

# SPOD C-, X- or Ku-Band Solid-State Power Amplifiers

Amplifiers



Model PS 1



Model PS 1.5



Model PS 2

## Overview

Our Series of High-Power Outdoor (SPOD) C-, X- and Ku-Band Solid-State Power Amplifiers (SSPAs) are cost-effective, reliable and deliver its rated power at the 1 dB compression point, to the transmit waveguide flange. A SPOD consists of an SSPA module with the Monitor/Control Processor (MCP), an integrated power supply and a field replaceable fan assembly. The amplifier features our low loss combining technique and MCP-based temperature versus gain compensation.

All SPOD SSPAs have a self-contained, extremely rugged, power supply. While generally fielded as an AC powered unit, SPODs are also available with -48 VDC power supplies.

The SSPAs are constructed with highly reliable Gallium Arsenide Field Effect Transistors (GaAs FETs). Solid-State provides significant advantage over alternate technologies, including:

- More superior third order inter-modulation products – from 4-6 dB better
- Saturated power levels up to twice that of the SPOD's rated output

The SPOD SSPAs are equipped with useful features that other manufacturers offer as options. Included in each unit's base price are:

- Temperature compensation
- Sample ports
- Power monitor
- Power factor corrected supply
- Full remote monitor and control capabilities, including Ethernet HTTP pages and SNMP

## Redundancy

The SPOD has the ability to function as a 1:1 (one backup for one primary) redundant controller in a redundant mode without the use of an external device. With a unique solution to system control, the SPOD offers a very cost-effective solution for 1:1 redundant TX requirements. The optional redundancy configuration is implemented by attaching a ganged waveguide/coax transfer switch(es) to the input and output connectors of the amplifiers, using a combination coaxial cable and waveguide kit.

## Data Logging Capability

The SPOD includes a built-in data logging capability to enhance system maintainability. By recording critical operational parameters (such as temperature, output power, mute status, etc.) at time stamped intervals, the user can quickly gather intelligence not only about the unit itself, but also the unit's operational environment.

## Specifications

### RF Output Frequency

5.850 – 6.425 GHz
5.850 – 6.650 GHz (optional)
5.850 – 6.725 GHz (optional)
6.725 – 7.025 GHz
7.900 – 8.400 GHz
14.00 – 14.50 GHz
13.75 – 14.50 GHz (optional)

Model	Psat (Typical)	P1dB (Guaranteed) <sup>Note 1</sup>
PS1-20Ku	43 dBm (20 W)	42 dBm (16 W)
PS1-32Ku	45 dBm (32 W)	44 dBm (25 W)
PS1-40Ku	46 dBm (40 W)	45 dBm (32 W)
PS1.5-50Ku	47 dBm (50 W)	46 dBm (40 W)
PS1.5-60Ku	48 dBm (60 W)	47 dBm (50 W)
PS2-100Ku	50 dBm (100 W)	49 dBm (80 W)
PS2-125Ku	51 dBm (125 W)	50 dBm (100 W)
PS1-32C, X	45 dBm (32 W)	44 dBm (25 W)
PS1-50C, X	47 dBm (50 W)	46 dBm (40 W)
PS1-60C, X	48 dBm (60 W)	47 dBm (50 W)
PS1.5-80C, X	49 dBm (80 W)	48.5 dBm (70 W)
PS1.5-110C, X	50.4 dBm (110 W)	49.5 dBm (90 W)
PS1.5 or PS2-125C, X	51 dBm (125 W)	50 dBm (100 W)
PS2-150C, X	51.8 dBm (150 W)	51 dBm (125 W)
PS2-200C, X	53 dBm (200 W)	52.5 dBm (175 W)
PS2-250C, X	54 dBm (250 W)	53 dBm (200 W)

Input Power Supply Requirements	90 – 264 VAC, 47-63 Hz, Power Factor Corrected, .96 (48 VDC optional)
Gain Min. (Typical) All power levels	70 (75 dB)
Max. Input level (no damage)	+10 dBm
Gain Adjust	20 dB in 0.25 dB steps
Gain Flatness	± 1.5 dB full band (optional ± 2.0 dB full band (-50 to +55C)) ± 0.30 dB per 40 MHz (optional ± 0.50 dB per 40 MHz (-50 to +55C))
Gain variation over temp	±1.5 dB max., -40 to +55 °C (optional ± 2.0 dB max. (-50 to +55C))
Input Return Loss	19.1 dB (1.25:1 VSWR)
Output Return Loss	19.1 dB (1.25:1 VSWR)
Noise Figure	8-10 dB typ., 15 dB max. @ min. attenuation
RF Mute Isolation	60 dB min.
AM/PM Conversion	2° typ., 3.5° max. @ Rated P1dB
3rd Order Intermod. Level (2 tones, @ -3 dB Total Back Off from P1 dB (-6 dBc SCL), Δ 1 MHz)	-30 dBc typ., -25 dBc Guaranteed

### Spurious Level

Harmonics	-50 dBc @ Prated - 3dB
Non-Harmonic Related	-65 dBc max.
Group delay variation	Linear: ± 0.03ns/MHz Parabolic: ± .003ns/MHz <sup>2</sup> Ripple: ± 1.0 ns pk-pk

Note:

1. Allow 1 dB degradation from 13.75 to 14.0 GHz and 6425 to 6725 MHz

Data Logging parameters	Non-Volatile RAM : Capacity 30 days @ 90 minute intervals Includes: RF Output Power Mute Status Heatsink Temperature
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### Environmental & Physical

#### Temperature

Operating	-40° to 122°F (-40° to 55°C) (optional -50 to 55C or -40 to +60°C)
Storage	-67° to 167°F (-55° to 75°C)

Humidity	100% condensing rain 2" per hour
Ingress Protection	Designed for IP-66 (Dust tight, strong water jets)
Altitude	10,000 AMSL (derate 2°C/1000 ft. AMSL)
Shock	Normal commercial shipping and handling

#### Dimensions

	height x width x depth (excluding connectors)
PS1, 1.5	7.37" x 6.26" x 12.65"
PS2	9.78" x 8.80" x 16.81"

#### Weight

PS1, 1.5	17 lbs Nominal
PS2	47 lbs Nominal

#### Connectors

RF Input	Type N, female
RF Output	PS1, C-Band: Type N, female
	PS1.5/PS2, C-Band: CPR137G
	PS1/1.5/PS2 X-Band: CPR112G
M&C/Ethernet/Redundancy Switches	PS1/1.5/PS2 Ku-Band: WR75G
	19-pin MS Style (Single Integrated cable assembly available, dependent upon configuration)



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