



1.1 kW C-Band High Power SSPA

## DESCRIPTION

Teledyne Paradise Datacom's Indoor, High Power Rack Mount (R) series SSPAs represent the industry's highest power density and most reliable high power amplifier systems. These high power amplifiers are accompanied with a separate 1RU power supply chassis.

The power supply is configured as a n+1 redundant, hot swappable power supply comprised of up to four modules. The power supply is populated with one module more than needed to power the HPA. In the event of a single power supply module failure, the amplifier system will not fail. The power supply module can be changed without ever taking the HPA out of service. The microwave amplifier architecture is also designed for maximum soft fail redundancy.

The High Power Rack Mount SSPA employs a modular design, which allows quick and easy replacement in the event of a catastrophic failure of one of the SSPA components. These modular assemblies include: front and rear fan trays; and a rear panel controller card.

## FEATURES

- Extremely High Power Density:  
to 1.1 kW C-Band;  
to 1000W X-Band;  
to 500W Ku-Band.
- Hot Swap, n+1 Redundant Power Supply
- Power Factor Corrected Power Supply
- Modular (soft-fail) Architecture
- Front Panel Touchscreen
- Removable fan assemblies
- Ethernet Port
- RF Output Sample Port
- Built-in 1:1 Redundancy Control
- Built-in Maintenance Switch Controller
- Hot/Cold Standby operating modes for reduced power consumption

## OPTIONS

- Extended Frequency Band
- L-Band Input operation
- Reflected Power Monitor
- Phase Combined Systems
- Remote Control Panel
- RF Input Sample Port
- Rear Panel Exhaust

## SPECIFICATIONS

- SSPA Chassis housing:  
19.0 X 10.47 X 30.25 in  
483 X 266 X 768 mm  
180 lbs. / 82 kg
- 1RU Power Supply:  
19.0 X 1.75 X 16.30 in  
483 X 45 X 414 mm  
33 lbs. / 15 kg
- Gray powder coat finish
- Operating temperature:  
0 to +50 °C

## Specifications, C-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range	Frequency selection "A" Frequency selection "B" <sup>1</sup> Frequency selection "C" <sup>2</sup>	5.850 to 6.425 5.850 to 6.725 5.750 to 6.670	GHz GHz GHz
Output Power Typical, P <sub>sat</sub> Guaranteed minimum, P <sub>1dB</sub>	HPAC6800ARXXXXP HPAC6900ARXXXXP HPAC611KARXXXXP	P <sub>sat</sub> / P <sub>1dB</sub> 59.0 (800) / 58.0 (630) 59.5 (900) / 58.5 (700) 60.4 (1100) / 59.4 (870)	dBm (W) dBm (W) dBm (W)
Power Requirements Line Frequency Line Power (Voltage) (typical @ 220 VAC)	power factor  HPAC6800ARXXXXP HPAC6900ARXXXXP HPAC611KARXXXXP	.98 47 to 63 4150 (180 to 265) 4850 (180 to 265) 6000 (180 to 265)	Hz W (VAC) W (VAC) W (VAC)

**Note 1:** De-rate output power by 1.0 dB linearly from 6.425 to 6.725 GHz.

**Note 2:** De-rate output power by 1.0 dB linearly from 5.850 to 5.750 GHz and by 1.0 dB linearly from 6.425 to 6.670 GHz.

Continuous operation at saturated power can negatively impact the life of the amplifier and will not be covered by warranty. Normal operating output should be limited to P<sub>1dB</sub> (1dB backed off from the full rated power, P<sub>sat</sub>).

## General Specifications: 6RU RM Series

PARAMETER	NOTES	LIMITS	UNITS
Gain	minimum	75	dB
Gain Flatness	full band	± 1.0	dB
	Extended C-Band units	± 1.5	dB
Gain Slope	per 40 MHz	± 0.3	dB/40 MHz
Gain Variation vs. Temperature	0 °C to +50 °C	± 1.0	dB
Gain Stability	at constant temperature	± 0.25	dB/24 hours
Gain Adjustment	0.1 dB resolution	20	dB
Intermodulation Distortion	@ P <sub>1dB</sub> - 3 dB	-25	dBc
AM/PM Conversion	@ rated P <sub>1dB</sub>	3.5	°/dB
	@ P <sub>1dB</sub> - 3 dB	0.5	°/dB
Spurious Harmonics	@ rated P <sub>1dB</sub>	-65	dBc
	@ rated P <sub>1dB</sub> - 3 dB	-50	dBc
Input VSWR	(all bands and power levels)	1.30:1 Maximum	
Output VSWR	(all bands and power levels)	1.50:1 Typical / 2.0:1 Maximum	
Group Delay (per 40 MHz segment)	Linear	0.01	ns/MHz
	Parabolic	0.003	ns/MHz <sup>2</sup>
	Ripple	1.0	ns p-p
Noise Output	TX Band	-75	dBW/4 KHz
	RX Band	-150	dBW/4 KHz
Output Isolation	@ full reflected power	25	dB
Residual AM Noise	0 - 10 KHz	-45	dBc
	10 KHz - 500 KHz	-20 (1.25 + log F)	dBc
	500 KHz - 1 MHz	-80	dBc
Phase Noise		IESS -308/309 - 10 dB	

## Mechanical

Size			
HPA Chassis (6RU)	width X height X depth	19.0 X 10.47 X 30.25 483 X 266 X 768	inches mm
Power Supply Chassis (1RU)	width X height X depth	19.0 X 1.75 X 16.30 483 X 44 X 414	inches mm
Weight			
HPA Chassis		180 (82)	lbs.(kg)
Power Supply Chassis (1RU)	Chassis plus four (4) modules	33 (15)	lbs.(kg)
Finish		powder coat	Gray

## Environmental

Operating Temperature	Ambient	0 to +50	°C
Operating Relative Humidity	Non-condensing	95	%
Operational Altitude	Above sea level	10,000 (3,048)	ft. (m)
Storage Temperature	Ambient	-20 to +75	°C
Storage Relative Humidity	Non-Condensing	90	%
Cooling System	Integrated	Forced air	

## L-Band Operation

Teledyne Paradise Datacom amplifiers are available with an integrated L-Band Block Up Converter. L-Band units utilize Teledyne Paradise Datacom's proprietary zBUC technology. The addition of a zBUC® converter to the SSPA typically increases the gain by 2-4 dB. The advantages of zBUC technology include:

- Autosensing zBUC includes an internal reference but will switch to an external reference if applied;
- Internal high stability (10 MHz) reference; will lock to externally supplied (10 or 50 MHz) reference;
- zBUC converter can accept a wide range of external reference power (-10 to +5 dBm);
- zBUC converter can accept FSK monitor and control signal via the IFL for complete amplifier remote control.

### Available Frequency Plans

Band	Frequency Band	IF Input	LO Frequency	RF Output	Gain Change
C	Sub-Band "A"	950 - 1525 MHz	4.900 GHz	5.850 - 6.425 GHz	0-4 dB
C	Sub-Band "B"	950 - 1825 MHz	4.900 GHz	5.850 - 6.725 GHz	0-4 dB
C	Sub-Band "C"	950 - 1870 MHz	4.800 GHz	5.750 - 6.670 GHz	0-4 dB

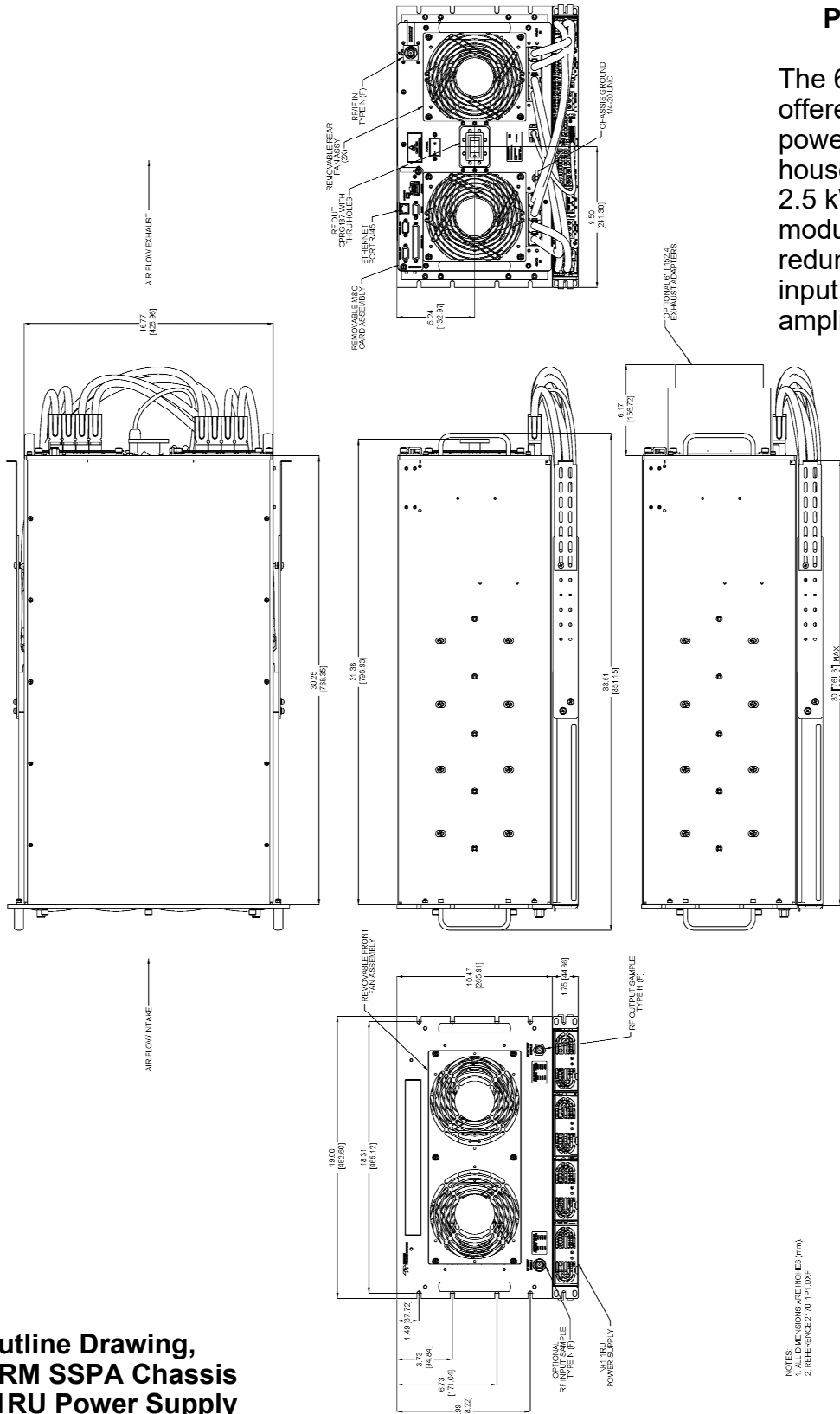
### Electrical Specifications for 6RU RM SSPA with ZBUC converter

PARAMETER	NOTES	LIMITS		UNITS
Gain	Nominal setting	75		dB
Gain Flatness	full band	± 2.0		dB
Gain Slope	per 40 MHz	± 0.5		dB/40 MHz
Gain Adjusted Range	Typical C-Band Adj. Range	20		dB
Gain Stability	-40 to +60 °C	60 - 80		dB
		± 1.5		dB
Phase Noise	Offset frequency from carrier	<u>Absolute max.</u>	<u>C-band (typ.)</u>	
	10 Hz	-30	-60	dBc/Hz
	100 Hz	-60	-74	dBc/Hz
	1 KHz	-70	-84	dBc/Hz
	10 KHz	-80	-100	dBc/Hz
	100 KHz	-90	-105	dBc/Hz
	1 MHz	-90	-125	dBc/Hz
Spurious	In-Band Signal Related (C-Band) (Extended C-Band)	-50		dBc
	Close to Carrier Spurious (≤ 20 MHz)	-40		dBc
	Local Oscillator	-50		dBc
		-30		dBm
Transmit Band Noise Output Power Density	Tx Band at Maximum gain	-65		dBW/4kHz
Input VSWR	L-Band	1.5 : 1		
Internal Reference Option	Reference Accuracy (initial)	± 1 • 10 <sup>-8</sup>		
	Aging per day (after 30 days)	± 1 • 10 <sup>-9</sup>		
	Aging per year (after 30 days)	± 6 • 10 <sup>-8</sup>		
	Reference Stability over Temperature (-40 to +40 °C, ambient)	± 1 • 10 <sup>-8</sup>		

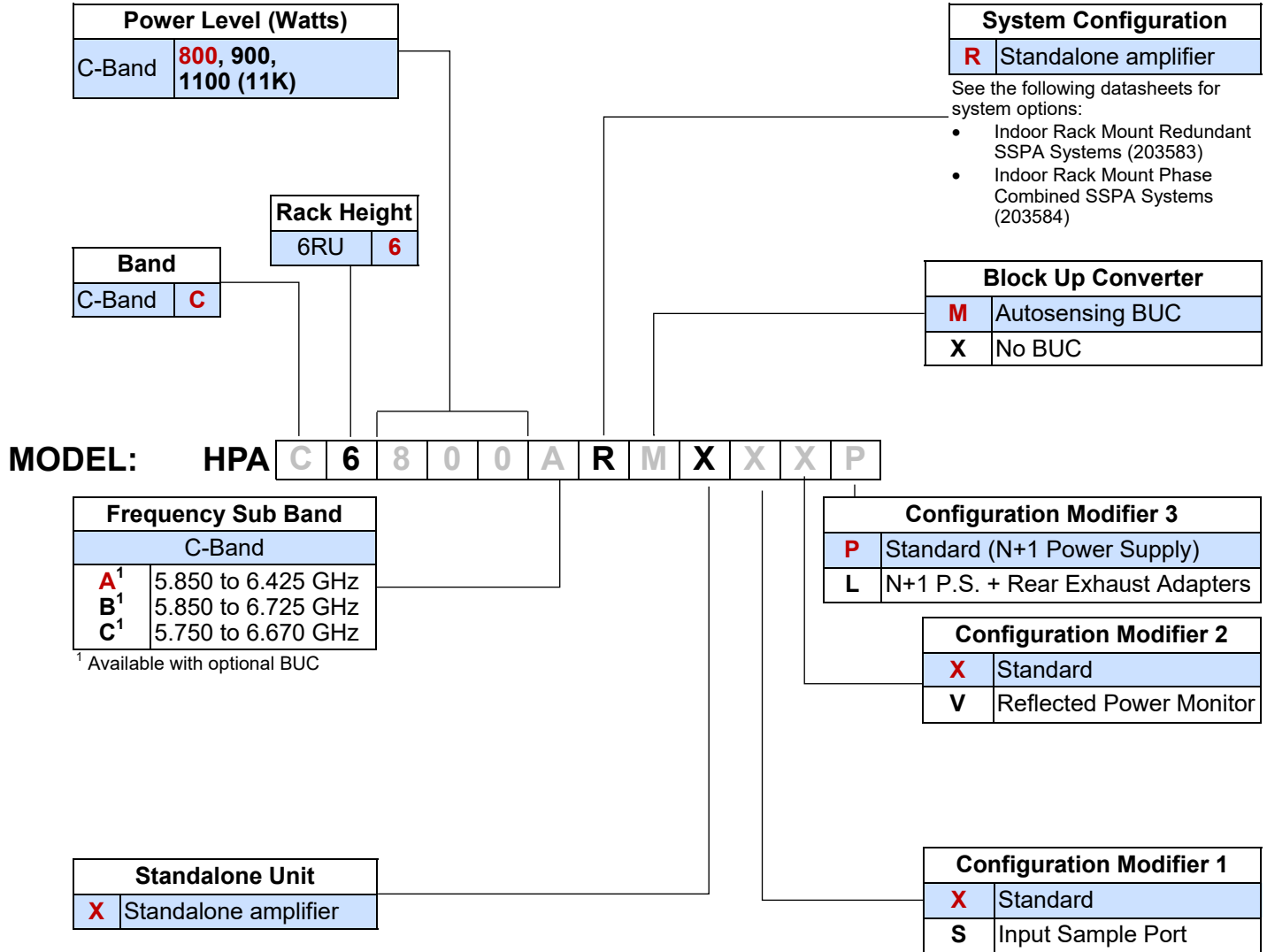
# 6RU Rack Mountable GaAs Solid State Power Amplifier

## Power Supply

The 6RU Chassis is offered with a 1RU power supply which houses up to four (4) 2.5 kW power supply modules, giving N+1 redundancy on the input power for the amplifier.



## Part Number Configuration Matrix



**Example** - A standalone 800W GaAs C-Band 6RU Rack Mount SSPA with standard N+1 external power supply and an optional internal reference block up converter is part number: **HPAC6800ARMXXXP**.

**COMMENTS:**

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Specifications are subject to change without notice.