

# NuWaves

## RF Solutions

## NuPower Xtender™ C10RX03 C-Band Solid State Bidirectional Amplifier

8 Watts CW  
4.4 GHz - 5.1 GHz

P/N: NW-BA-C-10-RX03

(Includes NW-BA-ACC-CB09MC interface cable)



**The NuPower Xtender™ C10RX03 is a small, highly efficient, solid state bidirectional amplifier (BDA) that provides at least 8 watts of RF power across the 4.4 to 5.1 GHz frequency range to boost performance of data links and transmitters.**

The NuPower Xtender C10RX03 accepts a nominal +30 dBm (1 W) RF input and provide 10 dB of gain from 4.4 to 5.1 GHz for continuous wave (CW) and near-constant envelope waveforms. In receive mode, the integrated low noise amplifier provides 10 dB of gain. The NuPower C10RX03 features auto-sense transmit/receive (T/R) control; For manual T/R control, please see the NuPower C10RX01.

Based on the latest gallium nitride (GaN) technology, the NuPower Xtender C10RX03's power efficiency and form factor make it ideal for size, weight, and power-constrained broadband RF telemetry, tactical communication systems, and electronic warfare systems.

NuPower BDA's feature over-voltage protection and can operate over a wide temperature range of -40 °C to +85 °C (baseplate)

**Extend your operational communication range with NuPower Xtender™ bidirectional amplifiers from NuWaves Engineering.**

### Features

- 10 Watts RF Output Power
- 4.4 GHz to 5.1 GHz
- Bidirectional Operation
- 10 dB of Transmit Gain
- 10 dB of Receive Gain
- Miniature Package
- Autosense T/R Control
- Single Power Supply
- Over-Voltage Protection
- 3.3 V or 5 V Logic Control

### Benefits

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

### Applications

- Unmanned Aircraft Systems (UAS), Group 2 & 3
- Unmanned Ground Vehicles (UGV)
- RF Telemetry
- RF Communication Systems
- Software Defined Radios

# NuPower Xtender™ C10RX03 BDA

## Specifications

### Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current @ 28 VDC	2.2	A
Max RF Input Power @ ANT Port, $Z_L = 50 \Omega$	+30	dBm
Max RF Input Power @ XCVR Port, $Z_L = 50 \Omega$	+35	dBm
Max Operating Temperature (ambient)	60	°C
Max Operating Temperature (baseplate)	85	°C
Storage Temperature	100	°C

Export Classification
EAR99

### Electrical Specifications - Operational @ 28 VDC, 25 °C, $Z_S=Z_L=50 \Omega$

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	4.4		5.1	GHz	
Switching Speed	$T_{XON/OFF}$		2		$\mu$ S	10% to 90%
Operating Voltage*	VDC	27	28	32	V	
Operating Current - Transmit	$I_{DD}$		1.75		A	CW, +28 Vin, Pout = 10 W
Operating Current - Receive	$I_{DD}$		45		mA	Receive Mode
Quiescent Current	$I_{DQ}$		400		mA	No RF Signal Applied, Transmit Mode
Module Efficiency			20		%	CW, Pout = 10W, Transmit mode

\* Module can operate down to +17 Vdc w/ reduced RF output power

### Electrical Specifications - Transmit @ 28 VDC, 25 °C, $Z_S=Z_L=50 \Omega$

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	4.4		5.1	GHz	
RF Output Power	$P_{SAT}$	8	10		W	4.4 GHz - 5.1 GHz, +30 dBm input
DC Power Consumption w.r.t. RF Output Power	DC		40		W	5W RF Output, 28Vdc
			48			7W RF Output, 28Vdc
			55			10W RF Output, 28Vdc
Input VSWR	VSWR		2:1			
Output Mismatch (No Damage)	VSWR			10:1		
Nominal Input Drive Level	$P_{IN}$		30		dBm	
Quiescent Current (Transmit Mode)	$I_{DQ}$		0.4		A	No RF Signal Applied
Operating Current	$I_{DD}$		1.75		A	Pout = 10 W
Module Efficiency			20		%	
Harmonics	2nd			-20 (TBR)	dBc	
	3rd			-20 (TBR)	dBc	

# NuPower Xtender™ C10RX03 BDA

## Specifications (cont.)

Electrical Specifications - Receive @ 28 VDC, 25 °C,  $Z_S=Z_L=50 \Omega$

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Receive P1dB	P1dB		+18		dBm	
Receive Gain	G		10		dB	
Receive Gain Flatness	$\Delta G$		$\pm 1$		dB	From 4.4 GHz to 5.1 GHz
Receive Current	$I_{RX}$		45		mA	
Receive Noise Figure	NF		3.0		dB	
Receive OIP3	OIP3		27		dBm	1 MHz tone spacing, Pin = -20 dBm
Receive Input Protection (limiter)			5		dBm	

## Mechanical Specifications

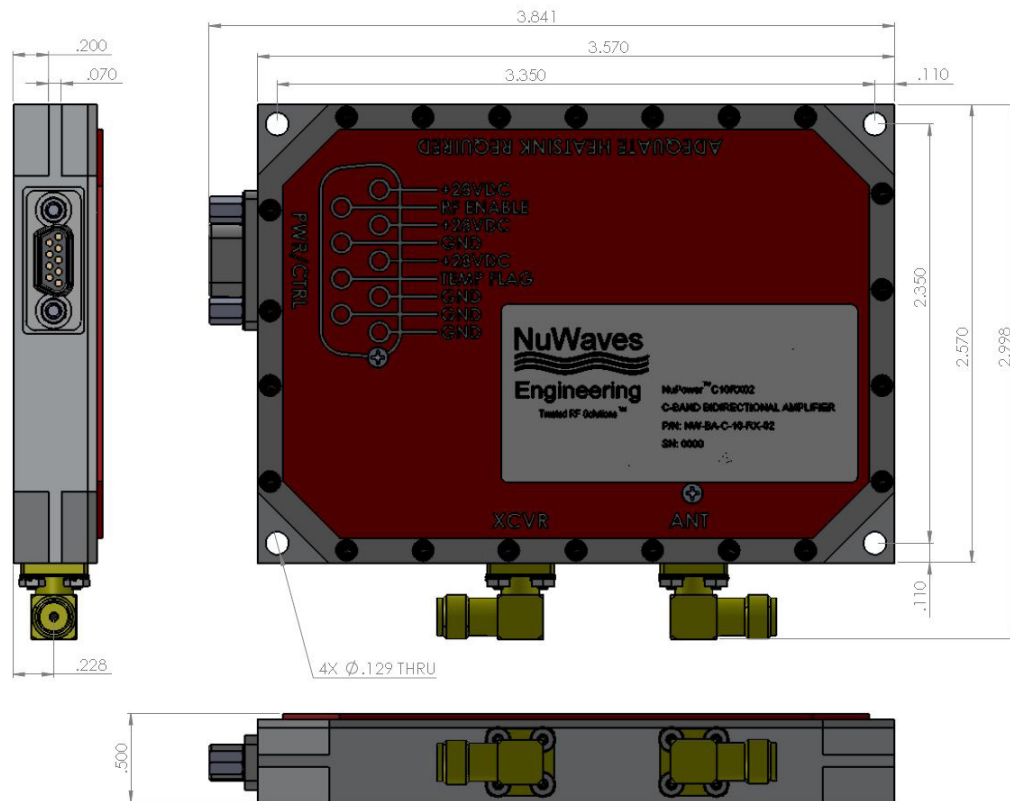
Parameter	Value	Unit	Limits
Dimensions	3.57 x 2.57 x 0.50	in	Max
Weight	< 5.0	oz	
RF Connectors, Input/Output	SMA Female, right angle		
Interface Connector	Micro-D, 9-pin Socket		
Cooling	Adequate Heatsink Required		

## 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	$T_{STG}$	-60		+100	°C	
Relative Humidity (non-condensing)	RH			95	%	
Altitude MIL-STD-810F - Method 500.4	ALT			30,000	ft	
Vibration Amplitude	4 Hz - 15 Hz	A	0.024	0.030	0.036	in
	16 Hz - 25 Hz	A	0.016	0.020	0.024	in
	26 Hz - 33 Hz	A	0.008	0.010	0.012	in
Shock Peak Acceleration (Functional Shock)				30 g for 15 ms		
				20 g for 20 ms		

# NuPowerXtender™ C10RX03 BDA

## Mechanical Outline



## Accessory Part Numbers

Part Number	Description
NW-BA-ACC-CB09MC	Standard Interface Cable Assembly - Flying Leads (included with module)
NW-BA-ACC-CT09MC	Upgraded Interface Cable Assembly - Banana Plug Termination
NW-BA-ACC-KT04	Accessory Kit, which includes Fan-Cooled Heatsink

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>

## Pinout

Function	I/O	Pin
DC Power (+28 Volts)	I	3, 4, 5
Ground	I	1, 2, 6, 8
Over Temperature Flag (0 Volts = Temperature Fault) (+5 Volts = No Fault)	O	7
T/R Control * (3.3 V OR 5 V Logic) Autosense Mode *	O	9
0V = Transmit		
5V = Receive		

\*Autosense Mode

Tx @ RF Input  $\approx$  +15 dBm

Rx @ RF Input  $\approx$  0 dBm

## Contact NuWaves



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