

NuWaves

RF Solutions

NuPower™ S-10-C01-S01 S-Band Solid State Power Amplifier

16 Watt CW (P_{sat}, typ)
3.0 GHz - 4.0 GHz



P/N: NW-PA-S-10-C01-S01

The NuPower™ S-10-C01-S01 is a small, highly efficient solid state power amplifier that provides 16 watts (typ) of RF power to boost performance of data links and transmitters.

Based on the latest gallium nitride (GaN) technology, NuPower's power efficiency and 3.25 in³ form factor make it ideal for size, weight, and power-constrained broadband RF telemetry and tactical communication systems.

The NuPower S-10-C01-S01 power amplifier accepts a nominal 0 dBm RF input and provides over 42 dB of gain from 3.0 GHz to 4.0 GHz. The NuPower S-10-C01-S01 module comes with an optional NW-PA-ACC-CB09MA interface cable, for ease of integration.

NuPower PAs feature over-voltage and reverse-voltage protection and can operate over a wide temperature range of -40 °C to +60 °C.

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

Features

- 16 Watts (typ) RF Output Power
- 3.0 GHz to 4.0 GHz
- Miniature Package (3.25" x 2.00" x 0.5")
- High-Efficiency GaN Technology
- 0 dBm Nominal RF Input
- Reverse-Voltage 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

NuPower™ S-10-C01-S01 Power Amplifier

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	2.6	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, $Z_S=Z_L=50 \Omega$, CW, 0dBm Input Power, Unless Otherwise Specified

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	3000		4000	MHz	
RF Output Power	P_{SAT}	10	16		W	
Output Power @ 1dB Compression	P1dB		22		dBm	3.0 GHz
			24			3.5 GHz
			24			4.0 GHz
Small Signal Gain	G		52		dB	3.0 GHz, @ -30 dBm input
			53			3.5 GHz, @ -30 dBm input
			52			4.0 GHz, @ -30 dBm input
Small Signal Gain Flatness	ΔG		± 3		dB	Pin = -30 dBm
Power Gain Flatness			± 1		dB	
Input VSWR	VSWR		4:1			
Nominal Input Drive Level	P_{IN}		0		dBm	
Operating Voltage	VDC	11	28	32	V	
Quiescent Current	I_{DQ}		0.4		A	
Operating Current	I_{DD}		2.2	2.6	A	
Module Efficiency			26		%	
Switching Speed	$TX_{ON/OFF}$			2	μS	10% to 90%
Third Order Intercept Point (Two tone test at 1 MHz spacing, $P_{out} = 20 \text{ dBm} / \text{tone}$)	OIP3		37		dBm	3.0 GHz
			39			3.5 GHz
			39			4.0 GHz
Harmonics	2nd		-30		dBc	
	3rd		-35			
Output Mismatch w/o Damage				10:1	Ψ	No damage at all phase angles

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Specifications (cont.)

Mechanical Specifications

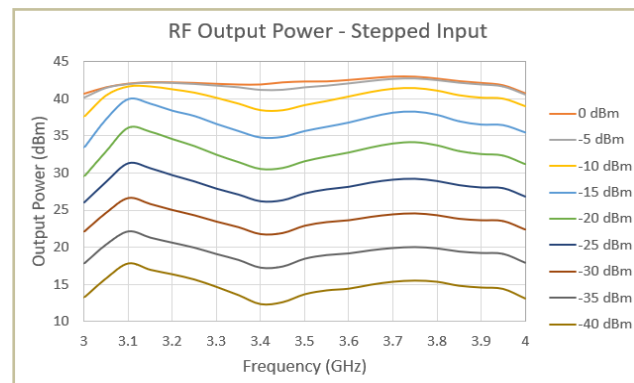
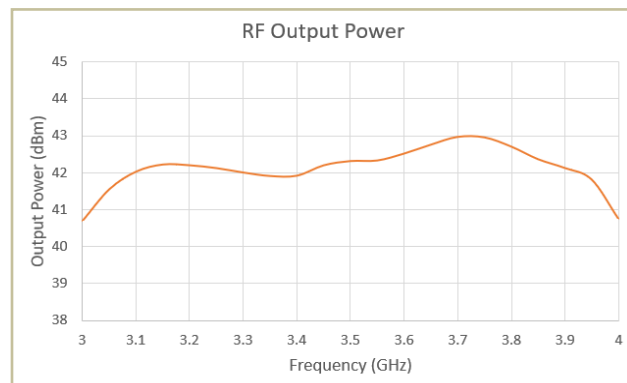
Parameter	Value	Unit	Limits
Dimensions	3.25 x 2.0 x 0.5	in	Max
Weight	3	oz	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D, 9-pin Socket		
Cooling	Adequate Heatsink Required		

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

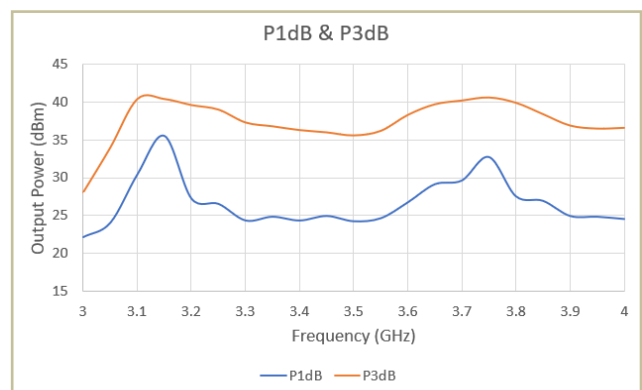
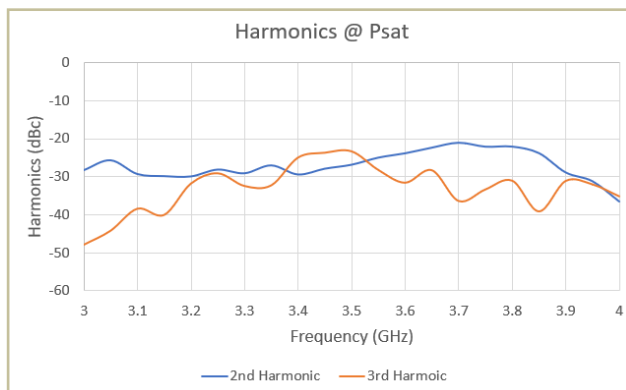
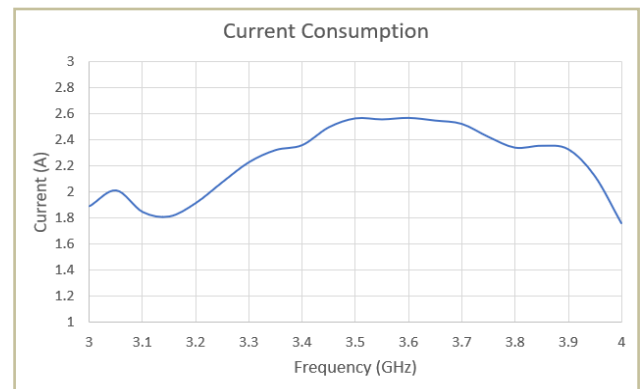
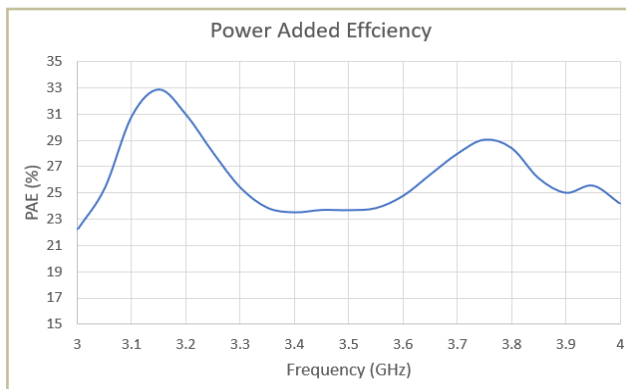
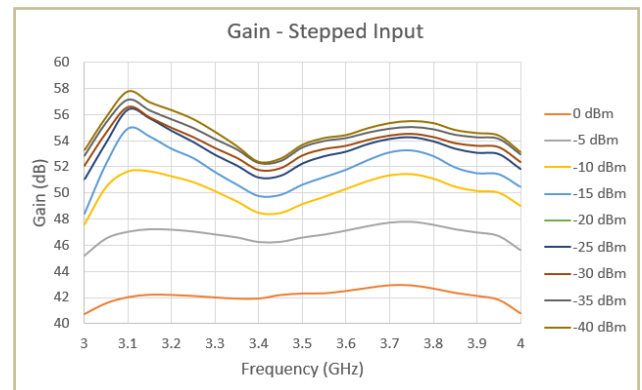
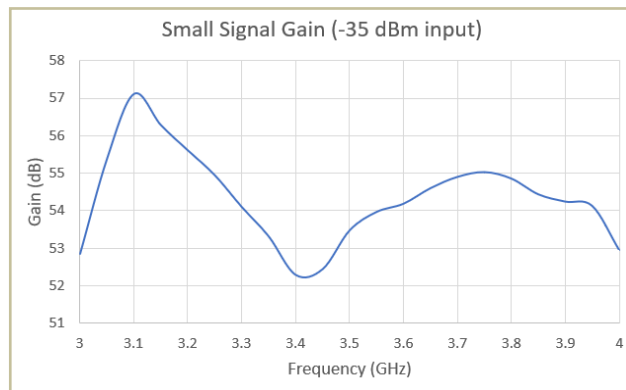
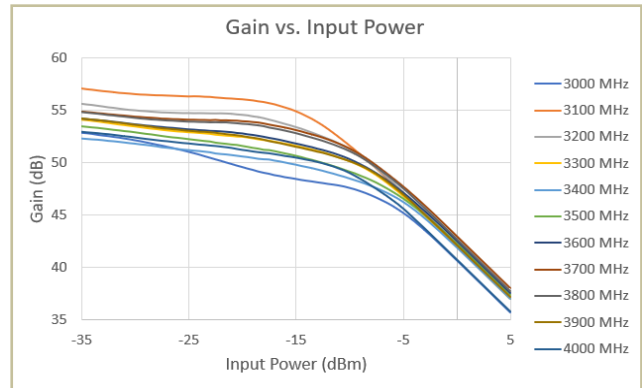
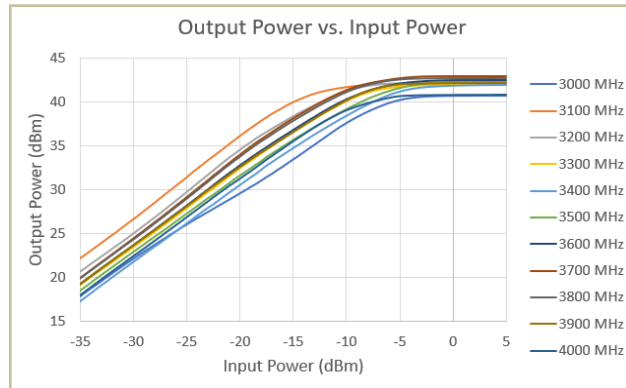
Test Conditions: 28 VDC, 25 °C, Z_S=Z_L=50 Ω, 0dBm Input Power, CW, Unless Otherwise Specified



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Performance Plots (cont.)

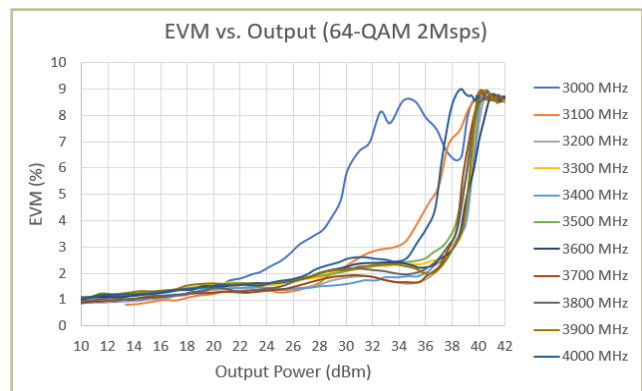
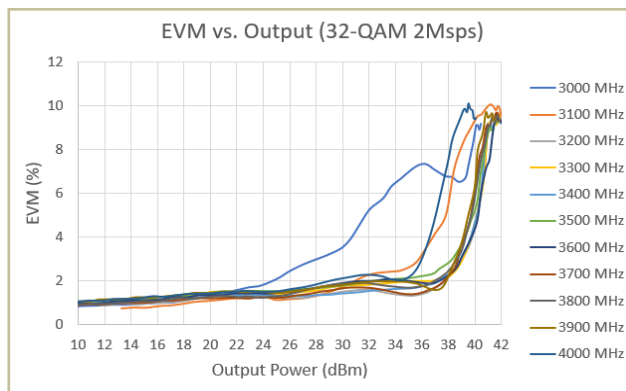
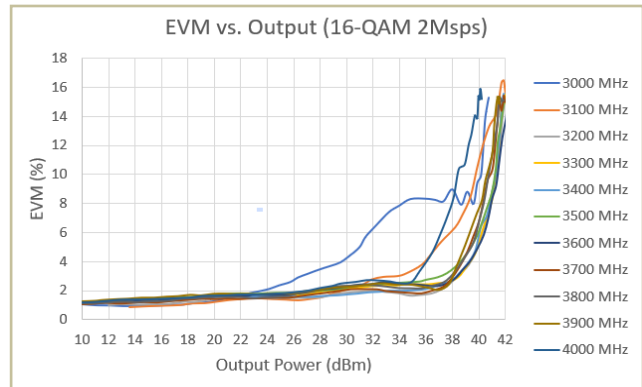
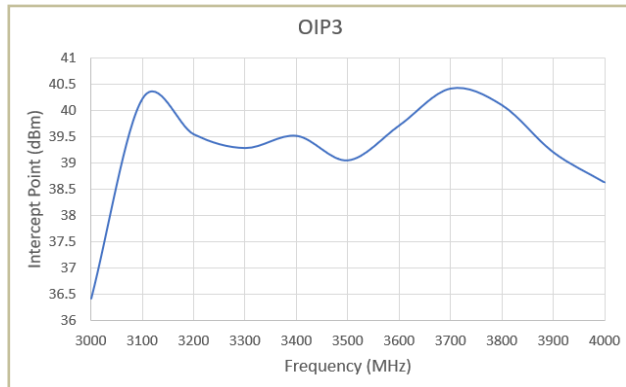
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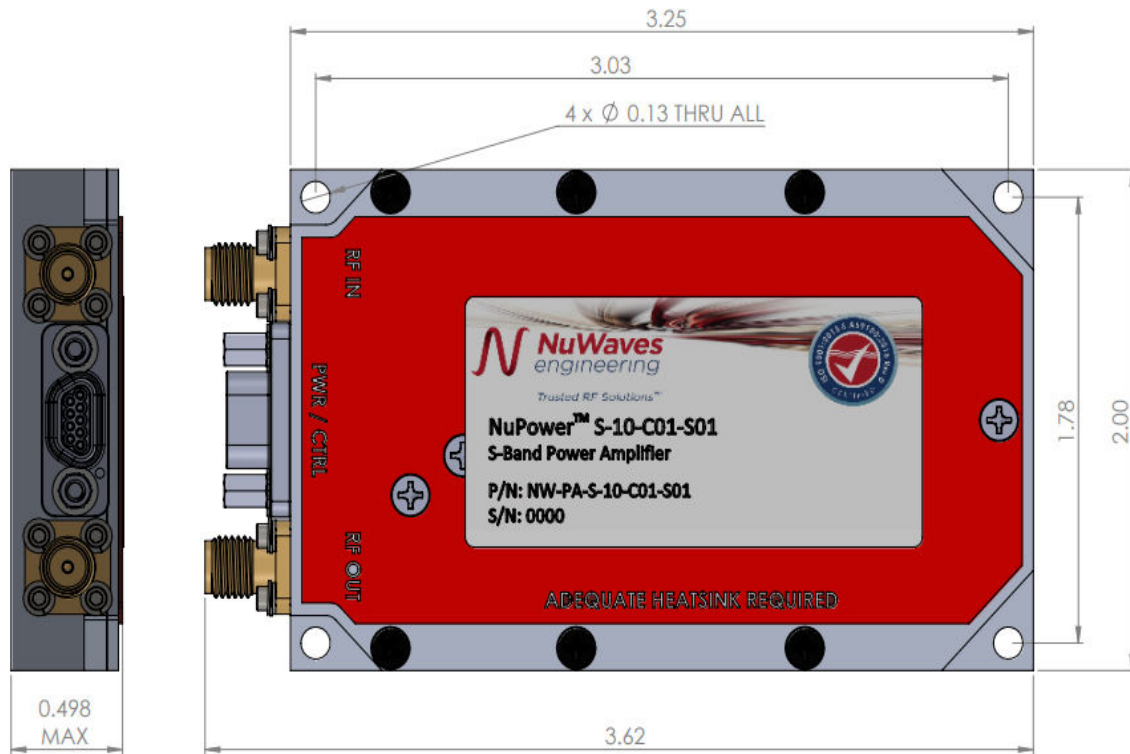
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Mechanical Outline



Accessory Part Numbers - Sold Separately

Part Number	Description
NW-PA-ACC-CB09MA	Standard Interface Cable Assembly - Flying Leads
NW-PA-ACC-CT09MA	Upgraded Interface Cable Assembly - Banana Plug Termination
HTSK-08	Heatsink with Integrated Fan

Pinout

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

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>

Contact NuWaves



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