

NuWaves

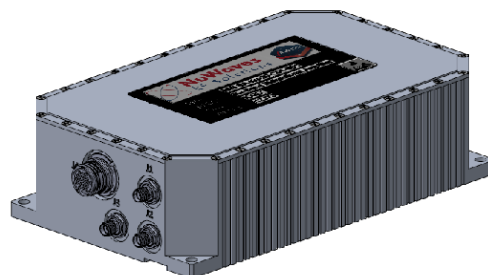
RF Solutions

NuPower Xtender™ KU-20-C01-S01

3-port, Full-Duplex, KU-Band,
Bidirectional Amplifier

30 Watt CW (typ)

P/N: NW-BA-KU-20-C01-S01



The NW-BA-KU-20-C01-S01 KU-Band Bidirectional Power Amplifier is a solid-state, full duplex system that provides > 20 dB of receive gain from 14.40 GHz to 14.83 GHz while simultaneously supplying 30W typical of RF power in the transmit path between 15.15 GHz and 15.35 GHz with a nominal +10 dBm input. The NW-BA-KU-20-C01-S01 is packaged in a ruggedized enclosure.

This product has been designed to meet MLT-STD-461G electromagnetic compatibility, MIL-STD-810G W/ CHANGE 1 and DO-160G environmental conditions, and MIL-STD-704F +28 VDC aircraft electrical power characteristics for operation in tactical and laboratory environments.

Based on the latest gallium nitride (GaN) technology, the NuPower Xtender™ KU-20-C01-S01's typical 22.7% power efficiency and 7.25" x 4.35" x 2.00" form factor make it ideal for size, weight, and power-constrained broadband RF telemetry and tactical communication systems.

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

Features

- 30 Watts (typ) RF Output Power
- 15.15-15.35 GHz
- High-Efficiency GaN Technology
- Over-Voltage Protection
- Logic On/Off Control

Benefits

- Extended Range
- Improved Link Margin
- Lessened load on DC power budget due to high efficiency operation

Applications

- Unmanned Aircraft Systems (UAS)
- RF Communication Systems
- Software Defined Radios
- Test Labs

NuPower Xtender™ KU-20-C01-S01 BDA

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	50	V
Max Device Current	7	A
Max RF Input Power, $Z_L = 50 \Omega$	+37 (J2 TX)	dBm
	+22 (J1 RX)	dBm
Max Operating Temperature (ambient)	55	°C
Max Operating Temperature (baseplate)	85	°C
Max Storage Temperature	85	°C

Export Classification
EAR99

Electrical Specifications @ 28 VDC, 25 °C, $Z_S=Z_L=50 \Omega$, CW, 15.15-15.35 GHz, $P_{in}=+10$ dBm, Unless otherwise Stated

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	15.15		15.35	GHz	
RF Output Power	P_{SAT}		30		W	15.15 GHz - 15.35 GHz
Power Gain Flatness	ΔG		± 1.2		dB	
Nominal Input Drive Level	P_{IN}		+10		dBm	
Operating Voltage	VDC	16	28	50	V	
Quiescent (no RF) Current	I_{DQ}		1.0		A	
Operating Current	I_{DD}		5.4	7	A	
Module Efficiency			22.7		%	
Output Mismatch (No Damage)				3:1	Ψ	No Damage at All Phase Angles

NuPower Xtender™ KU-20-C01-S01 BDA

Specifications (cont.)

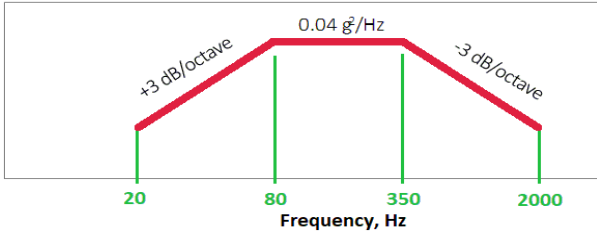
Electrical Specifications - Receive @ 28 VDC, 25 °C, $Z_S=Z_L=50\ \Omega$, CW, 14.4–14.83 GHz, -40 dBm Input Power (unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Receive Operating Frequency	BW	14.4		14.83	GHz	
Receive Gain	G	20	24.8		dB	
Receive Gain Flatness	ΔG		0.43		dBm	
Receive Current	I_{RX}		200		mA	
Receive Noise Figure	NF		2.63	3	dB	

Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	7.25 x 4.35 x 2.00	in	Max
Weight	46.88	oz	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	MD801-009-07M9-19PA		
Cooling	Adequate Heatsink Required		

Environmental Specifications

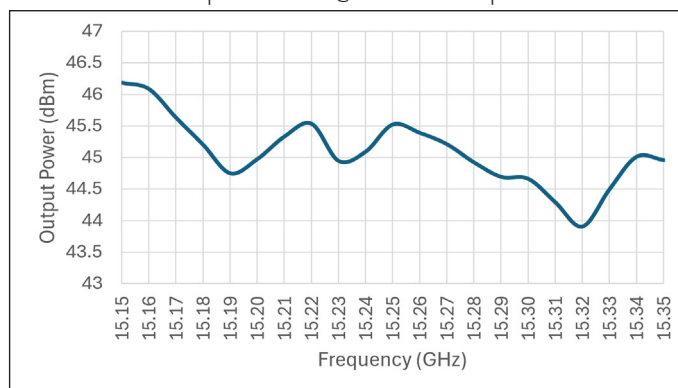
Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T_A	-40		+55	°C
Operating Temperature (baseplate)	T_C	-40		+85	°C
Storage Temperature	T_{STG}	-55		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude MIL-STD-810F - Method 500.4	ALT			40,000	ft
Vibration / Shock Profile (Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis)	 Power Spectral Density, g^2/Hz Frequency, Hz 0.04 g^2/Hz +3 dB/octave -3 dB/octave 20 80 350 2000				

NuPower Xtender™ KU-20-C01-S01 BDA

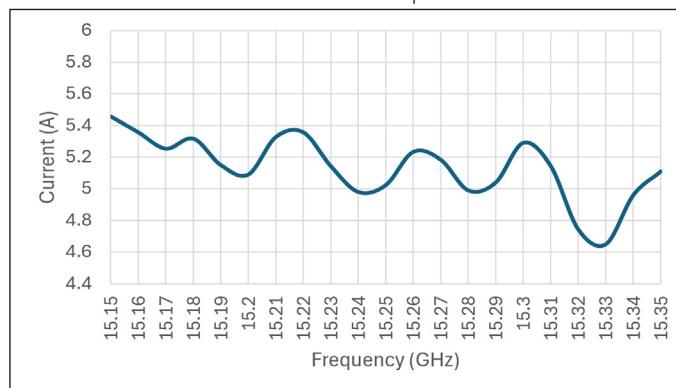
Transmit Performance Plots

Test Conditions: @ 28 VDC, 25 °C, $Z_S=Z_L=50\ \Omega$, CW, 15.15-15.35 GHz, Pin= +10 dBm, Unless otherwise Stated

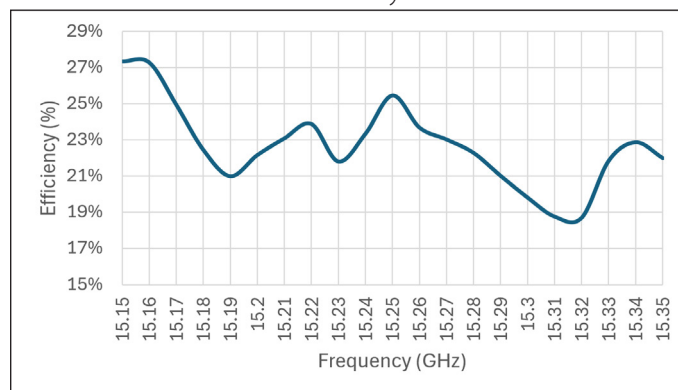
Output Power @ Nominal Input



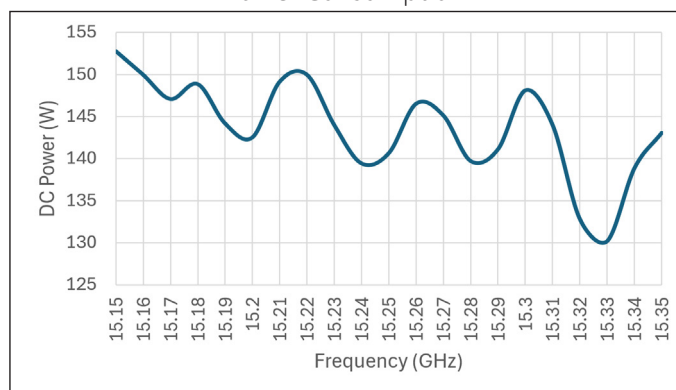
Current Consumption



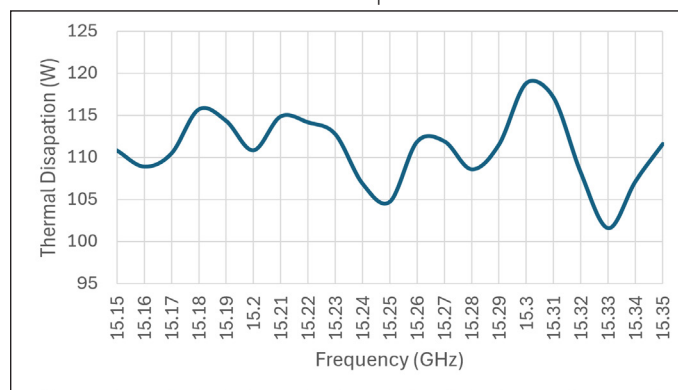
Efficiency



Power Consumption



Power Dissipation

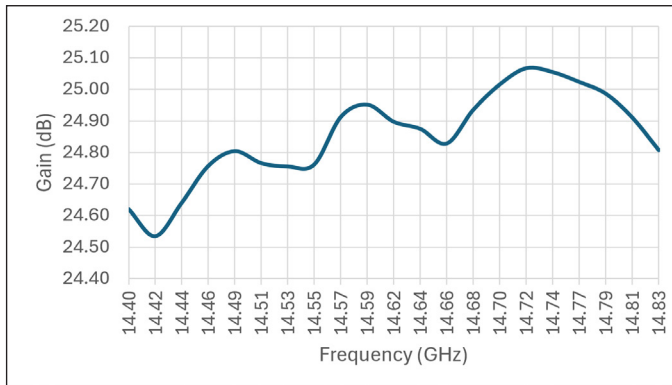


NuPower Xtender™ KU-20-C01-S01 BDA

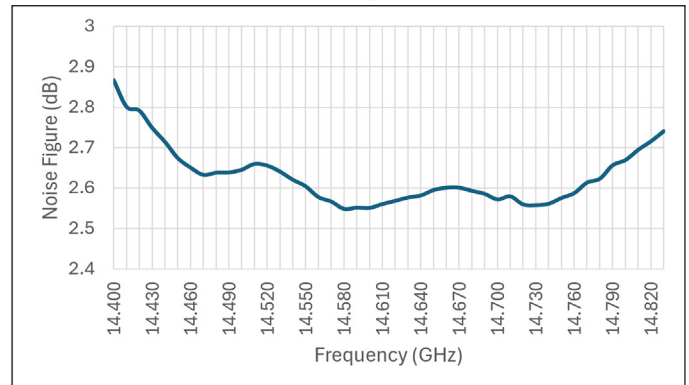
Receive Performance Plots

Test Conditions: @ 28 VDC, 25 °C, $Z_S=Z_L=50\ \Omega$, CW, 14.4–14.83 GHz, Pin= -40 dBm, Unless otherwise Stated

Receive Gain

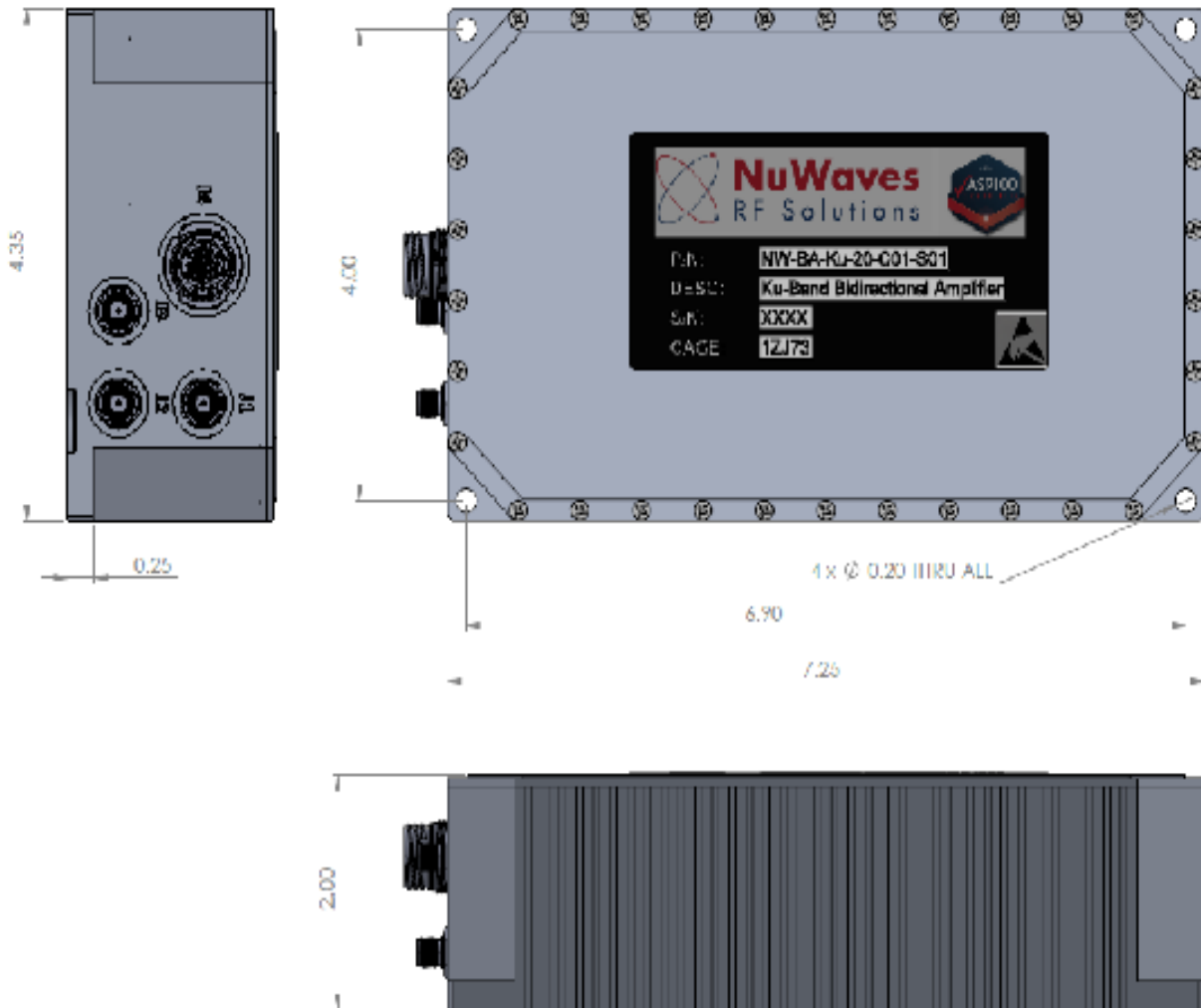


Noise Figure



NuPower Xtender™ KU-20-C01-S01 BDA

Mechanical Outline



NuPower Xtender™ KU-20-C01-S01 BDA

Interface Connector Pinout

Pin Number	Pin Name	I/O	Description
1-8	+28VDC_Input	I	DC Supply Voltage, +16 to +50VDC (+28VDC Nominal)
9	RF Enable	I	PA Bias Control
10	Chassis GND	-	Chassis Ground
11	OverTemp_Out	O	Thermal Fault Indicator
12-19	+28VDC_RTN	-	DC Supply Ground Return

RF Enable Logic

RF Enable	Description
High (+5VDC)- or- Floating	PA Bias Inactive
Low (Chassis GND)	PA Bias Active

Thermal Fault Logic

RF Enable	Description
High (+5VDC)- or- Floating	No Overtemp Detected
Low (Chassis GND)	Overtemp Detected

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



NuWaves RF Solutions
132 Edison Drive
Middletown, OH 45044

www.nuwaves.com
sales@nuwaves.com
513.360.0800

