Flat Gain, Ultra-Wideband

Monolithic Amplifier GVA-123+

50Ω 0.01 to 12 GHz

SOT-89 PACKAGE

The Big Deal

- Ultra broadband performance
- Excellent Gain Flatness
- Broadband without external matching components

Product Overview

GVA-123+ (RoHS compliant) is an advanced ultra-wideband amplifier fabricated using GaAs HBT technology and offers excellent gain flatness over a broad frequency range. In addition, the GVA-123+ has good input and output return loss over this frequency range without the need for external matching components. Lead finish is tin-silver over nickel. It has repeatable performance from lot to lot and is enclosed in a SOT-89 package for very good thermal performance.

Key Features

Feature	Advantages
Ultra Broad Band: 0.01 to 12 GHz	Broadband covering primary wireless communications bands: Cellular, PCS, LTE, WiMAX in a single amplifier.
Ultra Flat Gain ±0.7 dB typ: 0.05 - 8 GHz	Ultra Flat Gain, eliminates need for compensation networks to achieve published results
No External Matching Components Required	GVA-123+ provides good Input and Output Return Loss of 12-28 dB over 0.05 - 6 GHz without the need for any external matching components
Excellent ESD HBM: class 1C (1000 to <2000V) MM: class M2 (100 to <200V)	Simplifies ESD handling.

Flat Gain, Ultra-Wideband

Monolithic Amplifier 0.01-12 GHz

Product Features

- Excellent Gain Flatness, ±0.7 dB, 0.05-8 GHz
- Gain, 16.9 dB typ. at 2 GHz
- Excellent return loss, 20 dB typ., 2 GHz

CASE STYLE: DF782

GVA-123+

+RoHS Compliant

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

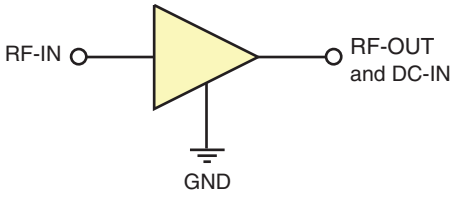
Typical Applications

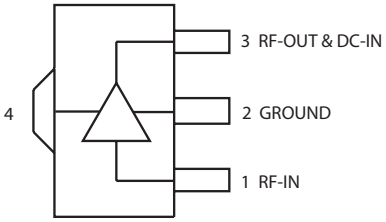
- Base station infrastructure
- Test instruments
- MMDS & Wireless LAN
- LTE
- Satellite communication
- Avionics

General Description

GVA-123+ (RoHS compliant) is an advanced ultra wideband amplifier fabricated using GaAs HBT technology and offers a broad frequency range. In addition, the GVA-123+ has good input and output return loss over this frequency range without the need for external matching components. Lead finish is tin-silver over nickel. It has repeatable performance from lot to lot and is enclosed in a SOT-89 package for very good thermal performance.

simplified schematic and pin description





Function	Pin Number	Description
RF IN	1	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
RF-OUT and DC-IN	3	RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in “Recommended Application Circuit”, Fig. 2
GND	2,4	Connections to ground. Use via holes as shown in “Suggested Layout for PCB Design” to reduce ground path inductance for best performance.

Electrical Specifications at 25°C and Vcc=5V, R= 16.5Ω unless noted

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.01		12.0	GHz
Gain	0.05	—	16.2	—	dB
	0.85	—	17.2	—	
	2.0	15.2	16.9	18.6	
	6.0	—	16.4	—	
	8.0	—	16.3	—	
	10.0	—	12.5	—	
	12.0	—	7.1	—	
Gain Flatness	0.05-8		±0.7		dB
Input Return Loss	0.05	—	12.7	—	dB
	0.85	—	24.9	—	
	2.0	16.0	23.8	—	
	6.0	—	22.2	—	
	8.0	—	9.2	—	
	10.0	—	7.5	—	
	12.0	—	6.3	—	
Output Return Loss	0.05		14.4		dB
	0.85		31.0		
	2.0		23.5		
	6.0		15.5		
	8.0		9.0		
	10.0		7.4		
	12.0		6.0		
Reverse Isolation	6.0		20.7		dB
Output Power at 1dB Compression	0.05		15.9		dBm
	0.85		16.3		
	2.0		16.2		
	6.0		13.4		
	8.0		10.3		
	10.0		7.4		
	12.0		5.1		
Output IP3	0.2		30.2		dBm
	0.85		31.1		
	2.0		29.9		
	6.0		24.5		
	8.0		21.8		
	10.0		19.1		
	12.0		14.9		
Noise Figure	0.2		3.8		dB
	0.85		3.9		
	2.0		4.0		
	6.0		4.4		
	8.0		4.9		
	12.0		6.9		
Supply Operating Voltage (Vcc)		4.8	5.0	5.2	V
Device Operating Current			52	57	mA
Device Current Variation vs. Temperature[2]			56		µA/°C
Device Current Variation vs. Voltage			0.020		mA/mW
Thermal Resistance, junction-to-ground lead			156		°C/W

(1) Measured on Mini-Circuits Characterization test board TB-665+. See Characterization Test Circuit (Fig. 1)
(2) (Current at 85°C — Current at -45°C)/130

Absolute Maximum Ratings(3)

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Operating Current at 5V (Vcc) & 16.5Ω resistor	100 mA
Power Dissipation	0.34 W
Input Power (CW)	28 dBm (5 min max.) 11 dBm (continuous)
DC Voltage on Pin 3	6 V

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

Characterization Test Circuit

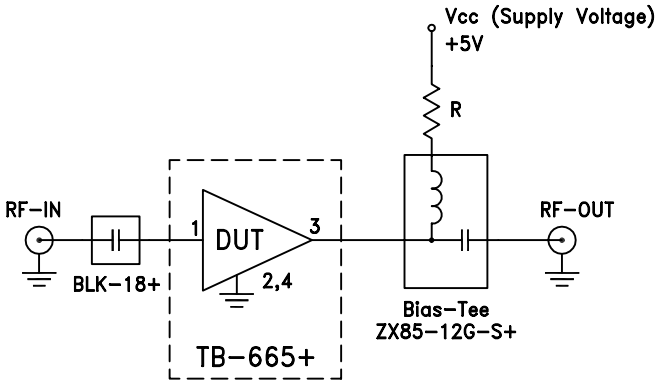


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-665+)
Gain, Return loss, Output power at 1dB compression (P1 dB) , output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.
(R=16.5Ω)

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

Recommended Application Circuit

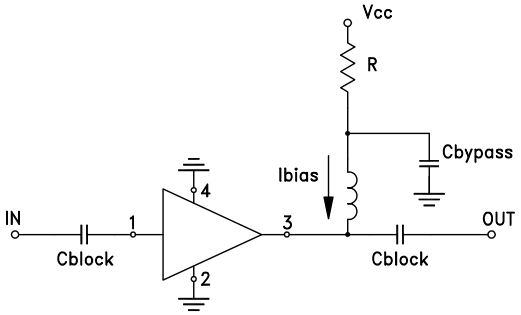
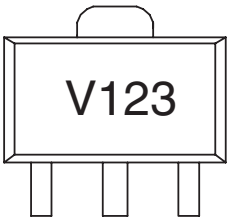


Fig 2. Test Board includes case, connectors, and components soldered to PCB
(Cblock=0.001 μF, Cbypass=0.1 μF, R=16.5Ω)

Product Marking



Marking may contain other features or characters for internal lot control