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NBB-302

CASCADABLE BROADBAND GaAs MMIC AMPLIFIER DC TO 12GHz

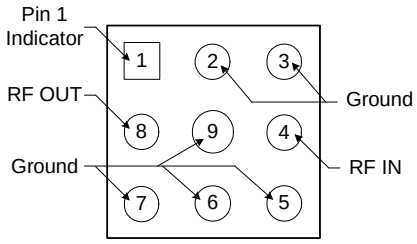
Package Style: MPGA, Bowtie, 3x3, Ceramic

Features

- Reliable, Low-Cost HBT Design
- 12.0dB Gain, +13.7dBm P1dB at 2GHz
- High P1dB of +14.0dBm at 6.0GHz and +11.0dBm at 14.0GHz
- 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 MW Radio/Optical Designs (PTP/PMP/ LMDS/UNII/VSAT/WiFi/Cellular/ DWDM)



Functional Block Diagram

Product Description

The NBB-302 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-302 provides flexibility and stability. The NBB-302 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 packaged or chip (NBB-300-D) form, where its gold metallization is ideal for hybrid circuit designs.

Ordering Information

NBB-302	25 piece bag
NBB-302-SB	5 piece sample bag
NBB-302-SR	100 pieces on 7”reel
NBB-302-T1	1000 pieces on 13” reel
NBB-302-PCK	Populated evaluation board with 5 piece sample bag
NBB-X-K1	Extended Frequency InGaP Amp Designer’s Tool Kit

Optimum Technology Matching® Applied

☐ GaAs HBT	☐ SiGe BiCMOS	☐ GaAs pHEMT	☐ GaN HEMT
☐ GaAs MESFET	☐ Si BiCMOS	☐ Si CMOS	☐ BiFET HBT
☑ InGaP HBT	☐ SiGe HBT	☐ Si BJT	☐ LDMOS

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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	150	°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.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RFMD Green: RoHS compliant per EU Directive 2002/95/EC, halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					V_D=+3.9V, I_{CC}=50mA, Z_0=50Ω, T_A=+25°C
Small Signal Power Gain, S21	12.0	13.5		dB	f=0.1GHz to 1.0GHz
	11.0	13.0		dB	f=1.0GHz to 4.0GHz
		12.5		dB	f=4.0GHz to 6.0GHz
	9.0	10.5		dB	f=6.0GHz to 12.0GHz
		9.5 (avg.)		dB	f=12.0GHz to 14.0GHz
Gain Flatness, GF		±0.6		dB	f=0.1GHz to 8.0GHz
Input and Output VSWR		2.4:1			f=0.1GHz to 4.0GHz
		2.0:1			f=4.0GHz to 12.0GHz
		2.8:1			f=12.0GHz to 15.0GHz
Bandwidth, BW		12.5		GHz	BW3 (3dB)
Output Power at -1dB Compression, P1dB		13.7		dBm	f=2.0GHz
		14.8		dBm	f=6.0GHz
		11.0		dBm	f=14.0GHz
Noise Figure, NF		5.5		dB	f=3.0GHz
Third Order Intercept, IP3		+23.5		dBm	f=2.0GHz
Reverse Isolation, S12		-15		dB	f=0.1GHz to 12.0GHz
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 at I_{CC}=50mA					
Case Temperature		85		°C	
Junction Temperature		122.9		°C	
MTTF		>1,000,000		hours	
Thermal Resistance					
θ_{JC}		194		°C/W	$\frac{J_T - T_{CASE}}{V_D \cdot I_{CC}} = \theta_{JC}(°C/Watt)$

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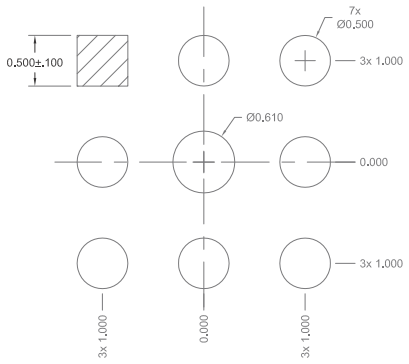
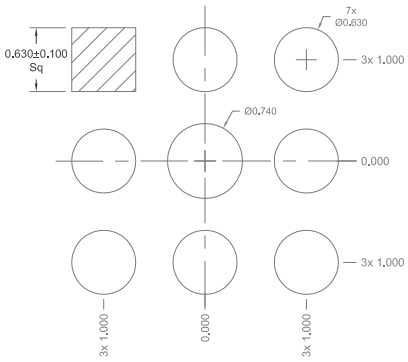
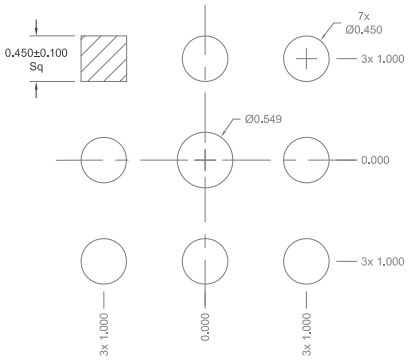
Recommended PCB Layout



PCB METAL PATTERN



PCB SOLDER MASK PATTERN



PCB STENCIL PATTERN