



NuWaves
engineering

Trusted RF Solutions™

NuPower Xtender™ C10RX03-C037 C-Band Solid State Bidirectional Amplifier

10 Watts CW (typ)
5125 - 5875 MHz

P/N: NW-BA-C-10-RX03-C037

(Includes NW-BA-ACC-CB09MG interface cable)



The NuPower Xtender™ C10RX03-C037 is a small, highly efficient, solid state bidirectional amplifier (BDA) that provides 10 watts (typ) of RF power across the 5125 to 5875 MHz frequency range to boost performance of data links and transmitters.

The NuPower Xtender C10RX03-C037 accepts a nominal +30 dBm (1 W) RF input and provides 10 dB of gain from 5125 to 5875 MHz for continuous wave (CW) and near-constant envelope waveforms. In receive mode, the integrated low noise amplifier provides 10 dB of gain (typ). The NuPower C10RX03-C037 features auto-sense transmit/receive (T/R) control.

Based on the latest gallium nitride (GaN) technology, the NuPower Xtender C10RX03-C037'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 W (typ) Psat
- 5125 to 5875 MHz
- Bidirectional Operation
- 10 dB (typ) Transmit Gain
- 10 dB (typ) 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-C037 BDA

Preliminary Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current @ 28 VDC	3.5	A
Max Peak RF Input Power @ ANT Port, $Z_L = 50 \Omega$	+30	dBm
Max Peak RF Input Power @ XCVR Port, $Z_L = 50 \Omega$	+33	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	5125		5875	MHz	
Switching Speed	$T_{XON/OFF}$		2		μ S	10% to 90%
Operating Voltage*	VDC	27	28	32	V	
Operating Current - Transmit	I_{DD}		2.5	3	A	CW, +28 Vin, Pout = 10 W
Operating Current - Receive	I_{DD}		50		mA	Receive Mode
Quiescent Current	I_{DQ}		330		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	5125		5875	MHz	
RF Output Power	P_{SAT}		10	17	W	5125-5875 MHz, +30 dBm input
Input VSWR	VSWR		2:1 (TBR)			
Output Mismatch (No Damage)	VSWR			10:1		
Nominal Input Drive Level	P_{IN}		30	33	dBm	
Quiescent Current (Transmit Mode)	I_{DQ}		330		mA	No RF Signal Applied
Operating Current	I_{DD}		2.5	3	A	Pout = 10 W
Module Efficiency			20		%	
Harmonics	2nd			-20 (TBR)	dBc	
	3rd			-20 (TBR)	dBc	

NuPower Xtender™ C10RX03-C037 BDA

Preliminary 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	ΔG		± 1.25		dB	
Receive Current	I_{RX}		50		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

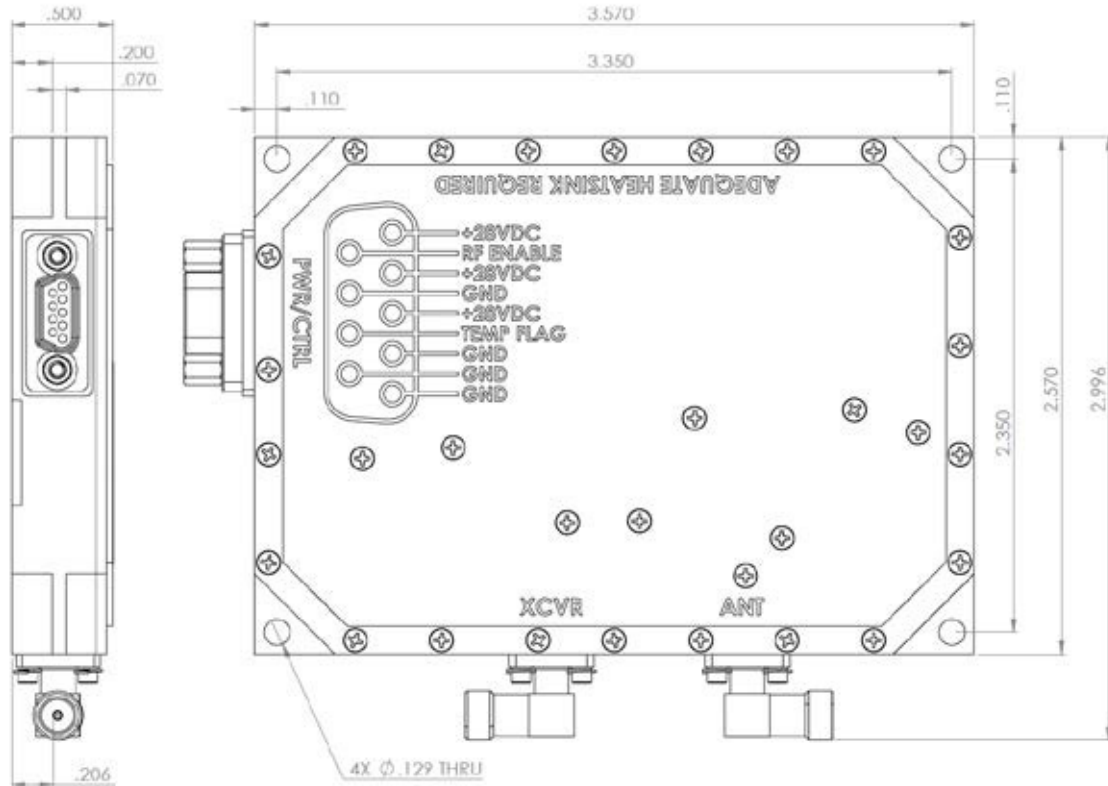
Parameter	Value	Unit	Limits
Dimensions	3.57 x 2.57 x 0.50	in	Max
Weight	< 5.0	oz	
RF Connectors, Input/Output	SMA Female, right angle		
Interface Connector	Micro-D, 9-pin Socket		
Cooling	Adequate Heatsink Required		

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-C037 BDA

Mechanical Outline



Accessory Part Numbers

Part Number	Description
NW-BA-ACC-CB09MG	Standard Interface Cable Assembly - Flying Leads (included with module)
NW-BA-ACC-CT09MG	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 +3.3 Volts* = No Fault	0	7
T/R Control (+3.3 V Logic*) Manual Mode 0 Volts = Transmit +3.3 Volts* = Receive	I	9

T/R Control is configured at the factory for Manual Mode or Autosense Mode.

*Configurable at factory for 3.3V or 5V logic

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