ULTRA HIGH DYNAMIC RANGE

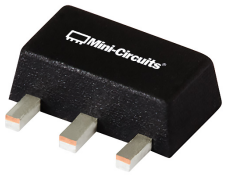
# Monolithic Amplifier

# PHA-83W+

50Ω 50 MHz to 8 GHz

## THE BIG DEAL

- Ultra Wideband, 50 MHz to 8 GHz
- Excellent Gain Flatness 15.7±1.4 dB Typ.
- High Linearity, +23.3 dBm P1dB & +35.5 dBm OIP3
- Robust ESD performance (Class 1B)



*Generic photo used for illustration purposes only*

CASE STYLE: DF782

**+RoHS Compliant**
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

## APPLICATIONS

- WiFi
- WLAN
- LTE
- WiMAX
- S-band Radar
- C-Band Satcom

## PRODUCT OVERVIEW

PHA-83W+ (RoHS compliant) is an advanced wideband amplifier fabricated using PHEMT technology and offers extremely high dynamic range over a broad frequency range and with excellent gain flatness. In addition, the PHA-83W+ has good input and output return loss over a broad frequency range. PHA-83W+ is enclosed in a SOT-89 package and has very good thermal performance.

## KEY FEATURES

| Feature | Advantages |
|---|---|
| Ultra Wideband: 50 MHz to 8 GHz | Broadband covering primary wireless communications bands |
| Extremely High IP3<br>+36.6 dBm typ. at 50 MHz<br>+37 dBm typ. at 6 GHz | The PHA-83W+ matches industry leading IP3 performance relative to device size and power consumption. The combination of the design and PHEMT Structure provides enhanced linearity over a broad frequency range as evidence in the IP3 being approximately 12 dB above the P1dB point. This feature makes this amplifier ideal for use in:<br>• Driver amplifiers for complex waveform up converter paths<br>• Drivers in linearized transmit systems<br>• Secondary amplifiers in ultra-High Dynamic range receivers |
| Excellent Gain Flatness | Typical ±1.4 dB gain flatness across the entire frequency range minimizes the need for external equalizer networks making it a great fit for instrumentation and EW application. |

REV. A
ECO-010399
PHA-83W+
MCL NY
240722

# Monolithic Amplifier

# PHA-83W+

50Ω 50 MHz to 8 GHz

## ELECTRICAL SPECIFICATIONS AT +25°C, 50Ω, UNLESS NOTED OTHERWISE

| Parameter | Condition (MHz) | Vd=+9V[1] | | | Vd=+5V[1] | Vd=+9V[2] | Vd=+5V[2] | Units |
|---|---|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | Typ. | Typ. | Typ. | |
| Frequency range | | 50 | | 8000 | 50-8000 | 50-8000 | 50-8000 | MHz |
| Gain | 50 | 14.2 | 16.7 | 19.2 | 15.1 | 16.3 | 14.9 | dB |
| | 2000 | 13.7 | 16.3 | 18.6 | 14.4 | 16 | 14.2 | |
| | 4000 | 13.2 | 15.7 | 17.8 | 13.2 | 15.3 | 12.8 | |
| | 6000 | 13.7 | 16 | 18.5 | 12.6 | 15.5 | 12.4 | |
| | 8000 | — | 14.2 | — | 10 | 12.4 | 8.2 | |
| Gain Flatness | 50 - 8000 | | 1.4 | | 2.8 | — | — | dB |
| Input Return Loss | 50 | | 23 | | 20 | 16 | 16 | dB |
| | 2000 | | 21 | | 14 | 21 | 17 | |
| | 4000 | | 13 | | 11 | 14 | 12 | |
| | 6000 | | 13 | | 14 | 14 | 16 | |
| | 8000 | | 4 | | 6 | 3 | 5 | |
| Output Return Loss | 50 | | 17 | | 26 | 13 | 17 | dB |
| | 2000 | | 30 | | 17 | 33 | 22 | |
| | 4000 | | 18 | | 13 | 17 | 12 | |
| | 6000 | | 18 | | 12 | 15 | 20 | |
| | 8000 | | 5 | | 6 | 6 | 6 | |
| Output Power @1 dB Compression | 50 | | +23.8 | | +16.5 | +23.7 | +15.6 | dBm |
| | 2000 | | +23.8 | | +16.3 | +24.3 | +16 | |
| | 4000 | | +23.3 | | +15.9 | +22.6 | +14.1 | |
| | 6000 | | +22.6 | | +16.4 | +22.6 | +15.8 | |
| | 8000 | | +18.5 | | +13.2 | +16.7 | +11 | |
| Output IP3 (Pout= 0dBm/Tone) | 50 | | +36.6 | | +24.1 | +36.5 | +25.9 | dBm |
| | 2000 | | +36 | | +23.4 | +35.4 | +24.6 | |
| | 4000 | | +35.5 | | +23.4 | +34.5 | +22.8 | |
| | 6000 | | +37 | | +23.6 | +35.6 | +25.1 | |
| | 8000 | | +31.9 | | +20.9 | +29.9 | +19.5 | |
| Noise Figure | 50 | | 3.3 | | 2.8 | 3.4 | 2.8 | dB |
| | 2000 | | 2.9 | | 2.7 | 2.9 | 2.7 | |
| | 4000 | | 3.3 | | 3.1 | 3.5 | 3.1 | |
| | 6000 | | 3.9 | | 3.6 | 3.9 | 3.5 | |
| | 8000 | | 5.1 | | 4.7 | 5.4 | 4.9 | |
| Device Operating Voltage | | +8.5 | +9 | +9.5 | +5 | +9 | +5 | V |
| Device Operating Current | | | 110 | 127 | 40.8 | 115 | 42.7 | mA |
| Device Current Variation vs. Temperature[3] | | | 34.6 | | 30.8 | 34.6 | 30.8 | µA/°C |
| Device Current Variation vs. Voltage[4] | | | 0.018 | | 0.015 | 0.018 | 0.015 | mA/mV |
| Thermal Resistance, junction-to-ground Lead at 85°C stage temperature | | | 41 | | 41 | 41 | 41 | °C/W |

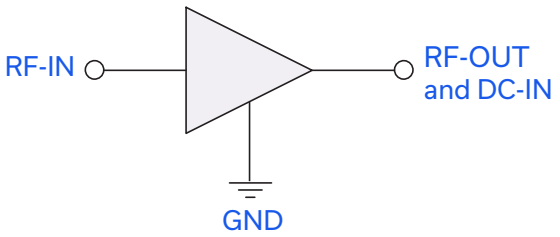
1. Measured on Mini-Circuits Characterization Test Board TB-PHA-83W+. See Characterization Test Circuit (Figure 1).
2. Measured on Mini-Circuits Application Evaluation Board TB-PHA-83WE+. See Application Test Circuit (Figure 2).
3. Device Current Variation vs. Temperature= (Current at 85°C - Current at -45°C)/130
4. Device Current Variation vs. Voltage = (Current at 9.5V - Current at 8.5V) / ((9.5V-8.5V)*1000 mV/V)

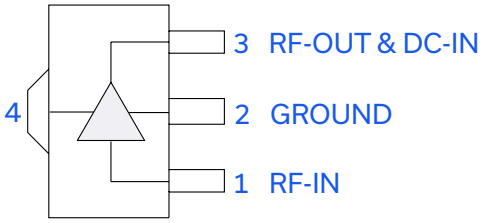
## ABSOLUTE MAXIMUM RATINGS[5]

| Parameter | Ratings |
|---|---|
| Operating Temperature (ground lead) | -40°C to +85°C |
| Storage Temperature | -65°C to +150°C |
| Power Dissipation | 1.58 W |
| Input Power (CW) | +18 dBm (continuous)<br>+24 dBm (5 minutes max) |
| DC Voltage on Pin 3 | +10.5 V |

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

## SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION




| Function | Pin Number | Description |
|---|---|---|
| RF IN | 1 | RF Input |
| RF-OUT and DC-IN | 3 | RF Output and DC Bias |
| GND | 2,4 | Connections to ground. |

## CHARACTERIZATION TEST CIRCUIT

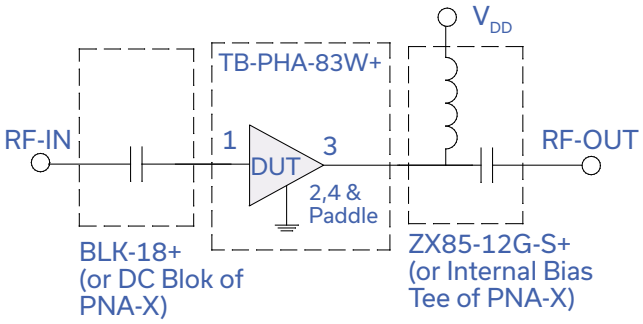
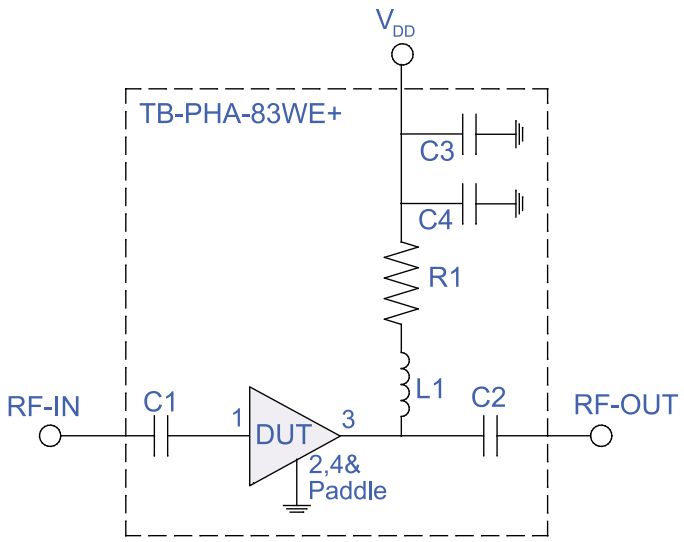



Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-PHA-83W+)
Gain, Return loss, Output power at 1dB compression (P1 dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

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

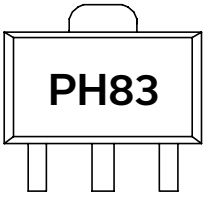
## APPLICATION TEST CIRCUIT




| Component | Size | Value | Part Number | Manufacturer |
|---|---|---|---|---|
| C1 | 0402 | 1000pF | GRM1555C1H102JA01D | Murata |
| C2 | 0402 | 180pF | GRM1555C1H181JA01D | Murata |
| C3 | 0402 | 0.1uF | GRM155R71C104KA88D | Murata |
| C4 | 0402 | 10000pF | GRM155R71E103KA01D | Murata |
| L1 | 0603 | 330nH | LQW18CNR33J00D | Murata |
| R1 | 0402 | 20hm | RK73H1ETTP2R00F | Koa |

Fig 2. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Application test board TB-PHA-83WE+)
Gain, Return loss, Output power at1dB compression (P1dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer
.
Conditions:
1. Gain and Return loss: $P_{IN}$= -25dBm
2. Output IP3 (OIP3): Two Tones spaced 1 MHz apart, 0 dBm/ tone at output.

## PRODUCT MARKING




Marking may contain other features or characters for internal lot control

**ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASHBOARD.** CLICK HERE

| | |
|---|---|
| **Performance Data** | Data Table<br>Swept Graphs<br>S-Parameter (S2P Files) Data Set (.zip file) |
| **Case Style** | DF782 (SOT 89) Plastic package, exposed paddle lead finish: matte-tin |
| **Tape & Reel**<br>**Standard quantities available on reel** | F55<br>7" reels with 20, 50, 100, 200, 500 or 1K devices |
| **Suggested Layout for PCB Design** | PL-653 |
| **Evaluation Board** | TB-PHA-83WE+ |
| **Environmental Ratings** | ENV08T1 |

## ESD RATING

Human Body Model (HBM): Class 1B (500V) in accordance with ANSI/ESD STM 5.1 - 2001

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

## *Typical Performance Data*

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

**Definitions:**

Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 9.00V, Id = 116mA @ 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) |
| 50 | 16.38 | 20.84 | 15.40 | 12.53 | 1.09 | 0.58 | 37.75 | 23.85 | 3.33 |
| 100 | 16.51 | 20.58 | 20.34 | 14.81 | 1.09 | 0.57 | 37.21 | 24.14 | 3.32 |
| 200 | 16.56 | 20.41 | 23.55 | 16.09 | 1.09 | 0.55 | 40.13 | 24.74 | 3.17 |
| 400 | 16.59 | 20.38 | 26.88 | 17.70 | 1.09 | 0.56 | 35.93 | 25.06 | 2.96 |
| 600 | 16.56 | 20.42 | 31.30 | 19.26 | 1.09 | 0.57 | 36.24 | 24.86 | 2.84 |
| 800 | 16.49 | 20.49 | 36.88 | 21.16 | 1.10 | 0.59 | 36.53 | 24.72 | 2.89 |
| 1000 | 16.46 | 20.50 | 34.07 | 23.90 | 1.11 | 0.60 | 36.90 | 24.26 | 2.78 |
| 1200 | 16.39 | 20.55 | 29.11 | 26.65 | 1.11 | 0.62 | 35.75 | 24.03 | 2.78 |
| 1400 | 16.30 | 20.60 | 26.25 | 29.45 | 1.12 | 0.63 | 35.95 | 24.32 | 2.81 |
| 1600 | 16.22 | 20.67 | 24.73 | 30.68 | 1.13 | 0.65 | 35.65 | 24.23 | 2.93 |
| 1800 | 16.12 | 20.76 | 24.15 | 29.50 | 1.14 | 0.66 | 35.28 | 24.29 | 2.93 |
| 2000 | 16.00 | 20.85 | 23.86 | 27.69 | 1.15 | 0.68 | 37.45 | 24.31 | 2.88 |
| 2200 | 15.92 | 20.92 | 24.41 | 26.49 | 1.16 | 0.69 | 35.08 | 24.24 | 2.89 |
| 2400 | 15.87 | 20.93 | 25.41 | 25.60 | 1.17 | 0.69 | 34.41 | 24.28 | 2.96 |
| 2600 | 15.81 | 20.97 | 26.22 | 24.74 | 1.17 | 0.70 | 36.09 | 24.70 | 2.98 |
| 2800 | 15.74 | 21.05 | 26.64 | 24.47 | 1.19 | 0.71 | 34.56 | 23.95 | 3.14 |
| 3000 | 15.69 | 21.09 | 26.42 | 25.65 | 1.19 | 0.71 | 34.60 | 23.59 | 3.20 |
| 3200 | 15.64 | 21.14 | 25.39 | 29.04 | 1.20 | 0.72 | 35.69 | 24.09 | 3.17 |
| 3400 | 15.60 | 21.24 | 22.93 | 42.09 | 1.21 | 0.73 | 35.45 | 22.85 | 3.23 |
| 3600 | 15.54 | 21.32 | 19.95 | 30.78 | 1.22 | 0.74 | 35.10 | 23.20 | 3.31 |
| 3800 | 15.48 | 21.43 | 17.15 | 22.88 | 1.23 | 0.75 | 34.72 | 23.32 | 3.31 |
| 4000 | 15.40 | 21.58 | 14.91 | 18.62 | 1.24 | 0.76 | 34.24 | 22.56 | 3.46 |
| 4200 | 15.32 | 21.71 | 13.12 | 15.82 | 1.24 | 0.76 | 34.88 | 22.83 | 3.52 |
| 4400 | 15.23 | 21.90 | 11.82 | 13.94 | 1.25 | 0.76 | 34.28 | 22.89 | 3.44 |
| 4600 | 15.16 | 22.01 | 10.97 | 12.72 | 1.24 | 0.76 | 34.94 | 22.66 | 3.52 |
| 4800 | 15.10 | 22.17 | 10.46 | 12.04 | 1.24 | 0.77 | 35.27 | 22.41 | 3.65 |
| 5000 | 15.09 | 22.25 | 10.33 | 11.84 | 1.24 | 0.78 | 35.08 | 22.59 | 3.59 |
| 5200 | 15.13 | 22.32 | 10.58 | 12.06 | 1.24 | 0.79 | 34.77 | 22.22 | 3.60 |
| 5400 | 15.20 | 22.37 | 11.15 | 12.62 | 1.23 | 0.81 | 34.80 | 22.78 | 3.73 |
| 5600 | 15.31 | 22.34 | 11.98 | 13.46 | 1.23 | 0.82 | 34.62 | 22.52 | 3.71 |
| 5800 | 15.45 | 22.32 | 12.95 | 14.29 | 1.22 | 0.82 | 34.73 | 22.49 | 3.79 |
| 6000 | 15.58 | 22.31 | 13.92 | 14.99 | 1.21 | 0.82 | 36.00 | 22.27 | 3.85 |
| 6200 | 15.72 | 22.27 | 14.70 | 15.58 | 1.20 | 0.81 | 36.22 | 21.71 | 3.99 |
| 6400 | 15.88 | 22.22 | 15.26 | 16.59 | 1.20 | 0.80 | 35.71 | 21.17 | 4.11 |
| 6600 | 16.02 | 22.19 | 15.08 | 19.07 | 1.20 | 0.80 | 35.85 | 20.46 | 4.23 |
| 6800 | 16.06 | 22.23 | 13.58 | 25.13 | 1.21 | 0.81 | 34.46 | 19.83 | 4.40 |
| 7000 | 15.92 | 22.49 | 11.02 | 24.69 | 1.23 | 0.84 | 33.45 | 18.67 | 4.61 |
| 7200 | 15.53 | 22.94 | 8.34 | 15.68 | 1.25 | 0.88 | 31.67 | 18.06 | 4.88 |
| 7400 | 14.85 | 23.73 | 6.19 | 11.03 | 1.29 | 0.91 | 30.04 | 16.93 | 5.04 |
| 7600 | 13.95 | 24.73 | 4.69 | 8.24 | 1.34 | 0.92 | 29.57 | 16.86 | 5.23 |
| 7800 | 12.99 | 25.76 | 3.70 | 6.49 | 1.39 | 0.91 | 28.60 | 15.95 | 5.39 |
| 8000 | 12.03 | 26.83 | 3.07 | 5.37 | 1.46 | 0.89 | 28.57 | 15.71 | 5.50 |
| 8200 | 11.20 | 27.67 | 2.70 | 4.53 | 1.51 | 0.84 | 27.93 | 15.37 | 5.58 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 8.5V, Id = 106mA @ 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) |
| 50 | 16.35 | 20.85 | 15.47 | 12.53 | 1.10 | 0.58 | 35.63 | 23.26 | 3.29 |
| 100 | 16.48 | 20.54 | 20.54 | 14.90 | 1.09 | 0.57 | 36.10 | 23.59 | 3.26 |
| 200 | 16.54 | 20.41 | 23.93 | 16.21 | 1.09 | 0.56 | 35.64 | 24.19 | 3.12 |
| 400 | 16.56 | 20.38 | 27.55 | 17.84 | 1.09 | 0.56 | 37.61 | 24.49 | 2.92 |
| 600 | 16.53 | 20.43 | 32.39 | 19.40 | 1.10 | 0.58 | 37.08 | 24.30 | 2.86 |
| 800 | 16.46 | 20.47 | 37.55 | 21.33 | 1.10 | 0.60 | 36.70 | 24.15 | 2.79 |
| 1000 | 16.43 | 20.47 | 33.57 | 24.14 | 1.11 | 0.60 | 36.14 | 23.68 | 2.72 |
| 1200 | 16.36 | 20.54 | 28.74 | 27.11 | 1.11 | 0.62 | 35.68 | 23.44 | 2.75 |
| 1400 | 16.26 | 20.61 | 25.89 | 30.35 | 1.12 | 0.64 | 35.93 | 23.74 | 2.78 |
| 1600 | 16.18 | 20.68 | 24.53 | 32.19 | 1.13 | 0.65 | 35.57 | 23.64 | 2.88 |
| 1800 | 16.08 | 20.74 | 23.98 | 31.10 | 1.14 | 0.66 | 35.14 | 23.84 | 2.86 |
| 2000 | 15.95 | 20.84 | 23.81 | 28.97 | 1.16 | 0.68 | 35.36 | 23.73 | 2.85 |
| 2200 | 15.87 | 20.89 | 24.40 | 27.60 | 1.16 | 0.69 | 36.53 | 23.79 | 2.85 |
| 2400 | 15.82 | 20.94 | 25.41 | 26.42 | 1.17 | 0.70 | 34.53 | 23.70 | 2.86 |
| 2600 | 15.76 | 20.99 | 26.34 | 25.32 | 1.18 | 0.70 | 34.94 | 24.25 | 2.96 |
| 2800 | 15.69 | 21.06 | 26.85 | 24.78 | 1.19 | 0.71 | 32.94 | 23.37 | 3.08 |
| 3000 | 15.63 | 21.13 | 26.56 | 25.73 | 1.20 | 0.72 | 35.83 | 23.01 | 3.16 |
| 3200 | 15.57 | 21.18 | 25.56 | 28.41 | 1.21 | 0.73 | 34.65 | 23.63 | 3.24 |
| 3400 | 15.52 | 21.29 | 23.11 | 34.75 | 1.22 | 0.74 | 34.68 | 22.39 | 3.23 |
| 3600 | 15.46 | 21.37 | 20.08 | 29.94 | 1.23 | 0.75 | 34.08 | 22.73 | 3.28 |
| 3800 | 15.40 | 21.50 | 17.31 | 23.02 | 1.24 | 0.76 | 34.24 | 22.86 | 3.29 |
| 4000 | 15.32 | 21.61 | 15.05 | 18.90 | 1.25 | 0.76 | 34.58 | 22.09 | 3.37 |
| 4200 | 15.23 | 21.78 | 13.25 | 16.16 | 1.26 | 0.77 | 33.78 | 22.36 | 3.47 |
| 4400 | 15.15 | 21.94 | 11.94 | 14.33 | 1.26 | 0.77 | 33.98 | 22.42 | 3.46 |
| 4600 | 15.07 | 22.09 | 11.10 | 13.12 | 1.26 | 0.78 | 33.96 | 22.20 | 3.52 |
| 4800 | 15.02 | 22.20 | 10.60 | 12.49 | 1.26 | 0.78 | 35.16 | 22.06 | 3.57 |
| 5000 | 15.01 | 22.31 | 10.47 | 12.36 | 1.26 | 0.79 | 34.82 | 22.25 | 3.49 |
| 5200 | 15.04 | 22.40 | 10.73 | 12.69 | 1.26 | 0.81 | 33.45 | 21.89 | 3.52 |
| 5400 | 15.12 | 22.41 | 11.29 | 13.40 | 1.26 | 0.82 | 34.71 | 22.44 | 3.67 |
| 5600 | 15.22 | 22.42 | 12.17 | 14.49 | 1.26 | 0.83 | 35.35 | 22.19 | 3.70 |
| 5800 | 15.33 | 22.42 | 13.17 | 15.53 | 1.25 | 0.84 | 35.15 | 22.14 | 3.74 |
| 6000 | 15.45 | 22.42 | 14.18 | 16.36 | 1.25 | 0.83 | 35.35 | 21.91 | 3.83 |
| 6200 | 15.57 | 22.38 | 15.07 | 16.90 | 1.24 | 0.82 | 35.66 | 21.44 | 3.94 |
| 6400 | 15.69 | 22.37 | 15.75 | 17.81 | 1.24 | 0.81 | 35.38 | 20.77 | 4.08 |
| 6600 | 15.81 | 22.35 | 15.80 | 20.23 | 1.24 | 0.81 | 33.50 | 20.15 | 4.18 |
| 6800 | 15.83 | 22.43 | 14.44 | 27.28 | 1.25 | 0.82 | 33.19 | 19.50 | 4.36 |
| 7000 | 15.69 | 22.66 | 11.83 | 27.50 | 1.27 | 0.85 | 31.72 | 18.33 | 4.56 |
| 7200 | 15.33 | 23.11 | 9.02 | 16.62 | 1.30 | 0.89 | 30.25 | 17.62 | 4.72 |
| 7400 | 14.70 | 23.82 | 6.72 | 11.70 | 1.34 | 0.93 | 28.63 | 16.51 | 4.97 |
| 7600 | 13.86 | 24.78 | 5.08 | 8.77 | 1.39 | 0.94 | 28.17 | 16.49 | 5.08 |
| 7800 | 12.95 | 25.75 | 4.00 | 6.92 | 1.44 | 0.93 | 27.43 | 15.63 | 5.27 |
| 8000 | 12.04 | 26.69 | 3.29 | 5.72 | 1.49 | 0.91 | 27.62 | 15.54 | 5.45 |
| 8200 | 11.25 | 27.51 | 2.87 | 4.83 | 1.54 | 0.87 | 26.94 | 15.10 | 5.47 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 9.5V, Id = 125mA @ 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) |
| 50 | 16.39 | 20.90 | 15.34 | 12.60 | 1.10 | 0.58 | 36.69 | 24.23 | 3.42 |
| 100 | 16.52 | 20.56 | 20.24 | 14.80 | 1.09 | 0.56 | 36.65 | 24.50 | 3.39 |
| 200 | 16.58 | 20.41 | 23.33 | 16.04 | 1.09 | 0.55 | 38.06 | 25.08 | 3.22 |
| 400 | 16.61 | 20.38 | 26.51 | 17.62 | 1.09 | 0.56 | 36.67 | 25.41 | 3.00 |
| 600 | 16.58 | 20.43 | 30.64 | 19.14 | 1.09 | 0.57 | 36.23 | 25.21 | 2.94 |
| 800 | 16.51 | 20.49 | 36.25 | 21.04 | 1.10 | 0.59 | 36.94 | 25.08 | 2.83 |
| 1000 | 16.48 | 20.48 | 34.39 | 23.76 | 1.10 | 0.60 | 36.14 | 24.62 | 2.76 |
| 1200 | 16.41 | 20.55 | 29.40 | 26.41 | 1.11 | 0.61 | 37.18 | 24.53 | 2.80 |
| 1400 | 16.32 | 20.62 | 26.33 | 28.86 | 1.12 | 0.63 | 37.35 | 24.69 | 2.79 |
| 1600 | 16.24 | 20.68 | 24.84 | 29.76 | 1.13 | 0.64 | 35.79 | 24.60 | 2.90 |
| 1800 | 16.14 | 20.74 | 24.17 | 28.65 | 1.14 | 0.66 | 36.47 | 24.78 | 2.93 |
| 2000 | 16.02 | 20.86 | 23.84 | 26.81 | 1.15 | 0.68 | 35.57 | 24.67 | 2.93 |
| 2200 | 15.94 | 20.91 | 24.44 | 25.72 | 1.16 | 0.69 | 35.66 | 24.73 | 2.94 |
| 2400 | 15.89 | 20.93 | 25.30 | 24.94 | 1.16 | 0.69 | 35.62 | 24.65 | 3.08 |
| 2600 | 15.84 | 20.96 | 26.09 | 24.31 | 1.17 | 0.69 | 35.69 | 25.06 | 3.02 |
| 2800 | 15.78 | 21.03 | 26.44 | 24.10 | 1.18 | 0.70 | 36.02 | 24.31 | 3.12 |
| 3000 | 15.73 | 21.06 | 26.19 | 25.38 | 1.19 | 0.71 | 35.10 | 23.96 | 3.20 |
| 3200 | 15.68 | 21.13 | 25.18 | 28.74 | 1.20 | 0.72 | 34.78 | 24.45 | 3.27 |
| 3400 | 15.64 | 21.21 | 22.75 | 39.25 | 1.21 | 0.73 | 35.45 | 23.21 | 3.25 |
| 3600 | 15.59 | 21.28 | 19.78 | 29.99 | 1.21 | 0.74 | 35.91 | 23.57 | 3.39 |
| 3800 | 15.53 | 21.40 | 17.02 | 22.45 | 1.22 | 0.74 | 35.43 | 23.58 | 3.37 |
| 4000 | 15.46 | 21.48 | 14.77 | 18.27 | 1.22 | 0.75 | 34.07 | 22.91 | 3.48 |
| 4200 | 15.37 | 21.64 | 12.98 | 15.54 | 1.23 | 0.75 | 34.44 | 23.18 | 3.54 |
| 4400 | 15.29 | 21.84 | 11.68 | 13.64 | 1.23 | 0.76 | 34.55 | 23.14 | 3.52 |
| 4600 | 15.21 | 21.98 | 10.83 | 12.42 | 1.23 | 0.76 | 33.49 | 22.89 | 3.56 |
| 4800 | 15.15 | 22.11 | 10.35 | 11.72 | 1.23 | 0.76 | 34.71 | 22.74 | 3.66 |
| 5000 | 15.14 | 22.24 | 10.22 | 11.48 | 1.23 | 0.77 | 35.11 | 22.81 | 3.56 |
| 5200 | 15.18 | 22.28 | 10.46 | 11.64 | 1.22 | 0.79 | 34.16 | 22.43 | 3.72 |
| 5400 | 15.26 | 22.32 | 11.00 | 12.10 | 1.21 | 0.80 | 35.43 | 22.99 | 3.76 |
| 5600 | 15.38 | 22.30 | 11.81 | 12.84 | 1.20 | 0.81 | 34.34 | 22.73 | 3.80 |
| 5800 | 15.52 | 22.29 | 12.76 | 13.53 | 1.20 | 0.81 | 34.36 | 22.72 | 3.87 |
| 6000 | 15.67 | 22.18 | 13.70 | 14.16 | 1.18 | 0.81 | 36.27 | 22.51 | 3.93 |
| 6200 | 15.83 | 22.21 | 14.43 | 14.77 | 1.18 | 0.80 | 36.39 | 21.96 | 4.10 |
| 6400 | 16.00 | 22.11 | 14.87 | 15.79 | 1.17 | 0.79 | 36.59 | 21.44 | 4.19 |
| 6600 | 16.16 | 22.08 | 14.54 | 18.10 | 1.17 | 0.79 | 34.63 | 20.74 | 4.31 |
| 6800 | 16.21 | 22.13 | 12.95 | 22.59 | 1.18 | 0.80 | 34.01 | 20.13 | 4.50 |
| 7000 | 16.06 | 22.38 | 10.41 | 21.50 | 1.19 | 0.83 | 33.79 | 19.08 | 4.69 |
| 7200 | 15.63 | 22.89 | 7.84 | 14.64 | 1.22 | 0.87 | 32.22 | 18.46 | 4.87 |
| 7400 | 14.91 | 23.71 | 5.80 | 10.41 | 1.26 | 0.90 | 30.75 | 17.32 | 5.11 |
| 7600 | 13.96 | 24.80 | 4.39 | 7.81 | 1.31 | 0.91 | 30.35 | 17.21 | 5.26 |
| 7800 | 12.96 | 25.85 | 3.48 | 6.16 | 1.36 | 0.90 | 29.35 | 16.40 | 5.44 |
| 8000 | 11.97 | 26.94 | 2.91 | 5.10 | 1.43 | 0.87 | 29.63 | 16.14 | 5.61 |
| 8200 | 11.11 | 27.86 | 2.58 | 4.32 | 1.49 | 0.83 | 28.72 | 15.78 | 5.62 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 9.00V, Id = 107mA @ Temperature = -45°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) |
| 50 | 16.46 | 20.92 | 15.21 | 12.46 | 1.09 | 0.58 | 36.50 | 23.70 | 2.53 |
| 100 | 16.61 | 20.60 | 20.27 | 14.84 | 1.09 | 0.56 | 37.79 | 23.95 | 2.56 |
| 200 | 16.67 | 20.44 | 23.77 | 16.29 | 1.08 | 0.55 | 36.58 | 24.67 | 2.49 |
| 400 | 16.70 | 20.40 | 26.61 | 17.62 | 1.08 | 0.55 | 36.38 | 24.84 | 2.25 |
| 600 | 16.68 | 20.45 | 30.40 | 19.07 | 1.09 | 0.56 | 35.97 | 24.63 | 2.24 |
| 800 | 16.62 | 20.51 | 34.23 | 20.64 | 1.10 | 0.58 | 36.56 | 24.49 | 2.27 |
| 1000 | 16.60 | 20.53 | 34.62 | 23.06 | 1.10 | 0.59 | 37.45 | 23.89 | 2.22 |
| 1200 | 16.55 | 20.56 | 29.90 | 25.51 | 1.10 | 0.60 | 36.56 | 23.67 | 2.22 |
| 1400 | 16.46 | 20.64 | 26.91 | 28.32 | 1.11 | 0.62 | 35.87 | 23.97 | 2.33 |
| 1600 | 16.40 | 20.66 | 25.09 | 30.73 | 1.12 | 0.63 | 35.62 | 23.90 | 2.36 |
| 1800 | 16.30 | 20.73 | 24.38 | 30.22 | 1.13 | 0.64 | 35.32 | 24.11 | 2.33 |
| 2000 | 16.18 | 20.85 | 23.96 | 28.06 | 1.14 | 0.66 | 36.12 | 24.15 | 2.32 |
| 2200 | 16.09 | 20.89 | 24.27 | 26.72 | 1.15 | 0.67 | 35.35 | 24.21 | 2.33 |
| 2400 | 16.06 | 20.95 | 25.37 | 25.44 | 1.16 | 0.68 | 34.75 | 24.29 | 2.47 |
| 2600 | 16.01 | 21.00 | 25.95 | 24.07 | 1.16 | 0.68 | 36.02 | 24.90 | 2.44 |
| 2800 | 15.95 | 21.07 | 26.06 | 23.20 | 1.17 | 0.69 | 36.50 | 23.99 | 2.48 |
| 3000 | 15.90 | 21.13 | 25.83 | 23.48 | 1.18 | 0.70 | 34.18 | 23.65 | 2.43 |
| 3200 | 15.86 | 21.15 | 25.74 | 25.05 | 1.19 | 0.70 | 34.92 | 24.44 | 2.47 |
| 3400 | 15.81 | 21.25 | 24.47 | 28.96 | 1.20 | 0.72 | 34.76 | 22.86 | 2.60 |
| 3600 | 15.77 | 21.34 | 21.57 | 33.73 | 1.21 | 0.73 | 34.95 | 23.38 | 2.62 |
| 3800 | 15.72 | 21.41 | 18.65 | 26.65 | 1.21 | 0.74 | 35.55 | 23.39 | 2.68 |
| 4000 | 15.66 | 21.53 | 16.11 | 21.34 | 1.22 | 0.74 | 34.21 | 22.81 | 2.72 |
| 4200 | 15.59 | 21.64 | 14.17 | 17.95 | 1.22 | 0.75 | 34.51 | 23.18 | 2.76 |
| 4400 | 15.53 | 21.77 | 12.77 | 15.83 | 1.22 | 0.75 | 34.84 | 23.53 | 2.80 |
| 4600 | 15.50 | 21.89 | 11.80 | 14.52 | 1.22 | 0.76 | 35.19 | 23.50 | 2.79 |
| 4800 | 15.46 | 22.03 | 11.21 | 13.84 | 1.22 | 0.77 | 35.59 | 23.27 | 2.80 |
| 5000 | 15.46 | 22.14 | 11.07 | 13.72 | 1.22 | 0.78 | 36.35 | 23.64 | 2.81 |
| 5200 | 15.52 | 22.18 | 11.27 | 14.04 | 1.22 | 0.79 | 35.39 | 23.36 | 2.81 |
| 5400 | 15.60 | 22.18 | 11.79 | 14.88 | 1.21 | 0.80 | 35.93 | 24.02 | 2.88 |
| 5600 | 15.69 | 22.19 | 12.58 | 16.04 | 1.21 | 0.81 | 36.65 | 23.80 | 2.91 |
| 5800 | 15.80 | 22.21 | 13.44 | 16.80 | 1.20 | 0.81 | 35.44 | 23.82 | 2.97 |
| 6000 | 15.94 | 22.15 | 14.23 | 17.21 | 1.18 | 0.80 | 36.18 | 23.75 | 3.05 |
| 6200 | 16.07 | 22.13 | 14.75 | 17.00 | 1.18 | 0.79 | 37.16 | 23.22 | 3.15 |
| 6400 | 16.21 | 22.10 | 15.04 | 16.67 | 1.17 | 0.77 | 35.95 | 22.63 | 3.26 |
| 6600 | 16.36 | 22.08 | 15.05 | 17.25 | 1.16 | 0.76 | 42.92 | 22.13 | 3.43 |
| 6800 | 16.50 | 22.03 | 14.57 | 19.58 | 1.15 | 0.76 | 40.71 | 21.63 | 3.53 |
| 7000 | 16.56 | 22.02 | 12.96 | 26.17 | 1.15 | 0.77 | 35.27 | 20.57 | 3.69 |
| 7200 | 16.43 | 22.24 | 10.39 | 22.92 | 1.16 | 0.80 | 32.39 | 20.23 | 3.87 |
| 7400 | 16.04 | 22.78 | 7.74 | 15.05 | 1.18 | 0.85 | 29.82 | 18.99 | 4.01 |
| 7600 | 15.35 | 23.53 | 5.64 | 10.90 | 1.20 | 0.90 | 29.58 | 18.96 | 4.19 |
| 7800 | 14.51 | 24.44 | 4.23 | 8.38 | 1.23 | 0.93 | 27.76 | 17.79 | 4.32 |
| 8000 | 13.70 | 25.40 | 3.27 | 6.38 | 1.24 | 0.89 | 28.34 | 17.77 | 4.48 |
| 8200 | 12.77 | 26.42 | 2.70 | 5.50 | 1.29 | 0.90 | 27.27 | 17.04 | 4.57 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 8.5V, Id = 97mA @ Temperature = -45°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) |
| 50 | 16.39 | 20.76 | 15.37 | 12.61 | 1.09 | 0.57 | 36.50 | 22.86 | 2.49 |
| 100 | 16.53 | 20.53 | 20.63 | 15.17 | 1.09 | 0.56 | 36.49 | 23.20 | 2.52 |
| 200 | 16.60 | 20.38 | 24.59 | 16.70 | 1.08 | 0.55 | 36.69 | 23.91 | 2.46 |
| 400 | 16.63 | 20.33 | 28.00 | 18.11 | 1.08 | 0.55 | 36.47 | 24.06 | 2.25 |
| 600 | 16.61 | 20.38 | 32.69 | 19.60 | 1.09 | 0.57 | 35.97 | 23.72 | 2.21 |
| 800 | 16.54 | 20.45 | 35.80 | 21.28 | 1.10 | 0.59 | 36.69 | 23.57 | 2.26 |
| 1000 | 16.53 | 20.46 | 33.52 | 23.92 | 1.10 | 0.59 | 36.87 | 22.96 | 2.19 |
| 1200 | 16.47 | 20.50 | 28.87 | 26.63 | 1.11 | 0.61 | 36.08 | 22.87 | 2.23 |
| 1400 | 16.38 | 20.56 | 26.11 | 30.02 | 1.11 | 0.62 | 35.72 | 23.04 | 2.27 |
| 1600 | 16.32 | 20.62 | 24.46 | 32.97 | 1.12 | 0.63 | 35.62 | 22.97 | 2.35 |
| 1800 | 16.22 | 20.70 | 23.81 | 32.33 | 1.13 | 0.65 | 35.32 | 23.18 | 2.33 |
| 2000 | 16.10 | 20.82 | 23.49 | 29.62 | 1.14 | 0.67 | 34.70 | 23.23 | 2.31 |
| 2200 | 16.01 | 20.85 | 23.84 | 28.12 | 1.15 | 0.68 | 35.45 | 23.28 | 2.31 |
| 2400 | 15.98 | 20.93 | 25.05 | 26.59 | 1.16 | 0.68 | 34.75 | 23.37 | 2.38 |
| 2600 | 15.93 | 20.95 | 25.78 | 25.00 | 1.17 | 0.69 | 36.46 | 23.98 | 2.38 |
| 2800 | 15.87 | 21.00 | 26.05 | 23.91 | 1.17 | 0.69 | 35.37 | 23.21 | 2.44 |
| 3000 | 15.82 | 21.07 | 25.86 | 24.18 | 1.18 | 0.70 | 34.18 | 22.87 | 2.41 |
| 3200 | 15.78 | 21.13 | 25.54 | 25.64 | 1.19 | 0.71 | 34.92 | 23.66 | 2.49 |
| 3400 | 15.73 | 21.23 | 24.05 | 29.23 | 1.20 | 0.72 | 34.76 | 22.08 | 2.54 |
| 3600 | 15.68 | 21.27 | 21.21 | 31.30 | 1.21 | 0.73 | 34.95 | 22.61 | 2.59 |
| 3800 | 15.62 | 21.38 | 18.37 | 25.40 | 1.22 | 0.74 | 35.19 | 22.76 | 2.62 |
| 4000 | 15.57 | 21.50 | 15.89 | 20.80 | 1.22 | 0.75 | 34.73 | 22.03 | 2.72 |
| 4200 | 15.49 | 21.60 | 14.02 | 17.68 | 1.23 | 0.75 | 34.46 | 22.52 | 2.75 |
| 4400 | 15.43 | 21.77 | 12.65 | 15.67 | 1.23 | 0.76 | 34.51 | 22.75 | 2.75 |
| 4600 | 15.40 | 21.89 | 11.71 | 14.43 | 1.23 | 0.76 | 35.04 | 22.72 | 2.75 |
| 4800 | 15.36 | 22.02 | 11.13 | 13.81 | 1.23 | 0.77 | 34.99 | 22.62 | 2.76 |
| 5000 | 15.36 | 22.11 | 10.99 | 13.75 | 1.23 | 0.78 | 35.21 | 22.89 | 2.76 |
| 5200 | 15.42 | 22.14 | 11.21 | 14.13 | 1.23 | 0.79 | 35.11 | 22.71 | 2.85 |
| 5400 | 15.50 | 22.17 | 11.73 | 15.08 | 1.22 | 0.80 | 35.19 | 23.38 | 2.88 |
| 5600 | 15.59 | 22.17 | 12.49 | 16.41 | 1.22 | 0.82 | 36.50 | 23.27 | 2.90 |
| 5800 | 15.70 | 22.16 | 13.37 | 17.38 | 1.21 | 0.82 | 35.44 | 23.21 | 2.94 |
| 6000 | 15.83 | 22.13 | 14.17 | 17.94 | 1.20 | 0.81 | 36.18 | 23.13 | 3.02 |
| 6200 | 15.96 | 22.11 | 14.74 | 17.67 | 1.19 | 0.80 | 36.58 | 22.70 | 3.10 |
| 6400 | 16.08 | 22.10 | 15.05 | 17.23 | 1.18 | 0.78 | 38.91 | 22.11 | 3.23 |
| 6600 | 16.22 | 22.07 | 15.10 | 17.69 | 1.17 | 0.77 | 39.33 | 21.60 | 3.38 |
| 6800 | 16.34 | 22.04 | 14.65 | 19.79 | 1.17 | 0.76 | 39.34 | 21.08 | 3.49 |
| 7000 | 16.39 | 22.10 | 13.09 | 24.77 | 1.17 | 0.78 | 35.27 | 20.11 | 3.66 |
| 7200 | 16.26 | 22.31 | 10.55 | 21.64 | 1.18 | 0.81 | 32.39 | 19.64 | 3.80 |
| 7400 | 15.86 | 22.79 | 7.91 | 14.91 | 1.20 | 0.86 | 29.82 | 18.38 | 3.98 |
| 7600 | 15.19 | 23.52 | 5.80 | 10.94 | 1.22 | 0.90 | 29.40 | 18.35 | 4.13 |
| 7800 | 14.37 | 24.44 | 4.35 | 8.46 | 1.25 | 0.93 | 27.76 | 17.19 | 4.26 |
| 8000 | 13.58 | 25.34 | 3.37 | 6.47 | 1.26 | 0.90 | 28.34 | 17.06 | 4.41 |
| 8200 | 12.67 | 26.34 | 2.77 | 5.58 | 1.31 | 0.90 | 27.27 | 16.47 | 4.51 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 9.5V, Id = 116mA @ Temperature = -45°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) |
| 50 | 16.51 | 20.94 | 15.09 | 12.38 | 1.09 | 0.57 | 36.58 | 24.30 | 2.64 |
| 100 | 16.65 | 20.65 | 20.04 | 14.67 | 1.09 | 0.56 | 38.13 | 24.62 | 2.61 |
| 200 | 16.72 | 20.47 | 23.27 | 16.09 | 1.08 | 0.55 | 39.05 | 25.26 | 2.52 |
| 400 | 16.75 | 20.45 | 25.88 | 17.39 | 1.08 | 0.55 | 38.55 | 25.56 | 2.28 |
| 600 | 16.73 | 20.50 | 29.32 | 18.77 | 1.09 | 0.56 | 37.94 | 25.23 | 2.25 |
| 800 | 16.67 | 20.55 | 32.94 | 20.28 | 1.10 | 0.58 | 37.80 | 25.09 | 2.33 |
| 1000 | 16.66 | 20.55 | 34.63 | 22.59 | 1.10 | 0.59 | 38.45 | 24.63 | 2.25 |
| 1200 | 16.60 | 20.58 | 30.47 | 24.88 | 1.10 | 0.60 | 37.28 | 24.42 | 2.29 |
| 1400 | 16.51 | 20.66 | 27.38 | 27.47 | 1.11 | 0.62 | 36.35 | 24.72 | 2.37 |
| 1600 | 16.45 | 20.69 | 25.47 | 29.55 | 1.12 | 0.63 | 38.02 | 24.64 | 2.42 |
| 1800 | 16.36 | 20.76 | 24.67 | 29.05 | 1.13 | 0.64 | 37.48 | 24.84 | 2.40 |
| 2000 | 16.24 | 20.89 | 24.15 | 27.12 | 1.14 | 0.66 | 36.56 | 24.75 | 2.34 |
| 2200 | 16.15 | 20.93 | 24.45 | 25.91 | 1.15 | 0.67 | 35.72 | 24.81 | 2.35 |
| 2400 | 16.11 | 20.95 | 25.52 | 24.70 | 1.15 | 0.67 | 35.35 | 24.89 | 2.50 |
| 2600 | 16.06 | 20.97 | 25.95 | 23.50 | 1.16 | 0.68 | 37.44 | 25.49 | 2.46 |
| 2800 | 16.01 | 21.06 | 25.97 | 22.69 | 1.17 | 0.69 | 36.75 | 24.72 | 2.52 |
| 3000 | 15.96 | 21.12 | 25.72 | 23.01 | 1.17 | 0.69 | 34.86 | 24.39 | 2.49 |
| 3200 | 15.92 | 21.19 | 25.79 | 24.60 | 1.18 | 0.70 | 36.59 | 25.17 | 2.56 |
| 3400 | 15.88 | 21.24 | 24.67 | 28.74 | 1.19 | 0.71 | 36.34 | 23.46 | 2.61 |
| 3600 | 15.83 | 21.30 | 21.81 | 36.26 | 1.20 | 0.72 | 36.12 | 23.97 | 2.68 |
| 3800 | 15.79 | 21.40 | 18.81 | 27.58 | 1.21 | 0.73 | 36.04 | 23.99 | 2.72 |
| 4000 | 15.74 | 21.53 | 16.22 | 21.66 | 1.21 | 0.74 | 37.41 | 23.41 | 2.78 |
| 4200 | 15.66 | 21.69 | 14.24 | 18.07 | 1.22 | 0.75 | 36.87 | 23.78 | 2.81 |
| 4400 | 15.61 | 21.79 | 12.83 | 15.88 | 1.22 | 0.75 | 35.80 | 24.14 | 2.83 |
| 4600 | 15.58 | 21.92 | 11.84 | 14.53 | 1.22 | 0.76 | 35.89 | 23.97 | 2.83 |
| 4800 | 15.54 | 22.03 | 11.25 | 13.81 | 1.22 | 0.76 | 36.93 | 23.85 | 2.85 |
| 5000 | 15.54 | 22.14 | 11.10 | 13.66 | 1.22 | 0.78 | 36.25 | 24.12 | 2.83 |
| 5200 | 15.60 | 22.16 | 11.30 | 13.92 | 1.21 | 0.78 | 36.70 | 23.83 | 2.91 |
| 5400 | 15.68 | 22.17 | 11.81 | 14.67 | 1.20 | 0.80 | 37.63 | 24.50 | 2.99 |
| 5600 | 15.77 | 22.19 | 12.59 | 15.72 | 1.20 | 0.81 | 36.44 | 24.37 | 2.97 |
| 5800 | 15.88 | 22.17 | 13.45 | 16.32 | 1.18 | 0.81 | 38.39 | 24.29 | 3.06 |
| 6000 | 16.02 | 22.15 | 14.22 | 16.69 | 1.17 | 0.80 | 36.81 | 24.21 | 3.11 |
| 6200 | 16.17 | 22.09 | 14.71 | 16.50 | 1.16 | 0.78 | 37.22 | 23.77 | 3.23 |
| 6400 | 16.31 | 22.07 | 14.95 | 16.25 | 1.15 | 0.77 | 36.99 | 23.08 | 3.30 |
| 6600 | 16.48 | 21.99 | 14.93 | 16.92 | 1.14 | 0.75 | 38.43 | 22.60 | 3.46 |
| 6800 | 16.63 | 21.95 | 14.40 | 19.32 | 1.14 | 0.75 | 39.39 | 22.11 | 3.58 |
| 7000 | 16.70 | 21.98 | 12.76 | 26.99 | 1.13 | 0.76 | 35.99 | 21.06 | 3.80 |
| 7200 | 16.59 | 22.19 | 10.20 | 23.95 | 1.14 | 0.80 | 34.91 | 20.75 | 3.92 |
| 7400 | 16.19 | 22.67 | 7.58 | 15.16 | 1.15 | 0.84 | 31.85 | 19.53 | 4.12 |
| 7600 | 15.49 | 23.48 | 5.50 | 10.85 | 1.18 | 0.90 | 31.41 | 19.49 | 4.24 |
| 7800 | 14.64 | 24.44 | 4.11 | 8.29 | 1.21 | 0.92 | 29.72 | 18.44 | 4.38 |
| 8000 | 13.81 | 25.38 | 3.18 | 6.29 | 1.22 | 0.89 | 30.33 | 18.40 | 4.56 |
| 8200 | 12.87 | 26.46 | 2.62 | 5.42 | 1.27 | 0.89 | 29.39 | 17.65 | 4.66 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 9.00V, Id = 111mA @ Temperature = +85°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) |
| 50 | 16.06 | 20.59 | 15.83 | 13.27 | 1.10 | 0.60 | 34.95 | 22.04 | 3.74 |
| 100 | 16.19 | 20.35 | 21.19 | 15.70 | 1.10 | 0.59 | 34.60 | 22.50 | 3.78 |
| 200 | 16.26 | 20.23 | 25.18 | 17.02 | 1.10 | 0.57 | 35.32 | 23.41 | 3.53 |
| 400 | 16.29 | 20.23 | 30.17 | 18.89 | 1.10 | 0.58 | 35.29 | 23.97 | 3.13 |
| 600 | 16.25 | 20.29 | 39.59 | 20.81 | 1.10 | 0.60 | 35.15 | 23.79 | 3.09 |
| 800 | 16.17 | 20.37 | 36.77 | 23.47 | 1.11 | 0.62 | 36.38 | 23.78 | 3.13 |
| 1000 | 16.13 | 20.39 | 29.66 | 27.37 | 1.12 | 0.63 | 33.87 | 23.29 | 3.12 |
| 1200 | 16.05 | 20.43 | 26.16 | 31.62 | 1.13 | 0.64 | 35.13 | 23.06 | 3.19 |
| 1400 | 15.95 | 20.51 | 24.06 | 33.91 | 1.14 | 0.65 | 34.98 | 23.35 | 3.27 |
| 1600 | 15.86 | 20.58 | 23.06 | 32.59 | 1.15 | 0.67 | 34.14 | 23.26 | 3.37 |
| 1800 | 15.74 | 20.65 | 22.81 | 30.16 | 1.16 | 0.68 | 34.40 | 23.31 | 3.30 |
| 2000 | 15.63 | 20.78 | 22.96 | 28.09 | 1.17 | 0.70 | 34.34 | 23.21 | 3.26 |
| 2200 | 15.54 | 20.81 | 23.74 | 26.94 | 1.18 | 0.71 | 34.23 | 23.25 | 3.39 |
| 2400 | 15.48 | 20.85 | 24.92 | 26.27 | 1.19 | 0.71 | 33.83 | 23.15 | 3.39 |
| 2600 | 15.42 | 20.90 | 25.96 | 26.02 | 1.20 | 0.72 | 34.96 | 23.68 | 3.45 |
| 2800 | 15.35 | 20.96 | 26.63 | 26.48 | 1.21 | 0.73 | 34.28 | 22.80 | 3.53 |
| 3000 | 15.29 | 21.04 | 25.95 | 29.45 | 1.22 | 0.74 | 32.96 | 22.43 | 3.57 |
| 3200 | 15.24 | 21.10 | 23.89 | 37.39 | 1.23 | 0.75 | 33.89 | 23.05 | 3.58 |
| 3400 | 15.16 | 21.18 | 20.96 | 32.08 | 1.24 | 0.76 | 32.74 | 21.80 | 3.71 |
| 3600 | 15.08 | 21.28 | 18.00 | 23.63 | 1.25 | 0.76 | 33.31 | 22.15 | 3.77 |
| 3800 | 14.99 | 21.47 | 15.50 | 18.95 | 1.27 | 0.77 | 33.43 | 22.10 | 3.88 |
| 4000 | 14.87 | 21.60 | 13.49 | 15.85 | 1.27 | 0.77 | 32.22 | 21.26 | 3.94 |
| 4200 | 14.74 | 21.77 | 11.97 | 13.66 | 1.28 | 0.77 | 32.66 | 21.49 | 4.02 |
| 4400 | 14.64 | 21.95 | 10.87 | 12.18 | 1.28 | 0.77 | 32.23 | 21.42 | 4.01 |
| 4600 | 14.56 | 22.10 | 10.15 | 11.23 | 1.28 | 0.77 | 32.30 | 21.08 | 4.04 |
| 4800 | 14.49 | 22.28 | 9.78 | 10.72 | 1.29 | 0.78 | 32.72 | 21.04 | 4.05 |
| 5000 | 14.47 | 22.39 | 9.77 | 10.60 | 1.29 | 0.79 | 32.30 | 21.06 | 4.05 |
| 5200 | 14.53 | 22.43 | 10.14 | 10.86 | 1.28 | 0.81 | 31.66 | 20.70 | 4.14 |
| 5400 | 14.60 | 22.46 | 10.81 | 11.42 | 1.28 | 0.82 | 32.67 | 21.39 | 4.19 |
| 5600 | 14.69 | 22.47 | 11.75 | 12.25 | 1.28 | 0.84 | 32.19 | 21.01 | 4.26 |
| 5800 | 14.79 | 22.47 | 12.78 | 12.98 | 1.28 | 0.85 | 32.31 | 20.96 | 4.30 |
| 6000 | 14.92 | 22.49 | 13.82 | 13.91 | 1.28 | 0.85 | 32.27 | 20.72 | 4.43 |
| 6200 | 15.02 | 22.49 | 14.70 | 14.91 | 1.29 | 0.85 | 31.69 | 20.10 | 4.58 |
| 6400 | 15.08 | 22.50 | 15.09 | 16.40 | 1.30 | 0.85 | 31.55 | 19.49 | 4.69 |
| 6600 | 15.10 | 22.61 | 14.24 | 19.41 | 1.33 | 0.86 | 30.40 | 18.78 | 4.93 |
| 6800 | 15.04 | 22.77 | 12.09 | 22.20 | 1.35 | 0.88 | 29.81 | 18.21 | 5.09 |
| 7000 | 14.81 | 23.12 | 9.53 | 16.79 | 1.37 | 0.90 | 29.30 | 17.43 | 5.32 |
| 7200 | 14.39 | 23.65 | 7.32 | 11.49 | 1.39 | 0.90 | 28.63 | 17.01 | 5.50 |
| 7400 | 13.70 | 24.41 | 5.63 | 8.11 | 1.40 | 0.87 | 27.72 | 16.14 | 5.70 |
| 7600 | 12.71 | 25.50 | 4.38 | 6.19 | 1.46 | 0.85 | 27.58 | 15.97 | 5.87 |
| 7800 | 11.80 | 26.42 | 3.62 | 4.65 | 1.48 | 0.77 | 27.00 | 15.04 | 5.99 |
| 8000 | 10.86 | 27.46 | 3.13 | 3.62 | 1.51 | 0.68 | 27.28 | 15.14 | 6.13 |
| 8200 | 9.74 | 28.65 | 2.85 | 3.42 | 1.70 | 0.71 | 26.15 | 14.25 | 6.24 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 8.5V, Id = 102mA @ Temperature = +85°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) |
| 50 | 16.05 | 20.56 | 15.93 | 13.26 | 1.10 | 0.60 | 35.84 | 21.69 | 3.62 |
| 100 | 16.18 | 20.34 | 21.34 | 15.70 | 1.10 | 0.59 | 35.02 | 22.15 | 3.64 |
| 200 | 16.24 | 20.22 | 25.61 | 17.08 | 1.09 | 0.57 | 35.87 | 22.95 | 3.43 |
| 400 | 16.27 | 20.21 | 31.06 | 19.01 | 1.10 | 0.58 | 35.19 | 23.45 | 3.10 |
| 600 | 16.23 | 20.27 | 42.94 | 20.96 | 1.10 | 0.60 | 34.83 | 23.38 | 3.07 |
| 800 | 16.15 | 20.33 | 35.31 | 23.70 | 1.11 | 0.62 | 34.67 | 23.25 | 3.08 |
| 1000 | 16.10 | 20.35 | 28.99 | 27.65 | 1.12 | 0.63 | 34.68 | 22.75 | 3.07 |
| 1200 | 16.02 | 20.42 | 25.74 | 32.57 | 1.13 | 0.64 | 34.59 | 22.51 | 3.13 |
| 1400 | 15.92 | 20.50 | 23.81 | 35.95 | 1.14 | 0.66 | 34.02 | 22.81 | 3.21 |
| 1600 | 15.83 | 20.56 | 22.86 | 34.56 | 1.15 | 0.67 | 33.63 | 22.72 | 3.28 |
| 1800 | 15.71 | 20.65 | 22.63 | 31.99 | 1.16 | 0.69 | 34.15 | 22.90 | 3.28 |
| 2000 | 15.60 | 20.76 | 22.85 | 29.51 | 1.17 | 0.70 | 34.12 | 22.80 | 3.26 |
| 2200 | 15.50 | 20.78 | 23.72 | 28.28 | 1.18 | 0.71 | 33.12 | 22.71 | 3.29 |
| 2400 | 15.44 | 20.84 | 24.98 | 27.32 | 1.19 | 0.72 | 33.13 | 22.74 | 3.34 |
| 2600 | 15.37 | 20.91 | 26.05 | 27.02 | 1.20 | 0.72 | 34.06 | 23.16 | 3.42 |
| 2800 | 15.30 | 21.00 | 26.76 | 27.34 | 1.22 | 0.73 | 32.52 | 22.39 | 3.44 |
| 3000 | 15.24 | 21.04 | 26.12 | 30.37 | 1.23 | 0.74 | 32.35 | 22.01 | 3.50 |
| 3200 | 15.17 | 21.10 | 24.06 | 40.90 | 1.24 | 0.75 | 32.69 | 22.52 | 3.53 |
| 3400 | 15.10 | 21.23 | 21.08 | 32.39 | 1.25 | 0.76 | 32.58 | 21.25 | 3.65 |
| 3600 | 15.01 | 21.34 | 18.16 | 23.81 | 1.27 | 0.77 | 32.11 | 21.71 | 3.72 |
| 3800 | 14.91 | 21.49 | 15.62 | 19.14 | 1.28 | 0.78 | 32.14 | 21.67 | 3.79 |
| 4000 | 14.80 | 21.65 | 13.61 | 16.08 | 1.29 | 0.78 | 30.95 | 20.83 | 3.83 |
| 4200 | 14.67 | 21.82 | 12.09 | 13.88 | 1.29 | 0.78 | 32.33 | 21.06 | 3.93 |
| 4400 | 14.56 | 22.02 | 11.00 | 12.42 | 1.30 | 0.78 | 31.25 | 20.99 | 3.95 |
| 4600 | 14.48 | 22.17 | 10.28 | 11.49 | 1.30 | 0.78 | 30.96 | 20.78 | 3.95 |
| 4800 | 14.41 | 22.34 | 9.91 | 11.02 | 1.31 | 0.79 | 32.12 | 20.63 | 3.95 |
| 5000 | 14.39 | 22.46 | 9.91 | 10.95 | 1.31 | 0.80 | 31.42 | 20.77 | 3.97 |
| 5200 | 14.45 | 22.50 | 10.29 | 11.26 | 1.31 | 0.82 | 30.65 | 20.42 | 4.01 |
| 5400 | 14.51 | 22.49 | 10.99 | 11.95 | 1.30 | 0.83 | 31.76 | 21.00 | 4.06 |
| 5600 | 14.59 | 22.49 | 11.95 | 12.91 | 1.30 | 0.85 | 31.82 | 20.72 | 4.13 |
| 5800 | 14.68 | 22.55 | 13.04 | 13.79 | 1.31 | 0.86 | 31.83 | 20.67 | 4.21 |
| 6000 | 14.79 | 22.53 | 14.17 | 14.84 | 1.31 | 0.86 | 31.19 | 20.41 | 4.31 |
| 6200 | 14.87 | 22.56 | 15.16 | 15.89 | 1.33 | 0.85 | 30.63 | 19.78 | 4.45 |
| 6400 | 14.91 | 22.62 | 15.72 | 17.53 | 1.35 | 0.86 | 29.87 | 19.14 | 4.61 |
| 6600 | 14.92 | 22.73 | 15.01 | 21.23 | 1.37 | 0.87 | 28.58 | 18.42 | 4.78 |
| 6800 | 14.85 | 22.90 | 12.81 | 26.74 | 1.40 | 0.89 | 27.74 | 17.83 | 4.95 |
| 7000 | 14.63 | 23.23 | 10.12 | 18.40 | 1.42 | 0.92 | 26.72 | 17.04 | 5.20 |
| 7200 | 14.23 | 23.71 | 7.80 | 12.32 | 1.43 | 0.92 | 26.31 | 16.64 | 5.39 |
| 7400 | 13.60 | 24.44 | 6.02 | 8.66 | 1.45 | 0.89 | 25.16 | 15.80 | 5.52 |
| 7600 | 12.68 | 25.40 | 4.69 | 6.54 | 1.50 | 0.86 | 25.40 | 15.69 | 5.64 |
| 7800 | 11.79 | 26.32 | 3.86 | 5.01 | 1.53 | 0.80 | 24.87 | 14.66 | 5.86 |
| 8000 | 10.90 | 27.26 | 3.31 | 3.86 | 1.55 | 0.71 | 25.10 | 14.65 | 6.01 |
| 8200 | 9.82 | 28.46 | 2.99 | 3.58 | 1.72 | 0.72 | 24.21 | 13.80 | 6.09 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 9.5V, Id = 119mA @ Temperature = +85°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) |
| 50 | 16.05 | 20.58 | 15.75 | 13.40 | 1.10 | 0.60 | 34.69 | 22.35 | 3.80 |
| 100 | 16.18 | 20.37 | 21.08 | 15.75 | 1.10 | 0.59 | 36.27 | 22.73 | 3.80 |
| 200 | 16.25 | 20.23 | 24.97 | 17.03 | 1.10 | 0.58 | 35.38 | 23.66 | 3.58 |
| 400 | 16.29 | 20.25 | 29.71 | 18.89 | 1.10 | 0.58 | 34.65 | 24.32 | 3.19 |
| 600 | 16.25 | 20.29 | 38.36 | 20.82 | 1.10 | 0.60 | 35.80 | 24.14 | 3.16 |
| 800 | 16.17 | 20.36 | 37.59 | 23.51 | 1.11 | 0.62 | 35.91 | 24.14 | 3.18 |
| 1000 | 16.13 | 20.38 | 30.01 | 27.34 | 1.12 | 0.62 | 35.41 | 23.66 | 3.20 |
| 1200 | 16.05 | 20.43 | 26.37 | 31.32 | 1.13 | 0.64 | 36.14 | 23.55 | 3.24 |
| 1400 | 15.95 | 20.49 | 24.17 | 32.82 | 1.13 | 0.65 | 35.82 | 23.71 | 3.31 |
| 1600 | 15.87 | 20.58 | 23.14 | 31.22 | 1.15 | 0.67 | 34.61 | 23.62 | 3.39 |
| 1800 | 15.75 | 20.64 | 22.83 | 29.13 | 1.16 | 0.68 | 33.99 | 23.80 | 3.38 |
| 2000 | 15.65 | 20.75 | 22.97 | 27.12 | 1.17 | 0.70 | 34.52 | 23.69 | 3.38 |
| 2200 | 15.56 | 20.81 | 23.68 | 26.13 | 1.18 | 0.71 | 34.24 | 23.62 | 3.40 |
| 2400 | 15.50 | 20.82 | 24.86 | 25.53 | 1.18 | 0.71 | 34.05 | 23.63 | 3.41 |
| 2600 | 15.44 | 20.89 | 25.79 | 25.42 | 1.20 | 0.72 | 34.44 | 24.04 | 3.52 |
| 2800 | 15.37 | 20.98 | 26.41 | 25.89 | 1.21 | 0.73 | 34.24 | 23.16 | 3.59 |
| 3000 | 15.32 | 21.01 | 25.66 | 28.59 | 1.22 | 0.73 | 33.54 | 22.80 | 3.62 |
| 3200 | 15.26 | 21.07 | 23.71 | 34.09 | 1.23 | 0.74 | 33.72 | 23.30 | 3.67 |
| 3400 | 15.20 | 21.18 | 20.76 | 30.44 | 1.24 | 0.75 | 33.19 | 22.17 | 3.78 |
| 3600 | 15.11 | 21.28 | 17.86 | 23.13 | 1.25 | 0.76 | 33.54 | 22.51 | 3.85 |
| 3800 | 15.02 | 21.38 | 15.36 | 18.62 | 1.26 | 0.76 | 33.81 | 22.47 | 3.92 |
| 4000 | 14.91 | 21.55 | 13.35 | 15.57 | 1.26 | 0.77 | 32.38 | 21.63 | 3.98 |
| 4200 | 14.78 | 21.77 | 11.84 | 13.41 | 1.27 | 0.77 | 33.41 | 21.85 | 4.07 |
| 4400 | 14.67 | 21.94 | 10.74 | 11.93 | 1.27 | 0.77 | 32.62 | 21.78 | 4.10 |
| 4600 | 14.60 | 22.11 | 10.03 | 10.97 | 1.27 | 0.77 | 32.37 | 21.44 | 4.11 |
| 4800 | 14.52 | 22.27 | 9.67 | 10.45 | 1.27 | 0.78 | 32.52 | 21.38 | 4.11 |
| 5000 | 14.50 | 22.36 | 9.65 | 10.31 | 1.27 | 0.79 | 32.13 | 21.40 | 4.15 |
| 5200 | 14.57 | 22.41 | 10.00 | 10.51 | 1.26 | 0.80 | 31.95 | 21.04 | 4.29 |
| 5400 | 14.64 | 22.41 | 10.66 | 11.01 | 1.26 | 0.81 | 32.99 | 21.62 | 4.26 |
| 5600 | 14.74 | 22.43 | 11.57 | 11.73 | 1.26 | 0.83 | 32.27 | 21.35 | 4.28 |
| 5800 | 14.85 | 22.45 | 12.57 | 12.38 | 1.25 | 0.84 | 32.18 | 21.21 | 4.35 |
| 6000 | 14.99 | 22.45 | 13.56 | 13.25 | 1.26 | 0.84 | 31.77 | 20.97 | 4.50 |
| 6200 | 15.10 | 22.40 | 14.35 | 14.19 | 1.26 | 0.84 | 31.83 | 20.37 | 4.62 |
| 6400 | 15.18 | 22.44 | 14.61 | 15.61 | 1.28 | 0.84 | 31.04 | 19.77 | 4.77 |
| 6600 | 15.21 | 22.53 | 13.65 | 18.10 | 1.30 | 0.85 | 30.47 | 19.07 | 5.01 |
| 6800 | 15.15 | 22.71 | 11.51 | 19.70 | 1.32 | 0.88 | 29.97 | 18.52 | 5.17 |
| 7000 | 14.91 | 23.06 | 9.04 | 15.37 | 1.34 | 0.90 | 29.60 | 17.74 | 5.41 |
| 7200 | 14.45 | 23.63 | 6.94 | 10.72 | 1.35 | 0.89 | 29.01 | 17.43 | 5.59 |
| 7400 | 13.71 | 24.44 | 5.32 | 7.61 | 1.38 | 0.85 | 28.17 | 16.53 | 5.80 |
| 7600 | 12.64 | 25.59 | 4.15 | 5.91 | 1.44 | 0.84 | 28.10 | 16.29 | 5.92 |
| 7800 | 11.74 | 26.53 | 3.45 | 4.35 | 1.45 | 0.74 | 27.69 | 15.61 | 6.11 |
| 8000 | 10.75 | 27.65 | 2.99 | 3.43 | 1.50 | 0.67 | 27.90 | 15.41 | 6.24 |
| 8200 | 9.60 | 28.90 | 2.75 | 3.31 | 1.70 | 0.70 | 26.50 | 14.62 | 6.35 |

## Typical Performance Data

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.00V, Id = 44mA @ 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) |
| 50 | 15.03 | 19.85 | 16.04 | 16.39 | 1.12 | 0.66 | 26.57 | 16.41 | 2.89 |
| 100 | 15.15 | 19.56 | 20.78 | 21.02 | 1.12 | 0.64 | 25.76 | 16.88 | 2.88 |
| 200 | 15.19 | 19.44 | 23.51 | 24.56 | 1.11 | 0.63 | 26.47 | 17.42 | 2.78 |
| 400 | 15.18 | 19.49 | 22.89 | 29.42 | 1.12 | 0.64 | 25.86 | 17.67 | 2.70 |
| 600 | 15.12 | 19.55 | 21.32 | 30.63 | 1.13 | 0.65 | 25.35 | 17.50 | 2.64 |
| 800 | 15.00 | 19.67 | 19.69 | 28.31 | 1.14 | 0.67 | 25.62 | 17.16 | 2.58 |
| 1000 | 14.92 | 19.71 | 18.46 | 25.05 | 1.14 | 0.68 | 25.49 | 16.60 | 2.52 |
| 1200 | 14.81 | 19.78 | 17.70 | 23.14 | 1.15 | 0.69 | 25.18 | 16.27 | 2.55 |
| 1400 | 14.68 | 19.89 | 17.10 | 21.95 | 1.17 | 0.70 | 25.14 | 16.41 | 2.57 |
| 1600 | 14.57 | 19.98 | 16.87 | 21.24 | 1.18 | 0.72 | 24.84 | 16.34 | 2.62 |
| 1800 | 14.44 | 20.04 | 17.01 | 21.32 | 1.20 | 0.73 | 24.95 | 16.54 | 2.66 |
| 2000 | 14.29 | 20.18 | 17.31 | 21.79 | 1.22 | 0.75 | 25.04 | 16.70 | 2.66 |
| 2200 | 14.19 | 20.27 | 17.90 | 21.71 | 1.24 | 0.76 | 25.27 | 16.89 | 2.62 |
| 2400 | 14.11 | 20.31 | 18.84 | 21.08 | 1.25 | 0.76 | 25.40 | 16.81 | 2.78 |
| 2600 | 14.01 | 20.36 | 19.71 | 20.08 | 1.26 | 0.77 | 25.95 | 17.34 | 2.73 |
| 2800 | 13.88 | 20.47 | 20.30 | 18.97 | 1.28 | 0.78 | 24.89 | 16.54 | 2.86 |
| 3000 | 13.75 | 20.60 | 20.01 | 17.72 | 1.30 | 0.79 | 24.22 | 16.04 | 2.92 |
| 3200 | 13.59 | 20.72 | 18.98 | 16.61 | 1.32 | 0.80 | 25.08 | 16.67 | 2.97 |
| 3400 | 13.43 | 20.89 | 17.45 | 15.51 | 1.34 | 0.81 | 24.15 | 15.25 | 2.97 |
| 3600 | 13.27 | 21.10 | 15.79 | 14.48 | 1.37 | 0.82 | 24.55 | 15.87 | 2.99 |
| 3800 | 13.10 | 21.27 | 14.20 | 13.47 | 1.39 | 0.83 | 24.52 | 15.67 | 3.03 |
| 4000 | 12.93 | 21.46 | 12.85 | 12.61 | 1.41 | 0.83 | 23.46 | 14.85 | 3.14 |
| 4200 | 12.78 | 21.63 | 11.74 | 11.90 | 1.43 | 0.84 | 23.76 | 15.36 | 3.19 |
| 4400 | 12.65 | 21.80 | 10.91 | 11.46 | 1.46 | 0.84 | 23.75 | 15.42 | 3.17 |
| 4600 | 12.55 | 21.93 | 10.41 | 11.33 | 1.48 | 0.85 | 23.79 | 15.43 | 3.22 |
| 4800 | 12.48 | 22.05 | 10.17 | 11.50 | 1.50 | 0.86 | 24.26 | 15.60 | 3.30 |
| 5000 | 12.46 | 22.09 | 10.26 | 12.15 | 1.52 | 0.87 | 24.21 | 15.64 | 3.24 |
| 5200 | 12.46 | 22.10 | 10.72 | 13.39 | 1.55 | 0.89 | 23.53 | 15.66 | 3.31 |
| 5400 | 12.49 | 22.14 | 11.53 | 15.36 | 1.58 | 0.90 | 24.72 | 16.41 | 3.38 |
| 5600 | 12.50 | 22.14 | 12.78 | 18.52 | 1.61 | 0.91 | 24.80 | 16.28 | 3.37 |
| 5800 | 12.47 | 22.20 | 14.43 | 22.21 | 1.64 | 0.92 | 25.55 | 16.41 | 3.51 |
| 6000 | 12.38 | 22.31 | 16.49 | 21.12 | 1.68 | 0.91 | 25.76 | 16.29 | 3.48 |
| 6200 | 12.22 | 22.47 | 18.84 | 17.33 | 1.73 | 0.90 | 25.02 | 15.98 | 3.56 |
| 6400 | 12.02 | 22.64 | 21.06 | 14.49 | 1.77 | 0.89 | 24.36 | 15.61 | 3.71 |
| 6600 | 11.76 | 22.88 | 21.03 | 12.48 | 1.81 | 0.88 | 23.40 | 15.01 | 3.78 |
| 6800 | 11.41 | 23.18 | 18.18 | 11.05 | 1.86 | 0.88 | 22.80 | 14.49 | 4.00 |
| 7000 | 10.97 | 23.58 | 14.70 | 9.95 | 1.93 | 0.89 | 21.78 | 13.76 | 4.15 |
| 7200 | 10.45 | 24.00 | 11.74 | 8.98 | 2.00 | 0.91 | 21.20 | 12.92 | 4.29 |
| 7400 | 9.86 | 24.50 | 9.40 | 8.12 | 2.07 | 0.92 | 19.99 | 12.04 | 4.54 |
| 7600 | 9.23 | 25.02 | 7.63 | 7.32 | 2.14 | 0.94 | 20.02 | 11.57 | 4.70 |
| 7800 | 8.62 | 25.50 | 6.33 | 6.61 | 2.18 | 0.94 | 19.14 | 11.00 | 4.82 |
| 8000 | 8.03 | 25.92 | 5.39 | 6.03 | 2.21 | 0.94 | 19.47 | 10.84 | 5.00 |
| 8200 | 7.54 | 26.22 | 4.75 | 5.50 | 2.21 | 0.92 | 18.92 | 10.21 | 5.03 |

## Typical Performance Data

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 39mA @ 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) |
| 50 | 14.72 | 19.54 | 15.68 | 17.60 | 1.13 | 0.67 | 25.11 | 15.91 | 2.89 |
| 100 | 14.82 | 19.32 | 19.46 | 23.49 | 1.12 | 0.65 | 24.33 | 16.39 | 2.89 |
| 200 | 14.86 | 19.20 | 21.07 | 29.03 | 1.12 | 0.64 | 25.02 | 16.92 | 2.79 |
| 400 | 14.85 | 19.27 | 20.42 | 36.68 | 1.12 | 0.65 | 24.42 | 17.17 | 2.73 |
| 600 | 14.78 | 19.35 | 19.18 | 29.99 | 1.13 | 0.66 | 23.89 | 17.17 | 2.68 |
| 800 | 14.65 | 19.45 | 17.92 | 25.69 | 1.14 | 0.68 | 24.20 | 16.98 | 2.63 |
| 1000 | 14.57 | 19.51 | 16.91 | 22.60 | 1.15 | 0.69 | 24.00 | 16.59 | 2.55 |
| 1200 | 14.45 | 19.60 | 16.30 | 20.98 | 1.16 | 0.70 | 23.80 | 16.24 | 2.58 |
| 1400 | 14.31 | 19.71 | 15.81 | 19.92 | 1.18 | 0.71 | 23.82 | 16.22 | 2.60 |
| 1600 | 14.20 | 19.78 | 15.66 | 19.37 | 1.19 | 0.72 | 23.46 | 16.15 | 2.69 |
| 1800 | 14.07 | 19.87 | 15.83 | 19.45 | 1.21 | 0.74 | 23.62 | 16.19 | 2.69 |
| 2000 | 13.92 | 19.98 | 16.13 | 19.92 | 1.23 | 0.76 | 23.66 | 16.66 | 2.70 |
| 2200 | 13.82 | 20.04 | 16.63 | 19.91 | 1.24 | 0.76 | 23.89 | 16.69 | 2.66 |
| 2400 | 13.74 | 20.07 | 17.44 | 19.52 | 1.25 | 0.77 | 24.03 | 16.46 | 2.68 |
| 2600 | 13.64 | 20.18 | 18.17 | 18.79 | 1.27 | 0.78 | 24.63 | 17.11 | 2.77 |
| 2800 | 13.50 | 20.24 | 18.67 | 17.91 | 1.29 | 0.78 | 23.50 | 16.17 | 2.87 |
| 3000 | 13.36 | 20.41 | 18.41 | 16.75 | 1.31 | 0.79 | 22.76 | 15.66 | 2.95 |
| 3200 | 13.19 | 20.55 | 17.55 | 15.66 | 1.33 | 0.80 | 23.72 | 16.27 | 2.98 |
| 3400 | 13.02 | 20.69 | 16.25 | 14.59 | 1.35 | 0.81 | 22.74 | 15.01 | 3.02 |
| 3600 | 12.84 | 20.90 | 14.80 | 13.57 | 1.38 | 0.82 | 23.21 | 15.45 | 3.03 |
| 3800 | 12.66 | 21.11 | 13.41 | 12.61 | 1.40 | 0.83 | 23.17 | 15.24 | 3.07 |
| 4000 | 12.48 | 21.29 | 12.20 | 11.81 | 1.43 | 0.83 | 22.13 | 14.57 | 3.15 |
| 4200 | 12.31 | 21.45 | 11.19 | 11.18 | 1.45 | 0.84 | 22.50 | 15.06 | 3.23 |
| 4400 | 12.18 | 21.64 | 10.46 | 10.80 | 1.47 | 0.84 | 22.50 | 15.13 | 3.20 |
| 4600 | 12.07 | 21.74 | 10.02 | 10.70 | 1.49 | 0.85 | 22.51 | 15.14 | 3.28 |
| 4800 | 12.00 | 21.86 | 9.82 | 10.89 | 1.52 | 0.86 | 22.91 | 15.14 | 3.36 |
| 5000 | 11.98 | 21.90 | 9.91 | 11.53 | 1.55 | 0.87 | 23.00 | 15.33 | 3.27 |
| 5200 | 11.99 | 21.91 | 10.39 | 12.70 | 1.57 | 0.89 | 22.27 | 15.35 | 3.38 |
| 5400 | 12.01 | 21.92 | 11.19 | 14.50 | 1.60 | 0.90 | 23.56 | 15.93 | 3.43 |
| 5600 | 12.02 | 21.89 | 12.41 | 17.20 | 1.63 | 0.91 | 23.73 | 15.94 | 3.43 |
| 5800 | 11.98 | 21.95 | 14.00 | 20.04 | 1.67 | 0.92 | 24.35 | 15.91 | 3.48 |
| 6000 | 11.88 | 22.02 | 15.99 | 19.53 | 1.71 | 0.91 | 24.60 | 15.79 | 3.52 |
| 6200 | 11.70 | 22.19 | 18.22 | 16.55 | 1.76 | 0.90 | 24.05 | 15.46 | 3.64 |
| 6400 | 11.47 | 22.39 | 20.02 | 13.94 | 1.81 | 0.89 | 23.57 | 15.07 | 3.78 |
| 6600 | 11.19 | 22.66 | 19.68 | 11.98 | 1.86 | 0.88 | 22.51 | 14.59 | 3.86 |
| 6800 | 10.80 | 22.95 | 17.06 | 10.57 | 1.91 | 0.88 | 22.03 | 14.04 | 4.05 |
| 7000 | 10.32 | 23.39 | 13.95 | 9.48 | 1.99 | 0.89 | 21.17 | 13.30 | 4.20 |
| 7200 | 9.76 | 23.84 | 11.26 | 8.52 | 2.06 | 0.90 | 20.74 | 12.74 | 4.35 |
| 7400 | 9.15 | 24.34 | 9.08 | 7.71 | 2.13 | 0.92 | 19.70 | 12.01 | 4.59 |
| 7600 | 8.50 | 24.90 | 7.43 | 6.97 | 2.21 | 0.93 | 19.78 | 11.54 | 4.75 |
| 7800 | 7.88 | 25.33 | 6.21 | 6.32 | 2.25 | 0.93 | 18.98 | 11.12 | 4.90 |
| 8000 | 7.29 | 25.72 | 5.32 | 5.80 | 2.28 | 0.93 | 19.29 | 10.81 | 5.06 |
| 8200 | 6.81 | 25.98 | 4.71 | 5.31 | 2.27 | 0.91 | 18.87 | 10.36 | 5.10 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id = 48mA @ 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) |
| 50 | 15.28 | 20.04 | 16.28 | 15.53 | 1.12 | 0.65 | 28.37 | 17.15 | 2.95 |
| 100 | 15.40 | 19.75 | 21.71 | 19.45 | 1.11 | 0.63 | 26.84 | 17.48 | 2.94 |
| 200 | 15.44 | 19.61 | 25.82 | 22.20 | 1.11 | 0.62 | 27.67 | 18.01 | 2.82 |
| 400 | 15.44 | 19.66 | 25.59 | 25.71 | 1.11 | 0.62 | 27.15 | 18.12 | 2.72 |
| 600 | 15.38 | 19.71 | 23.47 | 28.19 | 1.12 | 0.64 | 26.63 | 17.94 | 2.69 |
| 800 | 15.27 | 19.82 | 21.40 | 28.97 | 1.13 | 0.66 | 26.98 | 17.60 | 2.56 |
| 1000 | 15.20 | 19.87 | 19.92 | 27.11 | 1.14 | 0.67 | 26.80 | 17.06 | 2.57 |
| 1200 | 15.09 | 19.96 | 18.96 | 25.21 | 1.15 | 0.68 | 26.51 | 16.73 | 2.64 |
| 1400 | 14.97 | 20.03 | 18.25 | 23.90 | 1.16 | 0.69 | 26.52 | 16.87 | 2.57 |
| 1600 | 14.86 | 20.11 | 17.96 | 23.06 | 1.18 | 0.71 | 26.24 | 16.81 | 2.68 |
| 1800 | 14.73 | 20.21 | 18.08 | 23.11 | 1.19 | 0.72 | 26.30 | 17.01 | 2.70 |
| 2000 | 14.59 | 20.33 | 18.41 | 23.61 | 1.21 | 0.74 | 26.19 | 17.17 | 2.70 |
| 2200 | 14.48 | 20.38 | 19.03 | 23.43 | 1.23 | 0.75 | 26.70 | 17.36 | 2.63 |
| 2400 | 14.41 | 20.44 | 20.11 | 22.50 | 1.24 | 0.75 | 26.77 | 17.28 | 2.58 |
| 2600 | 14.31 | 20.54 | 21.15 | 21.19 | 1.25 | 0.76 | 27.16 | 17.97 | 2.77 |
| 2800 | 14.18 | 20.62 | 21.83 | 19.94 | 1.27 | 0.77 | 26.09 | 17.02 | 2.88 |
| 3000 | 14.06 | 20.77 | 21.49 | 18.61 | 1.29 | 0.78 | 25.56 | 16.69 | 2.92 |
| 3200 | 13.91 | 20.88 | 20.27 | 17.52 | 1.31 | 0.79 | 26.48 | 17.32 | 2.98 |
| 3400 | 13.77 | 21.06 | 18.53 | 16.44 | 1.33 | 0.80 | 25.42 | 15.93 | 3.01 |
| 3600 | 13.61 | 21.22 | 16.67 | 15.36 | 1.35 | 0.81 | 25.93 | 16.40 | 3.07 |
| 3800 | 13.46 | 21.41 | 14.90 | 14.29 | 1.38 | 0.82 | 25.91 | 16.21 | 3.06 |
| 4000 | 13.31 | 21.58 | 13.40 | 13.34 | 1.40 | 0.83 | 24.66 | 15.41 | 3.17 |
| 4200 | 13.16 | 21.76 | 12.18 | 12.56 | 1.42 | 0.83 | 25.02 | 16.08 | 3.20 |
| 4400 | 13.04 | 21.93 | 11.28 | 12.06 | 1.44 | 0.84 | 25.14 | 15.99 | 3.20 |
| 4600 | 12.94 | 22.05 | 10.72 | 11.86 | 1.46 | 0.85 | 25.13 | 15.99 | 3.25 |
| 4800 | 12.88 | 22.15 | 10.45 | 12.01 | 1.48 | 0.86 | 25.47 | 16.17 | 3.35 |
| 5000 | 12.85 | 22.24 | 10.51 | 12.66 | 1.51 | 0.87 | 25.36 | 16.21 | 3.26 |
| 5200 | 12.86 | 22.28 | 10.96 | 13.94 | 1.53 | 0.88 | 24.77 | 16.08 | 3.33 |
| 5400 | 12.89 | 22.28 | 11.78 | 16.07 | 1.55 | 0.90 | 25.84 | 16.98 | 3.38 |
| 5600 | 12.90 | 22.31 | 13.03 | 19.70 | 1.58 | 0.91 | 26.07 | 16.85 | 3.40 |
| 5800 | 12.88 | 22.35 | 14.67 | 24.72 | 1.61 | 0.91 | 26.52 | 16.99 | 3.57 |
| 6000 | 12.81 | 22.44 | 16.75 | 22.94 | 1.64 | 0.91 | 26.73 | 16.89 | 3.48 |
| 6200 | 12.67 | 22.65 | 19.14 | 18.20 | 1.69 | 0.90 | 25.91 | 16.58 | 3.58 |
| 6400 | 12.50 | 22.76 | 21.57 | 15.10 | 1.72 | 0.88 | 25.21 | 16.10 | 3.74 |
| 6600 | 12.27 | 23.04 | 22.05 | 13.02 | 1.77 | 0.88 | 24.16 | 15.66 | 3.86 |
| 6800 | 11.96 | 23.31 | 19.07 | 11.59 | 1.81 | 0.88 | 23.62 | 15.03 | 4.01 |
| 7000 | 11.55 | 23.66 | 15.29 | 10.49 | 1.87 | 0.89 | 22.44 | 14.18 | 4.15 |
| 7200 | 11.07 | 24.11 | 12.10 | 9.48 | 1.94 | 0.91 | 21.81 | 13.34 | 4.36 |
| 7400 | 10.50 | 24.61 | 9.60 | 8.55 | 2.01 | 0.93 | 20.45 | 12.32 | 4.57 |
| 7600 | 9.88 | 25.15 | 7.74 | 7.66 | 2.07 | 0.94 | 20.51 | 11.86 | 4.71 |
| 7800 | 9.27 | 25.62 | 6.38 | 6.87 | 2.11 | 0.95 | 19.55 | 11.14 | 4.84 |
| 8000 | 8.68 | 26.13 | 5.39 | 6.23 | 2.15 | 0.95 | 19.94 | 10.96 | 5.02 |
| 8200 | 8.17 | 26.43 | 4.72 | 5.64 | 2.15 | 0.93 | 19.31 | 10.47 | 5.06 |

## Typical Performance Data

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.00V, Id = 39mA @ Temperature = -45°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) |
| 50 | 14.76 | 19.50 | 15.42 | 17.63 | 1.12 | 0.67 | 23.63 | 14.49 | 2.18 |
| 100 | 14.87 | 19.27 | 19.12 | 24.50 | 1.12 | 0.65 | 22.68 | 14.82 | 2.29 |
| 200 | 14.92 | 19.16 | 20.59 | 31.98 | 1.11 | 0.63 | 23.55 | 15.52 | 2.22 |
| 400 | 14.93 | 19.20 | 20.29 | 43.79 | 1.12 | 0.64 | 22.93 | 16.11 | 2.08 |
| 600 | 14.87 | 19.29 | 19.10 | 30.60 | 1.12 | 0.65 | 22.51 | 15.96 | 2.10 |
| 800 | 14.77 | 19.38 | 17.98 | 26.09 | 1.13 | 0.66 | 22.78 | 15.29 | 2.15 |
| 1000 | 14.71 | 19.42 | 16.95 | 22.93 | 1.14 | 0.67 | 22.69 | 14.56 | 2.09 |
| 1200 | 14.62 | 19.50 | 16.25 | 21.17 | 1.15 | 0.68 | 22.38 | 14.23 | 2.12 |
| 1400 | 14.50 | 19.62 | 15.72 | 20.07 | 1.16 | 0.69 | 22.43 | 14.54 | 2.16 |
| 1600 | 14.42 | 19.67 | 15.35 | 19.33 | 1.17 | 0.70 | 22.01 | 14.36 | 2.23 |
| 1800 | 14.31 | 19.77 | 15.37 | 19.44 | 1.18 | 0.72 | 22.11 | 14.58 | 2.18 |
| 2000 | 14.18 | 19.87 | 15.56 | 20.18 | 1.20 | 0.73 | 22.29 | 15.09 | 2.20 |
| 2200 | 14.09 | 19.94 | 15.87 | 20.57 | 1.22 | 0.74 | 22.42 | 15.12 | 2.23 |
| 2400 | 14.06 | 19.96 | 16.73 | 20.62 | 1.22 | 0.74 | 22.57 | 15.10 | 2.34 |
| 2600 | 14.00 | 20.02 | 17.51 | 20.30 | 1.23 | 0.75 | 23.28 | 15.99 | 2.30 |
| 2800 | 13.91 | 20.11 | 18.07 | 19.58 | 1.25 | 0.76 | 22.18 | 15.06 | 2.31 |
| 3000 | 13.81 | 20.22 | 17.98 | 18.32 | 1.26 | 0.76 | 21.50 | 14.75 | 2.29 |
| 3200 | 13.70 | 20.34 | 17.25 | 17.05 | 1.28 | 0.77 | 22.42 | 15.58 | 2.36 |
| 3400 | 13.56 | 20.48 | 16.04 | 15.79 | 1.29 | 0.78 | 21.46 | 13.82 | 2.39 |
| 3600 | 13.42 | 20.68 | 14.62 | 14.54 | 1.31 | 0.79 | 21.86 | 14.65 | 2.42 |
| 3800 | 13.27 | 20.87 | 13.19 | 13.38 | 1.33 | 0.80 | 21.90 | 14.46 | 2.48 |
| 4000 | 13.12 | 21.06 | 11.90 | 12.43 | 1.35 | 0.81 | 20.85 | 13.64 | 2.56 |
| 4200 | 12.97 | 21.23 | 10.88 | 11.63 | 1.36 | 0.81 | 21.26 | 14.67 | 2.58 |
| 4400 | 12.86 | 21.38 | 10.09 | 11.13 | 1.38 | 0.81 | 21.34 | 14.56 | 2.62 |
| 4600 | 12.80 | 21.54 | 9.58 | 10.88 | 1.39 | 0.82 | 21.33 | 14.78 | 2.62 |
| 4800 | 12.75 | 21.64 | 9.30 | 10.99 | 1.40 | 0.83 | 21.65 | 15.03 | 2.62 |
| 5000 | 12.74 | 21.71 | 9.35 | 11.54 | 1.42 | 0.85 | 21.76 | 15.06 | 2.63 |
| 5200 | 12.79 | 21.72 | 9.64 | 12.44 | 1.43 | 0.86 | 21.03 | 15.09 | 2.70 |
| 5400 | 12.86 | 21.68 | 10.22 | 14.05 | 1.44 | 0.88 | 22.40 | 15.92 | 2.71 |
| 5600 | 12.92 | 21.66 | 11.10 | 16.52 | 1.46 | 0.89 | 22.57 | 16.15 | 2.74 |
| 5800 | 12.95 | 21.72 | 12.17 | 19.67 | 1.48 | 0.90 | 23.28 | 16.30 | 2.77 |
| 6000 | 12.96 | 21.70 | 13.40 | 20.88 | 1.49 | 0.89 | 23.47 | 16.30 | 2.85 |
| 6200 | 12.91 | 21.83 | 14.67 | 18.32 | 1.52 | 0.88 | 22.97 | 16.08 | 2.91 |
| 6400 | 12.78 | 22.00 | 15.82 | 15.44 | 1.55 | 0.87 | 22.39 | 15.77 | 3.00 |
| 6600 | 12.58 | 22.23 | 16.31 | 13.29 | 1.58 | 0.86 | 21.47 | 15.39 | 3.15 |
| 6800 | 12.31 | 22.49 | 15.49 | 11.64 | 1.62 | 0.86 | 20.96 | 15.07 | 3.25 |
| 7000 | 11.95 | 22.84 | 13.49 | 10.30 | 1.66 | 0.87 | 19.97 | 14.43 | 3.42 |
| 7200 | 11.45 | 23.35 | 11.06 | 9.13 | 1.72 | 0.88 | 19.62 | 13.94 | 3.58 |
| 7400 | 10.84 | 23.91 | 8.79 | 8.14 | 1.79 | 0.90 | 18.66 | 13.22 | 3.73 |
| 7600 | 10.13 | 24.56 | 6.98 | 7.34 | 1.86 | 0.92 | 18.88 | 12.99 | 3.85 |
| 7800 | 9.45 | 25.15 | 5.63 | 6.67 | 1.91 | 0.94 | 18.26 | 12.44 | 4.00 |
| 8000 | 8.84 | 25.77 | 4.66 | 5.77 | 1.92 | 0.92 | 18.59 | 12.29 | 4.17 |
| 8200 | 8.19 | 26.26 | 3.98 | 5.41 | 1.97 | 0.93 | 18.18 | 11.85 | 4.25 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 36mA @ Temperature = -45°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) |
| 50 | 14.36 | 19.23 | 14.80 | 19.03 | 1.13 | 0.68 | 22.05 | 14.92 | 2.15 |
| 100 | 14.47 | 19.02 | 17.56 | 27.71 | 1.13 | 0.66 | 21.11 | 15.42 | 2.28 |
| 200 | 14.52 | 18.92 | 18.40 | 34.90 | 1.12 | 0.65 | 21.87 | 16.11 | 2.21 |
| 400 | 14.52 | 18.96 | 18.06 | 30.14 | 1.12 | 0.65 | 21.41 | 16.51 | 2.09 |
| 600 | 14.46 | 19.05 | 17.17 | 25.32 | 1.13 | 0.66 | 20.86 | 16.69 | 2.11 |
| 800 | 14.35 | 19.16 | 16.29 | 22.46 | 1.14 | 0.68 | 21.23 | 16.56 | 2.13 |
| 1000 | 14.28 | 19.20 | 15.44 | 20.21 | 1.15 | 0.68 | 21.07 | 16.34 | 2.06 |
| 1200 | 14.18 | 19.29 | 14.89 | 18.85 | 1.16 | 0.69 | 20.80 | 16.19 | 2.16 |
| 1400 | 14.05 | 19.39 | 14.46 | 17.99 | 1.17 | 0.70 | 20.84 | 16.17 | 2.24 |
| 1600 | 13.97 | 19.45 | 14.17 | 17.40 | 1.18 | 0.71 | 20.44 | 15.97 | 2.22 |
| 1800 | 13.86 | 19.55 | 14.22 | 17.49 | 1.19 | 0.73 | 20.48 | 16.01 | 2.18 |
| 2000 | 13.72 | 19.65 | 14.43 | 18.08 | 1.21 | 0.74 | 20.65 | 16.19 | 2.19 |
| 2200 | 13.63 | 19.73 | 14.73 | 18.44 | 1.23 | 0.75 | 20.92 | 16.20 | 2.21 |
| 2400 | 13.60 | 19.73 | 15.46 | 18.42 | 1.23 | 0.75 | 21.07 | 16.20 | 2.18 |
| 2600 | 13.54 | 19.79 | 16.14 | 18.24 | 1.24 | 0.76 | 21.59 | 16.54 | 2.24 |
| 2800 | 13.45 | 19.86 | 16.65 | 17.71 | 1.26 | 0.76 | 20.42 | 16.13 | 2.32 |
| 3000 | 13.34 | 19.99 | 16.55 | 16.67 | 1.27 | 0.77 | 19.86 | 15.84 | 2.26 |
| 3200 | 13.21 | 20.10 | 15.93 | 15.56 | 1.29 | 0.78 | 20.65 | 15.96 | 2.36 |
| 3400 | 13.06 | 20.28 | 14.89 | 14.42 | 1.31 | 0.79 | 19.77 | 15.05 | 2.44 |
| 3600 | 12.90 | 20.45 | 13.64 | 13.31 | 1.33 | 0.80 | 20.26 | 15.18 | 2.45 |
| 3800 | 12.72 | 20.64 | 12.40 | 12.28 | 1.34 | 0.80 | 20.25 | 14.82 | 2.53 |
| 4000 | 12.56 | 20.83 | 11.24 | 11.45 | 1.36 | 0.81 | 19.30 | 14.15 | 2.59 |
| 4200 | 12.41 | 21.06 | 10.32 | 10.77 | 1.38 | 0.81 | 19.68 | 14.95 | 2.61 |
| 4400 | 12.28 | 21.18 | 9.63 | 10.36 | 1.39 | 0.81 | 19.71 | 15.02 | 2.65 |
| 4600 | 12.21 | 21.35 | 9.18 | 10.18 | 1.41 | 0.82 | 19.71 | 15.08 | 2.64 |
| 4800 | 12.16 | 21.42 | 8.95 | 10.32 | 1.42 | 0.83 | 20.04 | 15.11 | 2.65 |
| 5000 | 12.15 | 21.48 | 9.00 | 10.86 | 1.44 | 0.85 | 20.15 | 15.15 | 2.60 |
| 5200 | 12.20 | 21.48 | 9.32 | 11.71 | 1.46 | 0.86 | 19.53 | 15.30 | 2.67 |
| 5400 | 12.27 | 21.44 | 9.91 | 13.18 | 1.47 | 0.88 | 20.87 | 15.64 | 2.72 |
| 5600 | 12.32 | 21.41 | 10.78 | 15.27 | 1.49 | 0.89 | 20.98 | 15.60 | 2.75 |
| 5800 | 12.34 | 21.42 | 11.85 | 17.62 | 1.51 | 0.90 | 21.68 | 15.72 | 2.83 |
| 6000 | 12.34 | 21.48 | 13.07 | 18.30 | 1.54 | 0.90 | 21.98 | 15.70 | 2.84 |
| 6200 | 12.25 | 21.57 | 14.36 | 16.49 | 1.56 | 0.89 | 21.58 | 15.49 | 2.92 |
| 6400 | 12.09 | 21.71 | 15.50 | 14.18 | 1.59 | 0.87 | 21.18 | 15.16 | 3.05 |
| 6600 | 11.85 | 21.98 | 15.85 | 12.25 | 1.63 | 0.86 | 20.25 | 14.76 | 3.14 |
| 6800 | 11.53 | 22.29 | 14.98 | 10.73 | 1.68 | 0.86 | 19.79 | 14.39 | 3.31 |
| 7000 | 11.10 | 22.69 | 12.99 | 9.48 | 1.73 | 0.86 | 18.94 | 13.88 | 3.41 |
| 7200 | 10.56 | 23.19 | 10.71 | 8.42 | 1.79 | 0.87 | 18.67 | 13.49 | 3.57 |
| 7400 | 9.92 | 23.80 | 8.59 | 7.55 | 1.87 | 0.89 | 17.99 | 13.03 | 3.67 |
| 7600 | 9.20 | 24.38 | 6.90 | 6.88 | 1.94 | 0.91 | 18.34 | 12.69 | 3.92 |
| 7800 | 8.52 | 24.96 | 5.61 | 6.29 | 1.99 | 0.93 | 17.99 | 12.42 | 4.03 |
| 8000 | 7.91 | 25.50 | 4.69 | 5.52 | 2.00 | 0.91 | 18.34 | 12.18 | 4.16 |
| 8200 | 7.28 | 25.94 | 4.03 | 5.22 | 2.04 | 0.92 | 18.12 | 12.16 | 4.26 |

## Typical Performance Data

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id = 43mA @ Temperature = -45°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) |
| 50 | 15.08 | 19.74 | 15.79 | 16.77 | 1.12 | 0.65 | 25.10 | 14.63 | 2.20 |
| 100 | 15.19 | 19.50 | 20.41 | 22.07 | 1.11 | 0.63 | 24.12 | 14.96 | 2.29 |
| 200 | 15.25 | 19.37 | 22.90 | 26.78 | 1.11 | 0.62 | 24.91 | 15.49 | 2.24 |
| 400 | 15.26 | 19.39 | 22.71 | 33.35 | 1.11 | 0.62 | 24.48 | 15.92 | 2.09 |
| 600 | 15.21 | 19.46 | 21.17 | 35.01 | 1.12 | 0.63 | 23.92 | 15.61 | 2.09 |
| 800 | 15.12 | 19.58 | 19.71 | 30.12 | 1.13 | 0.65 | 24.16 | 15.28 | 2.16 |
| 1000 | 15.06 | 19.59 | 18.47 | 26.01 | 1.13 | 0.65 | 24.07 | 14.57 | 2.07 |
| 1200 | 14.98 | 19.69 | 17.59 | 23.72 | 1.14 | 0.67 | 23.95 | 14.41 | 2.14 |
| 1400 | 14.87 | 19.77 | 16.92 | 22.29 | 1.15 | 0.68 | 23.76 | 14.56 | 2.20 |
| 1600 | 14.79 | 19.85 | 16.46 | 21.40 | 1.16 | 0.69 | 23.50 | 14.54 | 2.22 |
| 1800 | 14.68 | 19.94 | 16.46 | 21.50 | 1.17 | 0.70 | 23.63 | 14.76 | 2.20 |
| 2000 | 14.55 | 20.07 | 16.65 | 22.44 | 1.19 | 0.72 | 23.52 | 14.94 | 2.18 |
| 2200 | 14.46 | 20.10 | 17.00 | 22.98 | 1.20 | 0.73 | 23.89 | 14.99 | 2.21 |
| 2400 | 14.43 | 20.11 | 17.93 | 23.03 | 1.21 | 0.73 | 24.27 | 15.12 | 2.19 |
| 2600 | 14.37 | 20.20 | 18.77 | 22.56 | 1.22 | 0.74 | 24.70 | 15.87 | 2.30 |
| 2800 | 14.29 | 20.30 | 19.45 | 21.49 | 1.24 | 0.75 | 23.50 | 15.09 | 2.32 |
| 3000 | 14.20 | 20.41 | 19.35 | 19.99 | 1.25 | 0.76 | 22.95 | 14.80 | 2.27 |
| 3200 | 14.10 | 20.54 | 18.53 | 18.60 | 1.27 | 0.77 | 23.88 | 15.65 | 2.33 |
| 3400 | 13.98 | 20.67 | 17.15 | 17.21 | 1.28 | 0.78 | 22.86 | 14.07 | 2.41 |
| 3600 | 13.85 | 20.84 | 15.53 | 15.82 | 1.30 | 0.79 | 23.34 | 14.90 | 2.43 |
| 3800 | 13.71 | 20.99 | 13.94 | 14.49 | 1.31 | 0.79 | 23.32 | 14.72 | 2.49 |
| 4000 | 13.58 | 21.18 | 12.50 | 13.39 | 1.33 | 0.80 | 22.25 | 13.93 | 2.56 |
| 4200 | 13.45 | 21.35 | 11.36 | 12.44 | 1.34 | 0.80 | 22.60 | 14.80 | 2.61 |
| 4400 | 13.35 | 21.51 | 10.50 | 11.85 | 1.36 | 0.81 | 22.78 | 14.70 | 2.64 |
| 4600 | 13.28 | 21.66 | 9.93 | 11.52 | 1.37 | 0.82 | 22.69 | 14.91 | 2.64 |
| 4800 | 13.23 | 21.76 | 9.61 | 11.59 | 1.38 | 0.83 | 23.01 | 15.17 | 2.58 |
| 5000 | 13.23 | 21.86 | 9.63 | 12.12 | 1.40 | 0.84 | 23.10 | 15.20 | 2.61 |
| 5200 | 13.28 | 21.89 | 9.91 | 13.04 | 1.41 | 0.86 | 22.39 | 15.23 | 2.70 |
| 5400 | 13.36 | 21.83 | 10.49 | 14.80 | 1.41 | 0.87 | 23.73 | 16.24 | 2.71 |
| 5600 | 13.42 | 21.88 | 11.35 | 17.63 | 1.43 | 0.89 | 23.84 | 16.33 | 2.72 |
| 5800 | 13.46 | 21.90 | 12.41 | 21.86 | 1.45 | 0.89 | 24.41 | 16.66 | 2.78 |
| 6000 | 13.49 | 21.92 | 13.59 | 24.44 | 1.46 | 0.89 | 24.70 | 16.81 | 2.86 |
| 6200 | 13.46 | 22.03 | 14.83 | 20.46 | 1.48 | 0.88 | 24.03 | 16.48 | 2.92 |
| 6400 | 13.37 | 22.18 | 15.97 | 16.82 | 1.50 | 0.87 | 23.44 | 16.32 | 3.00 |
| 6600 | 13.22 | 22.36 | 16.47 | 14.41 | 1.53 | 0.86 | 22.41 | 15.84 | 3.14 |
| 6800 | 13.01 | 22.60 | 15.79 | 12.66 | 1.56 | 0.86 | 21.79 | 15.43 | 3.28 |
| 7000 | 12.69 | 22.91 | 13.79 | 11.22 | 1.60 | 0.87 | 20.64 | 14.80 | 3.42 |
| 7200 | 12.24 | 23.40 | 11.25 | 9.92 | 1.65 | 0.88 | 20.22 | 14.31 | 3.58 |
| 7400 | 11.66 | 23.97 | 8.87 | 8.78 | 1.71 | 0.91 | 19.01 | 13.46 | 3.71 |
| 7600 | 10.96 | 24.65 | 6.98 | 7.81 | 1.78 | 0.93 | 19.24 | 12.96 | 3.88 |
| 7800 | 10.28 | 25.29 | 5.58 | 7.00 | 1.83 | 0.95 | 18.35 | 12.20 | 4.01 |
| 8000 | 9.66 | 25.83 | 4.58 | 6.00 | 1.83 | 0.93 | 18.66 | 11.89 | 4.15 |
| 8200 | 8.98 | 26.46 | 3.88 | 5.56 | 1.88 | 0.94 | 18.21 | 11.41 | 4.24 |

## Typical Performance Data

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.00V, Id = 43mA @ Temperature = +85°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) |
| 50 | 14.80 | 19.68 | 16.05 | 17.05 | 1.13 | 0.67 | 26.98 | 15.99 | 3.24 |
| 100 | 14.90 | 19.39 | 20.24 | 22.01 | 1.12 | 0.65 | 25.97 | 16.31 | 3.26 |
| 200 | 14.94 | 19.30 | 22.24 | 26.12 | 1.12 | 0.64 | 27.02 | 16.84 | 3.11 |
| 400 | 14.92 | 19.33 | 21.40 | 32.88 | 1.12 | 0.65 | 26.25 | 17.08 | 2.89 |
| 600 | 14.84 | 19.43 | 19.94 | 31.63 | 1.13 | 0.66 | 25.74 | 16.92 | 2.87 |
| 800 | 14.71 | 19.55 | 18.38 | 27.23 | 1.15 | 0.68 | 26.08 | 16.73 | 3.04 |
| 1000 | 14.61 | 19.63 | 17.27 | 23.85 | 1.16 | 0.69 | 25.91 | 16.17 | 2.92 |
| 1200 | 14.49 | 19.70 | 16.59 | 22.10 | 1.17 | 0.70 | 25.63 | 15.98 | 3.02 |
| 1400 | 14.35 | 19.80 | 16.14 | 21.03 | 1.18 | 0.72 | 25.65 | 16.11 | 3.09 |
| 1600 | 14.23 | 19.89 | 16.03 | 20.60 | 1.20 | 0.73 | 25.23 | 16.04 | 3.13 |
| 1800 | 14.09 | 19.98 | 16.29 | 21.04 | 1.22 | 0.75 | 25.53 | 16.07 | 3.16 |
| 2000 | 13.95 | 20.11 | 16.75 | 21.73 | 1.24 | 0.76 | 25.57 | 16.24 | 3.18 |
| 2200 | 13.83 | 20.16 | 17.42 | 22.08 | 1.26 | 0.77 | 25.84 | 16.41 | 3.16 |
| 2400 | 13.74 | 20.23 | 18.38 | 21.83 | 1.28 | 0.78 | 25.74 | 16.15 | 3.22 |
| 2600 | 13.62 | 20.32 | 19.11 | 20.91 | 1.29 | 0.79 | 26.28 | 16.81 | 3.26 |
| 2800 | 13.48 | 20.46 | 19.41 | 19.73 | 1.32 | 0.80 | 24.98 | 15.85 | 3.29 |
| 3000 | 13.33 | 20.57 | 18.89 | 18.18 | 1.34 | 0.81 | 24.51 | 15.32 | 3.29 |
| 3200 | 13.16 | 20.76 | 17.66 | 16.80 | 1.36 | 0.82 | 25.34 | 15.95 | 3.40 |
| 3400 | 12.98 | 20.93 | 16.07 | 15.40 | 1.39 | 0.83 | 24.41 | 14.68 | 3.49 |
| 3600 | 12.79 | 21.10 | 14.47 | 14.09 | 1.41 | 0.84 | 24.76 | 15.10 | 3.50 |
| 3800 | 12.59 | 21.32 | 13.03 | 12.90 | 1.44 | 0.84 | 24.71 | 15.02 | 3.62 |
| 4000 | 12.40 | 21.56 | 11.78 | 11.96 | 1.47 | 0.85 | 23.71 | 14.20 | 3.68 |
| 4200 | 12.22 | 21.75 | 10.82 | 11.21 | 1.49 | 0.85 | 24.06 | 14.51 | 3.74 |
| 4400 | 12.07 | 21.93 | 10.13 | 10.76 | 1.52 | 0.85 | 24.19 | 14.60 | 3.79 |
| 4600 | 11.98 | 22.09 | 9.72 | 10.61 | 1.55 | 0.86 | 24.16 | 14.60 | 3.76 |
| 4800 | 11.90 | 22.18 | 9.58 | 10.85 | 1.58 | 0.87 | 24.40 | 14.54 | 3.74 |
| 5000 | 11.86 | 22.23 | 9.78 | 11.56 | 1.61 | 0.89 | 24.48 | 14.71 | 3.80 |
| 5200 | 11.89 | 22.21 | 10.36 | 12.81 | 1.63 | 0.90 | 23.86 | 14.62 | 3.88 |
| 5400 | 11.89 | 22.24 | 11.31 | 15.02 | 1.68 | 0.92 | 24.98 | 15.19 | 3.87 |
| 5600 | 11.86 | 22.30 | 12.69 | 18.78 | 1.73 | 0.93 | 25.03 | 15.15 | 3.93 |
| 5800 | 11.78 | 22.40 | 14.46 | 25.02 | 1.79 | 0.94 | 25.51 | 15.11 | 4.00 |
| 6000 | 11.66 | 22.53 | 16.62 | 25.54 | 1.85 | 0.94 | 25.47 | 14.93 | 4.09 |
| 6200 | 11.44 | 22.71 | 18.86 | 19.63 | 1.92 | 0.93 | 24.59 | 14.42 | 4.22 |
| 6400 | 11.16 | 23.00 | 20.00 | 16.25 | 2.01 | 0.92 | 23.78 | 13.81 | 4.35 |
| 6600 | 10.83 | 23.33 | 18.15 | 14.15 | 2.10 | 0.93 | 22.83 | 13.25 | 4.49 |
| 6800 | 10.47 | 23.66 | 14.97 | 12.50 | 2.17 | 0.94 | 22.39 | 12.70 | 4.69 |
| 7000 | 10.07 | 23.98 | 12.08 | 10.94 | 2.20 | 0.95 | 21.56 | 11.98 | 4.87 |
| 7200 | 9.62 | 24.37 | 9.81 | 9.34 | 2.22 | 0.96 | 21.19 | 11.36 | 5.07 |
| 7400 | 9.11 | 24.80 | 8.07 | 7.83 | 2.21 | 0.94 | 20.20 | 10.73 | 5.25 |
| 7600 | 8.49 | 25.22 | 6.76 | 6.58 | 2.21 | 0.92 | 20.30 | 10.51 | 5.38 |
| 7800 | 7.82 | 25.77 | 5.77 | 5.74 | 2.27 | 0.89 | 19.41 | 9.92 | 5.50 |
| 8000 | 7.26 | 26.17 | 5.07 | 4.77 | 2.21 | 0.83 | 19.85 | 9.74 | 5.66 |
| 8200 | 6.53 | 26.64 | 4.59 | 4.36 | 2.31 | 0.81 | 19.03 | 9.22 | 5.75 |

## *Typical Performance Data*

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 39mA @ Temperature = +85°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) |
| 50 | 14.51 | 19.47 | 15.66 | 18.21 | 1.13 | 0.69 | 25.66 | 15.23 | 3.18 |
| 100 | 14.60 | 19.19 | 18.98 | 24.46 | 1.13 | 0.66 | 25.00 | 15.70 | 3.23 |
| 200 | 14.64 | 19.08 | 20.24 | 30.93 | 1.12 | 0.65 | 25.76 | 16.22 | 3.09 |
| 400 | 14.62 | 19.15 | 19.44 | 38.04 | 1.13 | 0.66 | 24.98 | 16.59 | 2.89 |
| 600 | 14.52 | 19.27 | 18.24 | 28.63 | 1.14 | 0.68 | 24.58 | 16.45 | 2.92 |
| 800 | 14.39 | 19.37 | 16.97 | 24.33 | 1.15 | 0.69 | 24.92 | 16.41 | 2.96 |
| 1000 | 14.29 | 19.41 | 16.07 | 21.60 | 1.16 | 0.70 | 24.67 | 15.86 | 2.95 |
| 1200 | 14.16 | 19.54 | 15.49 | 20.14 | 1.18 | 0.71 | 24.47 | 15.50 | 3.02 |
| 1400 | 14.01 | 19.63 | 15.10 | 19.25 | 1.19 | 0.73 | 24.41 | 15.79 | 3.07 |
| 1600 | 13.89 | 19.70 | 15.05 | 18.93 | 1.21 | 0.74 | 24.13 | 15.56 | 3.14 |
| 1800 | 13.75 | 19.82 | 15.29 | 19.27 | 1.23 | 0.75 | 24.25 | 15.73 | 3.14 |
| 2000 | 13.61 | 19.91 | 15.72 | 19.88 | 1.25 | 0.77 | 24.35 | 15.91 | 3.13 |
| 2200 | 13.49 | 19.99 | 16.34 | 20.20 | 1.27 | 0.78 | 24.62 | 16.07 | 3.15 |
| 2400 | 13.39 | 20.07 | 17.17 | 20.10 | 1.29 | 0.79 | 24.63 | 15.81 | 3.41 |
| 2600 | 13.27 | 20.14 | 17.81 | 19.44 | 1.30 | 0.79 | 25.10 | 16.31 | 3.26 |
| 2800 | 13.13 | 20.28 | 18.04 | 18.46 | 1.33 | 0.80 | 24.01 | 15.50 | 3.32 |
| 3000 | 12.97 | 20.41 | 17.61 | 17.07 | 1.35 | 0.81 | 23.26 | 14.96 | 3.31 |
| 3200 | 12.79 | 20.59 | 16.55 | 15.79 | 1.38 | 0.82 | 24.16 | 15.43 | 3.39 |
| 3400 | 12.59 | 20.77 | 15.15 | 14.44 | 1.40 | 0.83 | 23.30 | 14.31 | 3.47 |
| 3600 | 12.39 | 20.98 | 13.73 | 13.23 | 1.43 | 0.84 | 23.62 | 14.56 | 3.52 |
| 3800 | 12.18 | 21.17 | 12.40 | 12.15 | 1.45 | 0.85 | 23.71 | 14.62 | 3.63 |
| 4000 | 11.98 | 21.38 | 11.27 | 11.29 | 1.48 | 0.85 | 22.65 | 13.79 | 3.68 |
| 4200 | 11.79 | 21.56 | 10.39 | 10.61 | 1.50 | 0.85 | 23.02 | 14.24 | 3.72 |
| 4400 | 11.63 | 21.78 | 9.76 | 10.23 | 1.54 | 0.85 | 23.06 | 14.34 | 3.75 |
| 4600 | 11.54 | 21.91 | 9.40 | 10.12 | 1.56 | 0.86 | 23.02 | 14.19 | 3.78 |
| 4800 | 11.46 | 22.02 | 9.28 | 10.39 | 1.60 | 0.87 | 23.34 | 14.26 | 3.81 |
| 5000 | 11.42 | 22.05 | 9.49 | 11.11 | 1.63 | 0.89 | 23.39 | 14.29 | 3.81 |
| 5200 | 11.45 | 22.08 | 10.07 | 12.31 | 1.66 | 0.90 | 22.83 | 14.35 | 3.97 |
| 5400 | 11.46 | 22.04 | 11.01 | 14.42 | 1.70 | 0.92 | 23.96 | 14.90 | 3.89 |
| 5600 | 11.42 | 22.11 | 12.37 | 17.86 | 1.76 | 0.94 | 24.01 | 14.73 | 3.93 |
| 5800 | 11.33 | 22.18 | 14.09 | 22.73 | 1.82 | 0.94 | 24.70 | 14.67 | 4.02 |
| 6000 | 11.19 | 22.31 | 16.14 | 23.12 | 1.89 | 0.94 | 24.63 | 14.48 | 4.12 |
| 6200 | 10.95 | 22.51 | 18.19 | 18.67 | 1.97 | 0.93 | 23.76 | 13.97 | 4.23 |
| 6400 | 10.64 | 22.82 | 19.01 | 15.59 | 2.07 | 0.93 | 23.06 | 13.49 | 4.37 |
| 6600 | 10.28 | 23.12 | 17.22 | 13.53 | 2.15 | 0.93 | 22.14 | 12.91 | 4.54 |
| 6800 | 9.89 | 23.48 | 14.32 | 11.90 | 2.23 | 0.94 | 21.78 | 12.33 | 4.69 |
| 7000 | 9.46 | 23.80 | 11.63 | 10.40 | 2.26 | 0.95 | 21.10 | 11.60 | 4.90 |
| 7200 | 8.99 | 24.19 | 9.52 | 8.88 | 2.27 | 0.95 | 20.80 | 11.10 | 5.08 |
| 7400 | 8.46 | 24.61 | 7.88 | 7.46 | 2.27 | 0.94 | 19.89 | 10.60 | 5.25 |
| 7600 | 7.83 | 25.06 | 6.63 | 6.30 | 2.27 | 0.91 | 19.98 | 10.37 | 5.41 |
| 7800 | 7.15 | 25.57 | 5.69 | 5.54 | 2.32 | 0.88 | 19.18 | 9.81 | 5.56 |
| 8000 | 6.60 | 25.93 | 5.03 | 4.62 | 2.26 | 0.82 | 19.63 | 9.63 | 5.69 |
| 8200 | 5.87 | 26.37 | 4.57 | 4.23 | 2.35 | 0.80 | 18.89 | 9.28 | 5.80 |

## *Typical Performance Data*

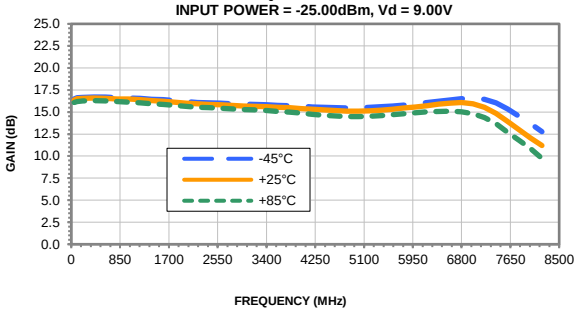
**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id = 47mA @ Temperature = +85°C

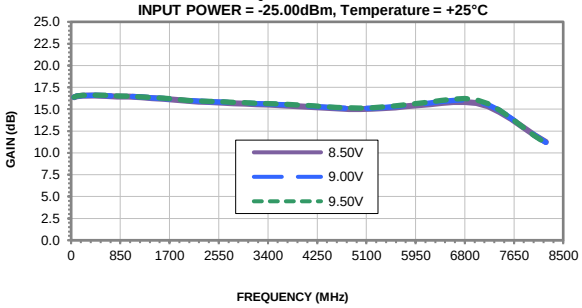
| FREQ | Gain | Isolation | Input Return Loss | Output Return Loss | Stability | | IP-3 Output | 1dB Comp. Output | Noise Figure |
|---|---|---|---|---|---|---|---|---|---|
| (MHz) | (dB) | (dB) | (dB) | (dB) | K | Measure | (dBm) | (dBm) | (dB) |
| 50 | 15.03 | 19.82 | 16.32 | 16.04 | 1.12 | 0.66 | 28.14 | 16.45 | 3.24 |
| 100 | 15.14 | 19.60 | 21.21 | 20.35 | 1.12 | 0.64 | 27.29 | 16.90 | 3.28 |
| 200 | 15.18 | 19.47 | 24.17 | 23.48 | 1.11 | 0.63 | 27.81 | 17.43 | 3.12 |
| 400 | 15.17 | 19.50 | 23.44 | 28.28 | 1.12 | 0.64 | 27.64 | 17.69 | 2.90 |
| 600 | 15.09 | 19.58 | 21.61 | 30.93 | 1.13 | 0.65 | 26.85 | 17.51 | 2.92 |
| 800 | 14.97 | 19.69 | 19.73 | 29.51 | 1.14 | 0.67 | 27.15 | 17.17 | 2.96 |
| 1000 | 14.88 | 19.76 | 18.45 | 26.05 | 1.15 | 0.68 | 27.05 | 16.77 | 2.94 |
| 1200 | 14.76 | 19.82 | 17.64 | 24.05 | 1.16 | 0.70 | 26.76 | 16.44 | 3.03 |
| 1400 | 14.62 | 19.94 | 17.10 | 22.79 | 1.18 | 0.71 | 26.69 | 16.58 | 3.06 |
| 1600 | 14.51 | 20.04 | 16.97 | 22.36 | 1.19 | 0.73 | 26.43 | 16.50 | 3.13 |
| 1800 | 14.37 | 20.14 | 17.22 | 22.81 | 1.21 | 0.74 | 26.58 | 16.68 | 3.14 |
| 2000 | 14.23 | 20.24 | 17.68 | 23.67 | 1.23 | 0.76 | 26.66 | 16.71 | 3.14 |
| 2200 | 14.11 | 20.28 | 18.46 | 23.98 | 1.25 | 0.76 | 27.04 | 16.87 | 3.15 |
| 2400 | 14.02 | 20.40 | 19.50 | 23.59 | 1.27 | 0.77 | 26.84 | 16.76 | 3.22 |
| 2600 | 13.90 | 20.47 | 20.37 | 22.38 | 1.29 | 0.78 | 27.31 | 17.29 | 3.23 |
| 2800 | 13.77 | 20.58 | 20.73 | 20.94 | 1.31 | 0.79 | 26.08 | 16.48 | 3.30 |
| 3000 | 13.63 | 20.75 | 20.11 | 19.30 | 1.33 | 0.80 | 25.70 | 15.97 | 3.29 |
| 3200 | 13.47 | 20.88 | 18.72 | 17.81 | 1.35 | 0.81 | 26.45 | 16.46 | 3.38 |
| 3400 | 13.30 | 21.06 | 16.91 | 16.34 | 1.38 | 0.83 | 25.68 | 15.21 | 3.46 |
| 3600 | 13.12 | 21.24 | 15.17 | 14.92 | 1.40 | 0.83 | 25.98 | 15.63 | 3.52 |
| 3800 | 12.94 | 21.43 | 13.57 | 13.62 | 1.43 | 0.84 | 25.73 | 15.56 | 3.60 |
| 4000 | 12.76 | 21.63 | 12.21 | 12.58 | 1.45 | 0.85 | 24.78 | 14.75 | 3.67 |
| 4200 | 12.58 | 21.83 | 11.17 | 11.73 | 1.48 | 0.85 | 25.14 | 15.21 | 3.73 |
| 4400 | 12.44 | 22.02 | 10.43 | 11.22 | 1.50 | 0.85 | 25.23 | 15.16 | 3.75 |
| 4600 | 12.35 | 22.19 | 9.98 | 11.03 | 1.53 | 0.86 | 25.18 | 15.00 | 3.77 |
| 4800 | 12.28 | 22.29 | 9.82 | 11.23 | 1.55 | 0.87 | 25.44 | 15.10 | 3.78 |
| 5000 | 12.23 | 22.38 | 10.00 | 11.92 | 1.59 | 0.88 | 25.40 | 15.27 | 3.78 |
| 5200 | 12.26 | 22.41 | 10.56 | 13.15 | 1.62 | 0.90 | 24.77 | 15.03 | 3.90 |
| 5400 | 12.27 | 22.41 | 11.53 | 15.41 | 1.65 | 0.91 | 25.90 | 15.75 | 3.88 |
| 5600 | 12.24 | 22.47 | 12.91 | 19.40 | 1.70 | 0.93 | 25.96 | 15.71 | 3.90 |
| 5800 | 12.18 | 22.57 | 14.70 | 26.98 | 1.75 | 0.94 | 26.30 | 15.68 | 3.99 |
| 6000 | 12.07 | 22.72 | 16.89 | 28.67 | 1.81 | 0.93 | 26.17 | 15.52 | 4.06 |
| 6200 | 11.88 | 22.88 | 19.28 | 20.66 | 1.88 | 0.93 | 25.25 | 14.87 | 4.17 |
| 6400 | 11.62 | 23.15 | 20.69 | 17.02 | 1.96 | 0.92 | 24.46 | 14.42 | 4.33 |
| 6600 | 11.33 | 23.46 | 18.91 | 14.86 | 2.04 | 0.93 | 23.50 | 13.74 | 4.51 |
| 6800 | 11.00 | 23.72 | 15.52 | 13.18 | 2.09 | 0.94 | 22.99 | 13.08 | 4.66 |
| 7000 | 10.62 | 24.08 | 12.41 | 11.54 | 2.14 | 0.95 | 22.14 | 12.38 | 4.86 |
| 7200 | 10.20 | 24.48 | 10.02 | 9.80 | 2.15 | 0.96 | 21.71 | 11.77 | 5.06 |
| 7400 | 9.70 | 24.83 | 8.21 | 8.17 | 2.13 | 0.95 | 20.65 | 11.15 | 5.21 |
| 7600 | 9.08 | 25.33 | 6.83 | 6.82 | 2.15 | 0.92 | 20.75 | 10.93 | 5.35 |
| 7800 | 8.41 | 25.87 | 5.79 | 5.92 | 2.20 | 0.90 | 19.85 | 10.33 | 5.52 |
| 8000 | 7.84 | 26.34 | 5.07 | 4.87 | 2.16 | 0.84 | 20.32 | 10.01 | 5.66 |
| 8200 | 7.10 | 26.88 | 4.57 | 4.44 | 2.27 | 0.81 | 19.33 | 9.45 | 5.76 |

## *Typical Performance Curves*

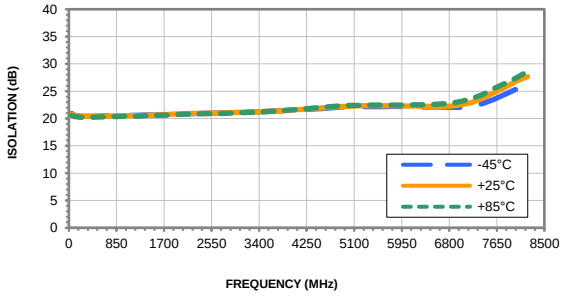
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V



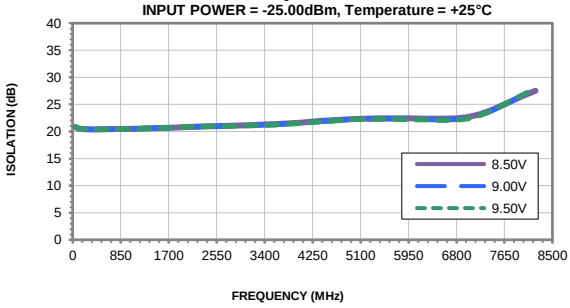

GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



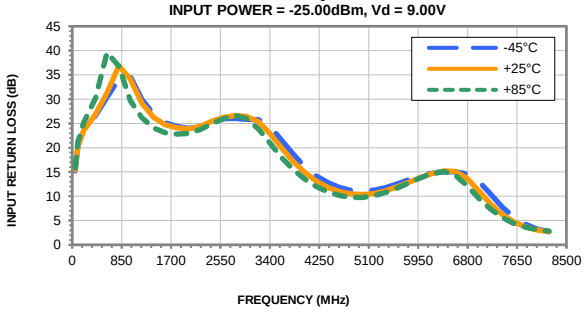

ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V



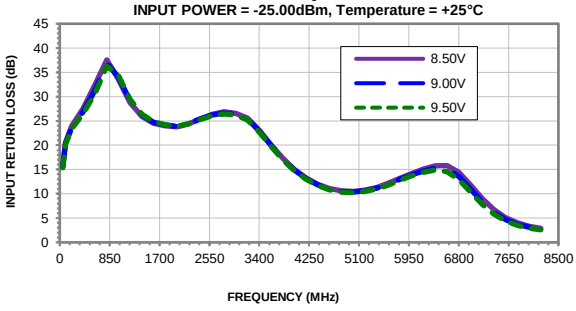

ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



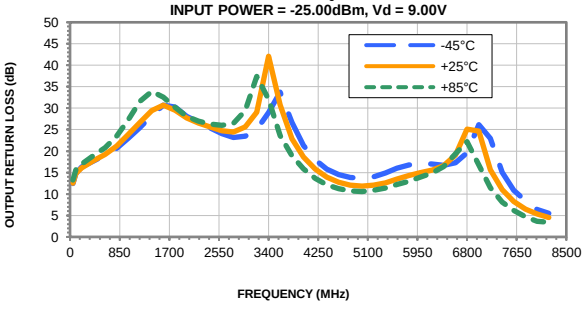

INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V



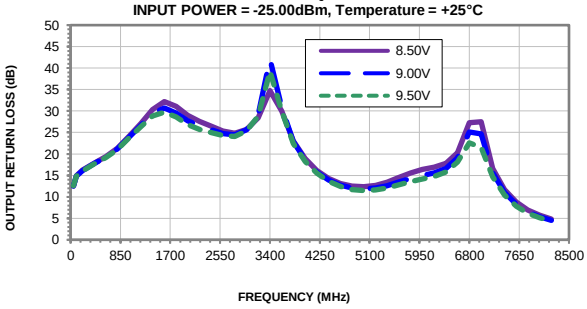

INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C




OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V

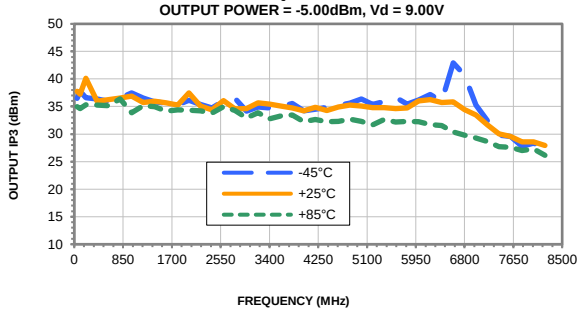



OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C

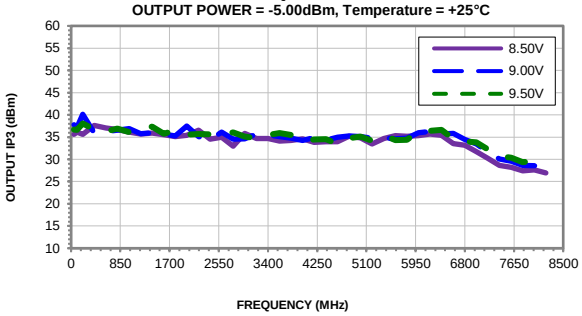


## Typical Performance Curves

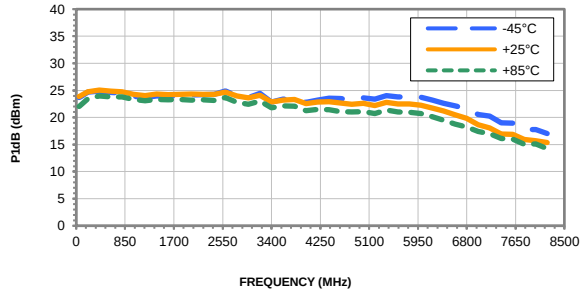
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
OUTPUT POWER = -5.00dBm, Vd = 9.00V



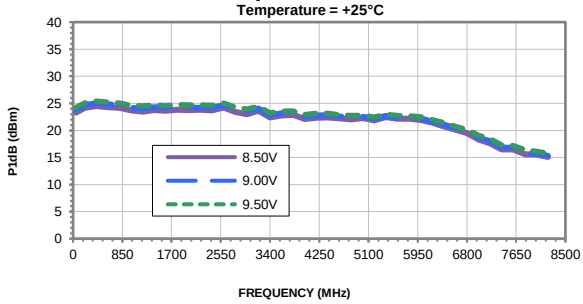

OUTPUT IP3 vs. FREQUENCY & DEVICE VOLTAGE
OUTPUT POWER = -5.00dBm, Temperature = +25°C



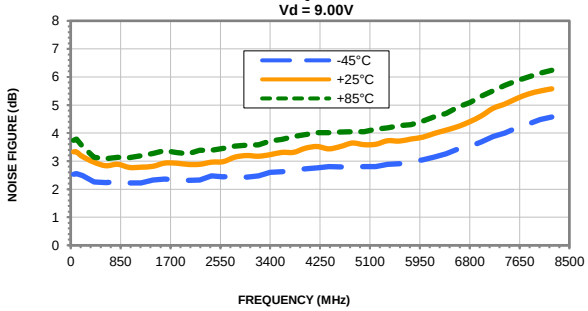

P1dB vs. FREQUENCY & TEMPERATURE
Vd = 9.00V



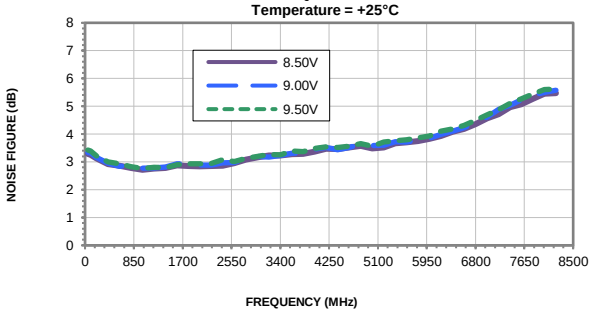

P1dB vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



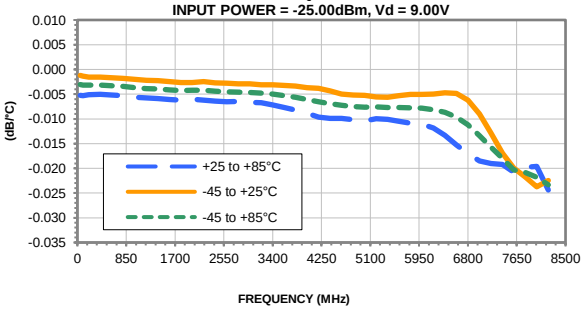

NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 9.00V




NOISE FIGURE vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C

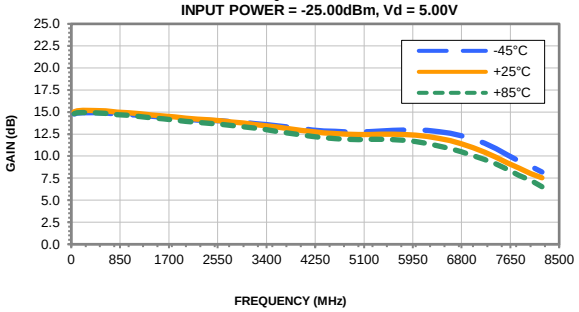



GAIN VARIANTS VS FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V

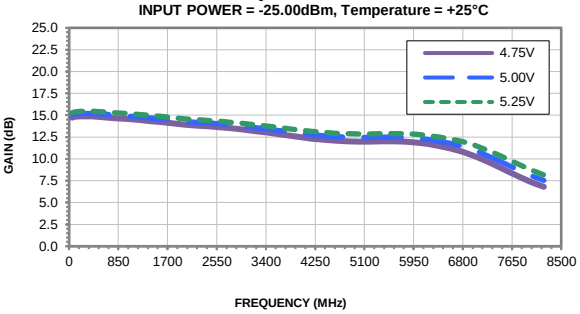


## *Typical Performance Curves*

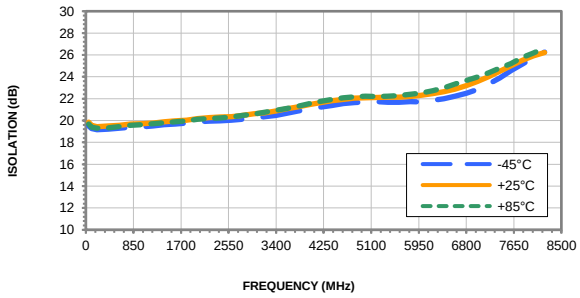
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



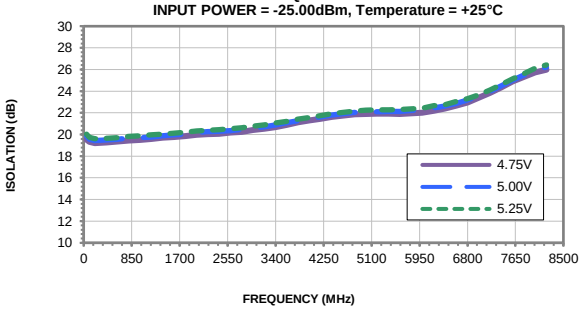

GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



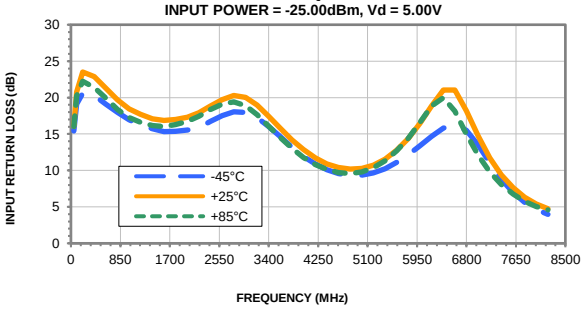

ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



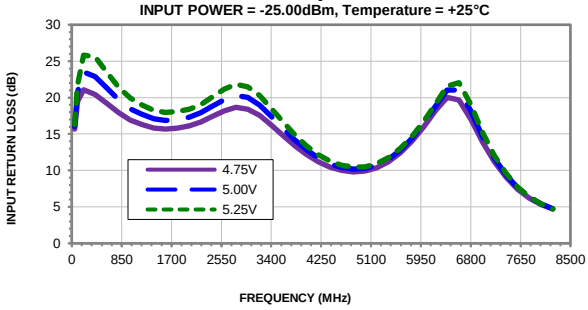

ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



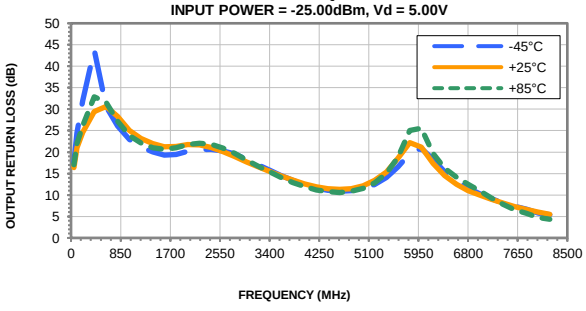

INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



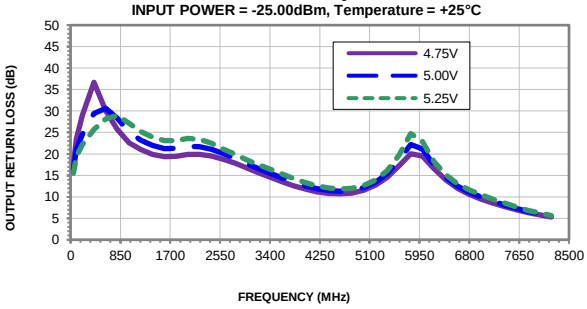

INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



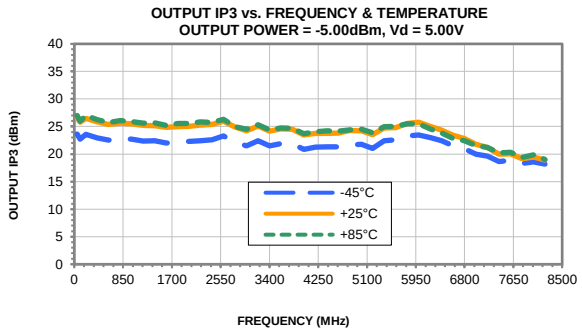

OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V

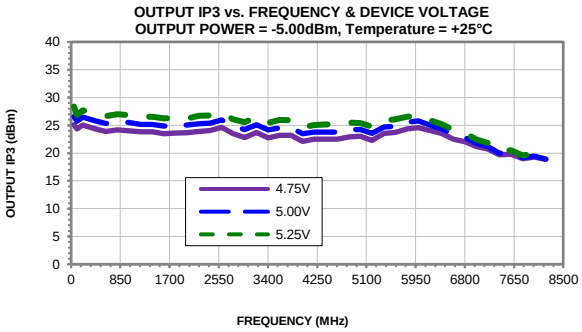


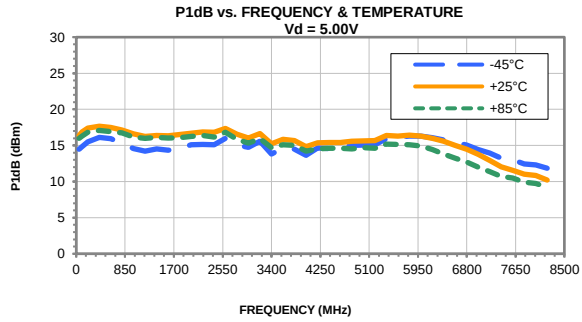

OUTPUT RETURN LOSS vs. FREQ. & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C

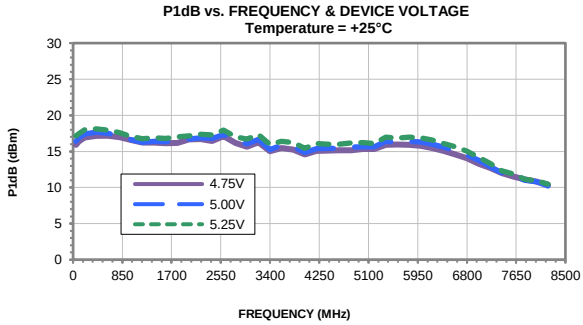


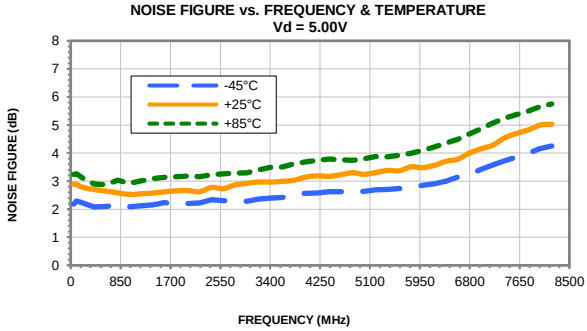
## *Typical Performance Curves*

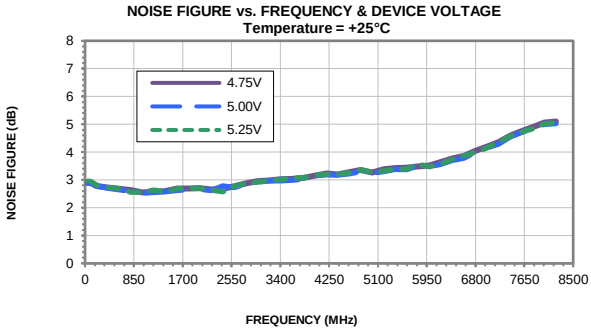


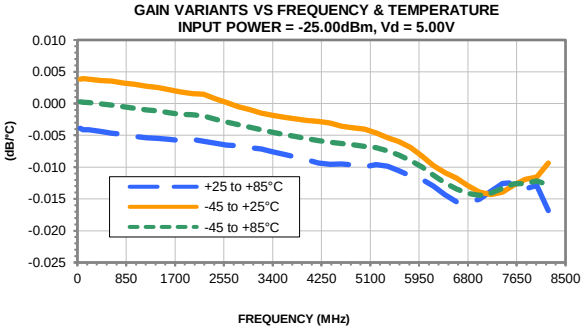



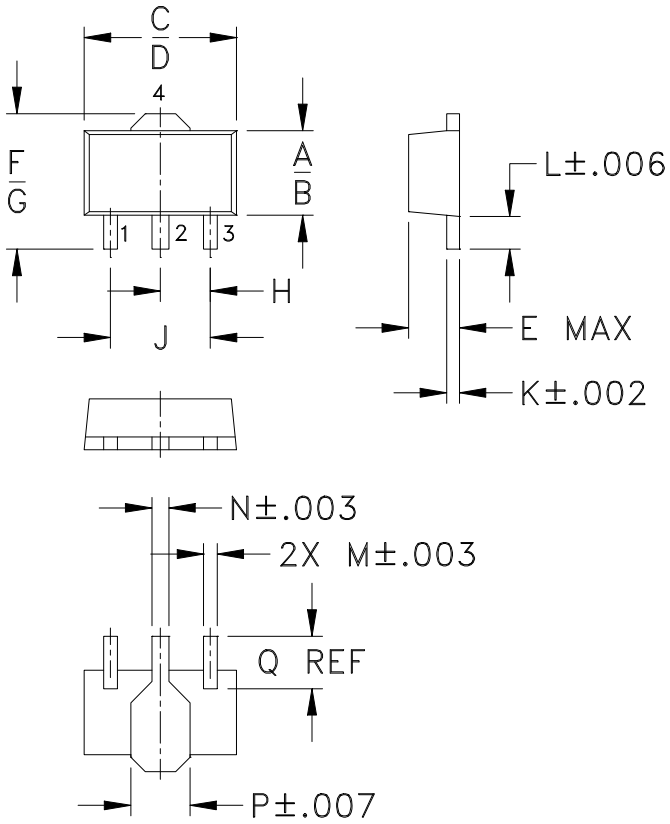



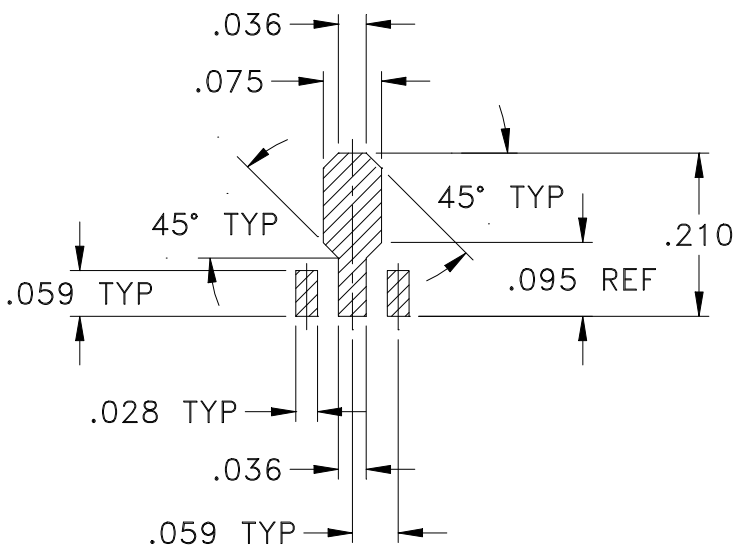
# Case Style DF

**DF782**

## Outline Dimensions




## PCB Land Pattern




Suggested Layout,
Tolerance to be within ±.002

| CASE # | A | B | C | D | E | F | G | H | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DF782 | .102 (2.59) | .090 (2.29) | .181 (4.60) | .173 (4.39) | .063 (1.60) | .167 (4.24) | .155 (3.94) | .059 (1.50) | .118 (3.00) | .015 (0.38) | .041 (1.04) | .016 (0.41) |

| CASE # | N | P | Q | WT. GRAM |
|---|---|---|---|---|
| DF782 | .019 (0.48) | .065 (1.65) | .062 (1.57) | .2 |

**Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3Pl. ± .005**

### Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin.
   All models, (+) suffix. See model Data sheet.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.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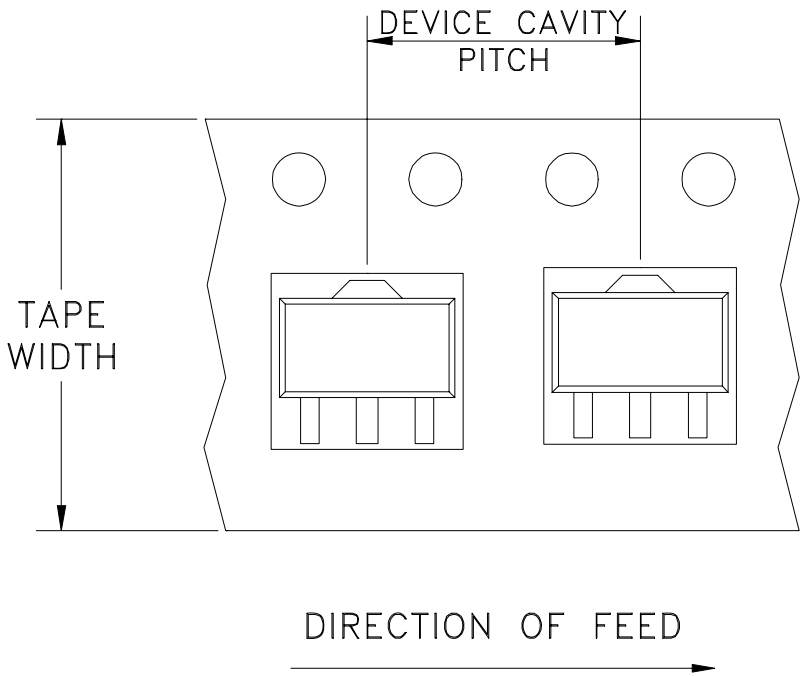
Mini-Circuits ISO 9001 & ISO 14001 Certified

# Tape & Reel Packaging TR-F55

DEVICE ORIENTATION IN T&R




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel | |
|---|---|---|---|---|
| 12 | 8 | 7 | Small quantity standard (see note) | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | | | 500 |
| | | | Standard | 1000 |

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

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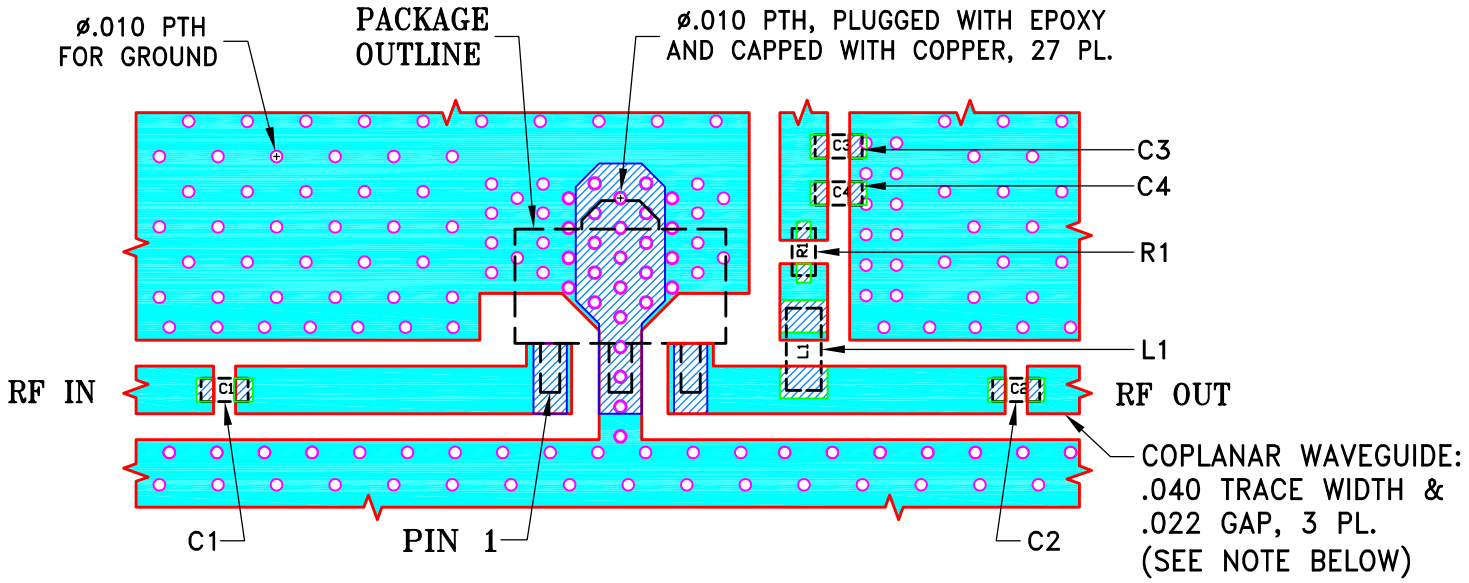
THIRD ANGLE PROJECTION

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| OR | ECO-000234 | NEW RELEASE | 10/08/19 | ITG | RS |
| | | | | | |
| | | | | | |
| | | | | | |

# SUGGESTED MOUNTING CONFIGURATION FOR DF782 CASE STYLE




| COMPONENT | SIZE |
|---|---|
| C1...C4 | 0402 |
| L1 | 0603 |
| R1 | 0402 |

NOTES:

1. LINE WIDTH & GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020±.0015"; COPPER: 1/2 OZ. FOR OTHER MATERIALS LINE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-PHA-83WE+.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES | DRAWN | ITG | 10/08/19 |
| TOLERANCES ON: | CHECKED | GF | 10/08/19 |
| 2 PL DECIMALS ± | APPROVED | RS | 10/08/19 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |



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

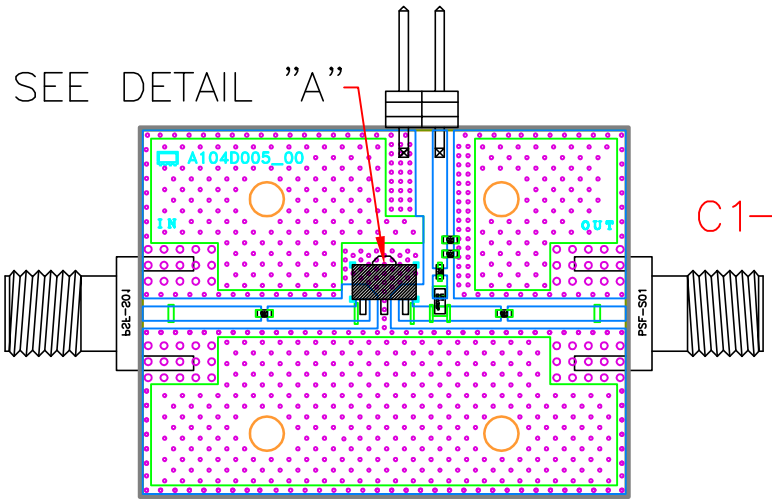
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

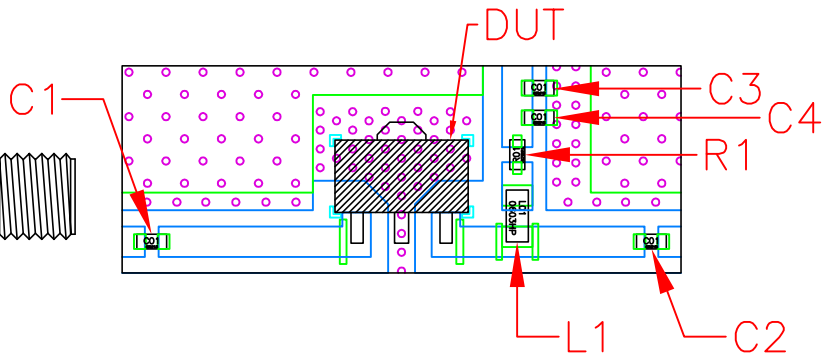
PL, DF782, TB-PHA-83WE+

| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-653 | OR |

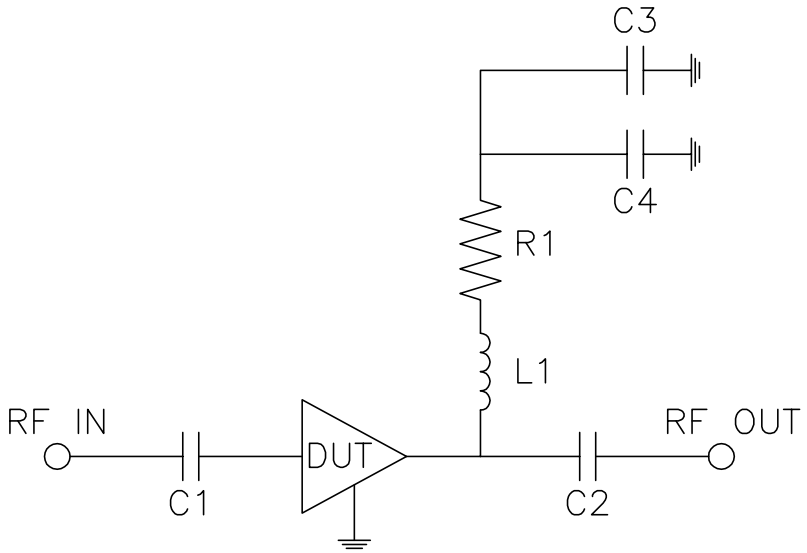
| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL653 | 6:1 | 1 OF 1 |

# Evaluation Board and Circuit




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




SCHEMATIC DIAGRAM

| Component | Size | Value | Part Number | Manufacturer |
|---|---|---|---|---|
| C1 | 0402 | 1000pF | GRM1555C1H102JA01D | Murata |
| C2 | 0402 | 180pF | GRM1555C1H181JA01D | Murata |
| C3 | 0402 | 0.1uF | GRM155R71C104KA88D | Murata |
| C4 | 0402 | 10000pF | GRM155R71E103KA01D | Murata |
| L1 | 0603 | 330nH | LQW18CNR33J00D | Murata |
| R1 | 0402 | 20hm | RK73H1ETTP2R00F | Koa |

## Notes:

1. 50 Ohm SMA Female Connectors.
2. PCB Material: Roger RO4350B or equivalent,
   Dielectric constant=3.5, Thickness=0.020 inch

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# Environmental Specifications ENV08T1

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 or -55° to 105° C or -40° to 105° C or -40° to 95° 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 |
| HTOL | 1000 hours at 125°C | MIL-STD-883, Method 1005, Condition B |
| 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 |

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 |
|---|---|---|
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |