



*Trusted RF Solutions™*

*Preliminary*

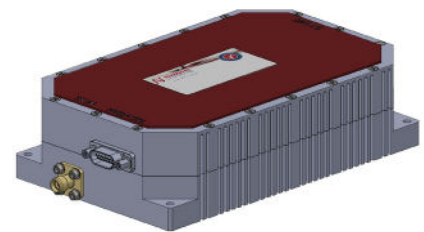
**NuPower™ ULSC-20-C01-S01**

**Ultra Wideband Power Amplifier**

500 MHz - 6.0 GHz

TX: 20 Watts RF Output Power (typ)

Custom options available upon request. For example, this module can be modified for various input drive levels to accommodate interfacing with various radios and transceivers.



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

(includes external interface cable)

**The NuPower™ ULSC-20-C01-S01 is a broadband, small, lightweight, and power-efficient power amplifier ideal for extending the communication range of full-duplex and half duplex wideband transceivers and radios. It is ideal for extending the coverage area of counter-UAS systems through signal jamming and command and control take over. The ULSC-20-C01-S01 amplifier generates 20 watts of RF power from 500 MHz to 6 GHz.**

The efficiency and compact form factor of the NuPower™ ULSC-20-C01-S01 power amplifier makes it ideal for size, weight, and power-constrained RF telemetry and tactical communication systems. This solid state power amplifier features a compact form-factor, allowing the system integrator to easily incorporate the unit into the communications payload of unmanned aircraft systems (UAS) or other small to medium-sized platforms.

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

## Features

- 20 Watts RF Output Power
- 38 dB (typ) of Transmit Gain
- Small form factor optimized for size, weight, and power (SWaP)
- High Efficiency GaN Technology
- Over-Voltage & Reverse-Voltage Protection
- Non-proprietary interfaces
- MIL-STD-704F 28 VDC Compliant
- MIL-STD-461F CS101, CS114-116, RS103, RE102, CE102 Compliant

## Applications

- Unmanned Aircraft Systems (UAS) - Group 2 and Group 3
- Small to medium-sized manned aircraft
- Airborne datalinks allowing ISR and command and control (C2) data transmission
- Remote video terminals (RTV)
- Unmanned Ground Vehicles (UGV)
- RF Communication Systems
- Software Defined Radios
- Counter UAS
- e-VTOL

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

## Specifications

### Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	3.5	A
Max RF Input Power, $Z_L = 50 \Omega$	10	dBm
Max Operating Temperature (ambient)	TBD	°C
Max Operating Temperature (baseplate)	TBD	°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	.5		6.0	GHz	
Operating Voltage	VDC	20	28	32	V	
Operating Current	$I_{DD}$		2.2	2.6	A	CW, $P_{in} = +5 \text{ dBm}$
Module Efficiency			30		%	CW, $P_{in} = +5 \text{ dBm}$

### Electrical Specifications - Transmit @ 28 VDC, 25 °C, $Z_S=Z_L=50 \Omega$ , Conditions at CW, $P_{in} = +5 \text{ dBm}$ (unless specified otherwise)

Parameter	Symbol	Min	Typ	Max	Unit	Condition
RF Output Power, $P_{sat}$	$P_{sat}$		20		W	
Power Gain	G		38		dB	at +5 dBm input power
Power Gain Flatness	$\Delta G$		TBD		dB	
Small Signal Gain	$\Delta G$		TBD		dB	
Small Signal Gain Flatness	$\Delta G$		TBD		dB	
2nd Harmonic			TBD		dBc	
3rd Harmonic			TBD		dBc	
Output Power at 1dB Compression					dBm	
Nominal Input Drive Level	$P_{IN}$		+5		dBm	
Transmit Current	$I_{TX}$		2.2	2.6	A	
Transmit - Output VSWR Mismatch Handling			TBD		$\psi$	no damage at all phase angles
Transmit Input VSWR				2:1		
Switching Speed	$TX_{ON/OFF}$		TBD		$\mu S$	10% to 90%

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

## Mechanical Specifications (cont.)

### Mechanical Specifications

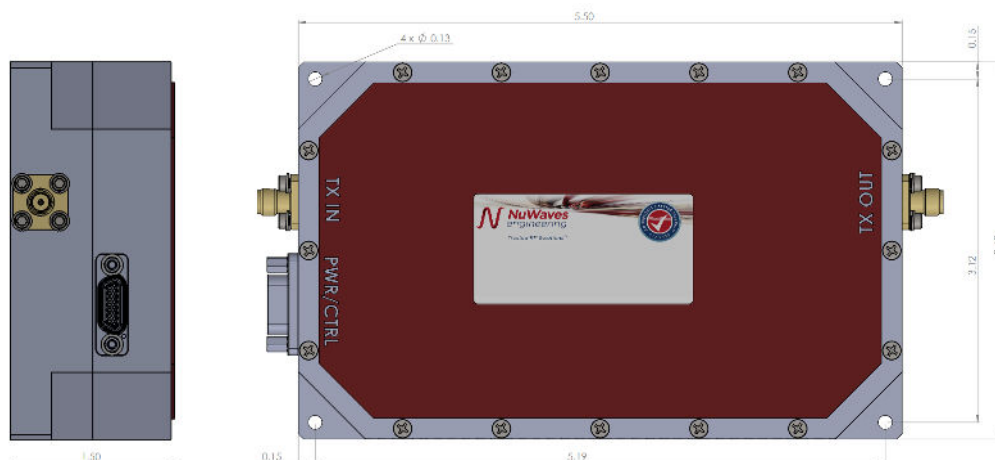
Parameter	Value	Unit	Limits
Dimensions	5.5 x 3.42 x 1.5	in	Max
Weight	28	oz.	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro D-sub, 15-pin Socket		
Cooling	Adequate Heatsink Required		

### Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T <sub>A</sub>	TBD		TBD	°C
Operating Temperature (baseplate)	T <sub>C</sub>	TBD		TBD	°C
Storage Temperature	T <sub>STG</sub>	TBD		TBD	°C
Relative Humidity (non-condensing)	RH	5		95	%
Altitude MIL-STD-810F - Method 500.4	ALT			30,000	ft
EMI/EMC MIL-STD-461F CS101, CS114-116, RS103, RE102, CE102					
Blowing Dust Withstand MIL-STD-810F Section 510.4					
Fungal Growth Withstand MIL-STD-810F Section 508.5					
Operational Shock RTCA/DO-160E Section 7, 6g peak value for 11ms					
Operational Vibration RTCA/DO-160F Section 8, Category S, Curve M					
Non-Operational Vibration RTCA/DO-160F Section 8, Category S, Curve M					
Transportation Vibration MIL-STD-810F Section 514.5					
Endurance Vibration RTCA/DO-160F					

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

## Mechanical Outline



## Accessory Part Numbers

Part Number	Description
TBD	Standard Interface Cable Assembly - Flying Leads (included with module)
TBD	Upgraded Interface Cable Assembly - Banana Plug Termination

★ MUX\_OUT is a general purpose output. Currently configured to do nothing but could be used as a temp flag or something similar.

All referenced to GND, not referenced to DC RTN.

## Pinout

Function	I/O	Pin
DC Power	I	TBD
DC Power	I	TBD
DC Power	I	TBD
DC Power	I	TBD
DC RTN	I	TBD
DC RTN	I	TBD
DC RTN	I	TBD
DC RTN	I	TBD
MUX_OUT 1	O	TBD
MUX_OUT 2	O	TBD
RS485 TX	O	TBD
RS485 RX	I	TBD
TX FLAG	O	TBD
TX ENABLE	I	TBD
GND	I	TBD

## Contact NuWaves



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