HIGH GAIN, HIGH IP3

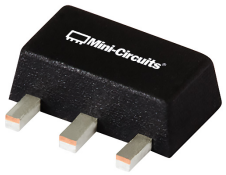
Monolithic Amplifier

GVA-63+

50Ω 0.01 to 6 GHz

THE BIG DEAL

- Gain, 21 dB typ. at 0.8 GHz
- Flat Gain, ±1.7, 50 to 4000 MHz
- High Pout, P1dB 19.0 dBm typ. at 0.8 GHz
- High IP3, 35 dBm typ. at at 0.8 GHz
- Excellent ESD protection, Class 1C for HBM
- Broadband High Dynamic Range without external Matching Components
- May be used as a replacement to RFMD SBB5089Z[a,b]



Generic photo used for illustration purposes only

CASE STYLE: DF782

+RoHS Compliant

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

FREE X-PARAMETERS*

APPLICATIONS

- Base station infrastructure
- Portable Wireless
- CATV & DBS
- MMDS & Wireless LAN
- LTE

PRODUCT OVERVIEW

GVA-63+ (RoHS compliant) is an wideband amplifier fabricated using InGap HBT technology and offers high gain over a broad frequency range and with high IP3. In addition, the GVA-63+, has good input and output return loss over a broad frequency range without the need for external matching components and has demonstrated excellent reliability. 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
Broad Band: 0.01 to 6.0 GHz	Broadband covering primary wireless communications bands: Cellular, PCS, LTE, WiMAX
Flat gain	High gain reduces number of gain stages, at lower real estate, component count and cost. ±1.7 dB from 50 MHz to 3 GHz
High IP3 Versus DC power Consumption 34 dBm typical at 0.05 GHz 35 dBm typical at 0.8 GHz	The GVA-63+ matches industry leading IP3 performance relative to device size and power consumption. The combination of the design and InGap HBT Structure provides enhanced linearity over a broad frequency range as evidence in the IP3 being typically 16 dB above the P 1dB point to 0.8 GHz. This feature makes this amplifier ideal for use in: • Driver amplifiers for complex waveform up converter paths • Drivers in linearized transmit systems
No External Matching Components Required	GVA-63+ provides Input and Output Return Loss of 12-25 dB up to 6 GHz without the need for any external matching components

*X-parameters is a registered trademark of Agilent Technologies, Inc. The X-parameters format and underlying equations are open and documented.
For more information, refer to X-parameters Open Documentation, Trademark Usage & Partnerships
A. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.
B. The RFMD SBB-4089Z part number is used for identification and comparison purposes only.

REV. B
ECO-010563
GVA-63+
TH/RS/CP
211108

Monolithic Amplifier GVA-63+

ELECTRICAL SPECIFICATIONS[1,2] AT 25°C, UNLESS NOTED

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range[2]		0.01		6	GHz
Gain	0.05	—	21.9	—	dB
	0.8	19.0	21.1	—	
	2.0	—	19.9	—	
	3.0	—	18.5	—	
	4.0	—	17.3	—	
	6.0	—	15.9	—	
Gain Flatness	0.05 - 3.0		±1.7		dB
	0.7 - 2.6		±1.3		
Input Return Loss	0.05	—	17.6	—	dB
	0.8	14.0	19.7	—	
	2.0	—	25.0	—	
	3.0	—	25.8	—	
	4.0	—	20.0	—	
	6.0	—	12.0	—	
Output Return Loss	0.05	—	14.5	—	dB
	0.8	14.0	20.6	—	
	2.0	—	16.6	—	
	3.0	—	16.5	—	
	4.0	—	17.1	—	
	6.0	—	13.8	—	
Reverse Isolation	2.0		23.7		dB
Output Power at 1dB Compression	0.05	—	18.7	—	dBm
	0.8	17.0	18.9	—	
	2.0	—	18.6	—	
	3.0	—	16.9	—	
	4.0	—	15.7	—	
	6.0	—	11.8	—	
Output IP3	0.05		33.5		dB
	0.8		34.8		
	2.0		32.2		
	3.0		28.6		
	4.0		26.6		
	6.0		25.0		
Noise Figure	0.05		3.6		dB
	0.8		3.8		
	2.0		3.7		
	3.0		3.7		
	4.0		4.0		
	6.0		4.6		
Device Operating Voltage		4.8	5.0	5.2	V
Device Operating Current		58	69	78	mA
Device Current Variation vs. Temperature[3]			61		µA/°C
Device Current Variation vs. Voltage			0.040		mA/mV
Thermal Resistance, junction-to-ground lead			91		°C/W

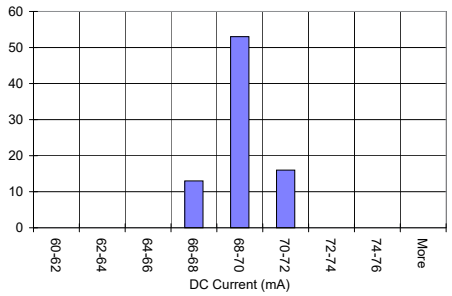
(1) Measured on Mini-Circuits Characterization test board TB-313. See Characterization Test Circuit (Fig. 1)
(2) Low Frequency cut-off determined by external coupling capacitors and external bias choke.
(3) Current at 85°C — Current at -45°C)/130

Monolithic Amplifier GVA-63+

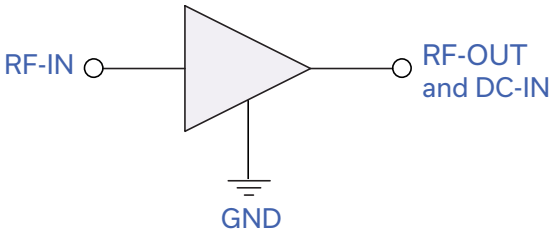
MAXIMUM RATINGS

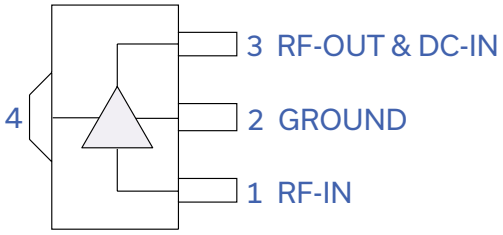
Parameter	Ratings
Operating Temperature (ground lead)	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Operating Current at 5V	100 mA
Power Dissipation	0.5 W
Input Power (CW)	13 dBm
DC Voltage on Pin 3	5.7 V

Permanent damage may occur if any of these limits are exceeded.
Electrical maximum ratings are not intended for continuous normal operation.
For continuous operation, do not exceed 5.2V device voltage.



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.

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CHARACTERIZATION TEST CIRCUIT

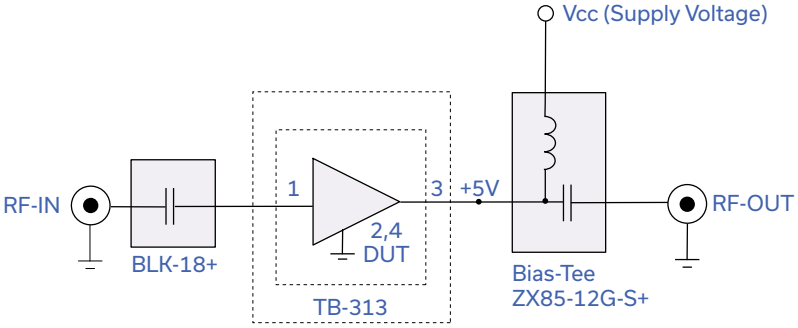


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-313)

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

RECOMMENDED APPLICATION CIRCUIT

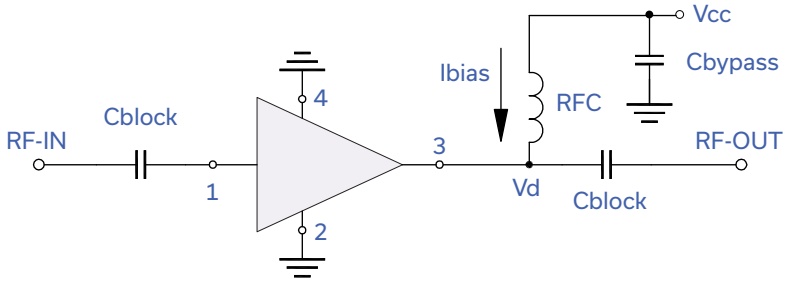
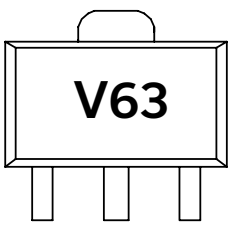


Fig 2. Test Board includes case, connectors, and components soldered to PCB

PRODUCT MARKING



Marking may contain other features or characters for internal lot control