

Ku-Band 100W Solid State Power Amplifiers

THE INTEGRAL DIFFERENCE



COMMAND
+ CONTROL



SIGNAL PROCESSING
+ DATA COMM.



ENTERPRISE
NETWORK MGMT.



COMM. INFO
ASSURANCE



SERVICES

Integral Systems SATCOM Solutions division's family of 100 Watt Solid State Power Amplifiers are a huge leap forward in efficiency and size for high-powered Solid State Power Amplifiers. The typical saturated efficiency is 24%, including fans and power supply parasitic power drain. Minus the fans and power supply, the core SSPA approaches 30% peak efficiency at 120 Watts output.

This remarkable and unprecedented high-power efficiency allows the Integral SSPA to produce large power outputs from a very small space, producing very little heat. This solves a wide array of problems, from heat build-up under radomes or in rack assemblies, excessive weight, and eliminates bulky, heavy SSPAs. At 10 lbs in component form and 15.3 lbs with cooling fins/fans, it greatly reduces system size. Furthermore, the industry-leading efficiency greatly reduces heat generation and power consumption, greatly simplifying system integration challenges.

TWTA Replacement

A key target application for the AMP-Ku100 is replacement and retrofitting for TWTA (Traveling Wave Tube Amplifiers) applications. The compact size and high efficiency matches that of TWTAs, allowing a form-fit-function drop-in replacement. Please contact our factory about options for a custom cooling and enclosure/connector attachments which can be designed to exactly replicate the external interfaces of your current TWTA.

Conversion from TWTA to SSPA (while maintaining the same power output, efficiency and size) brings many benefits, including higher reliability, eliminating tube replacement and service. Also, greatly reduced noise floor (by 20 to 40 dB in many applications), elimination of warm-up time (SSPA turn-on is <200ms), and elimination of high-voltage power supply, and elimination of vibration sensitivity.

Most importantly, conversion to SSPA often brings large reduction in cost. A 40% cost reduction is typical in most applications due to the inherently lower cost of solid state.



Features

- Remarkably Small Size:
 - 11.7" (L) x 5.3" (W) x 3.65" (H), 10.0 lbs. (component configuration with power supply)
 - 11.7" (L) x 5.3" (W) x 6.65" (H), 15.3 lbs. (outdoor configuration)
- Highest efficiency in 13.75-15.0 GHz band, and good power available over 13.0 to 18.0 GHz
- Ultra efficiency: 480W consumption (@120W RF out) typical for component unit
- Forward Power Monitor
- Gain vs. Temp. compensation
- Integrated heat-pipe baseplate
- Fully environmentally sealed
- Internal DC/DC power supply accepts wide 18-56VDC input

SPECIFICATIONS SUBJECT TO CHANGE

Ku-Band 100W SSPA Electrical and Mechanical Specifications

RF Parameters	Specification					
Frequency Band (GHz)	13.0-13.75	13.75-14.5	14.5-15.0	15.0-16.0	16.0-16.5	16.5-17.5
Rated Power Output* P1db	80W	100W	100W	80W	72W	40W
Rated Power Output* Psat	95W	120W	120W	95W	85W	48W
AM/PM Conversion @ 2dB below rated power	2.5°/dB					
F&R Pwr Mon (15 dB Range) @CF	+/- 0.25dB					
Gain (min.)	53dB	56dB	50dB	46dB	45 dB	40dB
Gain Variation over 1GHz	8dB max.	5dB max.	6dB max.	7dB max.	7dB max.	10dB max.
Gain Variation over any 40MHz	2dB max.	1.5dB max.	1.5dB max.	2dB max.	3dB max.	3dB max.
Gain Variation over Temperature	3 dB max.					
Gain Variation over Time	0.5dB per day					
Noise Figure in-band	12dB	12dB	12Db	12dB	12dB	12dB
Input VSWR	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	2:1
Output VSWR	2:1	2:1	2:1	2.3:1	2.3:1	2.3:1
with optional output isolator (derate power by 0.4dBm)	1.4:1	1.4:1	1.4:1	1.4:1	1.4:1	1.4:1
Spurious	-60dBc					
2nd Harmonic @ 3dB below rated pwr.	-45dBc					
3rd Order IMD @ 3dB max. backoff from rated pwr.	-25dBc					
Monitor & Control Parameters			Specification			
Discrete Mute Control Voltage ranges			mute:0-1.0V; enable:4.0-5.0V; has internal 10kohm pull-up to +5V			
Thermal Shutdown Control Threshold			+85°C			
Temperature Monitor Accuracy			+/- 3°C			
Input Power Parameters			Specification			
Input voltage range			18-56VDC			
Power consumption of 100W unit:						
At quiescent (small signal)			350 Watts			
At saturated output			480 Watts			
With cooling system			48 Watts			
Environmental/Physical Parameters			Specification			
Operating Temperature			-40°C to +70°C in SSPA bottom surface			
Humidity			100% condensing			
Altitude			80,000 ft with TCS			
Storage Temperature			-54°C to +105°C			
RF input connector			Type N			
RF output connector			WR-75 (WR-62 above 15.5GHz)			
Power Connector			AMPHENOL 10-194922P, 4 pins			
Monitor/Control Connector			MIL-26482 Series 1 receptacle, Shell size 12, 10 pins			
Outline Dimensions			11.7" x 5.3" x 3.65" component configuration with power supply 11.7" x 5.3" x 6.65" with fan cooling			
Weight			10.0 lbs component configuration with power supply 15.3 lbs with supply and fan cooling			