

# NuWaves

## RF Solutions

### NuPower™ CX-20-C01-S01 Solid State Power Amplifier

20 Watts CW (typ)  
6 GHz to 12 GHz

P/N: NW-PA-CX-20-C01-S01



Contact [sales@nuwaves.com](mailto:sales@nuwaves.com) for custom options.

**The NuPower™ CX-20-C01-S01 is a small connectorized solid state power amplifier that typically delivers 20 Watts of RF power to extend the operational range of data links and transmitters.**

The NuPower CX-20-C01-S01 accepts a nominal +5 dBm RF input and provides 38 dB (typ) of power gain from 6 GHz to 12 GHz for continuous wave (CW) and near-constant envelope waveforms. Based on the latest gallium nitride (GaN) technology, the power and form factor of the NuPower CX-20-C01-S01 make it ideal for size, weight, and power-constrained RF telemetry, tactical communication systems, and electronic warfare systems.

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

#### Features

- 20 Watts RF Output Power
- Small Form Factor
- Temp Fault Indicator
- Thermal Protection
- Optional Fan Cooling Heatsink

#### Benefits

- Extended Range
- Improved Link Margin
- Requires less volume on space-constrained platforms

#### Applications

- Unmanned Aircraft Systems (UAS)  
Group 2 through Group 5
- Counter UAS Detection & Mitigation
- Datalinks
- Radar
- Radio Range Extension
- Space Systems (must be qualified for specific mission)

# NuPower™ CX-20-C01-S01 Power Amplifier

## Specifications

### Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	28.5 (TBR)	V
Max Device Current	TBD	A
Max RF Input Power, $Z_L = 50 \Omega$ , CW	33	dBm
Max Operating Temperature (ambient)	TBD	°C
Max Operating Temperature (baseplate)	TBD	°C

Export Classification
EAR99

### Electrical Specifications @ 28 VDC, 25 °C, $Z_S=Z_L=50 \Omega$ , CW, 6-12 GHz, +5 dBm Input Power, Unless otherwise specified

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	6		12	GHz	
RF Output Power	$P_{SAT}$	43	44 (TBR)		dBm	
Output Power @ 1dB & 3dB Compression Points	$P_{1dB}/P_{3dB}$		TBD		dBm	6 GHz
			TBD			9 GHz
			TBD			12 GHz
Small Signal Gain	G		50 (TBR)		dB	6 GHz
			50 (TBR)			9 GHz
			50 (TBR)			12 GHz
Power Gain Flatness	$\Delta G$		$\pm 1$ (TBR)		dB	
Small Signal Gain Flatness	$\Delta G$		$\pm 3$ (TBR)		dB	$P_{in} = -40$ dBm
Input VSWR	VSWR		1.5:1 (TBR)			
Nominal Input Drive Level	$P_{IN}$		+5		dBm	
Operating Voltage	VDC	27.5 (TBR)	28	28.5 (TBR)	V	
Quiescent Current (RF Enable Off)	$I_{DQ}$		TBD		mA	
Quiescent Current (RF Enable On)	$I_{DQ}$		TBD		A	
Operating Current	$I_{DD}$		TBD		A	
Module Efficiency			30 (TBR)		%	
Switching Speed	$T_{XON/OFF}$		TBD	2 (TBR)	$\mu$ S	
Output Mismatch (No Damage)				2:1 (TBR)	$\Psi$	Band specific circulator recommended
2nd/3rd Harmonics @Psat			TBD		dBc	6 GHz
			TBD		dBc	9 GHz
			TBD		dBc	12 GHz

\*Contact NuWaves for custom solutions at Operating Voltages other than +28VDC.

# NuPower™ CX-20-C01-S01 Power Amplifier

## Specifications (cont.)

### Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	4.50 x 2.75 x 0.70 (TBR)	in	Max
Weight	TBD	oz	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D-Sub, 21 Pin Socket (TBR)		
Cooling	Adequate Heatsink Required		

### Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	$T_A$	-40		TBD	°C
Operating Temperature (baseplate)	$T_C$	-40		TBD	°C
Storage Temperature	$T_{STG}$	-55		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Vibration / Shock Profile (Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis)					

The graph shows a trapezoidal vibration profile. The y-axis is Power Spectral Density in  $g^2/Hz$  and the x-axis is Frequency in Hz. The profile starts at 20 Hz, rises with a slope of +3 dB/octave to 80 Hz, remains constant at 0.04  $g^2/Hz$  until 350 Hz, and then falls with a slope of -3 dB/octave to 2000 Hz.

# NuPower™ CX-20-C01-S01 Power Amplifier

## Performance Plots

Test Conditions: +28 VDC, +25 °C,  $Z_S=Z_L=50 \Omega$ , CW, +5dBm Input Power, Unless otherwise stated

Output Power



Output Power - Stepped Inputs



Output Power vs Temperature



Output Power vs Input Power



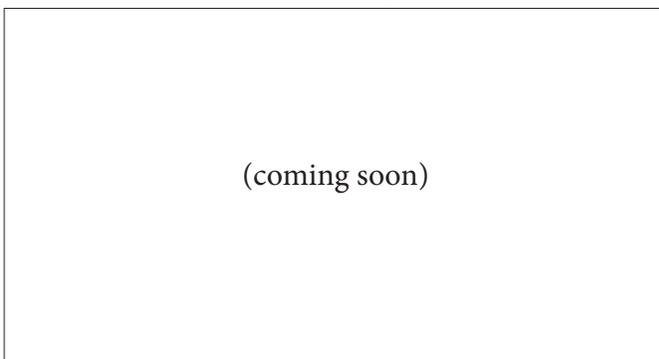
Gain vs Input Power



P1dB & P3dB



Efficiency

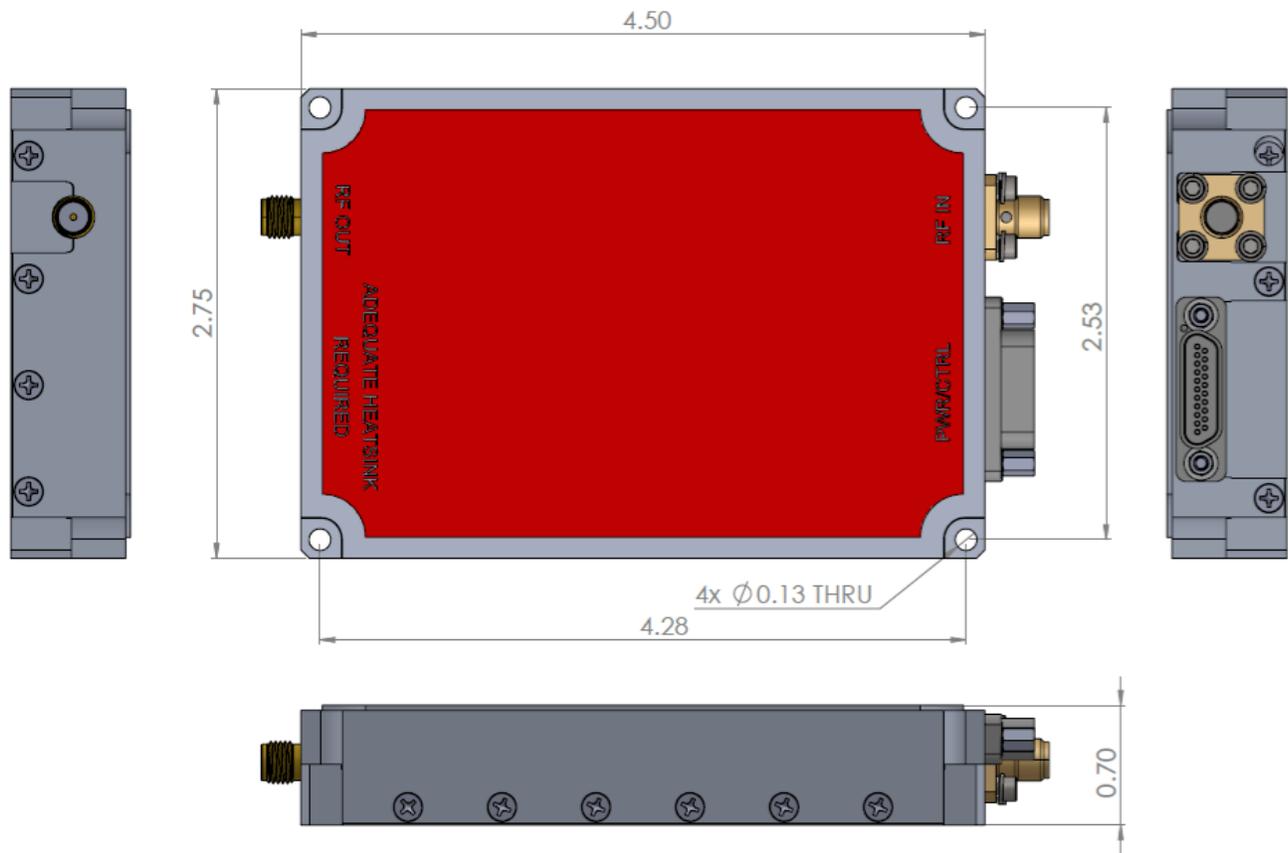


DC Current Consumption



# NuPower™ CX-20-C01-S01 Power Amplifier

## Mechanical Outline



# NuPower™ CX-20-C01-S01 Power Amplifier

## Accessory Part Numbers - Sold Separately

## Pinout

Part Number	Description
TBD	Standard Interface Cable Assembly - Flying Leads
TBD	Upgraded Interface Cable Assembly - Banana Plug Termination
TBD	Heatsink with Integrated Fan*

Function	I/O	Pin	Description
DC Power (+28 Volts)	I	TBD	
Ground	I	TBD	
Over Temperature Flag 0V = temperature fault +5V = no fault	O	TBD	+5V CMOS Logic Level
RF Enable 0V or GND = RF ON NC = RF OFF	I	TBD	5V CMOS Logic Levels: Logic HIGH [+2.1V to +5.0V] Logic LOW [0V to +0.8]

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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