

# NuWaves

## RF Solutions

### NuPower™ 05E05A-C01-S01 S-Band Solid State Power Amplifier

35 Watts (CW)  
2.3 - 2.5 GHz



P/N: NW-PA-05E05A-C01-S01

**The NuPower™ 05E05A-C01-S01 is a small, highly efficient connectorized solid state power amplifier that provides 35 Watts (min) of RF power to boost performance of data links and transmitters.**

The NuPower 05E05A-C01-S01 accepts a nominal 0 dBm (1 mW) RF input and provides >45 dB of gain from 2300 MHz to 2500 MHz for continuous wave (CW) and near-constant-envelope waveforms. Based on the latest gallium nitride (GaN) technology, the NuPower 05E05A-C01-S01's 33% to 39% power efficiency at rated power and <10 in<sup>3</sup> form factor make it ideal for size, weight, and power-constrained broadband RF telemetry, tactical communication, and electronic warfare systems.

NuPower PAs 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™ amplifiers from NuWaves RF Solutions.**

#### Features

- 35 Watts RF Output Power (typ)
- 2300 MHz to 2500 MHz
- Small Form Factor (4.50" x 3.50" x 0.61")
- High-Efficiency GaN Technology
- 0 dBm Nominal RF Input
- Over-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

- Broadband RF Telemetry
- RF Communication Systems
- Electronic Warfare - Airborne Electronic Attack
- Unmanned Aircraft Systems (UAS)
- Unmanned Ground Vehicles (UGV)
- Software Defined Radios

# NuPower™ 05E05A-C01-S01 PA

## Specifications

### Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	4.5	A
Max RF Input Power, $Z_L = 50 \Omega$	12	dBm
Max Operating Temperature (ambient)	70	°C
Max Operating Temperature (baseplate)	85	°C
Max Storage Temperature	85	°C

Export Classification
EAR99

### Electrical Specifications @ 28VDC, 25 °C, $Z_S=Z_L=50 \Omega$ , CW, Pin=0 dBm, Unless Otherwise Stated

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	2300		2500	MHz	
RF Output Power	$P_{SAT}$	31.6	39		W	2300 MHz - 2500 MHz
Output Power @ 1dB Compression	P1dB		31		dBm	2300 MHz
			31			2400 MHz
			30			2500 MHz
Small Signal Gain	G		53		dB	2300 MHz, @ -40 dBm input
			55			2400 MHz, @ -40 dBm input
			54			2500 MHz, @ -40 dBm input
Small Signal Gain Flatness	$\Delta G$		$\pm 1$		dB	Pin = -40 dBm
Input VSWR	VSWR		2.2:1			
Nominal Input Drive Level	$P_{IN}$		0		dBm	
Operating Voltage	VDC	27	28	32	V	
Quiescent Current (unbiased)	$I_{DQ}$		0.10		A	RF Off (RF Enable Floating)
Quiescent Current (biased)	$I_{DQ}$		0.65		A	RF On (RF Enable Low)
Operating Current	$I_{DD}$		3.9		A	
Module Efficiency			36		%	
Switching Speed	$TX_{ON/OFF}$			2	$\mu S$	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, Pout = 20 dBm / tone)	OIP3		44		dBm	2300 MHz
			44			2400 MHz
			44			2500 MHz
Harmonics	2nd		-20		dBc	
	3rd		-25			
Output Mismatch (No Damage)				10:1	$\Psi$	No Damage at All Phase Angles

# NuPower™ 05E05A-C01-S01 PA

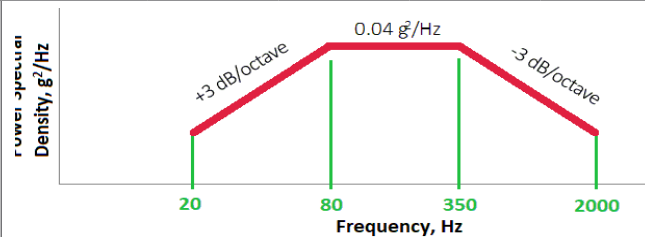
## Specifications (cont.)

### Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	4.5 x 3.5 x 0.61	in	Max
Weight	9	oz	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D, 9-pin Socket		
Cooling	Adequate Heatsink Required		

### Environmental Specifications

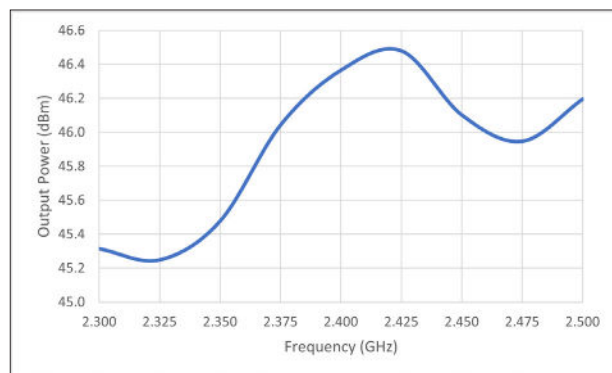
Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	$T_A$	-40		+70	°C
Operating Temperature (baseplate)	$T_C$	-40		+85	°C
Storage Temperature	$T_{STG}$	-55		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude MIL-STD-810F - Method 500.4	ALT			30,000	ft
Vibration / Shock Profile (Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis)					



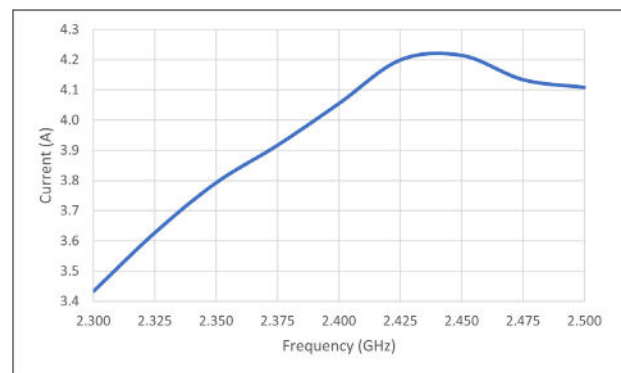
## Performance Plots

Test Conditions: +28 VDC, +25 °C,  $Z_S=Z_L=50 \Omega$ , CW, Pin = 0 dBm, Unless Otherwise Stated

Output Power @ Nominal Input Drive



Current Consumption

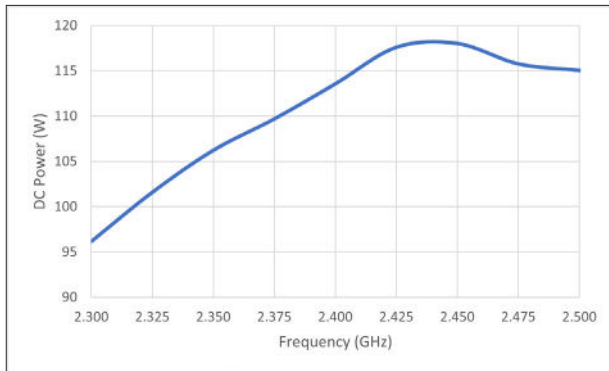


# NuPower™ 05E05A-C01-S01 PA

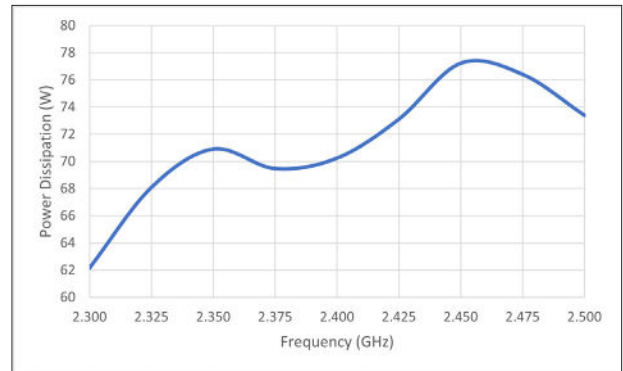
## Performance Plots (cont.)

Test Conditions: +28 VDC, +25 °C,  $Z_S=Z_L=50 \Omega$ , CW, Pin = 0 dBm, Unless Otherwise Stated

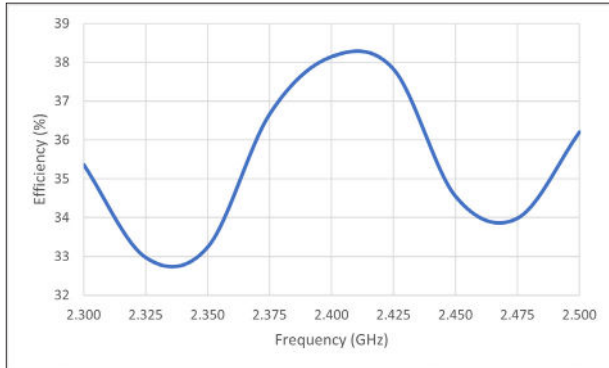
DC Power Consumption



Power Dissipation

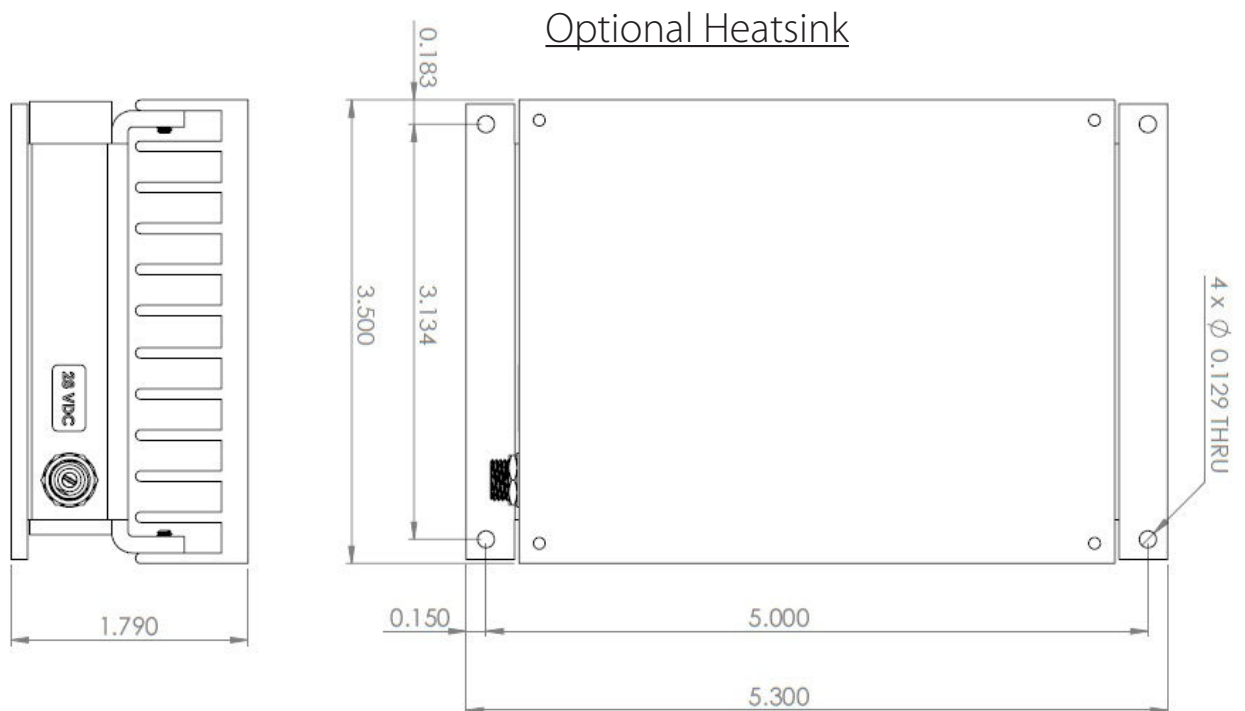
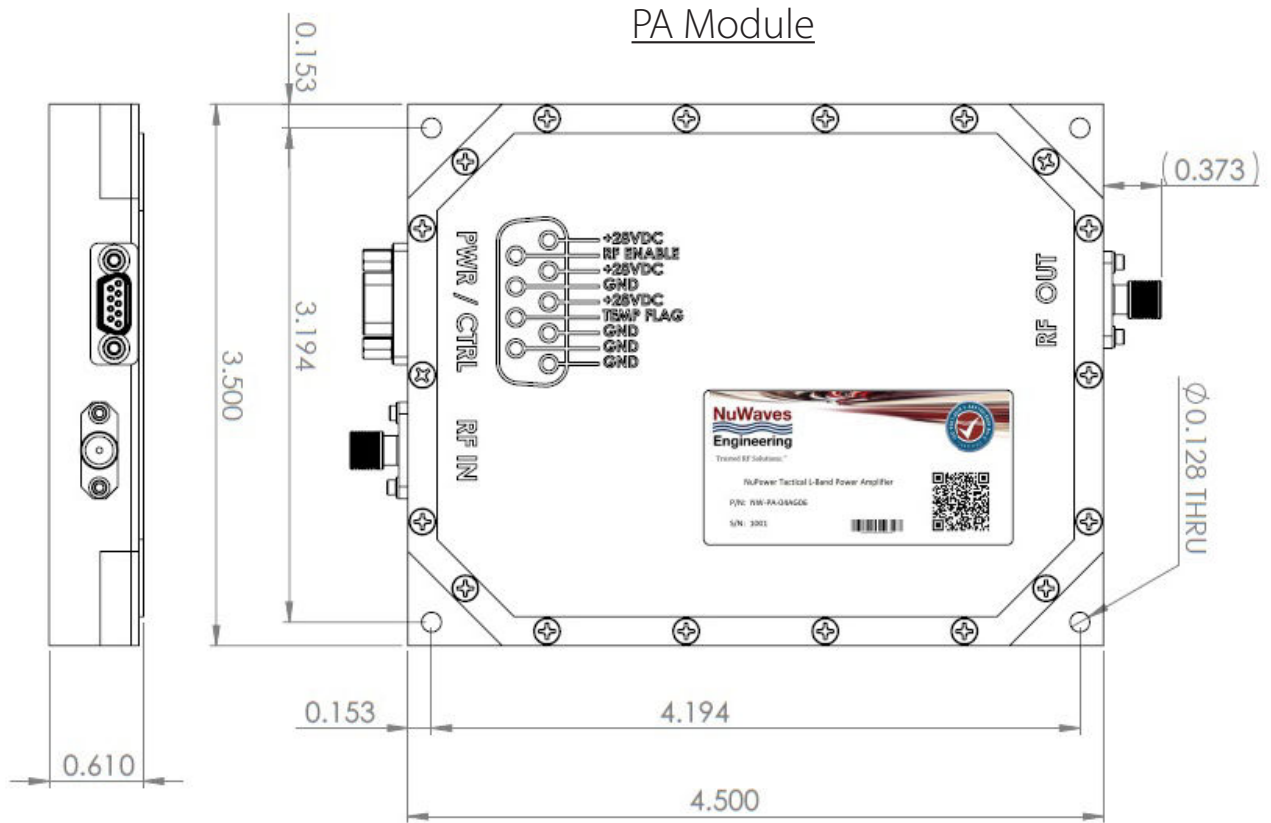


Efficiency



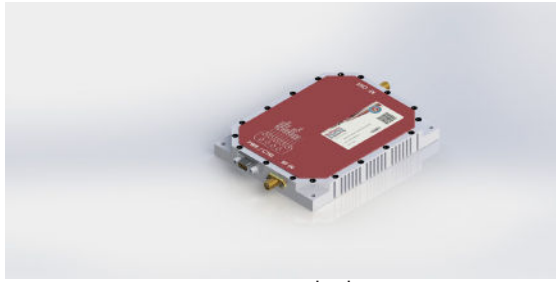
# NuPower™ 05E05A-C01-S01 PA

## Mechanical Outlines

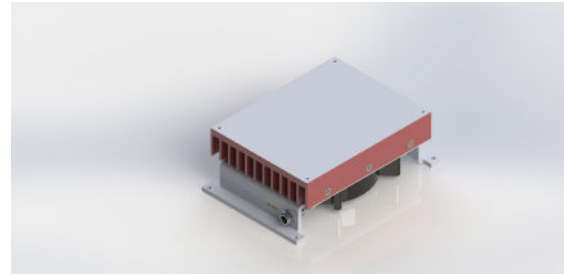


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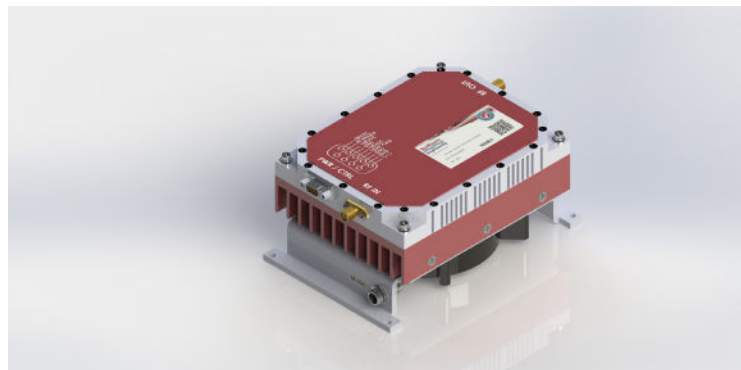
## PA Module and Accessory Images



PA Module



Optional Fan-Cooled Heatsink



PA Module w/ Fan-Cooled Heatsink

## Accessory Part Numbers - Sold Separately

Part Number	Description
<a href="#">NW-FL-05LPLE-2500-SFSF-M01</a>	Harmonic Filter Module
NW-PA-ACC-CB09MC	Standard Interface Cable Assembly - Flying Leads
NW-PA-ACC-CT09MC	Upgraded Interface Cable Assembly - Banana Plug Termination
HTSK-02	Heatsink with Integrated Fan

## Pinout

Function	I/O	Pin
DC Power (+28 Volts)	I	3, 4, 5
Ground	I	1, 2, 6, 8
Over Temperature Flag 0V = temperature fault +5V = no fault	O	7
RF Enable 0V or GND = RF ON +5V or NC = RF OFF	I	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>

## Contact NuWaves



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