NuWaves
RF Solutions

Preliminary

NuPower Xtender™ VU4GX02-C101

VHF/UHF Solid State Bidirectional Amplifier

225 MHz - 450 MHz
12 Watts CW @ -10 dBm
16 Watts Linear

P/N: NW-BA-VU-4-GX02-C101

The NuPower Xtender™ VU4GX02-C101 is a highly efficient, miniature solid state amplifier with receive pass through that provides 12 watts at nominal input drive (typical) and 16 watts of linear RF power across the 225 MHz to 450 MHz frequency range. This BDA is ideal for extending the communication range of half-duplex transceivers running constant envelope waveforms such as FM, BPSK, and GMSK, as well as high peak-to-average waveforms such as OFDM.

The efficiency and compact form factor of the NuPower Xtender™ VU4GX02-C101 BDA makes it ideal for size, weight, and power-constrained RF telemetry and tactical communication systems. This solid state BDA features a compact form-factor, allowing the system integrator to easily incorporate the unit into the communications payload of small unmanned aircraft systems (UAS) or other small platforms.

Extend your operational communication range with NuPower Xtender™ bidirectional amplifiers from NuWaves RF Solutions.

Features

- 12 Watts at Nominal Input Drive and 16 Watts Linear
- 225 MHz to 450 MHz
- Bidirectional Operation
- Low Loss Rx Passthrough
- Miniature Package
- External T/R Control
- Single Power Supply
- Over-Voltage Protection

Benefits

- Extended Range
- Improved Link Margin
- Lessened load on DC power budget due to high efficiency operation
- Consumes less volume on space-constrained platforms

Applications

- Low Power VHF/UHF Transceivers
- Unmanned Aircraft Systems (UAS), Group 2 & 3
- Unmanned Ground Vehicles (UGV)
- RF Telemetry
- RF Communication Systems
- Software Defined Radios
- ANW2 Waveform

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Specifications

Absolute Maximums

Parameter		Rating	Unit
Max Device Voltage		32	V
Max Device Current	@ 10 VDC	7	A
	@ 28 VDC	2.5	A
	@ 32 VDC	2.25	A
Max RF Input Power @ ANT Port, $Z_L = 50\ \Omega$		+30	dBm
Max RF Input Power @ XCVR Port, $Z_L = 50\ \Omega$		0	dBm
Max Operating Temperature (baseplate)		85	°C
Max Storage Temperature		85	°C

Export Classification
EAR99

Electrical Specifications - Operational

@ 28 VDC, 25 °C, Z_S=Z_L=50 Ω, CW Input Power -10dBm, Unless otherwise stated

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	225		450	MHz	
Switching Speed	$TX_{ON/OFF}$		8	10	µS	10% to 90%
Operating Voltage	VDC	10	28	32	V	
Operating Current - Transmit	I_{DD}		1.4	2.5	A	
Operating Current - Receive	I_{DD}		150		mA	Receive Mode
Quiescent Current	I_{DQ}		300		mA	No RF Signal Applied, Transmit Mode
Module Efficiency			35		%	Transmit mode

Electrical Specifications - Transmit

@ 28 VDC, 25 °C, Z_S=Z_L=50 Ω, CW Input Power -10dBm, Unless otherwise stated

Parameter	Symbol	Min	Typ	Max	Unit	Condition
RF Output Power, Linear	P_L		10		W	
RF Output Power, Psat	Psat	5	12		W	
P1dB Compression Point	P1dB	37	40		dBm	
Small Signal Gain	G		51		dB	Pin = -40 dBm
Small Signal Gain Flatness	ΔG		±1.5		dB	Pin = -40 dBm
Input VSWR	VSWR		TBD			
Output Mismatch VSWR	VSWR			10:1	Ψ	No damage at all phase angles
Nominal Input Drive Level	P_{IN}		-10		dBm	
Harmonics	2nd		TBD		dBc	
	3rd		TBD			

Specifications (cont.)

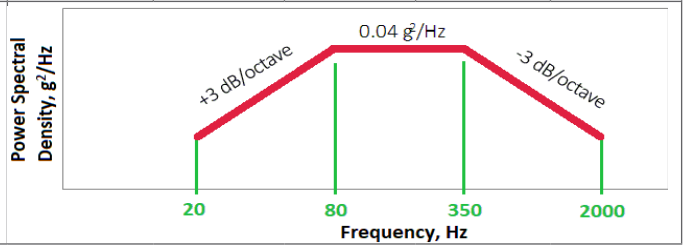
Electrical Specifications - Receive Passthrough @ 28 VDC, 25 °C, Z_S=Z_L=50 Ω

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Receive Path Loss	IL		-1.15	-2	dB	Pin = 0 dBm

Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	2.34 x 2.34 x 0.7	in	Max
Weight	2.4	oz	
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D, 15-pin Socket		
Cooling	Adequate Heatsink Required		

Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T_A	-40		+60	°C
Operating Temperature (baseplate)	T_C	-40		+85	°C
Storage Temperature	T_{STG}	-55		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude MIL-STD-810F - Method 500.4	ALT			30,000	ft
Vibration / Shock Profile (Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis)					

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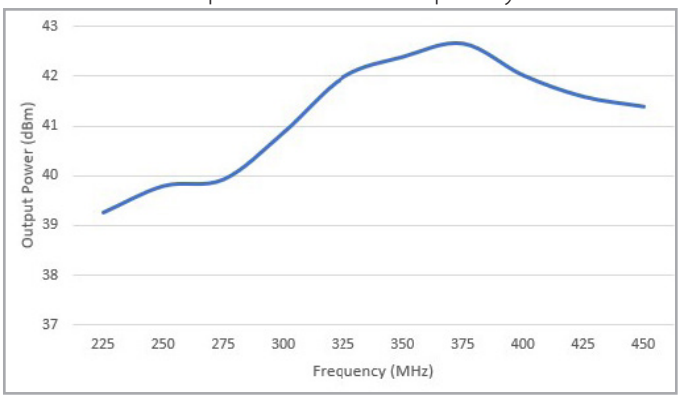
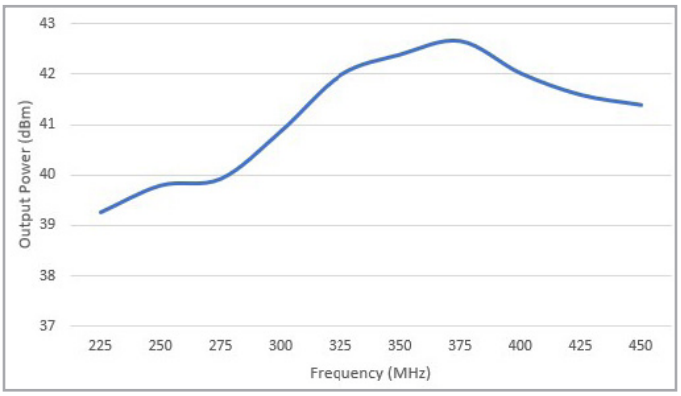
Performance Plots

Test Conditions: +28 VDC, +25 °C, Z_S=Z_L=50 Ω, -10 dBm Input Power (unless otherwise stated)

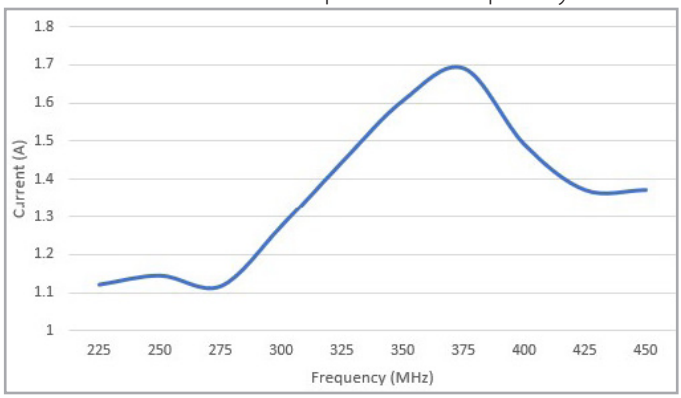
Output Power vs. Frequency



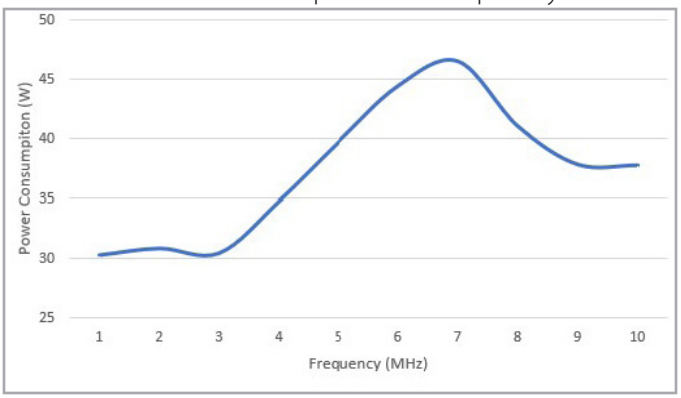
Output Power vs. Input Power



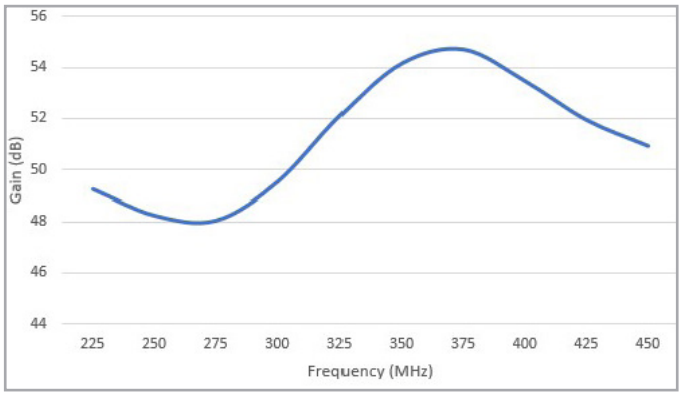
Current Consumption vs. Frequency



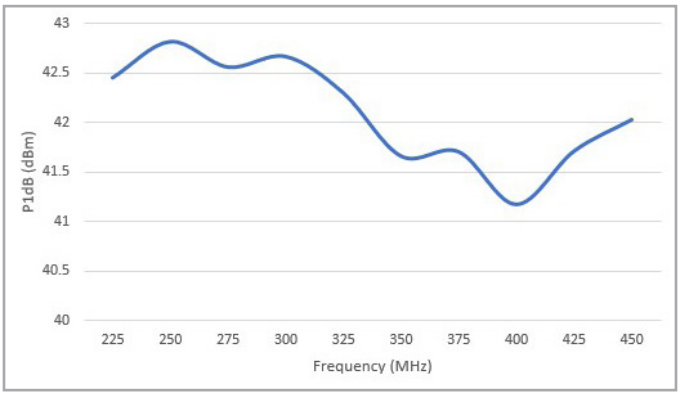
Power Consumption vs. Frequency



Small Signal Gain vs. Frequency [-50 dBm Input Power]



P1dB vs. Frequency



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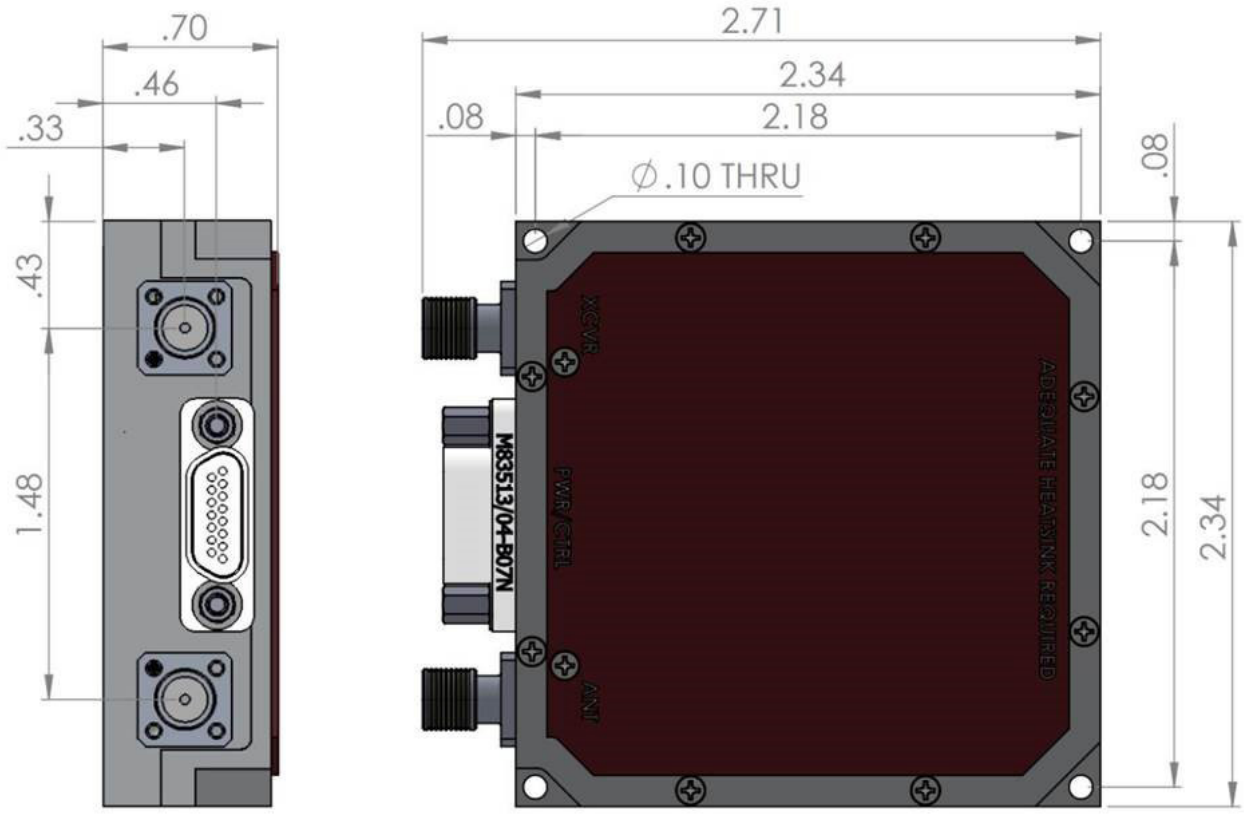
Mechanical Outline



Accessory Part Numbers - Sold Separately

Part Number	Description
NW-BA-ACC-CB15MA	Standard Interface Cable Assembly - Flying Leads
NW-BA-ACC-CT15MA	Upgraded Interface Cable Assembly - Banana Plug Termination
HTSK-01	Heatsink with Integrated Fan

Pinout

Function	I/O	Pin
DC Power (+10 to +32 Volts)	I	3, 4, 5, 6, 12, 13
Ground	I	1, 7, 8, 10, 11, 14, 15
Over Temperature Flag 0 V = Temperature Fault +5 V = No Fault	O	2
T/R Enable 0 V or GND = Transmit +5 V or NC = Receive	I	9

For information on product disposal (end-of-life), please refer to this document:
https://nuwaves.com/wp-content/uploads/Product-Disposal-End-of-Life.pdf

Contact NuWaves

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