

# NWSPA905101-55

300W X-Band SSPA



**NANOWAVE**  
Technologies Inc.

SPACE Products

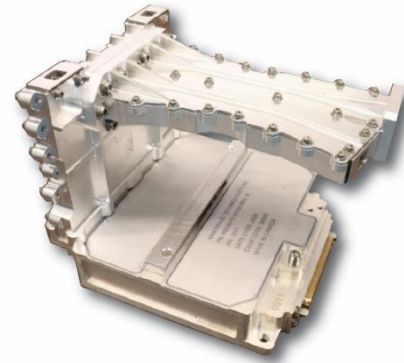
Revision 2.1

## GENERAL DESCRIPTION

The NWSPA905101-55 is a GaN-based Solid-State Power Amplifier offering 300W peak output power over a 1.1GHz band with center frequency of 9.55 GHz.

NANOWAVE also offers compatible EPCs to this unit.

The SSPA package and connectivity interfaces are customizable allowing form-fit functionality to customer requirements.



(Product photo with optional WG filter and combiner)

## FEATURES

- High efficiency GaN SSPA
- Multiple SSPAs combination for increased output power levels
- Gain And phase calibration capability for optimized output power in combined systems
- Voltage and temperature monitoring
- Space qualified

## APPLICATIONS

- Synthetic Aperture Radar (SAR) for LEO satellite



## ELECTRICAL PARAMETERS

Parameter	Unit	Min	Typ	Max	Remarks
Center Frequency (CF)	GHz		9.55		
Operational Bandwidth	GHz		1.1		
Input Power	dBm		-39		
RF Peak Output Power	dBm	54	55		At the nominal input power and over the defined duty cycle and PRF.
PAE	%		32		
Duty Cycle	%			15	
Pulse Repetition Frequency (PRF)	kHz	4		12	PRF range for which all requirements are applicable. Wider PRF range possible.
RF Output Pulse Power variation over temperature range	dB/10°C			0.05	Over the defined operational temperature range
Pulse Output Power variation over frequency	dB			0.8	
Pulse Output Power variation between pulses	dB			0.1	Over any 5 second duration
Output Phase variation over frequency within any single pulse	°			20	Deviation from linear phase
Pulse Output Phase variation between pulses	°			1	Over any 5 second duration
AM to AM Conversion	dB/dB			0.2	Given an input power variation of $\pm 1$ dB with respect to the defined nominal input power level
AM to PM Conversion	%dB			5	Given an input power variation of $\pm 1$ dB with respect to the defined nominal input power level
Harmonic Output Level	dBc			-50	
In-pulse Signal-to-Noise Ratio	dB	40			
Noise power density between pulses	dBm/MHz			-100	Measured Noise density 1us after and 1us before a transmission pulse
RF Input VSWR	-			1.35:1	
RF Output VSRW	-			1.35:1	
Output Phase Adjustment Range	°	330			Used for calibration when multiple SSPAs are combined in parallel to achieve optimal power



#### SUPPLY VOLTAGES

Parameter	Unit	Min	Typ.	Max	Remarks
Current @ +28V	A		4.2		1)
Current @ +24.5V	A		1.2		1)
Current @ +42V	A		0.007		1)
Current @ +14V	A		0.02		1)
Current @ +5V	A		0.025		1)
Current @ +2.5V	A		0.3		1)
Current @ -7V	A		0.03		1)

**Note:**

1) At 15% duty cycle operation.

High Efficiency EPC is available from NANOWAVE to provide the SSPA voltage supply rails from a 28V primary bus.

#### Mechanical and Environmental Parameters

Parameter	Unit	Min	Typ	Max	Remarks
Operation Acceptance Temperature Range	°C	-15		+65	
Operation Qualification Temperature Range	°C	-20		+70	
Non-Operational Acceptance Temperature Range	°C	-30		+80	
Non-Operational Qualification Temperature Range	°C	-35		+85	
Unit Envelope	mm		165 x 132 x 120		
Weight	gram			1320	
Total Ionizing Dose (TID)	krad	30			

#### Connector Interfaces

Interface	Interface Type	Remarks
RF Input Interface	SMA	
RF Output Interface	Waveguide	WR-90 with a 6 hole flange
DC Power, Control and Telemetry Interface	D-sub	37-pin standard density, Male

#### Monitor and Control Interface

##### TELECOMAND INTERFACES

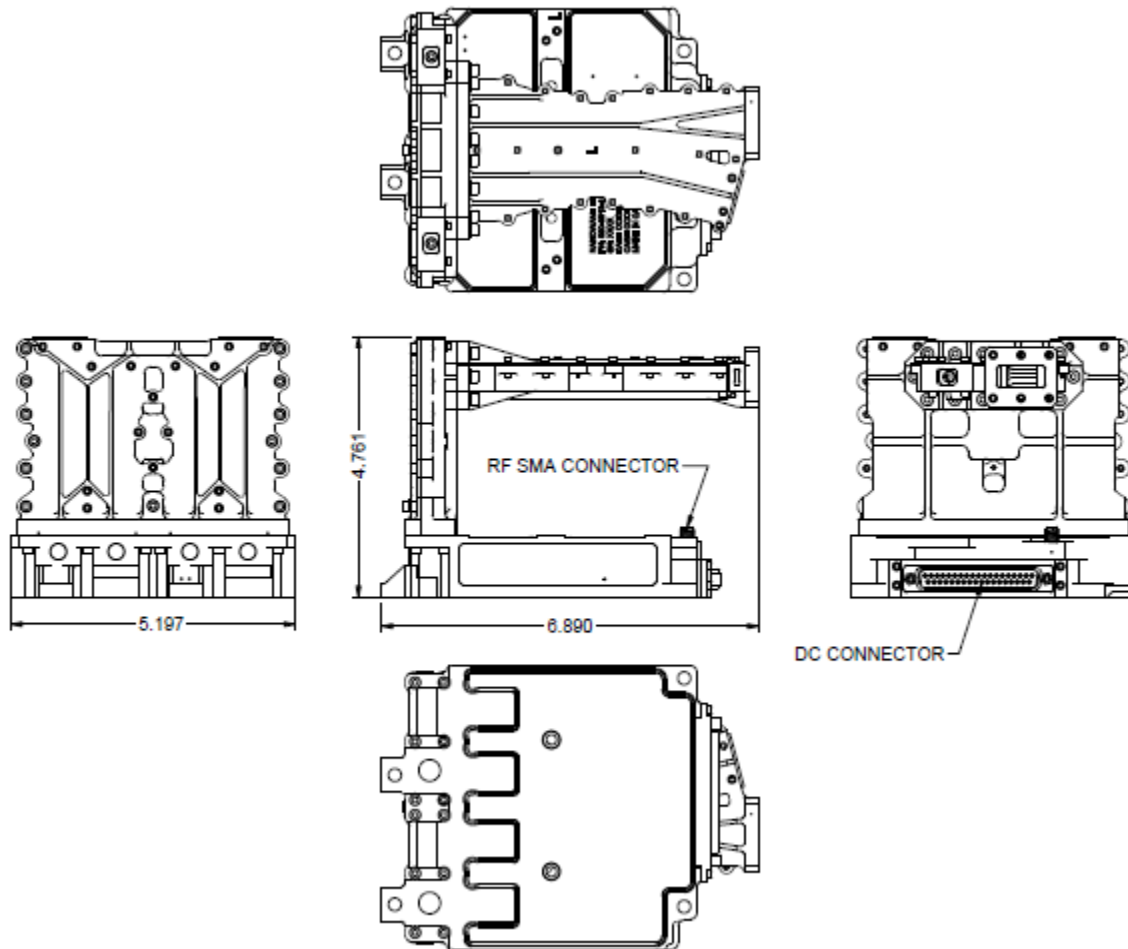
Control Signal	Signal Type	Input Signal Voltage Level	Remarks
RF_GATE	Level Control, Active High	0 to 3.3V	18% maximum duty cycle
Phase Control	Analog Voltage Level control	0 to 3V	Output Phase shift control dependent on voltage setting

##### TELEMETRY INTERFACES

Telemetry Signal	Signal Type	Output Signal Voltage Level	Remarks
Drain and Gate Bias Telemetry	Analog Voltage Level Telemetry	0 to 2.5V	Calibration curve will be provided for each equipment to convert the analog voltage signal to temperature and voltage
Temperature Telemetry	Analog Voltage Level Telemetry	0 to 2.5V	



## OUTLINE DRAWING



**Fig 1: Outline Drawing of the X-Band 300W SSPA  
(includes an optional WG filter)**

### **Additional features:**

- Marking: The unit is marked with manufacturer part no., date code, and Serial Number.
- All plating and painting is RoHS compliant

For further information please contact NANOWAVE Technologies Inc. at [sales@nanowavetech.com](mailto:sales@nanowavetech.com) , or call at (+1) 416-252-5602