NuWaves
RF Solutions

NuPower Xtender™ DUAL-S-50-C02-S01

50 Watt CW

2.2 GHz - 2.5 GHz

P/N: NW-BA-DUAL-S-50-C02-S01

Contact sales@nuwaves.com for custom options, including 3x3 or 4x4 options in a single housing

The NuPower Xtender™ DUAL-S-50-C02-S01 is a 50W 2x2 dual channel bi-directional amplifier ideal for extending the range of communications and datalinks for ISR applications. This amplifier supports NxN MIMO radios, where 2x2 or 4x4 configurations are used for high data rate applications. This amplifier combines a power amplifier, LNA, and switch, in an integrated microwave assembly for a low SWaP solution to pair with MIMO radios.

Based on highly linear LDMOS technology, this amplifier is perfect for applications requiring both high data rates and high RF output power for long distance data links. It supports complex modulations with high peak-to-average ratios (PARs), where minimal signal distortion is required. Constant envelope signals such as CW, AM, and FM are also supported.

At a nominal +30dBm (1Watt) RF input, the amplifier provides 17dB of gain to achieve a nominal 50 Watts at each of the antenna ports. Each channel is its own independent bi-directional amplifier. The amplifier switches between transmit and receive through a DC control input. Alternatively, the module can be configured for Autosense where it switches between transmit and receive automatically based on the RF input power detected at the XCVR Port.

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

Features

- 50 Watts (typ) RF Output Power
- 2.2 to 2.5 GHz
- Bidirectional Operation
- 17 dB (typ) of Transmit Gain
- 12 dB (typ) Receive Gain
- Fast T/R Mode Switching with Auto-Sensing or Manual T/R Line
- Small Form Factor
- Highly Linear LDMOS Technology
- Over-Voltage & Reverse-Voltage Protection

Applications

- Unmanned Aircraft Systems (UAS) - Group 2 and Group 3
- Unmanned Ground Vehicles (UGV)
- Software Defined Radios
- Counter UAS Detection and Mitigation
- MIMO/MANET Radio Range Extension
- SISO Radio Range Extension

132 Edison Drive, Middletown, OH 45044 | 513.360.0800 | sales@nuwaves.com | www.nuwaves.com

NuPower Xtender™ DUAL-S-50-C02-S01

Specifications

Absolute Maximums

Per Channel		
Parameter	**Rating**	**Unit**
Max Device Voltage	N/A	V
Max Device Current	TBD	A
Max RF Input Power CW, Z_L=50Ω	TBD	dBm
	TBD	
Max Operating Temperature (ambient)	+71 °C	°C
Max Operating Temperature (baseplate)	+85 °C	°C

Export Classification
EAR 99

Electrical Specifications - Operational @ 28 VDC, 25 °C, Z_S=Z_L=50 Ω, CW, Pin = +30 dBm (unless otherwise specified)

Per Channel						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Condition**
RF Output Power, Psat	Psat		47		dBm	
Operating Frequency	BW	2200		2500	MHz	
Switching Speed	$TX_{ON/OFF}$		1.0	2.0	µs	
Operating Voltage	VDC		+28		V	
Operating Current (Transmit)	I_{DD}		TBR		A	

Electrical Specifications - Transmit @ 28 VDC, 25 °C, Z_S=Z_L=50 Ω, CW, Pin = +30 dBm (unless otherwise specified)

Per Channel						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Condition**
RF Output Power, Psat	Psat		47		W	
Tx Gain	G		17		dB	
Power Gain Flatness	ΔG		±1.0		dB	1-2.5 GHz
Small Signal Gain Flatness	ΔG		TBD		dB	Pin= 0 dBm, 1-2.5 GHz
Harmonics	2nd		TBD		dBc	
Nominal Input Drive Level	P_{IN}		+30		dBm	
Quescent Current	I_{DQ}		TBD		mA	T/R Enable Off (Receive Current)
Tx Current	I_{TX}		TBD	6.5A	A	
Tx Input VSWR (XCVR Port)	VSWR		2:1			

Electrical Specifications - Receive @ 28 VDC, 25 °C, Z_S=Z_L=50 Ω, CW, -30 dBm Input Power (unless otherwise specified)

Per Channel						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Condition**
RF Gain	G		12.0		dB	
Rx P1dB	P1dB		7.0		dBm	
Rx Gain Flatness	ΔG		±1.0		dB	
Rx Current	I_{RX}		TBD		mA	
Rx Noise Figure	NF		2.5		dB	
RX Input VSWR (ANT Port)	VSWR		2:1			

Specifications (cont.)

Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	4 x 7 x 1.25	in	Max
Weight	TBD	oz	Max
Weight with Heatsink	TBD		
RF Connectors, Input/Output	TNC/TNC		
Interface Connector	Circular Locking		
Cooling	Adequate Heatsink Required		

Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T_A	-40		+71	°C
Operating Temperature (baseplate)	T_C	-40		+85	°C
Storage Temperature	T_{STG}	-55		+85	°C
Altitude	ALT		TBD	50,000	ft
Vibration / Shock Profile TBD	(Profile TBD)				

EVM vs Output Power vs Modulation

Per Channel				
Modulation (802.11g, 20MHz BW, OFDM)	Date Rate	Output Power (W)	EVM (dB)	EVM (%)
64QAM	54 MBPS	10	≤ -27	≤ 4.46
16QAM	36 MBPS	20	≤ -21	≤ 8.91
QPSK	12 MBPS	35	≤ -15	≤ 17.78
BPSK	9 MBPS	50	≤ -7	≤ 44.66

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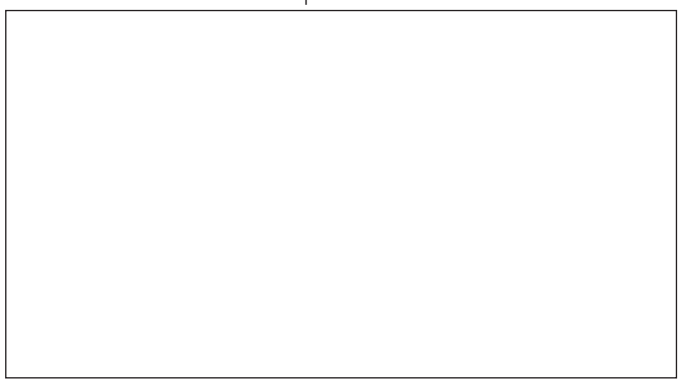
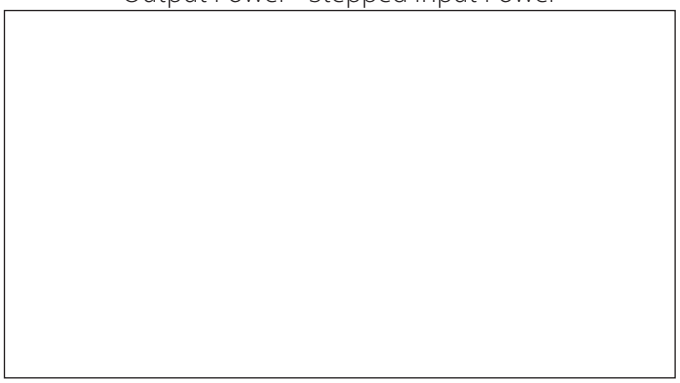
Transmit Performance (to be provided soon)

Test Conditions: +28 VDC, +25 °C, Z_S=Z_L=50 Ω, CW, +30 dBm Input Power (unless otherwise specified)

Output Power

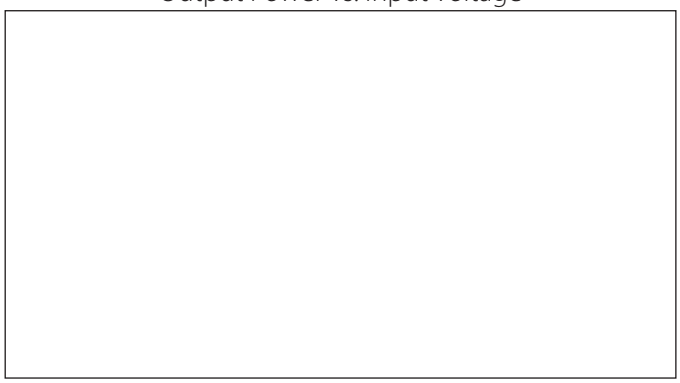


Output Power - Stepped Input Power



Output Power vs. Input Power

Output Power vs. Input Voltage

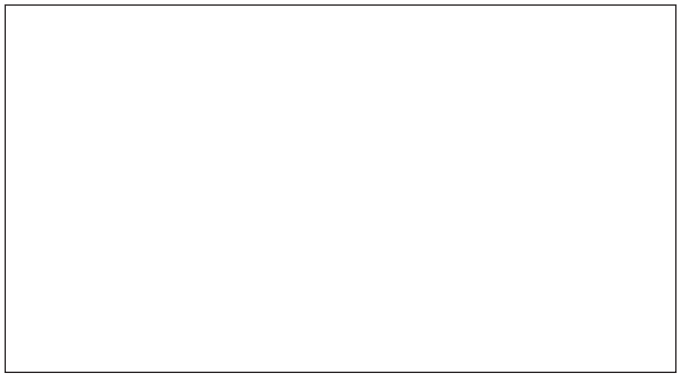


Current Consumption

Transmit Small Signal Gain [0dBm Input Power]

Efficiency

Efficiency vs. Output Power



Transmit Performance Plots (cont.)

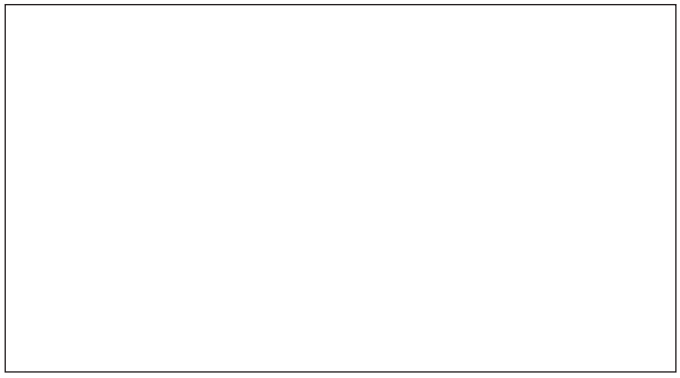
Test Conditions: +28 VDC, +25 °C, Z_S=Z_L=50 Ω, CW, +30 dBm Input Power (unless otherwise specified)

Transmit Input VSWR

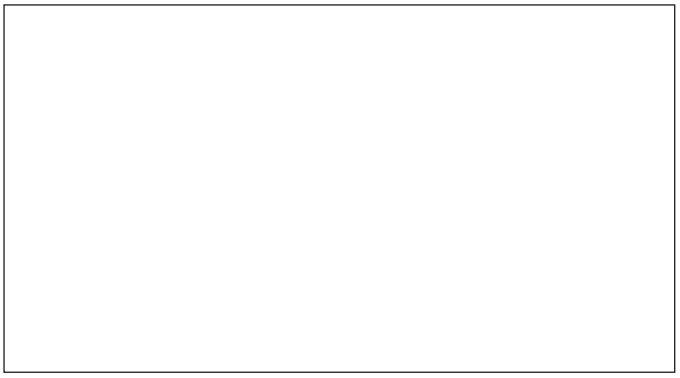
Harmonics

Transmit P1dB

EVM vs. Output Power [BPSK (OFDM)]



EVM vs. Output Power [QPSK (OFDM)]



EVM vs. Output Power [16QAM (OFDM)]

EVM vs. Output Power [64QAM (OFDM)]

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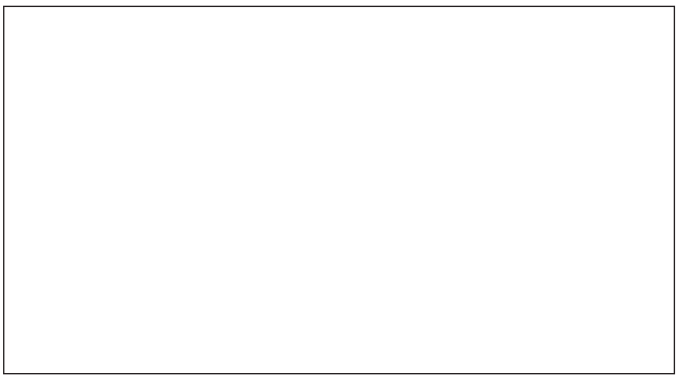
Receive Performance Plots (to be provided soon)

Test Conditions: +28 VDC, +25 °C, Z_S=Z_L=50 Ω, CW, -30 dBm Input Power (unless otherwise specified)

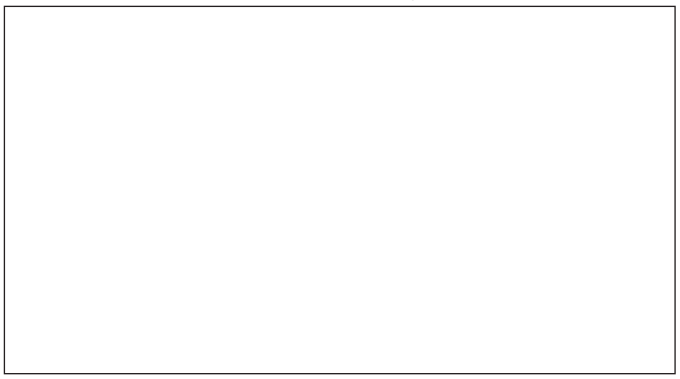
Receive Gain

Receive Gain vs Temperature

Receive P1dB



Receive Noise Figure



Receive Noise Figure vs Temperature

Receive Input VSWR

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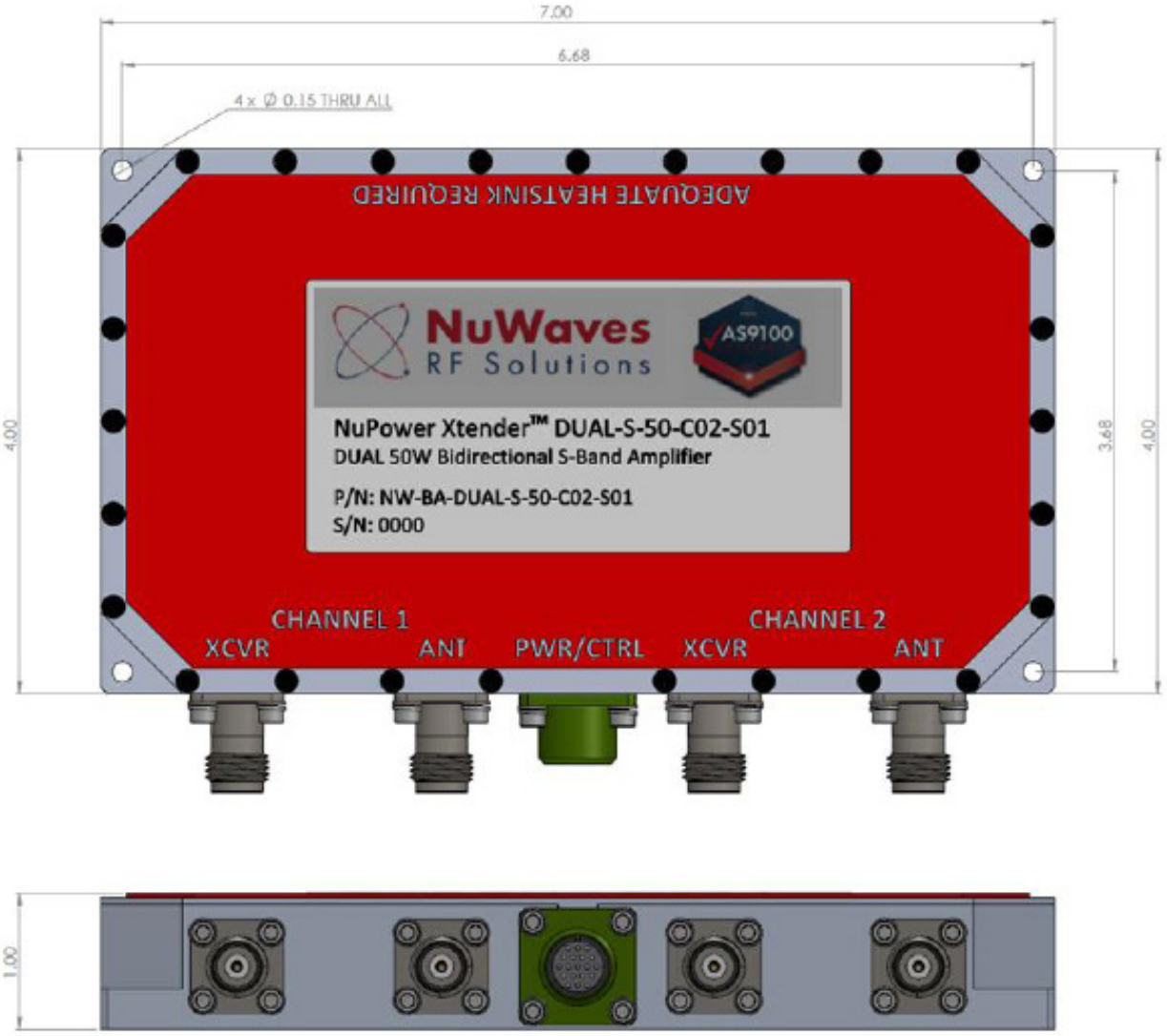
Mechanical Outline



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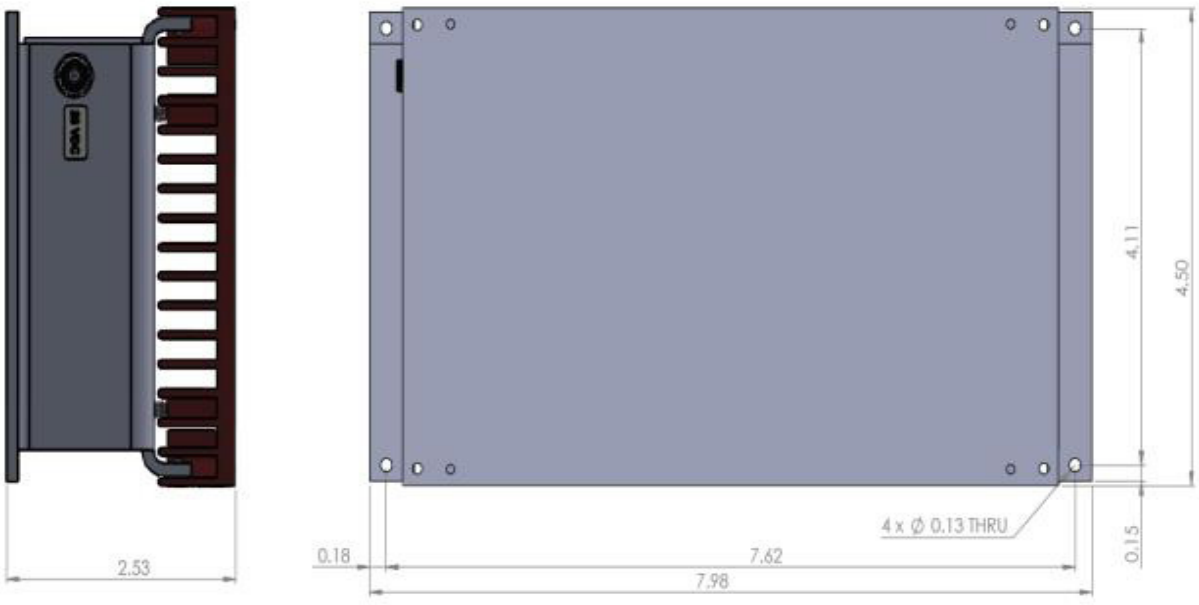
Optional Heatsink Drawing

Heatsink and Integrated Fan: HTSK-07



NuPower Xtender™ DUAL-S-50-C02-S01

Accessory Part Numbers - Sold Separately

Part Number	Description
NW-FL-05LPLE-2500-SFSF-M01	Harmonic Filter Module
TBD	Standard Interface Cable Assembly - Flying Leads
TBD	Upgraded Interface Cable Assembly - Banana Plug Termination
HTSK-07	Heatsink with Integrated Fan

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	Logic Voltage
DC Power (Primary Power, +11 to +32 Volts)	I	TBD	-
Ground (DC Return)	I	TBD	-
Over Temperature Flag	I	TBD	-
T/R Enable	I/O	TBD	TBD
T/R Mode: Source (Autosense)[1] T/R Mode: Sink (Manual T/R) [High TX / Low RX]			TBD

[1] Autosense automatically switches to transmit and receive based on input signal strength. Typical threshold is TBD; see user manual for complete information.

Contact NuWaves

NuWaves RF Solutions
132 Edison Drive
Middletown, OH 45044

www.nuwaves.com
sales@nuwaves.com
513.360.0800