

NuWaves

RF Solutions

NuPower™ 11C01A Multi-Octave Solid State Power Amplifier

10 Watt CW
225 MHz to 2400 MHz



P/N: NW-PA-11C01A

The NuPower™ 11C01A is a multi-octave power amplifier (MOPA) that offers broadband operation spanning across VHF through S-band frequencies and delivers 15 watts of RF power across the frequency range of 225 MHz to 2.4 GHz.

Based on the latest gallium nitride (GaN) technology, NuPower's 25% - 45% power efficiency and 3.9 in³ form factor brings state-of-the-art power amplifier technology to the warfighter, meeting present challenges in size and weight reduction.

The NuPower 11C01A is ideal for broadband RF telemetry and tactical communication systems that require reliability, efficiency and versatility in a compact housing.

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

Features

- 15 Watts RF Output Power
- 225 MHz to 2.4 GHz
- Miniature Package (3.00" x 2.00" x 0.65")
- High-Efficiency GaN Technology
- 0 dBm Nominal RF Input
- Over-Voltage Protection
- Reverse-Voltage Protection
- Thermal Protection
- Logic On/Off Control

Benefits

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

Applications

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

NuPower™ 11C01A Power Amplifier

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	2.4	A
Max RF Input Power, $Z_L = 50 \Omega$	10	dBm
Max Operating Temperature (ambient)	60	°C
Max Operating Temperature (baseplate)	85	°C
Max Storage Temperature	85	°C

Export Classification
EAR99

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

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	225		2400	MHz	
RF Output Power	P_{SAT}	10	15		W	$P_{in} = 0$ dBm
Output Power @ 1dB Compression	P1dB		34		dBm	500 MHz
			30			900 MHz
			29			1500 MHz
			30			2000 MHz
			34			2400 MHz
Small Signal Gain	G		55		dB	500 MHz, @ -30 dBm input
			54			900 MHz, @ -30 dBm input
			51			1500 MHz, @ -30 dBm input
			50			2000 MHz, @ -30 dBm input
			46			2400 MHz, @ -30 dBm input
Small Signal Gain Flatness	ΔG		± 9		dB	$P_{in} = -30$ dBm
Power Gain Flatness			± 3		dB	$P_{in} = 0$ dBm
Input VSWR	VSWR	1.1:1	1.8:1	5:1		
Nominal Input Drive Level	P_{IN}		0		dBm	
Operating Voltage	VDC	11	28	30	V	
Quiescent Current	I_{DQ}		0.35		A	
Operating Current	I_{DD}		1.5	2.4	A	$P_{in} = 0$ dBm
Module Efficiency			30		%	
Switching Speed	$TX_{ON/OFF}$			2	μS	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, $P_{out} = 20$ dBm / tone)	OIP3		49		dBm	500 MHz
			48			900 MHz
			44			1500 MHz
			43			2000 MHz
			40			2400 MHz
Harmonics	2nd	-46	-21	-8	dBc	
	3rd	-35	-24	-11		
Output Mismatch (No Damage)				10:1		

NuPower™ 11C01A Power Amplifier

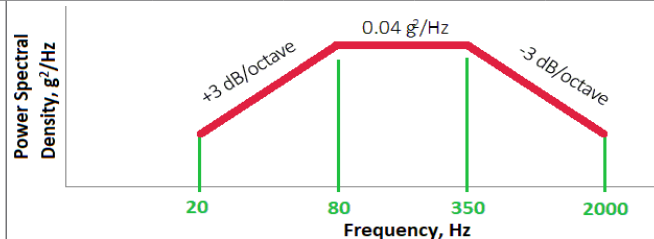
Specifications (cont.)

Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	3.0 x 2.0 x 0.65	in	Max
Weight	3	oz	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D, 9-pin Socket		
Cooling	Adequate Heatsink Required		

Environmental Specifications

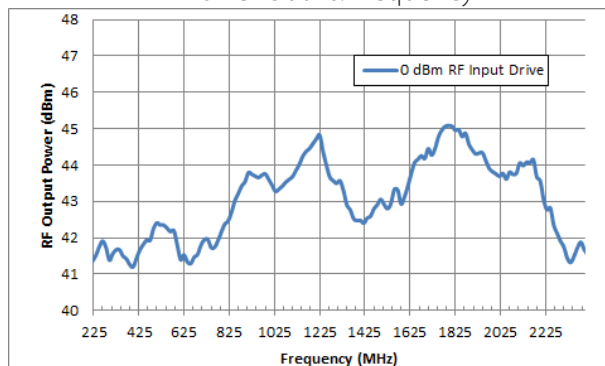
Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T_A	-40		+60	°C
Operating Temperature (baseplate)	T_C	-40		+85	°C
Storage Temperature	T_{STG}	-55		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude MIL-STD-810F - Method 500.4	ALT			30,000	ft
Vibration / Shock Profile (Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis)					



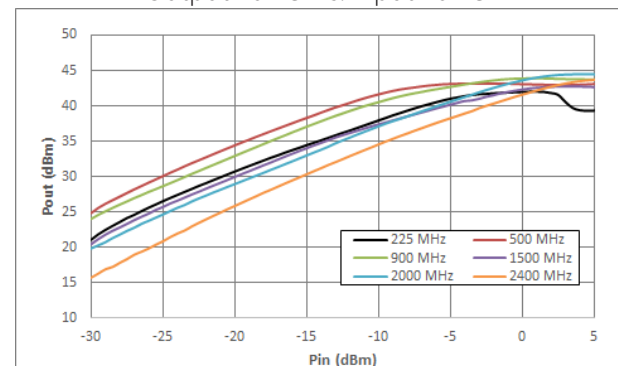
Performance Plots

Test Conditions: +28 VDC, +25 °C, $Z_S=Z_L=50 \Omega$

RF Power Out vs. Frequency



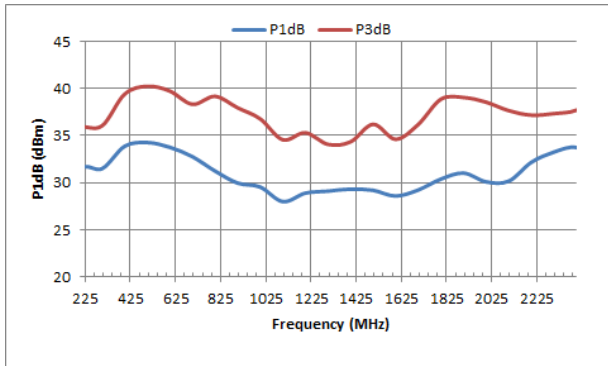
Output Power vs. Input Power



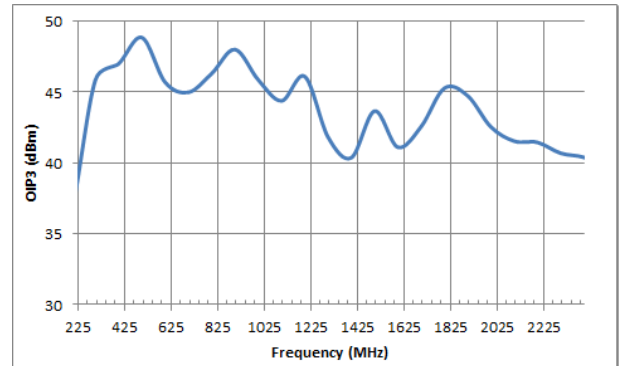
NuPower™ 11C01A Power Amplifier

Performance Plots (cont.)

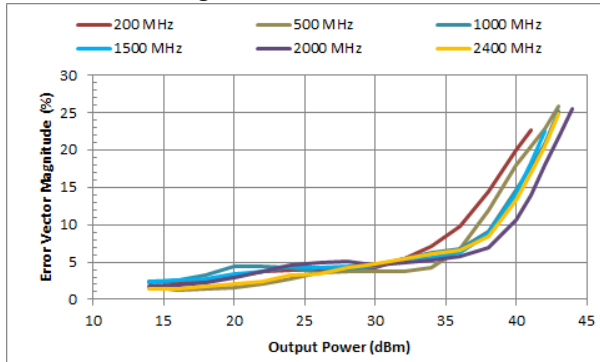
P1dB & P3dB



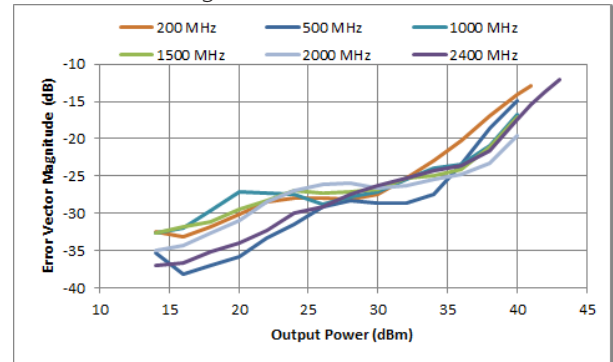
OIP3



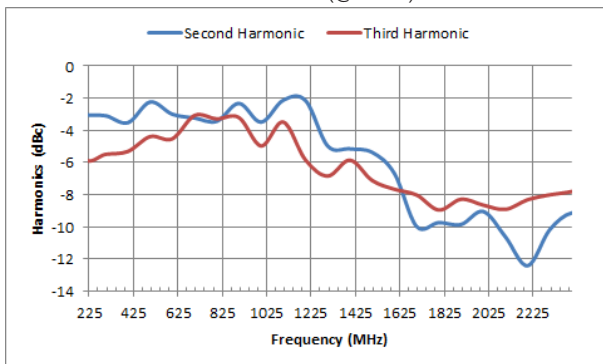
Error Vector Magnitude (%) [w/ OFDM Waveform]



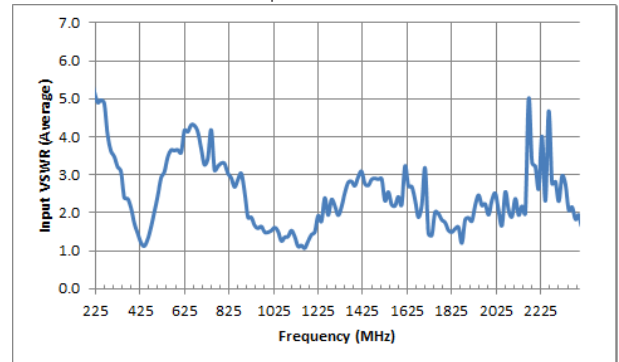
Error Vector Magnitude (dB) [w/ OFDM Waveform]



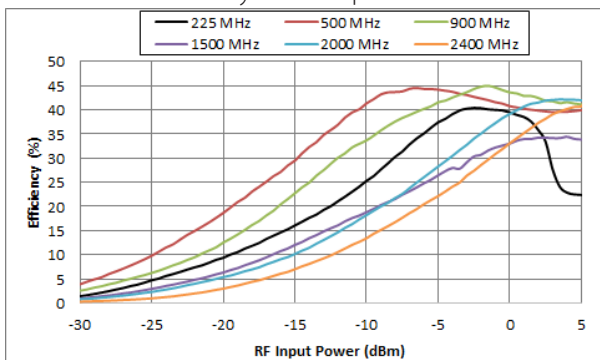
Harmonics (@ Psat)



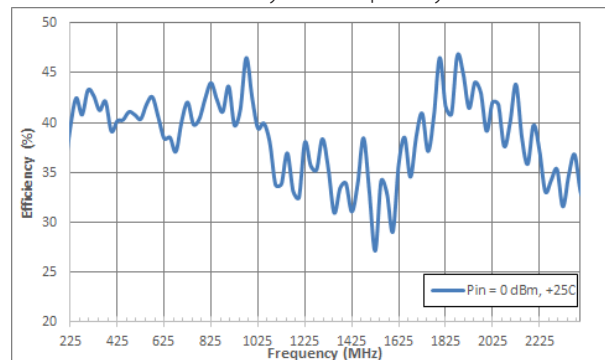
Input VSWR



Efficiency vs. RF Input Power

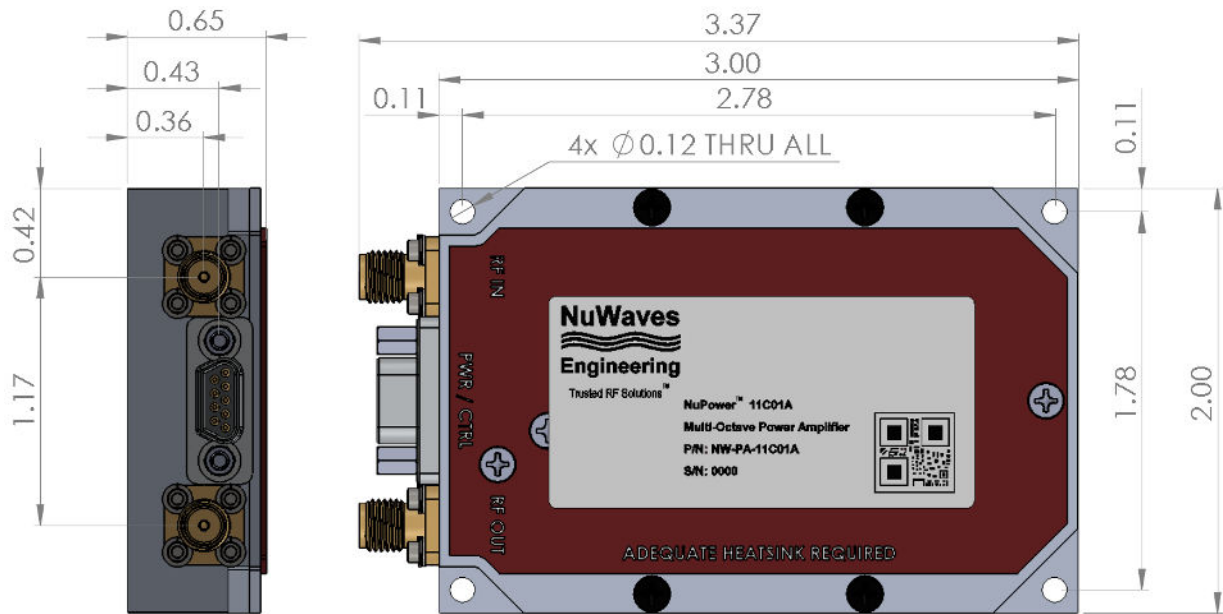


Efficiency vs. Frequency



NuPower™ 11C01A Power Amplifier

Mechanical Outline



Accessory Part Numbers - Sold Separately

Part Number	Description
NW-FL-05LPLE-2500-SFSF-M01	Harmonic Filter Module
NW-PA-ACC-CB09MA	Standard Interface Cable Assembly - Flying Leads
NW-PA-ACC-CT09MA	Upgraded Interface Cable Assembly - Banana Plug Termination
HTSK-01	Heatsink with Integrated Fan

Pinout

Function	I/O	Pin	Logic Voltage
DC Power (+11 to +32 VDC)	I	1, 2	–
Ground	I	3, 4	–
Over Temperature Flag 0V = temperature fault +5V = no fault	O	8	–
RF Enable 0V or GND = RF ON NC = RF OFF	I	5	0V to 1.5V = Logic Low 3.0V to +5V = Logic High ¹
No Connect	–	6, 7, 9	–

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>

¹RF Enable is pulled high internally and does not require user to apply voltage to this line

Contact NuWaves



NuWaves RF Solutions
 132 Edison Drive
 Middletown, OH 45044

www.nuwaves.com
sales@nuwaves.com
 513.360.0800

