            |
| 4800  | 17.85 | 25.38     | -12.91                  | -14.14                   | 1.29      | 0.87    | 31.44          | 26.18                  | 2.39            |
| 5000  | 17.80 | 25.33     | -13.46                  | -13.61                   | 1.29      | 0.86    | 31.14          | 26.04                  | 2.37            |
| 5200  | 17.75 | 25.24     | -13.94                  | -12.97                   | 1.28      | 0.85    | 31.62          | 25.83                  | 2.44            |
| 5400  | 17.70 | 25.17     | -14.14                  | -12.23                   | 1.26      | 0.85    | 31.64          | 25.18                  | 2.36            |
| 5600  | 17.63 | 25.12     | -14.14                  | -11.51                   | 1.25      | 0.84    | 31.42          | 25.29                  | 2.33            |
| 5800  | 17.54 | 25.05     | -13.97                  | -10.82                   | 1.23      | 0.84    | 31.49          | 24.67                  | 2.24            |
| 6000  | 17.45 | 25.04     | -13.70                  | -10.21                   | 1.22      | 0.83    | 31.55          | 24.14                  | 2.34            |
| 6200  | 17.33 | 25.07     | -13.39                  | -9.66                    | 1.21      | 0.83    | 31.48          | 23.83                  | 2.31            |
| 6400  | 17.18 | 25.04     | -13.18                  | -9.24                    | 1.20      | 0.83    | 31.45          | 23.51                  | 2.33            |
| 6600  | 16.84 | 25.28     | -13.21                  | -9.51                    | 1.28      | 0.85    | 31.40          | 23.30                  | 2.35            |
| 6800  | 16.92 | 25.00     | -12.66                  | -8.91                    | 1.20      | 0.84    | 32.08          | 23.09                  | 2.34            |
| 7000  | 16.86 | 24.95     | -12.54                  | -8.35                    | 1.18      | 0.83    | 32.31          | 22.97                  | 2.35            |
| 7200  | 16.75 | 24.91     | -12.51                  | -8.10                    | 1.17      | 0.82    | 32.41          | 22.85                  | 2.36            |
| 7400  | 16.62 | 24.90     | -12.43                  | -7.98                    | 1.18      | 0.83    | 32.29          | 22.75                  | 2.39            |
| 7600  | 16.47 | 24.88     | -12.25                  | -8.01                    | 1.19      | 0.83    | 32.24          | 22.87                  | 2.46            |
| 7800  | 16.29 | 24.93     | -11.73                  | -8.18                    | 1.21      | 0.85    | 32.49          | 22.60                  | 2.59            |
| 8000  | 16.04 | 25.02     | -10.84                  | -8.57                    | 1.25      | 0.89    | 32.85          | 22.89                  | 2.72            |

## Typical Performance Data

### Definitions:

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = 6.00V$ ,  $V_{Iadj} = 2.0V$ ,  $I_{DD} = 107mA$  @ Temperature = +25°C

| FREQ  | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | Noise Figure |
|-------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------------|
| (MHz) | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (dB)         |
| 400   | 20.87 | 28.50     | -12.37            | -8.98              | 1.27      | 0.69    | 41.00       | 24.99            | 3.22         |
| 600   | 20.93 | 28.31     | -13.30            | -10.06             | 1.27      | 0.72    | 41.65       | 24.98            | 3.13         |
| 800   | 20.89 | 28.25     | -13.48            | -10.79             | 1.27      | 0.75    | 40.54       | 24.91            | 3.10         |
| 1000  | 20.80 | 28.25     | -13.40            | -11.43             | 1.28      | 0.78    | 40.69       | 25.35            | 3.05         |
| 1200  | 20.68 | 28.20     | -13.17            | -12.11             | 1.29      | 0.80    | 38.01       | 25.16            | 3.09         |
| 1400  | 20.56 | 28.15     | -12.90            | -12.87             | 1.30      | 0.83    | 36.29       | 25.19            | 3.05         |
| 1600  | 20.41 | 28.10     | -12.60            | -13.67             | 1.30      | 0.85    | 35.39       | 25.24            | 3.00         |
| 1800  | 20.26 | 28.07     | -12.31            | -14.54             | 1.31      | 0.88    | 35.34       | 25.49            | 2.97         |
| 2000  | 20.14 | 28.00     | -12.08            | -15.56             | 1.32      | 0.89    | 34.95       | 25.56            | 2.95         |
| 2200  | 20.01 | 27.98     | -11.88            | -16.39             | 1.33      | 0.91    | 36.15       | 26.01            | 2.90         |
| 2400  | 19.86 | 27.94     | -11.74            | -17.28             | 1.35      | 0.92    | 34.70       | 25.65            | 2.85         |
| 2600  | 19.69 | 27.93     | -11.75            | -18.20             | 1.37      | 0.93    | 35.37       | 25.81            | 2.90         |
| 2800  | 19.51 | 27.89     | -11.76            | -19.26             | 1.39      | 0.94    | 34.99       | 25.76            | 2.94         |
| 3000  | 19.42 | 27.85     | -11.56            | -19.81             | 1.40      | 0.94    | 34.70       | 25.66            | 2.83         |
| 3200  | 19.39 | 27.69     | -11.34            | -19.54             | 1.38      | 0.94    | 35.15       | 25.97            | 2.77         |
| 3400  | 19.38 | 27.50     | -11.31            | -19.14             | 1.36      | 0.93    | 34.11       | 25.78            | 2.72         |
| 3600  | 19.34 | 27.33     | -11.47            | -18.79             | 1.35      | 0.92    | 34.72       | 25.90            | 2.63         |
| 3800  | 19.31 | 27.23     | -11.76            | -18.47             | 1.35      | 0.92    | 34.05       | 25.64            | 2.57         |
| 4000  | 19.27 | 27.07     | -12.18            | -18.13             | 1.34      | 0.91    | 33.78       | 25.51            | 2.53         |
| 4200  | 19.23 | 26.94     | -12.72            | -17.72             | 1.34      | 0.90    | 34.60       | 25.81            | 2.47         |
| 4400  | 19.17 | 26.84     | -13.38            | -17.12             | 1.34      | 0.89    | 34.45       | 25.69            | 2.46         |
| 4600  | 19.11 | 26.78     | -14.03            | -16.32             | 1.34      | 0.88    | 35.11       | 25.96            | 2.39         |
| 4800  | 19.04 | 26.61     | -14.64            | -15.43             | 1.33      | 0.87    | 34.52       | 25.76            | 2.37         |
| 5000  | 18.95 | 26.55     | -15.02            | -14.43             | 1.32      | 0.86    | 34.30       | 25.60            | 2.34         |
| 5200  | 18.86 | 26.45     | -15.18            | -13.49             | 1.31      | 0.85    | 34.47       | 25.40            | 2.31         |
| 5400  | 18.76 | 26.41     | -14.99            | -12.57             | 1.31      | 0.84    | 34.07       | 24.91            | 2.34         |
| 5600  | 18.66 | 26.35     | -14.60            | -11.75             | 1.29      | 0.84    | 34.04       | 25.03            | 2.34         |
| 5800  | 18.54 | 26.33     | -14.12            | -11.04             | 1.28      | 0.83    | 33.69       | 24.52            | 2.34         |
| 6000  | 18.42 | 26.28     | -13.66            | -10.43             | 1.27      | 0.83    | 33.66       | 24.11            | 2.31         |
| 6200  | 18.28 | 26.25     | -13.26            | -9.92              | 1.26      | 0.83    | 33.57       | 23.69            | 2.32         |
| 6400  | 18.11 | 26.33     | -12.97            | -9.53              | 1.27      | 0.84    | 33.28       | 23.34            | 2.31         |
| 6600  | 17.77 | 26.50     | -13.04            | -9.82              | 1.35      | 0.85    | 33.52       | 22.99            | 2.34         |
| 6800  | 17.83 | 26.23     | -12.60            | -9.35              | 1.27      | 0.85    | 33.80       | 22.73            | 2.32         |
| 7000  | 17.74 | 26.18     | -12.44            | -8.84              | 1.25      | 0.84    | 33.98       | 22.66            | 2.34         |
| 7200  | 17.61 | 26.14     | -12.35            | -8.62              | 1.25      | 0.84    | 34.54       | 22.43            | 2.35         |
| 7400  | 17.46 | 26.13     | -12.19            | -8.50              | 1.26      | 0.84    | 34.69       | 22.44            | 2.39         |
| 7600  | 17.27 | 26.15     | -11.84            | -8.52              | 1.28      | 0.85    | 34.93       | 22.56            | 2.46         |
| 7800  | 17.05 | 26.18     | -11.16            | -8.66              | 1.30      | 0.87    | 34.96       | 22.39            | 2.61         |
| 8000  | 16.76 | 26.34     | -10.17            | -8.98              | 1.35      | 0.91    | 35.16       | 22.78            | 2.74         |



## Typical Performance Data

### Definitions:

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = 6.00V$ ,  $V_{Iadj} = 3.0V$ ,  $I_{DD} = 144mA$  @ Temperature = +25°C

| FREQ  | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | Noise Figure |
|-------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------------|
| (MHz) | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (dB)         |
| 400   | 21.28 | 29.01     | -12.21            | -8.45              | 1.27      | 0.68    | 40.53       | 25.09            | 3.25         |
| 600   | 21.34 | 28.95     | -13.07            | -9.35              | 1.28      | 0.71    | 39.88       | 25.14            | 3.18         |
| 800   | 21.29 | 28.84     | -13.25            | -9.96              | 1.28      | 0.74    | 39.17       | 25.03            | 3.12         |
| 1000  | 21.20 | 28.83     | -13.19            | -10.53             | 1.29      | 0.76    | 39.09       | 25.47            | 3.09         |
| 1200  | 21.09 | 28.79     | -13.01            | -11.13             | 1.29      | 0.79    | 37.02       | 25.19            | 3.13         |
| 1400  | 20.96 | 28.72     | -12.78            | -11.80             | 1.30      | 0.82    | 35.69       | 25.21            | 3.10         |
| 1600  | 20.83 | 28.64     | -12.54            | -12.54             | 1.30      | 0.84    | 34.90       | 25.32            | 3.04         |
| 1800  | 20.68 | 28.62     | -12.30            | -13.35             | 1.32      | 0.87    | 34.66       | 25.49            | 3.02         |
| 2000  | 20.56 | 28.50     | -12.13            | -14.31             | 1.32      | 0.88    | 34.25       | 25.58            | 2.98         |
| 2200  | 20.44 | 28.49     | -11.98            | -15.15             | 1.33      | 0.90    | 34.81       | 25.95            | 2.96         |
| 2400  | 20.29 | 28.44     | -11.89            | -16.09             | 1.35      | 0.91    | 33.98       | 25.70            | 2.94         |
| 2600  | 20.12 | 28.42     | -11.93            | -17.11             | 1.38      | 0.92    | 34.25       | 25.86            | 2.95         |
| 2800  | 19.95 | 28.35     | -12.01            | -18.35             | 1.40      | 0.93    | 33.98       | 25.89            | 3.01         |
| 3000  | 19.86 | 28.29     | -11.85            | -19.32             | 1.40      | 0.94    | 33.81       | 25.79            | 2.90         |
| 3200  | 19.83 | 28.09     | -11.66            | -19.53             | 1.38      | 0.93    | 34.01       | 26.10            | 2.82         |
| 3400  | 19.81 | 27.97     | -11.65            | -19.40             | 1.37      | 0.93    | 33.45       | 25.93            | 2.78         |
| 3600  | 19.77 | 27.81     | -11.83            | -19.13             | 1.36      | 0.92    | 33.71       | 25.97            | 2.70         |
| 3800  | 19.73 | 27.65     | -12.13            | -18.81             | 1.35      | 0.91    | 33.34       | 25.75            | 2.63         |
| 4000  | 19.68 | 27.51     | -12.58            | -18.42             | 1.35      | 0.90    | 33.18       | 25.56            | 2.58         |
| 4200  | 19.63 | 27.41     | -13.14            | -17.86             | 1.35      | 0.90    | 33.61       | 25.82            | 2.53         |
| 4400  | 19.57 | 27.27     | -13.79            | -17.12             | 1.34      | 0.88    | 33.54       | 25.76            | 2.49         |
| 4600  | 19.49 | 27.10     | -14.39            | -16.21             | 1.33      | 0.87    | 33.94       | 25.97            | 2.45         |
| 4800  | 19.40 | 27.02     | -14.97            | -15.23             | 1.33      | 0.86    | 33.89       | 25.77            | 2.41         |
| 5000  | 19.31 | 26.96     | -15.24            | -14.20             | 1.33      | 0.85    | 33.99       | 25.57            | 2.42         |
| 5200  | 19.20 | 26.85     | -15.23            | -13.25             | 1.32      | 0.84    | 33.90       | 25.44            | 2.42         |
| 5400  | 19.10 | 26.78     | -14.90            | -12.34             | 1.31      | 0.84    | 33.59       | 24.97            | 2.40         |
| 5600  | 18.98 | 26.74     | -14.42            | -11.55             | 1.30      | 0.83    | 33.69       | 25.09            | 2.38         |
| 5800  | 18.86 | 26.72     | -13.87            | -10.85             | 1.29      | 0.83    | 33.28       | 24.58            | 2.36         |
| 6000  | 18.73 | 26.72     | -13.35            | -10.27             | 1.28      | 0.83    | 33.25       | 24.16            | 2.37         |
| 6200  | 18.58 | 26.65     | -12.96            | -9.77              | 1.27      | 0.83    | 33.25       | 23.74            | 2.37         |
| 6400  | 18.40 | 26.70     | -12.67            | -9.40              | 1.28      | 0.83    | 33.11       | 23.36            | 2.38         |
| 6600  | 18.06 | 26.94     | -12.74            | -9.70              | 1.36      | 0.85    | 33.30       | 23.02            | 2.39         |
| 6800  | 18.12 | 26.61     | -12.37            | -9.26              | 1.29      | 0.84    | 33.41       | 22.77            | 2.39         |
| 7000  | 18.03 | 26.54     | -12.20            | -8.78              | 1.26      | 0.84    | 33.53       | 22.72            | 2.40         |
| 7200  | 17.89 | 26.51     | -12.11            | -8.57              | 1.26      | 0.84    | 33.87       | 22.59            | 2.41         |
| 7400  | 17.73 | 26.49     | -11.94            | -8.45              | 1.27      | 0.84    | 33.96       | 22.71            | 2.46         |
| 7600  | 17.54 | 26.54     | -11.58            | -8.47              | 1.30      | 0.85    | 34.31       | 22.86            | 2.54         |
| 7800  | 17.30 | 26.58     | -10.88            | -8.58              | 1.32      | 0.87    | 34.43       | 22.70            | 2.67         |
| 8000  | 17.00 | 26.70     | -9.91             | -8.87              | 1.36      | 0.90    | 34.38       | 23.14            | 2.82         |

## Typical Performance Data

### Definitions:

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

Isolation = -S12 (dB)

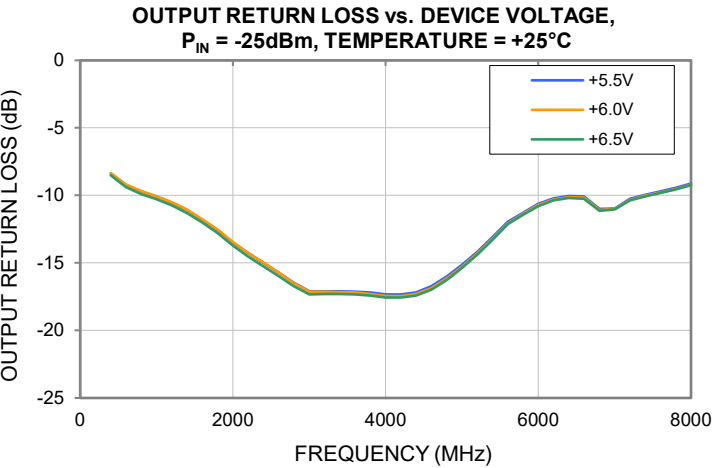
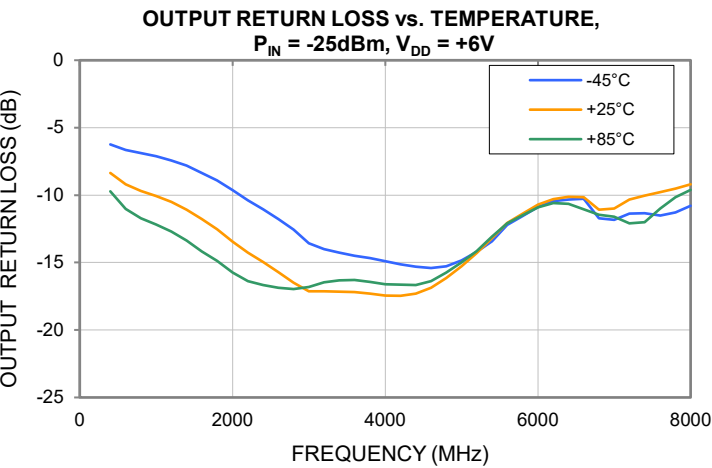
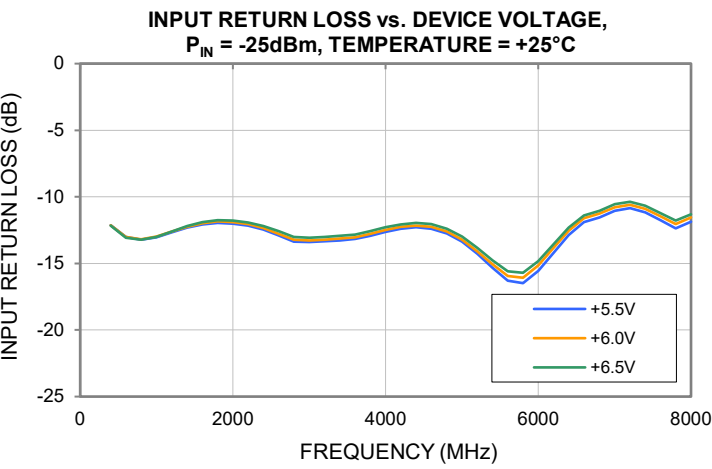
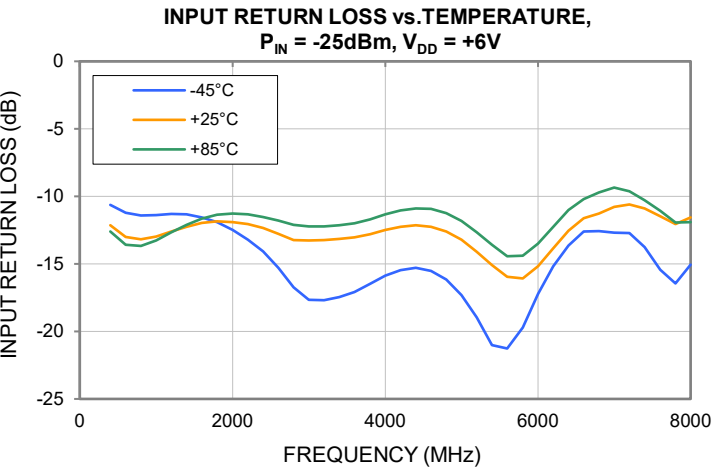
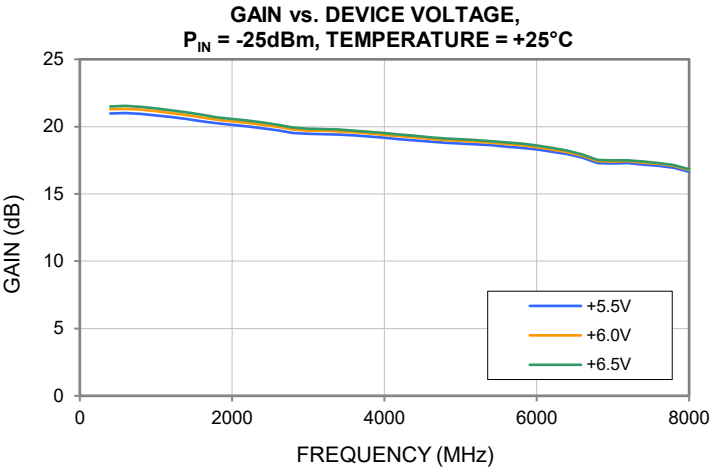
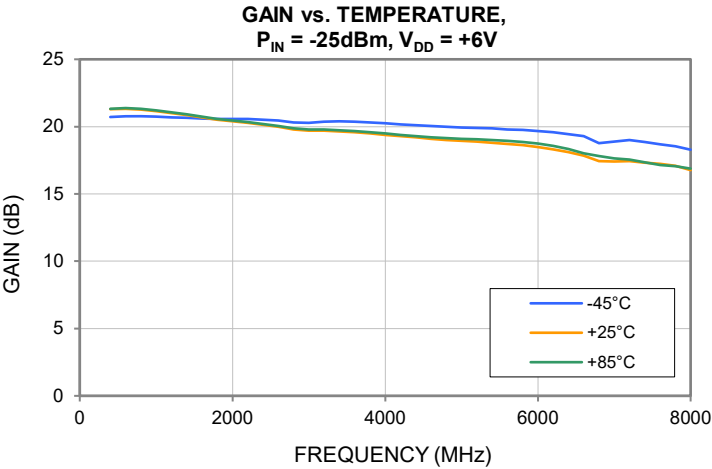
Output Return Loss = S22 (dB)

TEST CONDITIONS:  $V_{DD} = 6.00V$ ,  $V_{Iadj} = 4.0V$ ,  $I_{DD} = 174mA$  @ Temperature = +25°C

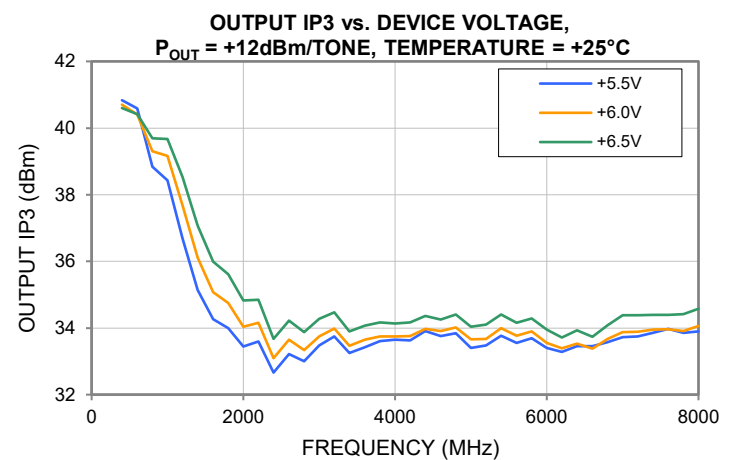
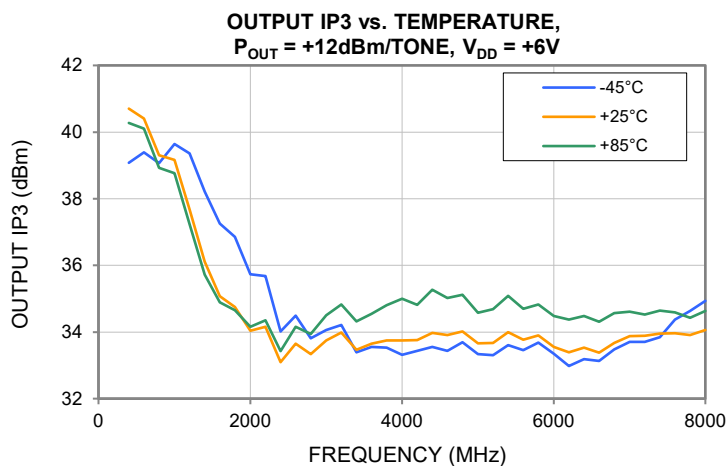
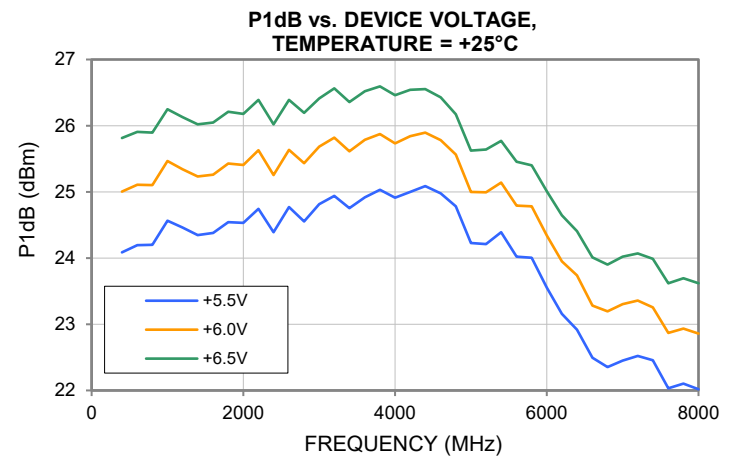
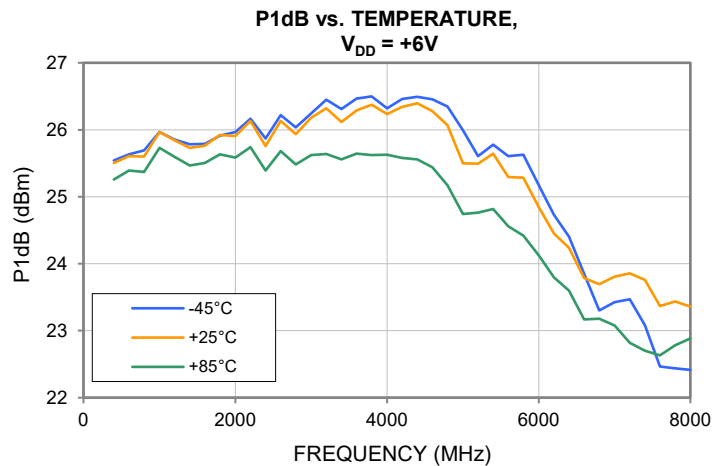
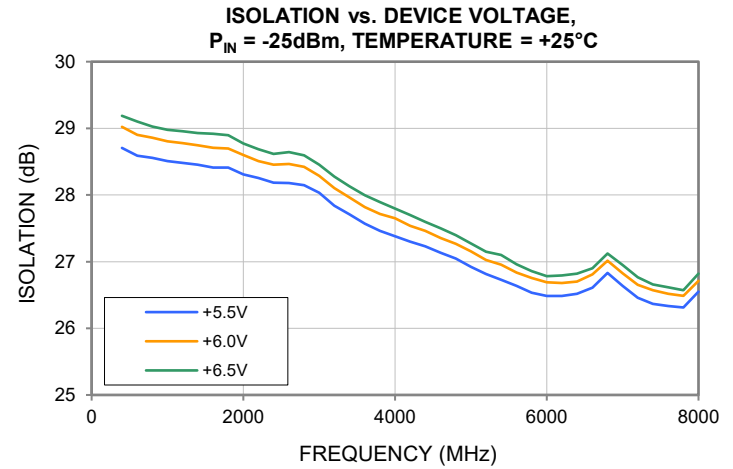
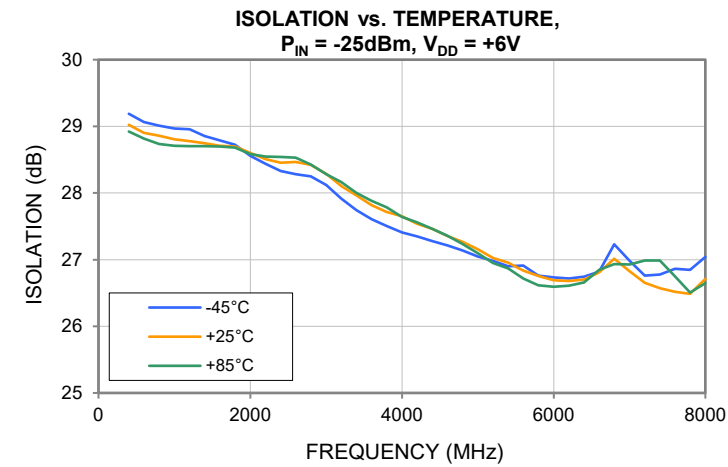
| FREQ  | Gain  | Isolation | Input Return Loss | Output Return Loss | Stability |         | IP-3 Output | 1dB Comp. Output | Noise Figure |
|-------|-------|-----------|-------------------|--------------------|-----------|---------|-------------|------------------|--------------|
| (MHz) | (dB)  | (dB)      | (dB)              | (dB)               | K         | Measure | (dBm)       | (dBm)            | (dB)         |
| 400   | 21.49 | 29.27     | -12.14            | -8.33              | 1.27      | 0.68    | 40.82       | 25.15            | 3.33         |
| 600   | 21.54 | 29.19     | -12.97            | -9.18              | 1.28      | 0.71    | 40.40       | 25.18            | 3.24         |
| 800   | 21.49 | 29.09     | -13.15            | -9.76              | 1.28      | 0.73    | 39.46       | 25.05            | 3.22         |
| 1000  | 21.40 | 29.11     | -13.09            | -10.31             | 1.29      | 0.76    | 39.32       | 25.50            | 3.16         |
| 1200  | 21.29 | 29.02     | -12.90            | -10.88             | 1.29      | 0.79    | 37.40       | 25.20            | 3.19         |
| 1400  | 21.16 | 28.97     | -12.69            | -11.55             | 1.30      | 0.81    | 35.99       | 25.16            | 3.16         |
| 1600  | 21.03 | 28.90     | -12.47            | -12.26             | 1.31      | 0.84    | 35.11       | 25.27            | 3.10         |
| 1800  | 20.88 | 28.86     | -12.24            | -13.06             | 1.32      | 0.86    | 34.90       | 25.52            | 3.09         |
| 2000  | 20.76 | 28.80     | -12.08            | -13.97             | 1.33      | 0.88    | 34.49       | 25.61            | 3.04         |
| 2200  | 20.64 | 28.69     | -11.94            | -14.79             | 1.33      | 0.90    | 35.00       | 26.01            | 3.01         |
| 2400  | 20.49 | 28.63     | -11.88            | -15.70             | 1.35      | 0.91    | 34.18       | 25.74            | 2.98         |
| 2600  | 20.33 | 28.65     | -11.94            | -16.72             | 1.38      | 0.92    | 34.34       | 25.92            | 3.01         |
| 2800  | 20.16 | 28.60     | -12.03            | -17.95             | 1.40      | 0.93    | 34.18       | 25.95            | 3.04         |
| 3000  | 20.07 | 28.50     | -11.90            | -18.96             | 1.40      | 0.93    | 33.92       | 25.86            | 2.91         |
| 3200  | 20.04 | 28.38     | -11.72            | -19.26             | 1.39      | 0.94    | 34.17       | 26.16            | 2.90         |
| 3400  | 20.02 | 28.17     | -11.73            | -19.24             | 1.37      | 0.93    | 33.61       | 25.96            | 2.84         |
| 3600  | 19.98 | 28.01     | -11.92            | -18.99             | 1.36      | 0.92    | 33.88       | 26.02            | 2.76         |
| 3800  | 19.94 | 27.85     | -12.24            | -18.72             | 1.35      | 0.91    | 33.54       | 25.73            | 2.68         |
| 4000  | 19.88 | 27.68     | -12.69            | -18.27             | 1.34      | 0.90    | 33.25       | 25.58            | 2.63         |
| 4200  | 19.83 | 27.59     | -13.26            | -17.70             | 1.35      | 0.89    | 33.70       | 25.84            | 2.59         |
| 4400  | 19.76 | 27.38     | -13.89            | -16.93             | 1.33      | 0.88    | 33.68       | 25.72            | 2.58         |
| 4600  | 19.69 | 27.30     | -14.50            | -16.02             | 1.33      | 0.87    | 34.13       | 26.00            | 2.50         |
| 4800  | 19.60 | 27.23     | -15.03            | -15.04             | 1.34      | 0.86    | 34.10       | 25.81            | 2.47         |
| 5000  | 19.49 | 27.12     | -15.21            | -14.02             | 1.33      | 0.85    | 34.40       | 25.57            | 2.44         |
| 5200  | 19.39 | 27.05     | -15.16            | -13.06             | 1.32      | 0.84    | 34.31       | 25.39            | 2.40         |
| 5400  | 19.28 | 26.99     | -14.75            | -12.17             | 1.31      | 0.83    | 33.88       | 24.90            | 2.44         |
| 5600  | 19.16 | 26.96     | -14.23            | -11.38             | 1.30      | 0.83    | 34.03       | 25.02            | 2.45         |
| 5800  | 19.03 | 26.93     | -13.65            | -10.68             | 1.29      | 0.83    | 33.58       | 24.50            | 2.46         |
| 6000  | 18.90 | 26.90     | -13.14            | -10.11             | 1.28      | 0.82    | 33.59       | 24.08            | 2.42         |
| 6200  | 18.75 | 26.90     | -12.74            | -9.63              | 1.28      | 0.83    | 33.62       | 23.71            | 2.44         |
| 6400  | 18.57 | 26.89     | -12.45            | -9.26              | 1.28      | 0.83    | 33.48       | 23.26            | 2.41         |
| 6600  | 18.23 | 27.00     | -12.52            | -9.57              | 1.35      | 0.85    | 33.57       | 23.01            | 2.45         |
| 6800  | 18.29 | 26.82     | -12.19            | -9.11              | 1.29      | 0.84    | 33.72       | 22.77            | 2.44         |
| 7000  | 18.19 | 26.73     | -12.05            | -8.65              | 1.26      | 0.83    | 33.80       | 22.73            | 2.46         |
| 7200  | 18.05 | 26.71     | -11.96            | -8.43              | 1.26      | 0.83    | 34.16       | 22.72            | 2.49         |
| 7400  | 17.89 | 26.72     | -11.79            | -8.32              | 1.28      | 0.83    | 34.22       | 22.75            | 2.52         |
| 7600  | 17.70 | 26.66     | -11.40            | -8.32              | 1.29      | 0.84    | 34.51       | 23.00            | 2.61         |
| 7800  | 17.46 | 26.80     | -10.73            | -8.41              | 1.32      | 0.86    | 34.71       | 22.85            | 2.72         |
| 8000  | 17.15 | 26.90     | -9.76             | -8.68              | 1.36      | 0.90    | 34.64       | 23.16            | 2.89         |



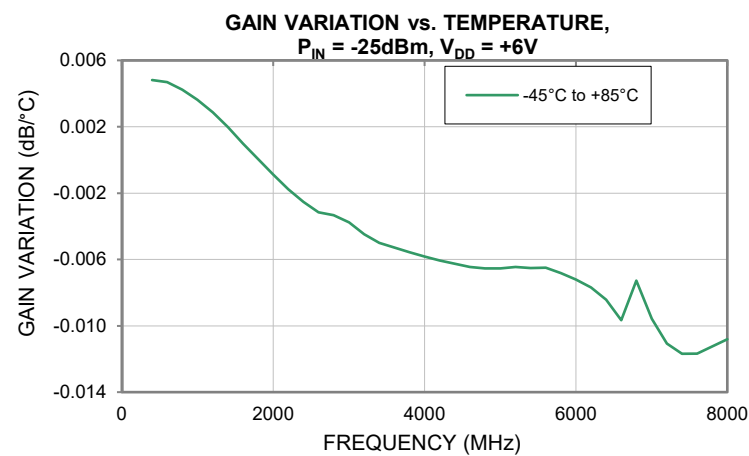
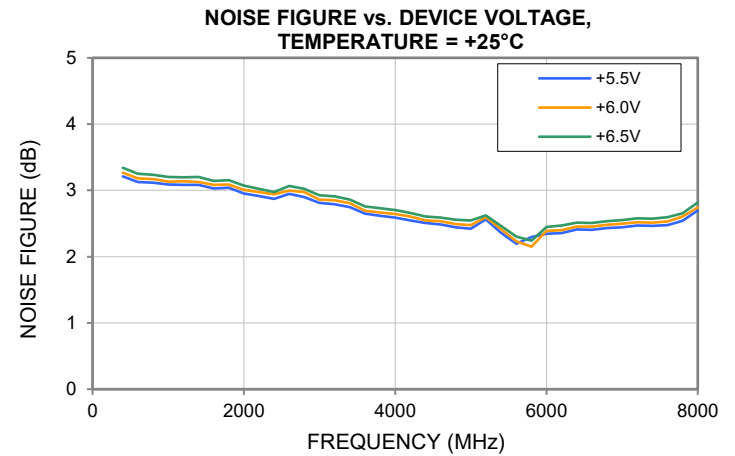
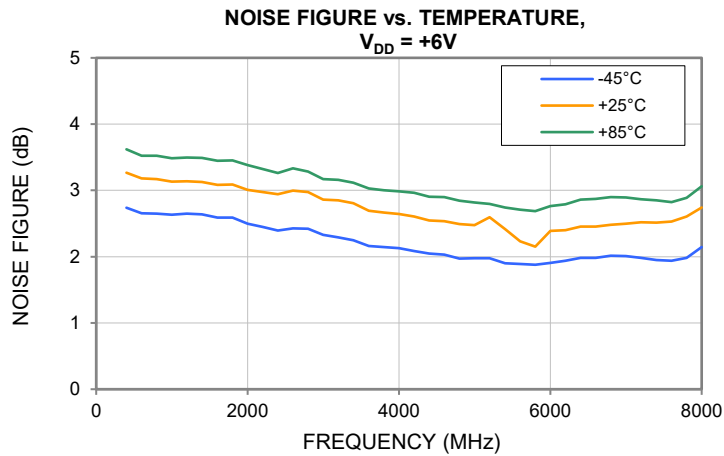
Typical Performance Curves



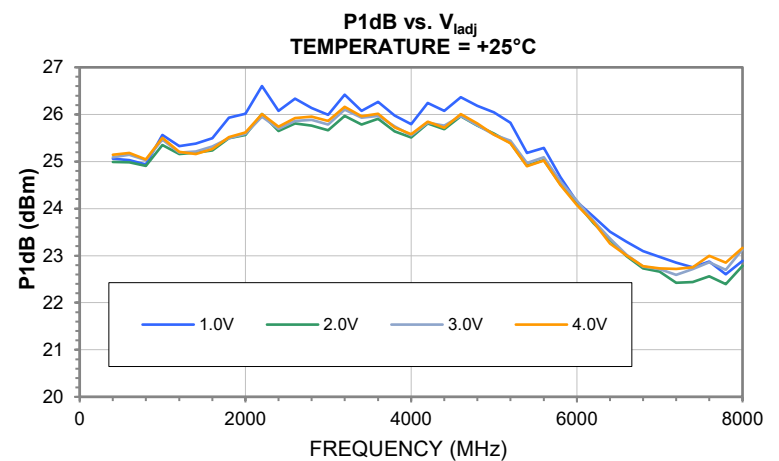
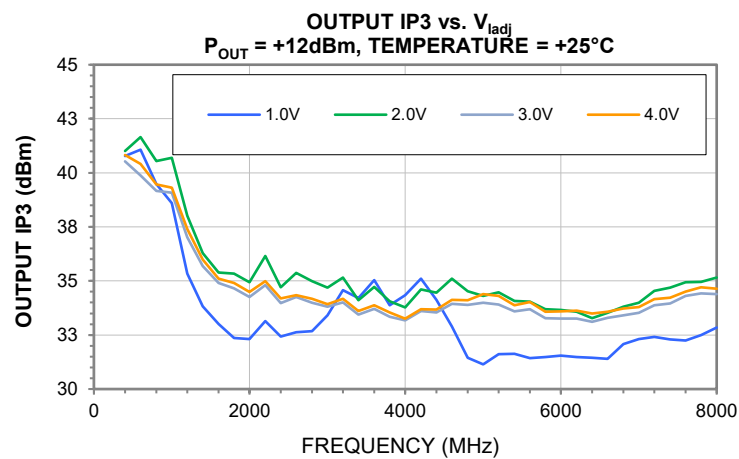
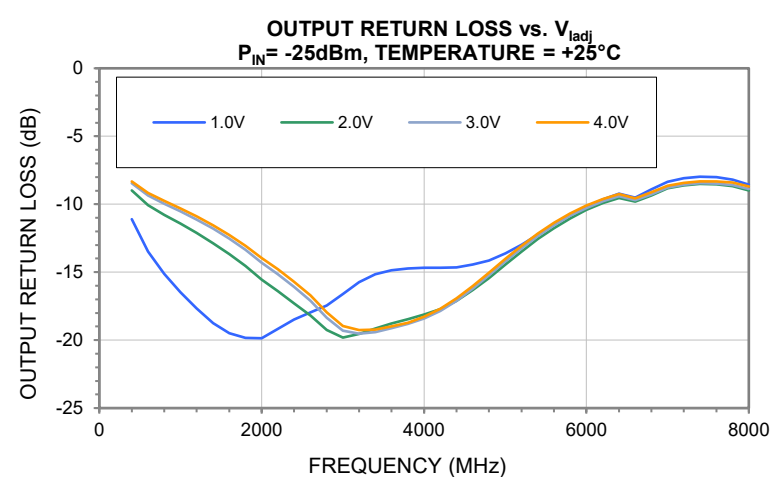
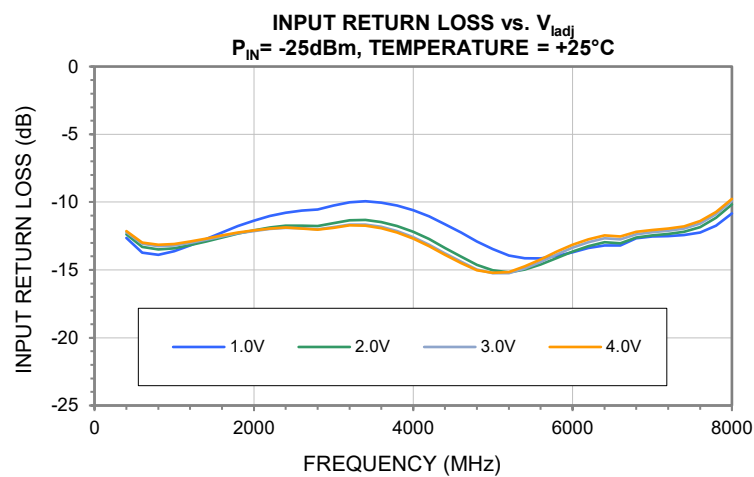
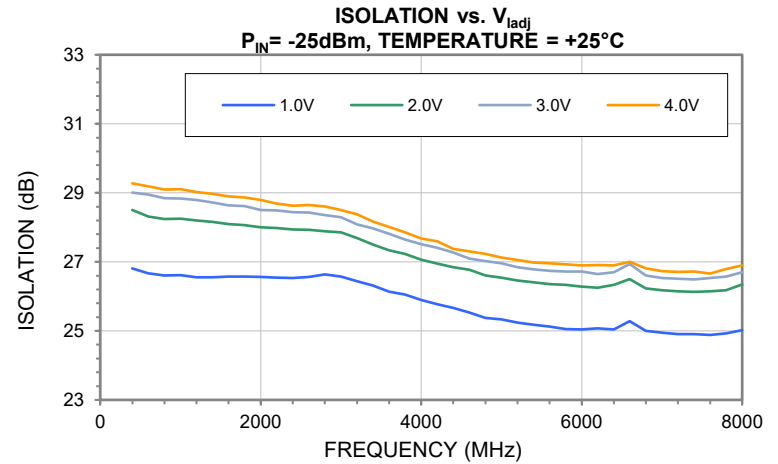
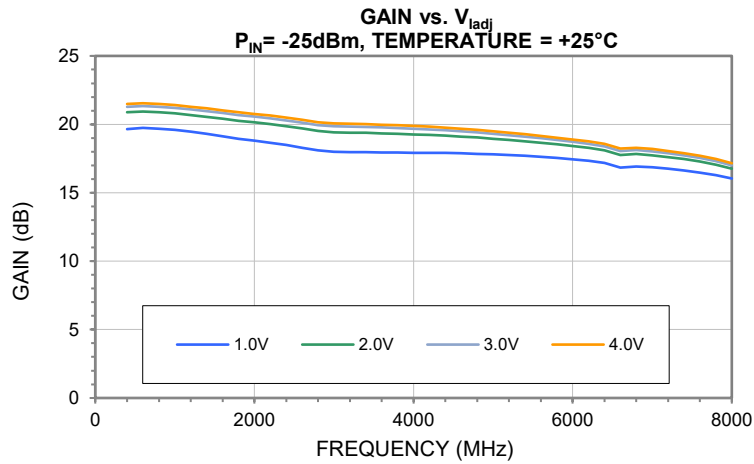
## Typical Performance Curves



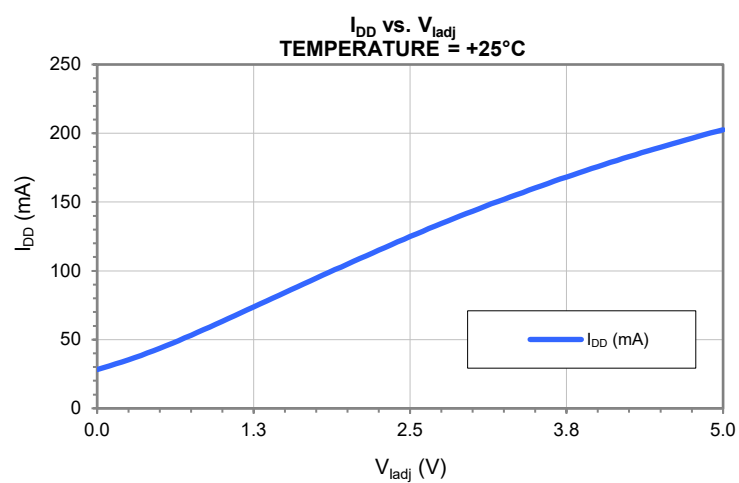
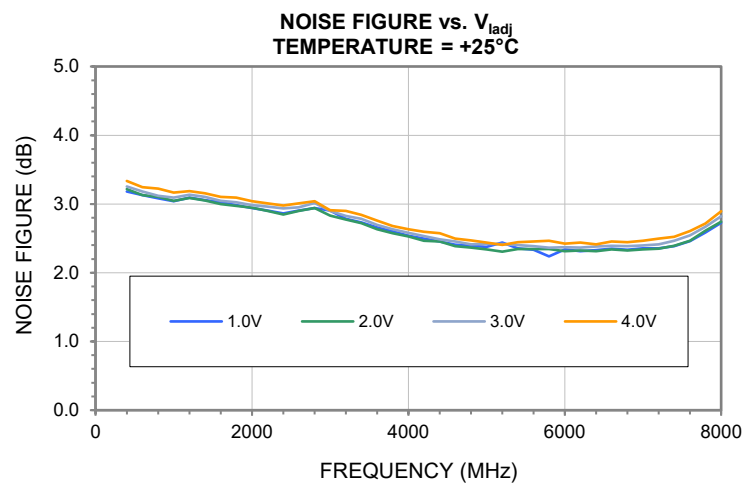
## Typical Performance Curves



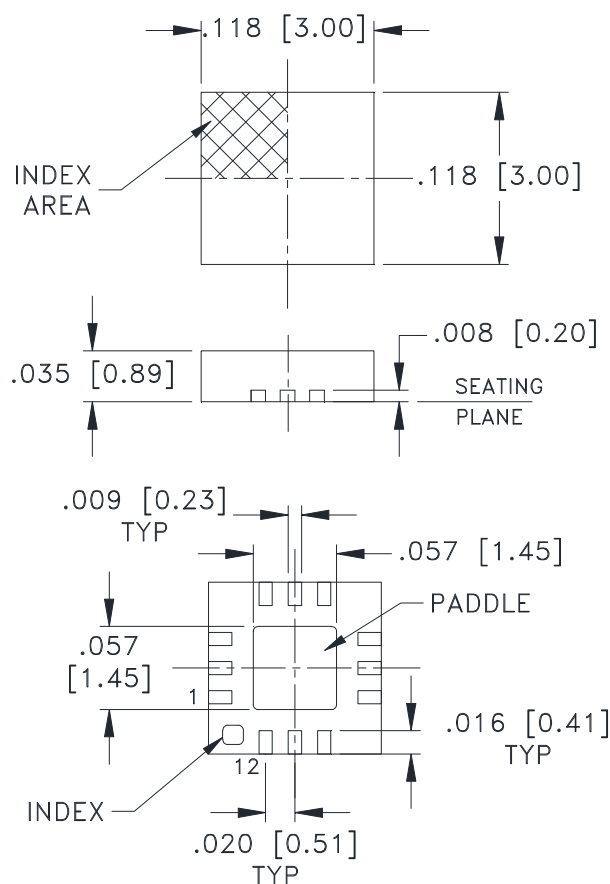
## Typical Performance Curves



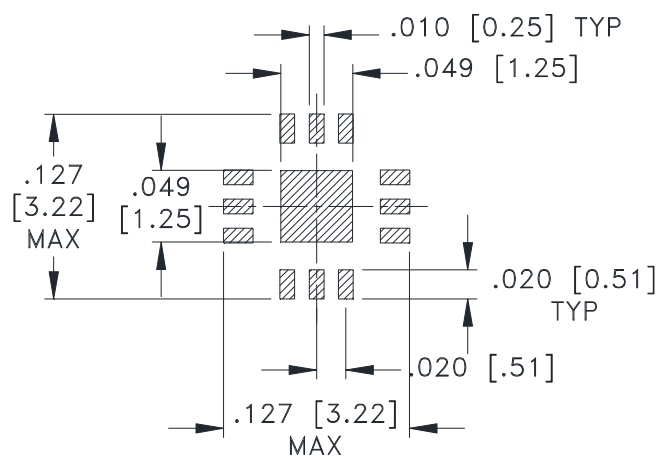
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



SUGGESTED LAYOUT,  
TOLERANCE TO BE WITHIN  $\pm .002$

**Weight: .02 Grams**

**Dimensions are in inches (mm). Tolerances: 2Pl.  $\pm .01$ ; 3 Pl.  $\pm .004$**

### Notes:

- Case material: Plastic.
- Termination finish:
  - For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin. All models, (+) suffix. See Data sheet.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

**Mini-Circuits®**

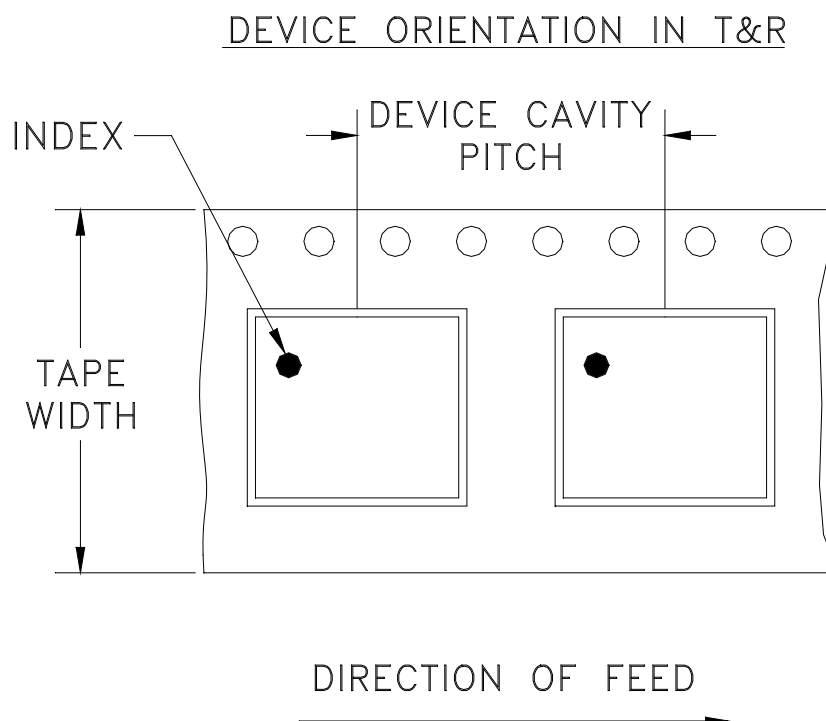
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

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P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

# 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 |

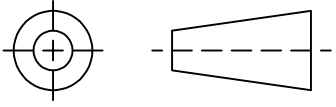
Note: Please consult individual model data sheet to determine device per reel availability.

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.

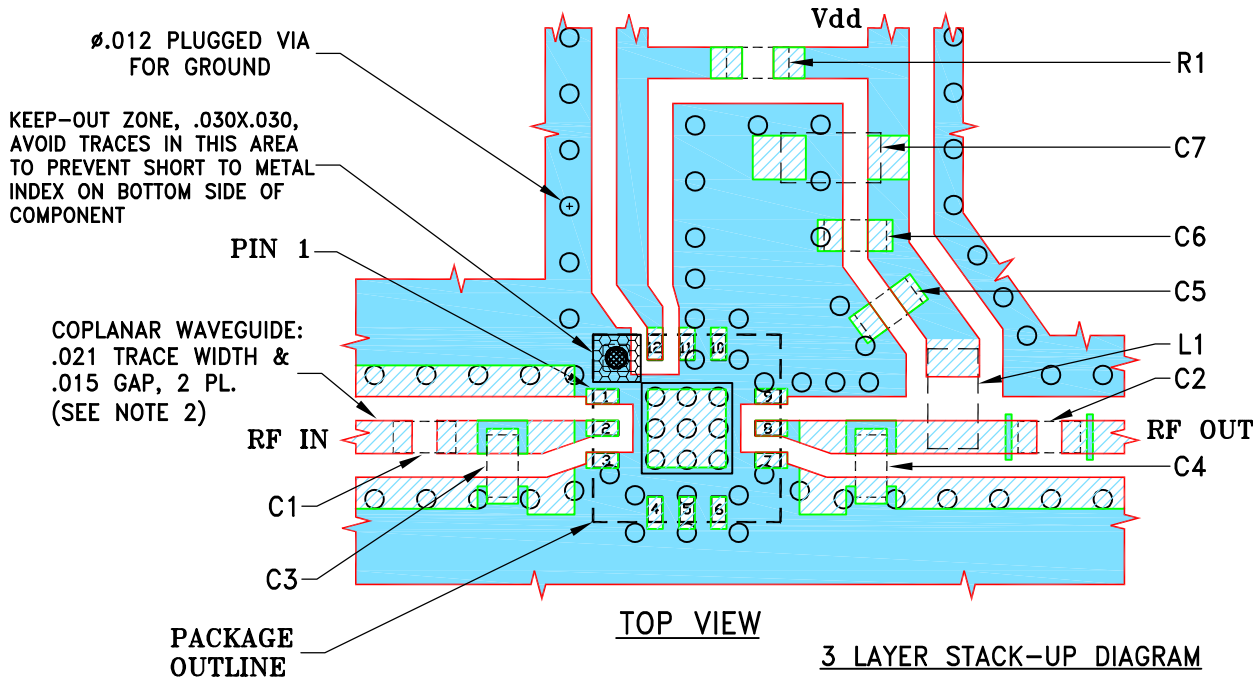
Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



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P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661  
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| THIRD ANGLE PROJECTION                                                           |  | REVISIONS |            |               |          |         |
|----------------------------------------------------------------------------------|--|-----------|------------|---------------|----------|---------|
|  |  | REV       | ECN No.    | DESCRIPTION   | DATE     | DR AUTH |
|                                                                                  |  | OR        | ECO-018697 | NEW RELEASE   | 07/28/23 | ITG IL  |
|                                                                                  |  | A         | NPO-003730 | UPDATE TB P/N | 07/27/23 | IK CY   |
|                                                                                  |  |           |            |               |          |         |

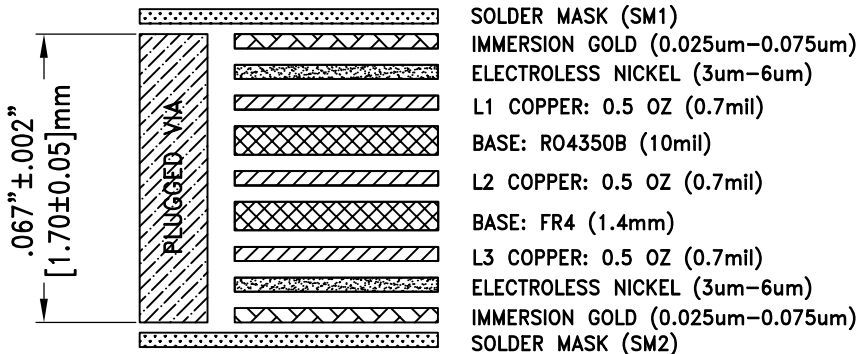
SUGGESTED MOUNTING CONFIGURATION FOR  
DQ1225 CASE STYLE



| COMPONENT | SIZE |
|-----------|------|
| C1...C6   | 0402 |
| C7,L1     | 0603 |
| R1        | 0402 |

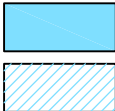
TOP VIEW

3 LAYER STACK-UP DIAGRAM



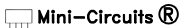
NOTES:

- PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
- TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010"±.001"; COPPER: 1/2 OZ. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-PMA3-83LP+.
- COPPER LAYERS L2 & L3 OF THE PCB ARE CONTINUOUS GROUND PLANES.



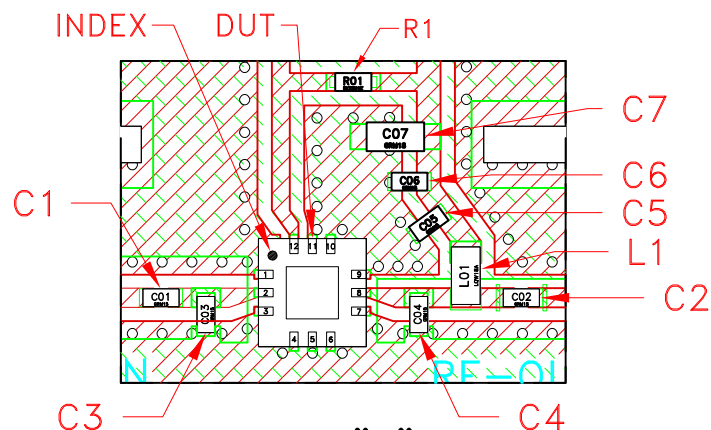
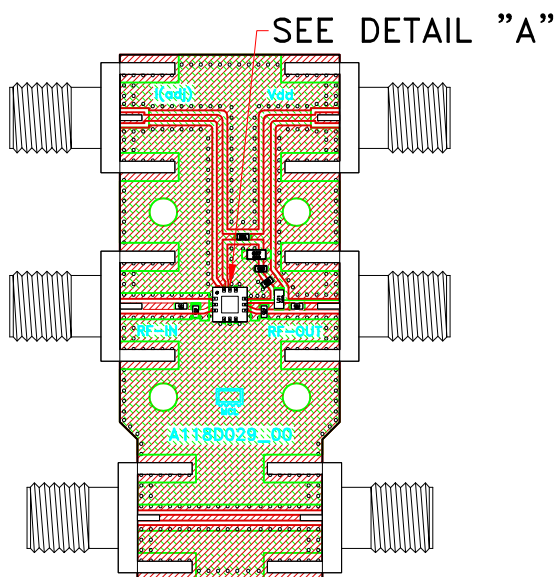
DENOTES PCB COPPER LAYOUT WITH SMOBC  
(SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

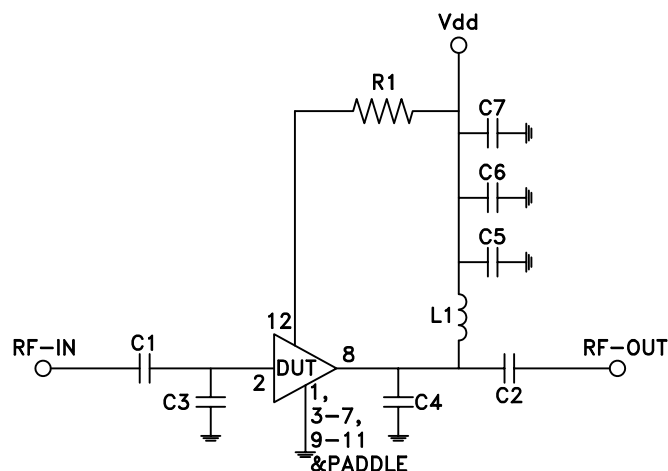
| UNLESS OTHERWISE SPECIFIED                                                                                                                                                                                                                                                                                                                                                                                                                   |  | INITIALS | DATE |  <b>Mini-Circuits®</b> 13 Neptune Avenue<br>Brooklyn NY 11235 |            |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| DIMENSIONS ARE IN INCHES                                                                                                                                                                                                                                                                                                                                                                                                                     |  | DRAWN    | ITG  |                                                                                                                                                  |            |               |
| TOLERANCES ON:                                                                                                                                                                                                                                                                                                                                                                                                                               |  | CHECKED  | GF   |                                                                                                                                                  |            |               |
| 2 PL DECIMALS ±                                                                                                                                                                                                                                                                                                                                                                                                                              |  | APPROVED | IL   |                                                                                                                                                  |            |               |
| 3 PL DECIMALS ± .005                                                                                                                                                                                                                                                                                                                                                                                                                         |  |          |      | <b>PL, DQ1225, TB-PMA3-83LPC+</b>                                                                                                                |            |               |
| ANGLES ±                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |          |      |                                                                                                                                                  |            |               |
| FRACTIONS ±                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |          |      |                                                                                                                                                  |            |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |          |      |                                                                                                                                                  |            |               |
|  Mini-Circuits®                                                                                                                                                                                                                                                                                                                                           |  |          |      | SIZE                                                                                                                                             | CODE IDENT | DRAWING NO:   |
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| ASHEETA1.DWG REV:A DATE:01/12/95                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |      | FILE:                                                                                                                                            | 98-PL-757  | SCALE: 8:1    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |          |      |                                                                                                                                                  |            | SHEET: 1 OF 1 |



# Evaluation Board and Circuit



DETAIL "A"  
LOCATION OF COMPONENTS  
ON THE PCB  
(SCALE 3:1)



SCHEMATIC DIAGRAM

| Component | Size | Value   | Part Number        | Manufacturer |
|-----------|------|---------|--------------------|--------------|
| C1,C2     | 0402 | 100pF   | GRM1555C1H101JA01D | Murata       |
| C3        | 0402 | 0.4pF   | GJM1555C1HR40WB01D | Murata       |
| C4        | 0402 | 0.1pF   | GJM1555C1HR10WB01D | Murata       |
| C5        | 0402 | 10pF    | GRM1555C1H100JA01D | Murata       |
| C6        | 0402 | 1uF     | GRM155C71A105KE11D | Murata       |
| C7        | 0603 | 10uF    | GRM188D71A106MA73J | Murata       |
| L1        | 0603 | 33nH    | 0603CS-33NXJEW     | Coilcraft    |
| R1        | 0402 | 2.2KOhm | RK73H1ETTP2201F    | KOA Speer    |

## Notes:

1. 50 Ohm SMA Female Connectors.
2. PCB Material: Roger R04350B or equivalent,  
Dielectric constant=3.5, Thickness=0.010 inch



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 |                |