NuWaves engineering

Trusted RF Solutions™

NuPower™ 15D05A

Broadband Solid State Power Amplifier

20 Watts CW,
800 MHz to 2500 MHz
2 Watts Linear, 4% EVM @ 33 dBm

P/N: NW-PA-15D05A

(Includes NW-PA-ACC-CB09MC interface cable)

The NuPower™ 15D05A is a small, highly efficient, connectorized solid state power amplifier that delivers over 20 watts of RF power to extend the operational range of data links and transmitters.

The NuPower 15D05A accepts a nominal 0 dBm (1 mW) RF input and provides 44 dB of gain from 800 MHz to 2500 MHz for continuous wave (CW) and near-constant envelope waveforms.

Based on the latest gallium nitride (GaN) technology, NuPower 15D05A's 25% power efficiency at rated power and <10 in^3 form factor make it ideal for size, weight, and power-constrained broadband RF telemetry, tactical communication systems, 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 Engineering.

Features

- >20 Watts RF Output Power
- 800 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

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NuPower™ 15D05A Power Amplifier

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	4.75	A
Max RF Input Power, $Z_L = 50\ \Omega$	15	dBm
Max Operating Temperature (ambient)	55	°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 Ω

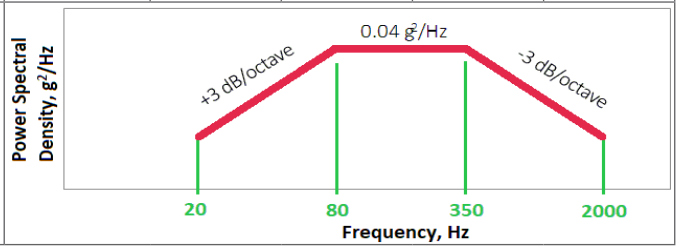
Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	800		2500	MHz	
RF Output Power	P_{SAT}	20			W	800 MHz - 2500 MHz, 0 dBm input
Output Power @ 1dB Compression	P1dB		40		dBm	800 MHz
			46			1600 MHz
			44			2500 MHz
Small Signal Gain	G		61		dB	800 MHz, @ -30 dBm input
			54			1700 MHz, @ -30 dBm input
			49			2500 MHz, @ -30 dBm input
Small Signal Gain Flatness	ΔG		12		dB	Pin = -30 dBm
Input VSWR	VSWR		2:1			
Nominal Input Drive Level	P_{IN}		0		dBm	
Operating Voltage	VDC	27	28	30	V	
Quiescent Current (RF Enable Off)	I_{DQ}		40		mA	
Quiescent Current (RF Enable On)	I_{DQ}		0.85		A	no RF applied
Operating Current	I_{DD}		3.6		A	Pin = 0 dBm
Module Efficiency			25		%	Pin = 0 dBm, +28 V
Switching Speed	$TX_{ON/OFF}$			2	µS	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, Pout = 20 dBm / tone)	OIP3		44		dBm	
Harmonics	2nd			-25	dBc	
	3rd			-25		
Output Mismatch (No Damage)				10:1		

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		

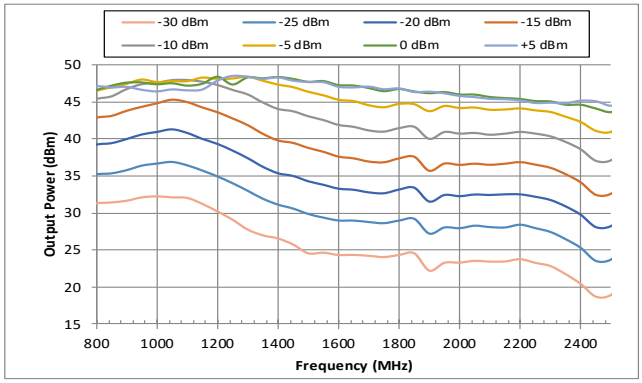
Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T_A	-40		+55	°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)					

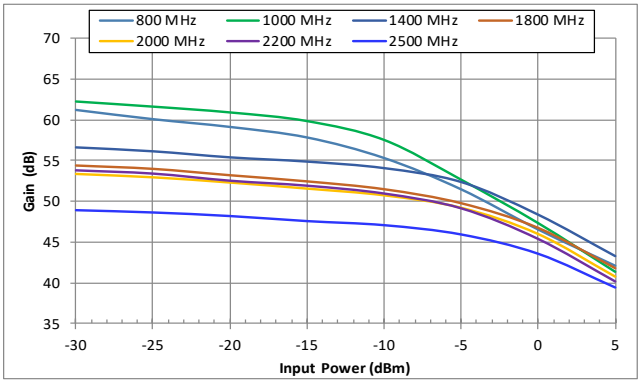
Performance Plots

Test Conditions: +28 VDC, +25 °C, Z_S=Z_L=50 Ω

Output Power vs. Frequency



Gain vs. Input Power



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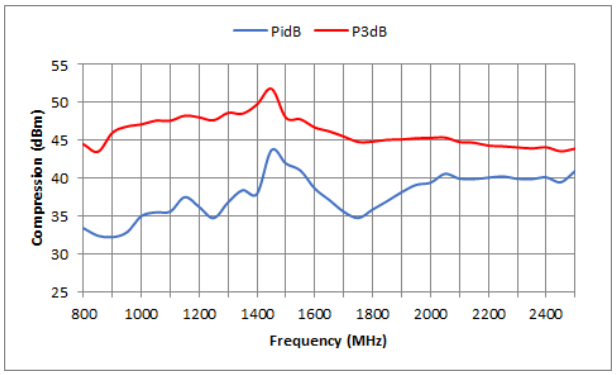
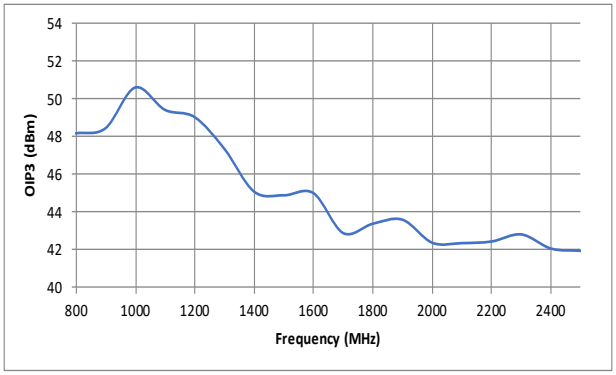
Performance Plots (cont.)

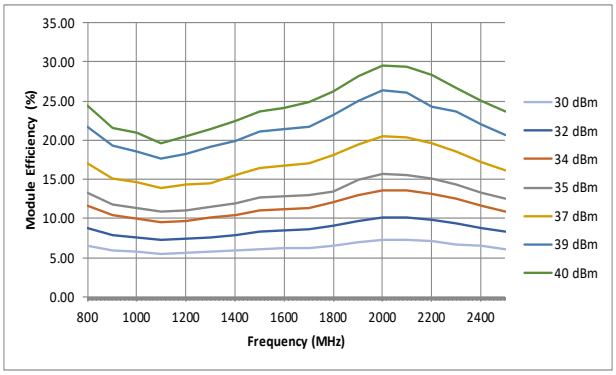
P1dB & P3dB



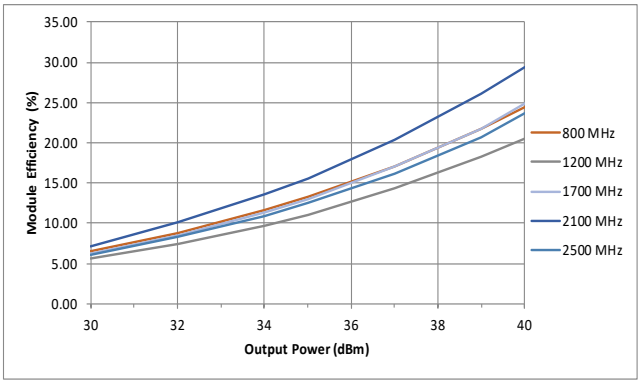
OIP3



Efficiency vs. Frequency

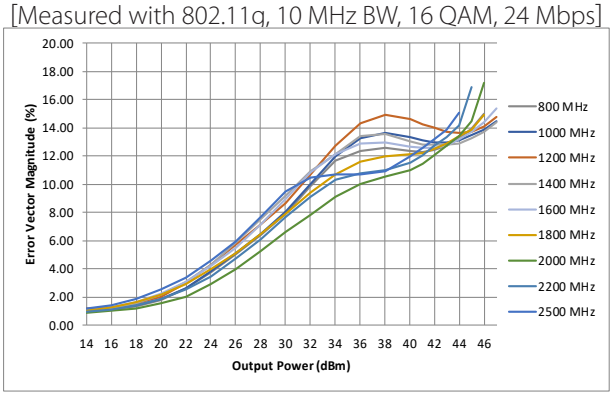


Efficiency vs. Output Power



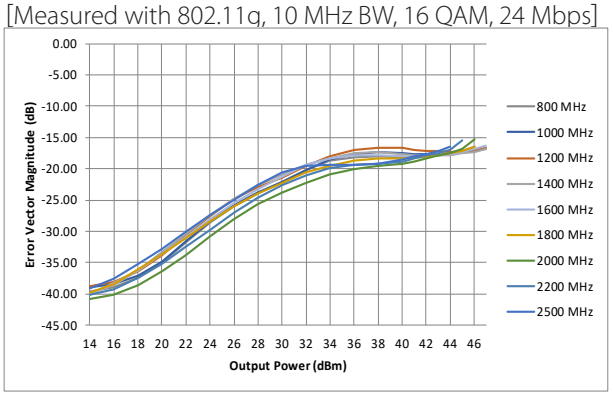
Error Vector Magnitude (%)

[Measured with 802.11g, 10 MHz BW, 16 QAM, 24 Mbps]

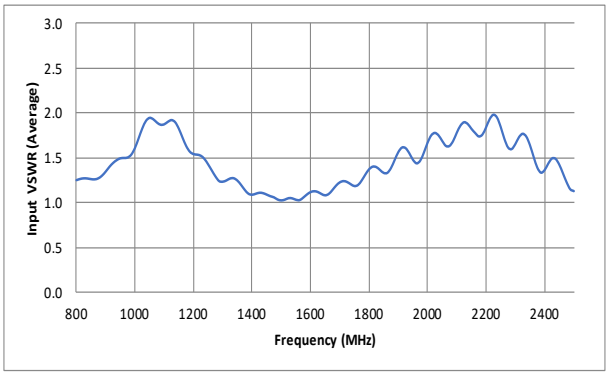


Error Vector Magnitude (dB)

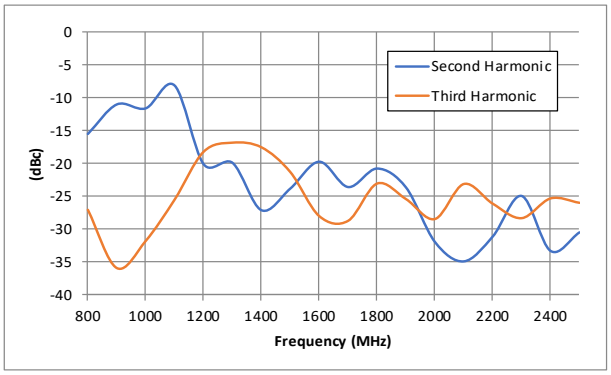
[Measured with 802.11g, 10 MHz BW, 16 QAM, 24 Mbps]



VSWR



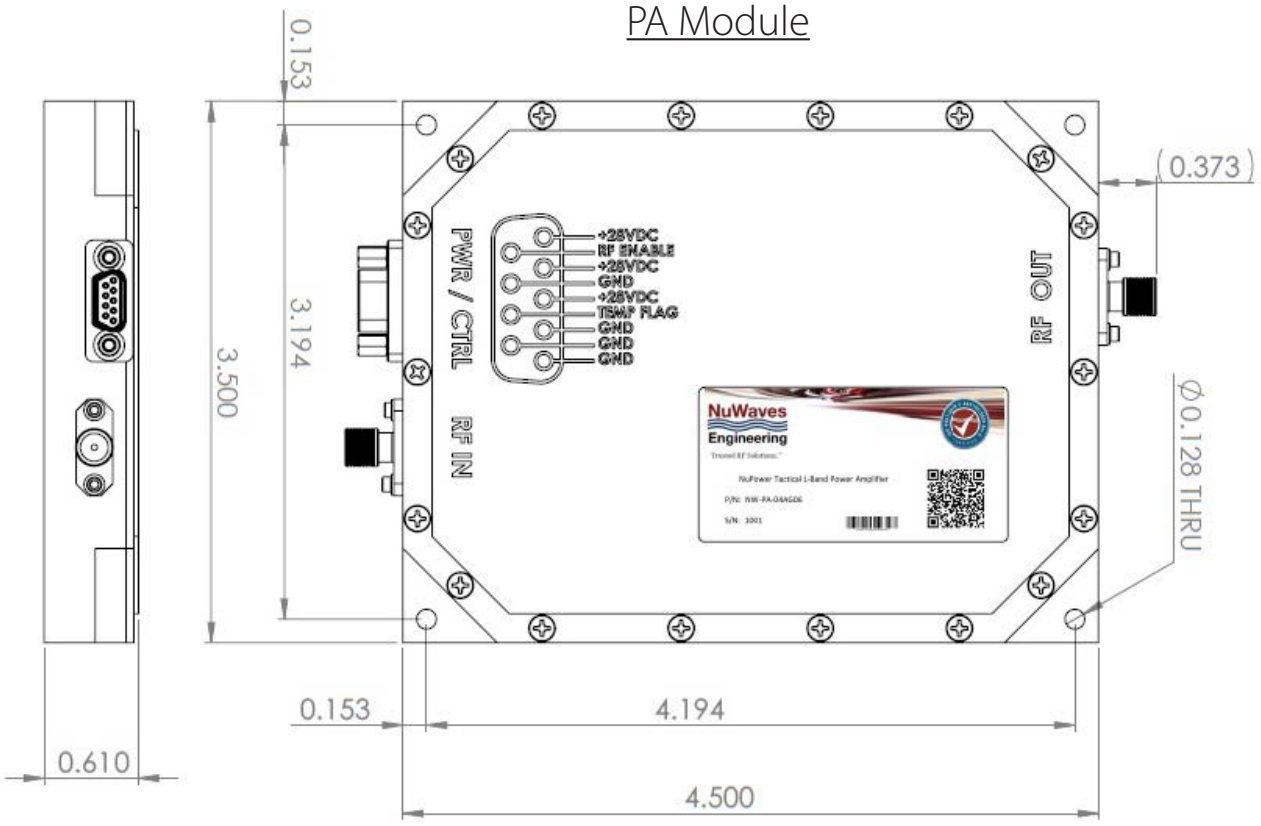
Harmonics



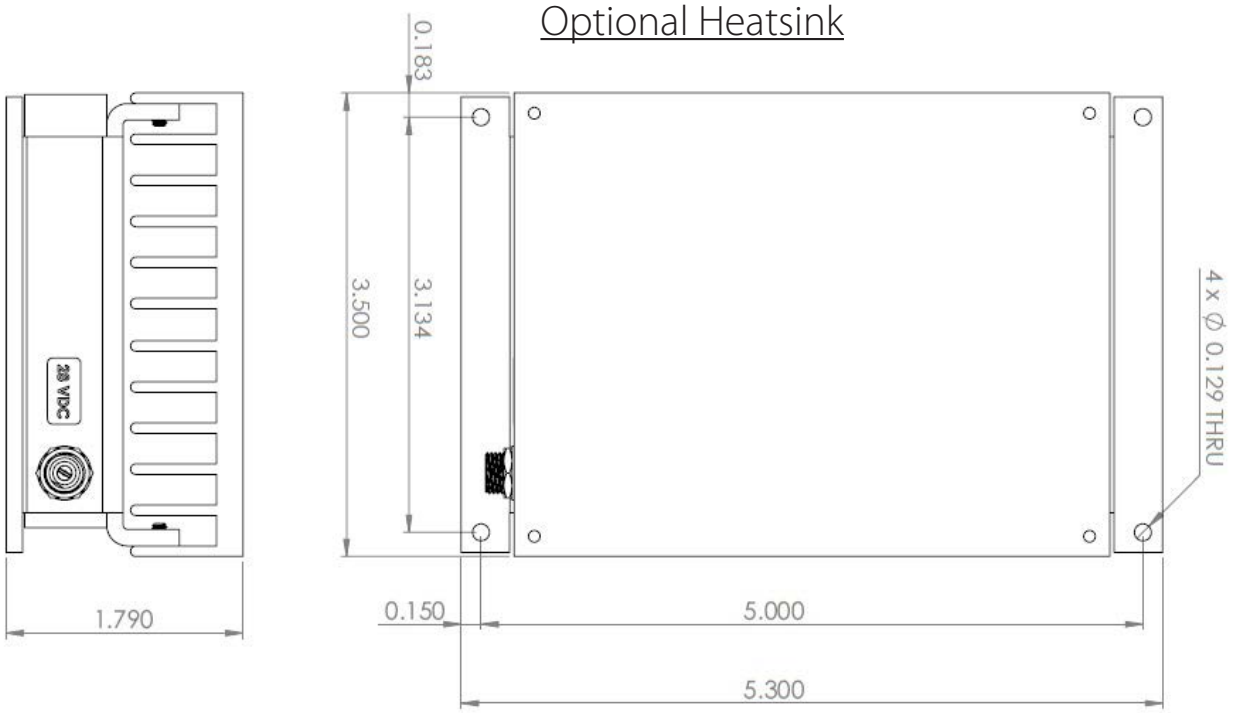
NuPower™ 15D05A Power Amplifier

Mechanical Outlines

PA Module



Optional Heatsink



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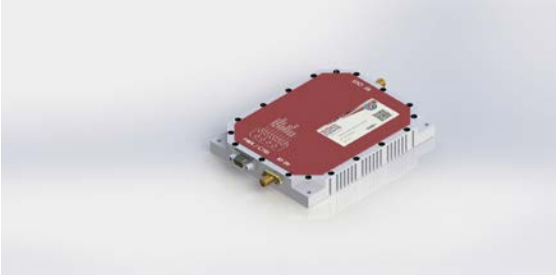
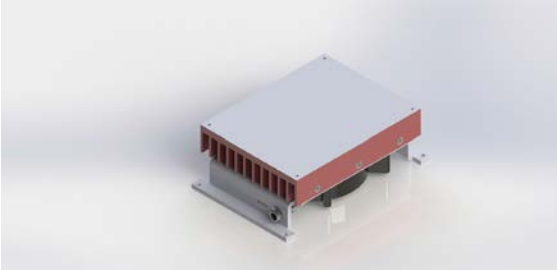
PA Module and Accessory Images



PA Module



Optional Fan-Cooled Heatsink

PA Module w/ Fan-Cooled Heatsink

Accessory Part Numbers

Part Number	Description
NW-PA-ACC-CB09MC	Standard Interface Cable Assembly - Flying Leads (included with module)
NW-PA-ACC-CT09MC	Upgraded Interface Cable Assembly - Banana Plug Termination
NW-PA-ACC-KT03	Accessory Kit, which includes Fan-Cooled Heatsink and Upgraded Interface Cable
NW-PA-ACC-HS05	Heatsink with Integrated Fan

Pinout

Function	Pin	Input/Output
DC Power (+28 Volts)	3, 4, 5	Input
Ground	1, 2, 6, 8	Input
Over Temperature Flag (Low = temperature fault)	7*	Output
RF Enable (GND to enable)	9	Input

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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