



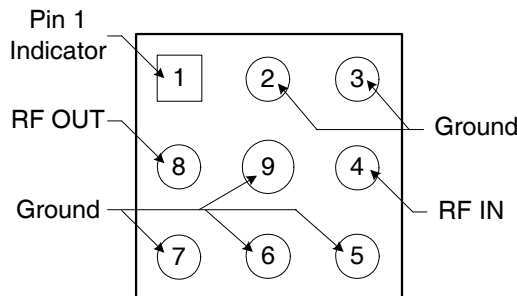
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GENERAL PURPOSE
AMPLIFIERS (LNAs,
HPAs, LINEAR AMPS)

Features

- Reliable, Low-Cost HBT Design
- 19.0dB Gain, +13.0dBm P1dB@2GHz
- High P1dB of +14.0dBm@6.0GHz
- Single Power Supply Operation
- 50Ω I/O Matched for High Freq. Use

Applications

- Narrow and Broadband Commercial and Military Radio Designs
- Linear and Saturated Amplifiers
- Gain Stage or Driver Amplifiers for MWRadio/Optical Designs (PTP/PMP/LMDS/UNII/VSAT/WLAN/Cellular/DWDM)



Functional Block Diagram

Product Description

The NBB-502 cascadable broadband InGaP/GaAs MMIC amplifier is a low-cost, high-performance solution for general purpose RF and microwave amplification needs. This 50Ω gain block is based on a reliable HBT proprietary MMIC design, providing unsurpassed performance for small-signal applications. Designed with an external bias resistor, the NBB-502 provides flexibility and stability. The NBB-502 is packaged in a low-cost, surface-mount ceramic package, providing ease of assembly for high-volume tape-and-reel requirements. It is available in either 1,000 or 3,000 piece-per-reel quantities.

Ordering Information

NBB-502	Cascadable Broadband GaAs MMIC Amplifier DC to 4GHz
NBB-502	Cascadable Broadband GaAs MMIC Amplifier DC to 4GHz
NBB-502-T1	Tape & Reel, 1000 Pieces
NBB-502-E	Fully Assembled Evaluation Board
NBB-X-K1	Extended Frequency InGaP Amp Designer's Tool Kit

Optimum Technology Matching® Applied

- | | | | |
|---|--------------------------------------|-------------------------------------|-----------------------------------|
| <input type="checkbox"/> GaAs HBT | <input type="checkbox"/> SiGe BiCMOS | <input type="checkbox"/> GaAs pHEMT | <input type="checkbox"/> GaN HEMT |
| <input type="checkbox"/> GaAs MESFET | <input type="checkbox"/> Si BiCMOS | <input type="checkbox"/> Si CMOS | |
| <input checked="" type="checkbox"/> InGaP HBT | <input type="checkbox"/> SiGe HBT | <input type="checkbox"/> Si BJT | |

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Absolute Maximum Ratings

Parameter	Rating	Unit
RF Input Power	+20	dBm
Power Dissipation	300	mW
Device Current	70	mA
Channel Temperature	200	°C
Operating Temperature	-45 to +85	°C
Storage Temperature	-65 to +150	°C

Exceeding any one or a combination of these limits may cause permanent damage.



Caution! ESD sensitive device.

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RoHS status based on EUDirective2002/95/EC (at time of this document revision).

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					$V_D = +3.9V, I_{CC} = 35mA, Z_0 = 50\Omega, T_A = +25^\circ C$
Small Signal Power Gain, S ₂₁	19.0	20.5		dB	f=0.1GHz to 1.0GHz
		19.0		dB	f=1.0GHz to 2.0GHz
	16.0	17.0		dB	f=2.0GHz to 4.0GHz
Gain Flatness, G _F		±0.8		dB	f=1.0GHz to 3.0GHz
Input and Output VSWR		1.55:1			f=0.1GHz to 4.0GHz
		1.50:1			f=4.0GHz to 6.0GHz
		1.55:1			f=6.0GHz to 10.0GHz
Bandwidth, BW		4.2		GHz	BW3 (3dB)
Output Power @ -1dB Compression, P _{1dB}		13.0		dBm	f=2.0GHz
		14.0		dBm	f=6.0GHz
Noise Figure, NF		4.0		dB	f=3.0GHz
Third Order Intercept, IP ₃		+23.0		dBm	f=2.0GHz
Reverse Isolation, S ₁₂		-17.0		dB	f=0.1GHz to 10.0GHz
Device Voltage, V _D	3.6	3.9	4.2	V	
Gain Temperature Coefficient, $\delta G_T / \delta T$		-0.0015		dB/°C	
MTTF versus Temperature @ I_{CC} = 35mA					
Case Temperature		85		°C	
Junction Temperature		109.4		°C	
MTTF		>1,000,000		hours	
Thermal Resistance					
θ_{JC}		179		°C/W	$\frac{J_T - T_{CASE}}{V_D \cdot I_{CC}} = \theta_{JC} (^\circ C / Watt)$