

High Directivity

Monolithic Amplifier

0.5-2.5 GHz

Product Features

- 3V & 5V operation
- no external biasing circuit required
- internal DC blocking at RF input and output
- high directivity, 20 dB typ.
- wide bandwidth, 0.5 to 2.5 GHz
- low noise figure, 5.5 dB typ.
- output power, up to +18.2 dBm typ.
- low cost



VNA-25+

CASE STYLE: XX211-1
PRICE: \$2.50 ea. QTY. (20)

Typical Applications

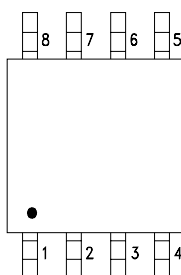
- buffer amplifier
- cellular
- PCN

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

General Description

VNA-25+ is a wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in an 8-lead SOIC package. VNA-25+ is fabricated using GaAs MESFET technology. Expected MTBF at 85°C case temperature is 40,000 years at 2.8V, 2,000 at 5V.



Pin Description

| Function | Pin Number | Description |
|----------|------------|---|
| RF IN | 3 | RF input pin. |
| RF OUT | 6 | RF output pin. |
| DC | 1 | Bias pin |
| GND | 2,4,5,7,8 | Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance. |

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P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine  Provides ACTUAL Data Instantly at minicircuits.com
IF/RF MICROWAVE COMPONENTS

For detailed performance specs
& shopping online see web site

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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/MCLStore/terms.jsp.

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Electrical Specifications at 25°C

| Parameter | | Min. | Typ. | | Max. | Units |
|---|---|------|-------|-------|------|-------|
| Frequency Range | | 0.5 | | | 2.5 | GHz |
| at DC Volts | | 5.0 | 5.0 | 2.8 | 5.0 | V |
| Gain | f=0.5 GHz f=1.0 GHz f=1.5 GHz f=2.0 GHz f=2.5 GHz | 16 | 15.5 | 14.5 | | dB |
| | | | 18.0 | 16.7 | | |
| | | | 18.6 | 17.4 | | |
| | | | 17.8 | 17 | | |
| | | | 16 | 15.5 | | |
| Input Return Loss | f=0.75 to 2.5 GHz | | 14 | 14 | | dB |
| Output Return Loss | f=0.75 to 2.5 GHz | | 12.5 | 12.5 | | dB |
| Output Power @ 1 dB compression | f=0.5 to 2.5 GHz | | 18.2 | 12 | | dBm |
| Output IP3 | f=0.5 to 2.5 GHz | | 29 | 24 | | dBm |
| Noise Figure | f=0.5 to 2.5 GHz | | 5.5 | 5.5 | | dB |
| Directivity (Isolation-Gain) | f=0.5 to 2.5 GHz | | 18-24 | 16-25 | | dB |
| DC Current | | | 85 | 80 | 105 | mA |
| Thermal Resistance, junction-to-case ¹ | | | 125 | | | °C/W |

Absolute Maximum Ratings

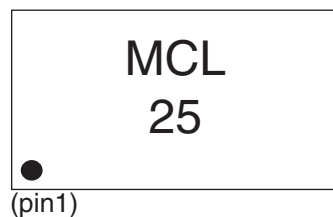
| Parameter | Ratings |
|-----------------------|--------------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 150°C |
| DC Voltage | +7V, -1.0V reverse |
| Power Dissipation | 1000mW |
| Input Power | 10dBm |

Note: Permanent damage may occur if any of these limits are exceeded.

These ratings are not intended for continuous normal operation.

¹Case is defined as ground leads.

Product Marking



Additional Detailed Technical Information

Additional information is available on our web site. To access this information enter the model number on our web site home page.

Performance data, graphs, s-parameter data set (.zip file)

Case Style: XX211-1

VNA-25+: Plastic molded, 8-lead SOIC, lead finish: Tin Plate

Tape & Reel: F16

7" reels with 20, 50, 100, 200, 500 or 1K devices.

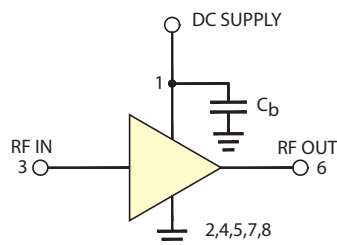
13" reel with 2.5K devices.

Suggested Layout for PCB Design: PL-077

Evaluation Board: TB-01

Environmental Ratings: ENV08T1

Recommended Application Circuit



$C_b = 100\text{pF to } 10\text{ nF}$
Test Board includes case, connectors, and components (in bold) soldered to PCB

ESD Rating

Human Body Model (HBM): Class 1A (250 v to < 500 v) in accordance with ANSI/ESD STM 5.1 - 2001

Charged Device Model (CDM): Class III (500 v to 1000v) in accordance with JESD22-C101A

MSL Rating

Moisture Sensitivity: MSL1 in accordance with IPC/JEDECJ-STD-020C

| No. | Test Required | Condition | Standard | Quantity |
|-----|------------------------------|---|-----------------------------|----------|
| 1 | Visual Inspection | Low Power Microscope Magnification 40x | MIP-IN-0003 (MCT spec) | 10 units |
| 2 | Electrical Test | Room Temperature | SCD (MCL spec) | 10 units |
| 3 | SAM Analysis | Less than 10% growth in term of delamination | J-Std-020C (Jedec Standard) | 10 units |
| 4 | Moisture Sensitivity Level 1 | Bake at 125°C for 24 hours Soak at 85°C/85%RH for 168 hours Reflow 3 cycles at 260°C peak | J-Std-020C (Jedec Standard) | 10 units |

MSL Test Flow Chart