

NuWaves

RF Solutions

NuPower™ LS75T01 L- & S-Band Solid State Power Amplifier

75 Watts CW
800 MHz to 2.5 GHz

P/N: NW-PA-LS-75-T01



The NuPower™ LS75T01 is a highly efficient solid state power amplifier that typically provides 75 Watts of RF power to boost performance of data links and transmitters.

The NuPower LS75T01 Power Amplifier accepts a nominal +3 dBm (2 mW) RF input and provides ~46 dB of gain from 800 MHz to 2500 MHz. This module handles both constant envelope and complex waveforms such as OFDM, QAM, DVB-T, etc.

Based on the latest gallium nitride (GaN) technology, the NuPower LS75T01's 40% power efficiency at rated power and <math><31\text{ in}^3</math> 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 $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ (baseplate).

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

Features

- 75 Watts RF Output Power (typ)
- 800 MHz to 2.5 GHz
- Small Form Factor (5" x 10" x 0.61")
- High-Efficiency GaN Technology
- +3 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™ LS75T01 Power Amplifier

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	11	A
Max RF Input Power, $Z_L = 50 \Omega$	15	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, $Z_S=Z_L=50 \Omega$, 0.8-2.5 GHz, CW, Pin=+3 dBm, unless otherwise stated

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	800		2500	GHz	
RF Output Power	P_{SAT}	65	85		W	800-1500 MHz
		45	70			1600-2300 MHz
		30	44			2400-2500 MHz
Output Power @ 1 dB / 3 dB Compression Points	P1dB / P3dB		33 / 39		dBm	800 MHz
			34 / 41			1500 MHz
			36 / 43			2500 MHz
Small Signal Gain	G		58		dB	800 MHz @ -30 dBm input
			53			1500 MHz @ -30 dBm input
			47			2500 MHz @ -30 dBm input
Input VSWR	VSWR		1.35:1			
Nominal Input Drive Level	P_{IN}		+3		dBm	
Operating Voltage	VDC	27	28	32	V	
Quiescent Current	I_{DQ}		0.20		A	RF Disabled (no RF)
			1.35			RF Enabled (no RF)
Operating Current	I_{DD}		6.5	11	A	Pin = 0 dBm
Module Efficiency			40		%	
Switching Speed	$TX_{ON/OFF}$		2		μ S	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, $P_{out} = 20$ dBm / tone)	OIP3		47		dBm	800 MHz
			45			1500 MHz
			46			2500 MHz
Harmonics @ Psat	2nd		-27		dBc	
	3rd		-28			
Output Mismatch (No Damage)				10:1	Ψ	No damage at all phase angles

NuPower™ LS75T01 Power Amplifier

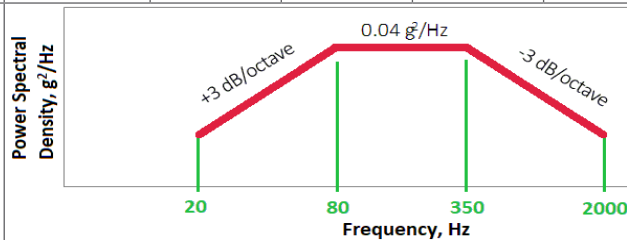
Specifications (cont.)

Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	5.0 x 10.0 x 0.61	in	Max
Weight	1.3	lb	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D, 15-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)					

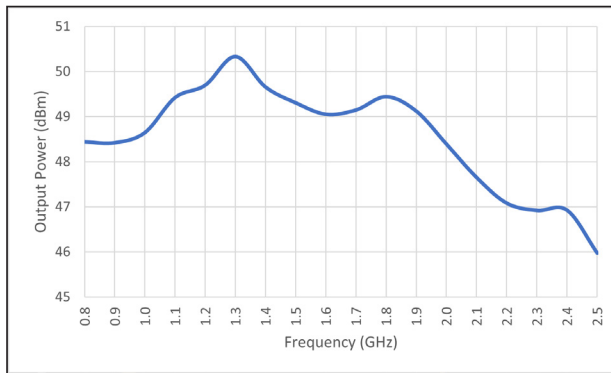


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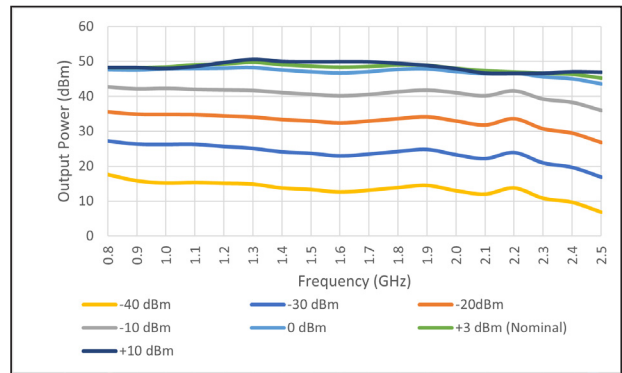
Performance Plots

Test Conditions: +28VDC, +25 °C, $Z_S=Z_L=50 \Omega$, CW, Pin=+3 dBm, unless otherwise stated

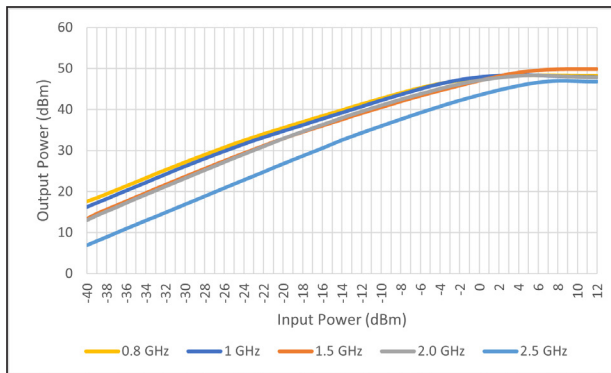
Output Power @ Nominal Drive



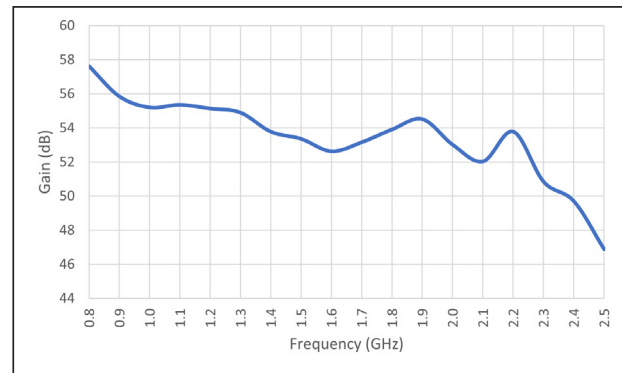
Output Power - Stepped Input



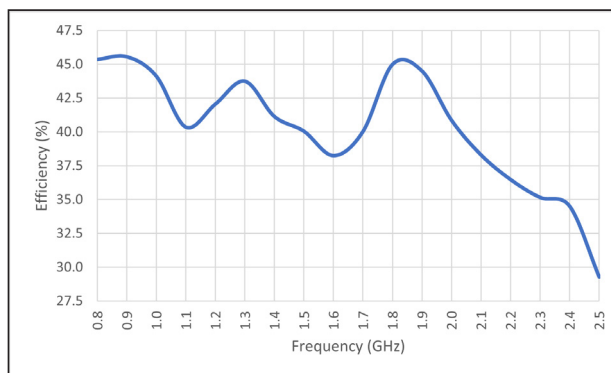
Output Power vs. Input Power



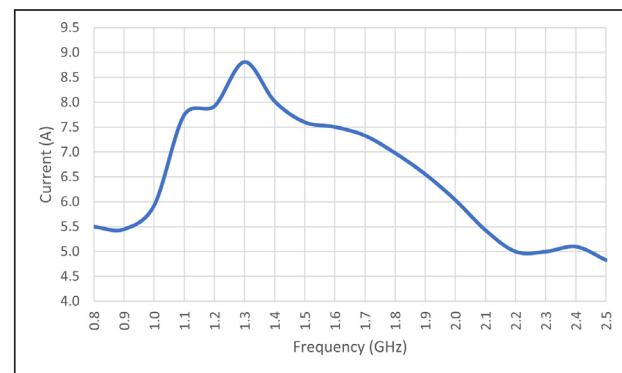
Small Signal Gain [-40dBm Input Power]



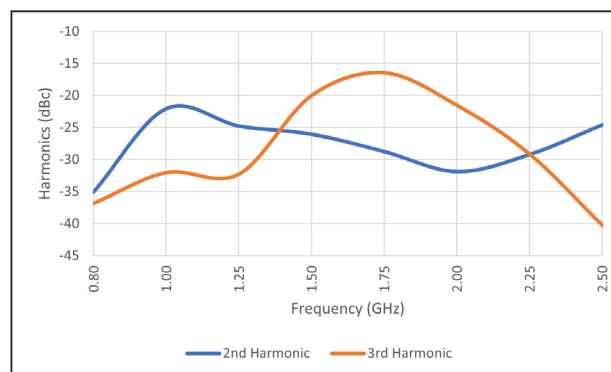
Efficiency



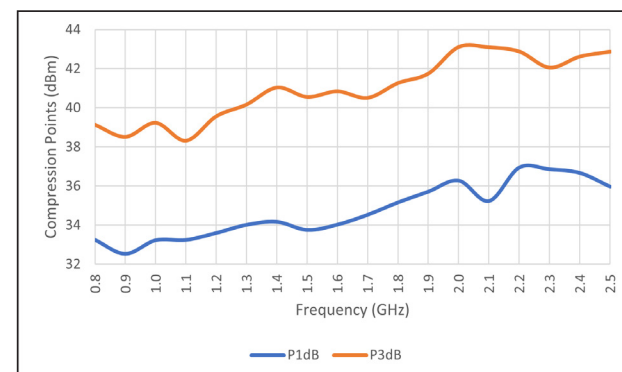
Current Consumption



Harmonics

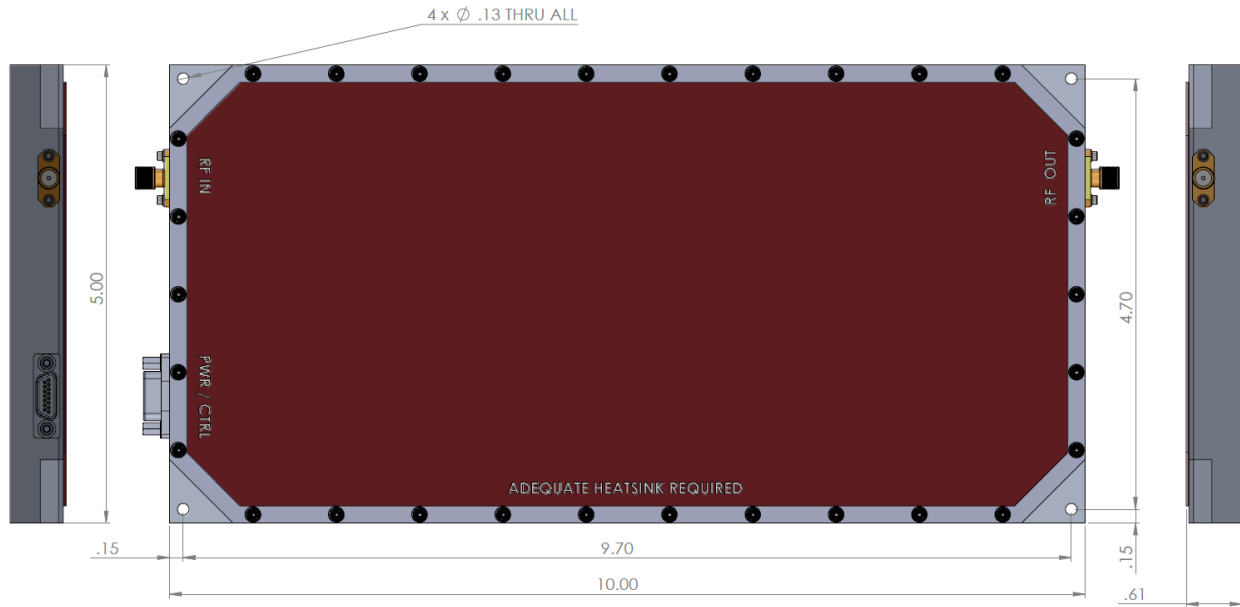


P1dB & P3dB



NuPower™ LS75T01 Power Amplifier

Mechanical Outline



NuPower™ LS75T01 Power Amplifier

Accessory Part Numbers

Pinout

Part Number	Description
NW-PA-ACC-CB15MK	Standard Interface Cable Assembly - Flying Leads (sold separately)
NW-PA-ACC-CT15MK	Upgraded Interface Cable Assembly - Banana Plug Termination (sold separately)
HTSK-04	Heatsink with Integrated Fan (sold separately)

Function	I/O	Pin	Logic Voltage
DC Power (+28 Volts)	I	1-6	N/A
Ground	I	9-14	N/A
Over Temperature Flag: 0V = temperature fault +5V = no fault	O	Temp Flag 1: Pin 7	Logic Low: 0VDC to +0.4VDC
		Temp Flag 2: Pin 8	Logic High: +3.85VDC to +5VDC
RF Enable: 0 V or GND = RF ON NC = RF OFF	I	Pin 15	Logic Low: 0VDC to +1.65VDC Logic High: +3.85VDC to +5VDC

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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