

NWPA8996-55

300W X-Band Transmitter

v 1.2

GENERAL DESCRIPTION

The NWPA8996-55 is a high-reliable X-band Transmitter unit in a 19" rack mountable housing (height 2U) based on Solid-State Power Amplifier (SSPA) modules. It provides a minimum of 300W peak output power within the desired frequency band. By customizing the design, the entire X-Band Radar Frequency Band ranging from 8.5GHz to 10.55GHz can be covered. Typically, the amplifier is operated in full saturation.



The unit can accommodate a mains power supply of 95 to 265 VAC input voltages. Forced air fan cooling is incorporated in the unit. Sophisticated Control Logic enables remote sensing of Bias Conditions and RF power levels, as well as functional control (e.g. RF ON/OFF switching) via an Ethernet interface. The unit also hosts a Control Graphical User Interface (GUI) via a standard web browser. Built-in-Test (BIT) capabilities allow easy troubleshooting of the hardware.

The Transmitter has an incorporated gate pulse shaper, which limits the maximum gate width and duty cycle to protect the RF hardware.

FEATURES

- Possibility to configure ID for usage in a larger system
- Full internal current, voltage, power, and temperature monitoring
- High phase and pulse-to-pulse stability for good signal processing performance.
- Ethernet Control Interface
- Web GUI for remote diagnostics via Ethernet (MODBUS)

APPLICATIONS

- Coastal Surveillance Radar
- Ground Station Radar
- Naval applications

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ELECTRICAL PARAMETERS

Parameter	Unit	Min	Typ.	Max	Remarks
Operating Frequency Range	GHz	8.9		9.6	1)
Peak Output Power	dBm		55.4		2)
	W		320		
Output Power Variation over Frequency	dB		± 1.0		@ 10 dBm input power
Pulse Droop	dB			1.0	@ rated power and +10dBm input power level 3)
Small Signal Gain	dB		55.0		
Gain Variation over Frequency	dB		± 0.5		Within 400 MHz bands
Input and Output VSWR			2:1		4)
Pulse Width Capability	µs	2.0		55.0	Measured at 50 % points
Duty Cycle	%			15.0	Maximum
Rise and Fall Time	ns	50.0		100.0	TBD
Phase Drift within Pulse	deg			10.0	With max 2 deg drift of input signal
Harmonics Level 2 nd	dBc		-30.0		
Harmonics Level 3 rd , 4 th	dBc		-70.0		
Out of Band Spurious Level	dBc		-60.0		From 5 to 40 GHz
In-Band Spurious Level					NTIA conformal 5)
Phase Alignment Unit to Unit	deg		± 7.5		

Notes:

- 1) Operation frequency band is custom designable
- 2) Minimum output power in frequency band is 54.8 dBm
- 3) Pulse droop measured 1 µs into the pulse from each edge.
- 4) Input and Output VSWR are better than 2:1. The output can handle arbitrary load VSWR without degradation of the unit.
- 5) NTIA, Section 5.5 Criteria B, NON-FM Pulse Radars

MECHANICAL AND ENVIRONMENTAL PARAMETERS

Parameter	Unit	Min	Typ.	Max	Remarks
DC Power Consumption	VA			650	@ 15 % duty cycle
Power Supply Voltage	V	96		265	Multi-Standard AC
Size (length, width, height)					2 HU 19" rack chassis
Weight	Kg		12		
Operating Temperature Range	°C	+5		+40	
Non-Operating Temperature Range	°C	-40		+70	
Operating Humidity	%			93	Noncondensing @ +40°C ambient temperature
Input / Output Connectors			WR90		TBD
Material					All plating and painting are RoHS compliant
Marking					Manufacturer name, model, serial number, date code

Notes: Specifications subject to change without notice.

COMMUNICATION AND CONTROL INTERFACE

The SSPA can be monitored and controlled via a web Graphical User Interface (GUI). The communication is established once the unit is connected to Ethernet. In addition, there is another communication link through Ethernet MODBUS protocol allowing detailed telemetry exchange (TM). The web browser and the unit's fixed IP address (IPV4) option, and the MODBUS communication, allows ease of access with the benefit of multi-level security. The embedded control system runs a RTOS (in Linux), while having a built-in memory for event recording and logs, and factory setup features. Optionally, higher-level communication interfaces and protocols (e.g. SCPI, CAN-Bus) can be implemented.

Monitored parameters are (TM):

- Temperatures
- Voltages
- Current Failures
- RF Power OK
- General Status

The following functions can be remote controlled (TC):

- RF Power ON / OFF
- Transmitter Reset
- Network IP configuration (DHCP/Static)
- Threshold Settings
- Setup for possible graceful degradation
- SSPA Standby / Operate (optional)
- (further options on request)



Fig 1: Screenshots of GUI for remote diagnostics

OUTLINE DRAWING

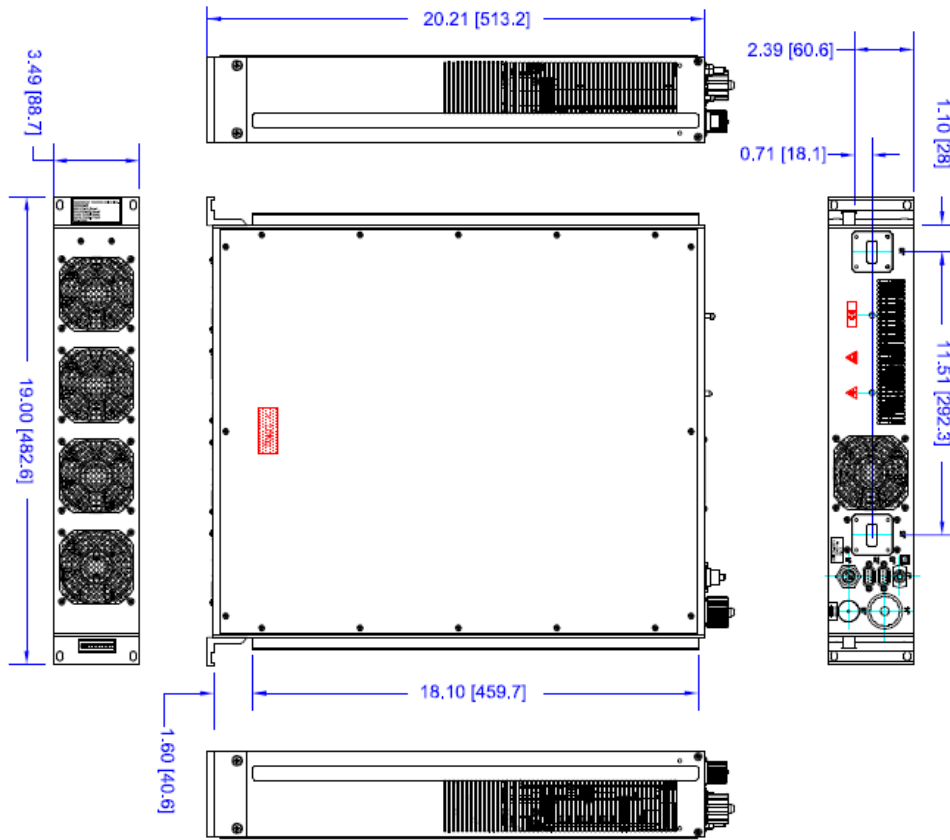


Fig 2: Outline Drawing of 400 W X-Band Transmitter Unit

Table 1: List of Connectors

J1	AC Power
J2	TX-ID
J3	TX-CTRL
J4	Ethernet / LAN
J5	RF input
J6	RF output
J7	GND M6X23
J8	Fuse Holder

Notes:

The outline of this SSPA unit is fully customizable. Arbitrary shapes are possible to accommodate form-fit functionality.

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 , or call at (+1) 416-252-5602