7RU Rack Mountable
Solid State Power Amplifiers

7RU Rack Mount SSPA with 3RU Power Supply

FEATURES

- Extremely High Power Density:
  1.1 kW S-Band;
  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
- Removable fan assemblies
- Ethernet Port
- RF Output Sample Port (-40 dB)
- Built-in 1:1 Redundancy Control

OPTIONS

- Extended Frequency Band
- L-Band Input operation
- Reflected Power Monitor
- Phase Combined Systems
- Remote Control Panel
- RF Input Sample Port (-10 dB)
- Rear Panel Air Intake and Exhaust

SPECIFICATIONS

- SSPA Chassis housing:
  7 Rack Units (RU)
  19.0 X 12.22 X 30.0 in
  483 X 310 X 762 mm
  180 lbs / 82 kg
- 3RU Power Supply:
  19.0 X 5.25 X 15.44 in
  483 X 134 X 433 mm
  50 lbs / 23 kg
- Gray powder coat finish
- Operating temperature:
  0 to +50 °C

DESCRIPTION

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.

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: hot-swap SSPA modules, front and rear fan trays; and a rear panel controller card. These amplifiers are powered via a separate power supply chassis.

The power supply is configured as a n+1 redundant, hot swappable, power supply comprised of three modules. Only two modules are required to operate the HPA, therefore one module is redundant. In the event of a power supply module failure, the amplifier system will not fail. The module can then be changed without ever taking the HPA out of service.

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Power Specifications

BAND	PARAMETER	NOTES	LIMITS	UNITS
S-BAND	Frequency Range	Band A Band B	2.02 to 2.12 2.20 to 2.30	GHz GHz
	Output Power @: Saturation/P_{1dB} (Typical/Guaranteed minimum)	HPAS6211KARXXXXX	P_{sat} / P_{1dB} 60.5 / 59.5 (1100 / 900)	dBm (W)
	Power Requirements Line Voltage Line Frequency Power Factor Line Power	 HPAS611KARXXXXX	 180 to 265 47 to 63 .90 5200	 VAC Hz W
C-BAND	Frequency Range	(see options for extended band)	5.850 to 6.425	GHz
	Output Power @: Saturation/P_{1dB} (Typical/Guaranteed minimum)	HPAC6750ARXXXXX HPAC611KARXXXXX	P_{sat} / P_{1dB} 58.7 / 58.0 (750 / 630) 60.4 / 60.0 (1100 / 1000)	dBm (W) dBm (W)
	Power Requirements Line Voltage Line Frequency Power Factor Line Power	 HPAC6750ARXXXXX HPAC611KARXXXXX	 180 to 265 47 to 63 .90 4150 6000	 VAC Hz W W
X-BAND	Frequency Range		7.9 to 8.4	GHz
	Output Power @: Saturation/P_{1dB} (Typical/Guaranteed minimum)	HPAX6700ARXXXXX HPAX610KARXXXXX	P_{sat} / P_{1dB} 58.5 / 58.1 (700 / 650) 60.0 / 59.5 (1000 / 900)	dBm (W) dBm (W)
	Power Requirements Line Voltage Line Frequency Power Factor Line Power	 HPAX6700ARXXXXX HPAX610KARXXXXX	 180 to 265 47 to 63 .90 5500 6000	 VAC Hz W W
KU-BAND	Frequency Range	(see options for extended band)	14.0 to 14.5	GHz
	Output Power @: Saturation/P_{1dB} (Typical/Guaranteed minimum)	HPAK6400ARXXXXX HPAK6500ARXXXXX	P_{sat} / P_{1dB} 56.0 / 55.0 (400 / 300) 57.0 / 56.0 (500 / 400)	dBm (W) dBm (W)
	Power Requirements Line Voltage Line Frequency Power Factor Line Power	 Power Factor Corrected HPAK6400ARXXXXX HPAK6500ARXXXXX	 180 to 265 47 to 63 .90 4600 5100	 VAC Hz W W

Options

Extended C-Band 5.850 to 6.725 GHz 5.750 to 6.670 GHz	 De-rate power by 1.0 dB linearly from 6.425 to 6.725 GHz De-rate power by 1.0 dB linearly from 6.425 to 6.670 GHZ and by 0.5 dB from 5.750 to 5.850	 HPAC2XXXBRXXXXX HPAC2XXXCRXXXXX
Extended Ku-Band 13.75 to 14.5 GHz	 De-rate power by 1.0 dB linearly from 13.75 to 14.0 GHz	 HPAK2XXXBRXXXXX
Reflected Power Monitor		See Configurator
Block Up Converter (BUC)		See Configurator
RF Input Sample Port (-10 dB)		See Configurator

General Specifications: 6RU RM Series

PARAMETER	NOTES	LIMITS	UNITS
Gain Gain Flatness Gain Slope Gain Variation vs. Temperature Gain Adjustment	minimum full band Extended C-Band units per 40 MHz 0°C to +55°C 0.1 dB resolution adjustable by either serial or analog voltage input: 0.5 to 2.5 VDC	75 ±1.0 ±1.5 ±0.3 ±1.0 20	dB dB dB dB/40 MHz dB dB
Intermodulation Distortion	3dB back off relative to P_{1dB}	-25	dBc
AM/PM Conversion	(@ rated P_{1dB}) (@P_{1dB}-3dB)	3.5 0.5	°/dB °/dB
Spurious Harmonics	(@ rated P_{1dB}) (@ rated $P_{1dB-3dB}$)	-60 -50	dBc dBc
Input/Output VSWR	All units except Extended C-Band Extended C-Band units[1]	1.30:1 1.50:1	
Noise Figure	at maximum gain	12	dB
Group Delay (per 40 MHz segment)	Linear Parabolic Ripple	0.01 0.003 1.0	ns/MHz ns/MHz^2 ns p-p
Noise Output	TX Band (C-, X- or Ku-Band) RX Band (C- or Ku-Band) RX Band (X-Band)	-75 -150 -100	dBW/4 KHz dBW/4 KHz dBW/4 KHz
Residual AM Noise	0 - 10 KHz 10 KHz - 500 KHz 500 KHz - 1 MHz	-45 -20 (1.25 + log F) -80	dBc dBc dBc
Phase Noise		IESS –308/309 - 10 dB	

Mechanical

Size HPA Chassis	 width X height X depth	19.0 X 10.47 X 30.0 483 X 266 X 762	inches mm
Power Supply Chassis	width X height X depth	19.0 X 5.25 X 15.44 483 X 134 X 433	inches mm
Weight HPA Chassis Power Supply Chassis (3RU)		 180 (82) 50 (23)	 lbs.(kg) lbs.(kg)
Finish		powder coat	Gray

Environmental

Operating Temperature	Ambient	0 to +50	°C
Relative Humidity	Condensing	95	%
Cooling System	Integrated	Forced air	

[1] Extended C-Band units may meet 1.30:1 as a special option. Discuss with your sales representative.

Specifications are subject to change.

Interface Specifications; 6RU RM Series

PORT	NOTES	LIMITS	PIN-OUT
Monitor & Control (J7)	Parallel Port Outputs	Power Supply Fault Auxiliary Fault Mute BUC Fault Temperature Fault Voltage Fault DC Current Fault Low RF Fault	Form C relay Form C relay Form C relay Form C relay Form C relay Form C relay Form C relay Form C relay
Monitor & Control (J7)	Parallel Port Inputs	Mute Input Local / Remote Fault Clear Standby Select Auxiliary Fault Ground	Opto Isolator Opto Isolator Opto Isolator Opto Isolator Opto Isolator
Main Serial Port (J4)	RS232 / RS485 DB9 (F)	RS232 Out, RS485 TX- RS232 In, RS485 RX- RS485 RX+ RS485 TX+ Service Request 1 Service Request 2 Service Request Common Termination Ground	Pin 2 Pin 3 Pin 4 Pin 1 Pin 6 Pin 8 Pin 7 Pin 9 Pin 5
Auxiliary Serial Port (J5)	RS232 / RS485 DB9 (F)	RS232 In, RS485 RX- RS232 Out, RS485 TX- RS232 DTR, RS485 TX+ RS485 RX+ Termination Ground	Pin 2 Pin 3 Pin 4 Pin 1 Pin 9 Pin 5
Link Port (J8)	1:1 Redundant System Control Link DB9 (F)	RS485+ RS485- Link Out Link In Ground	Pin 1,4 Pin 2,3 Pin 6,7 Pin 8,9 Pin 5
Switch Port (J3)	Redundant Switch Control Molex (43810-0002)	+28 VDC RF Switch 1, pos 1 RF Switch 1, pos 2 RF Switch 2, pos 1 RF Switch 2, pos 2	Pin 1,4 Pin 3 Pin 2 Pin 6 Pin 5
Program Port (J6)	Flash Firmware Program Port	DB25(F)	-
Ethernet Port (J9)	RJ45	TX+ TX- RX- RX+ Ground	Pin 1 Pin 2 Pin 3 Pin 6 Pins 4,5,7,8
Connectors	RF Input, Input & Output Sample RF Output HPAK7XXXR HPAC7XXXR HPAX7XXXR HPAS7XXXR Line Power	Type N WR75 Waveguide WR137 Waveguide WR112 Waveguide Type N (f) (3) IEC feeds	Female Grooved (PBR-120) CPR137G flange CPR112G (PDR-84) Type N (m) Plug

Power Supply Options

The 7RU Chassis may be fitted with a variety of power supply options. The dual 1RU power supply configuration provides redundancy with all power levels; or may be used as a non-redundant supply by utilizing fewer power supply modules. The stand-alone 1RU power supply can be used to power the 750W C-Band or 400W Ku-Band chassis. The standard 3RU, three-module power supply offers redundancy for all power levels. See the table below.

1RU NON-REDUNDANT (750W C-Band & 400W KU-Band only)				
PS1	MOD	MOD	MOD	MOD

DUAL 1RU (Redundant for 750W C-Band & 400W Ku-Band; Non-redundant for others)				
PS1	MOD	MOD	MOD	MOD
PS2	MOD	BLANK	BLANK	MOD

Note: Single pair of DC cables between PS2 and SSPA

DUAL 1RU REDUNDANT (All power levels)				
PS1	MOD	MOD	MOD	MOD
PS2	MOD	MOD	MOD	MOD

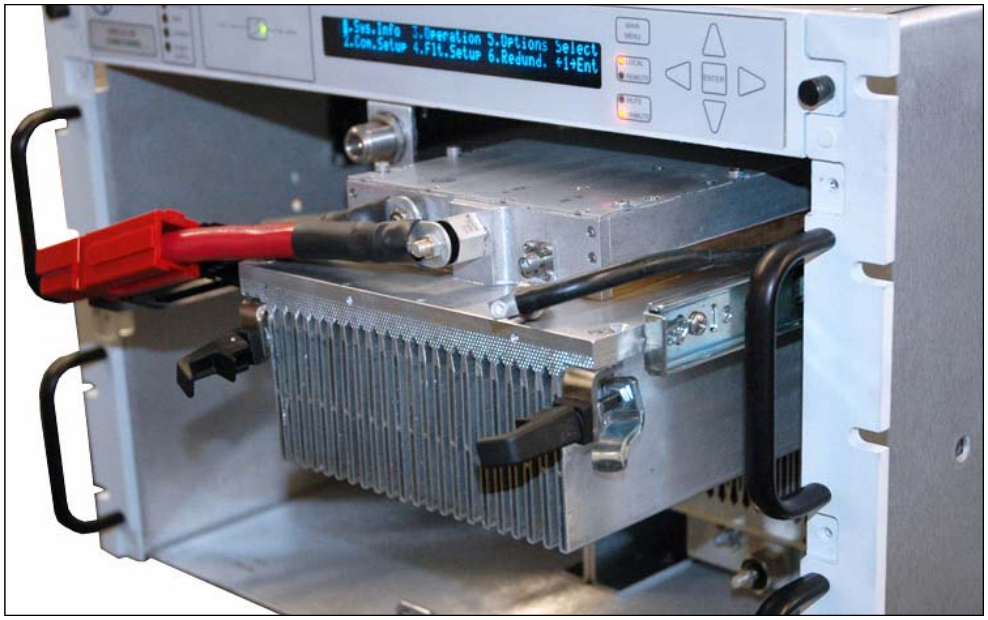
Note: Two pair of DC cables between PS2 and SSPA

3RU REDUNDANT (All power levels)				
PS1	MOD	MOD	MOD	

Hot-Swap SSPA Modules

Four SSPA modules are phase combined inside the 7RU Rack Mountable SSPA to produce the amplifiers total output power. Each of the SSPA modules is hot-swappable, allowing the unit to remain in service while a failed SSPA module is replaced.

The chassis front panel is removable to access the SSPA modules, even while the unit is in operation.



Part Number Configuration

HPA [ ] 7 [ ][ ][ ][ ] R [ ][ ][ ][ ][ ]

Band
S - S-Band
C - C-Band
X - X-Band
K - Ku-Band

Power Level (in Watts)
S-Band
1100 (11K)
C-Band
750, 1100 (11K)
X-Band
700, 1000 (10K)
Ku-Band
400, 500

Frequency Sub Band

S-Band
A - 2.02 - 2.12 GHz
B - 2.20 - 2.30 GHz

C-Band
A* - 5.85 - 6.425 GHz
B* - 5.85 - 6.725 GHz
C - 5.750 - 6.670 GHz
E* - 6.425 - 6.725 GHz (Palapa)
F* - 6.725 - 7.025 GHz (Insat)
G* - 5.750 - 6.475 GHz

X-Band
A* - 7.90 - 8.40 GHz
B - 7.50 - 8.50 GHz
C - 9.50 - 10.50 GHz
D - 7.70 - 8.40 GHz

Ku-Band
A* - 14.00 - 14.50 GHz
B* - 13.75 - 14.50 GHz

* Available with optional BUC

Configuration Modifier
XXX = Standard (3RU Redundant Power Supply)
DXX[1] = Non-redundant 1RU Power Supply
EXX[1] = Non-redundant 1RU Power Supply & Input Sample Port
FXX = (2) 1RU Power Supplies, Non-redundant[2]
GXX = (2) 1RU Power Supplies, Non-redundant[2] & Input Sample Port
HXX = (2) 1RU Power Supplies, Redundant
JXX = (2) 1RU Power Supplies, Redundant & Input Sample Port
SXX = Input Sample Port
XVX = Reflected Power Monitor
XXE[3] = Rear Panel Exhaust Adapters

[1] Only available with 750W C-Band; 400W Ku-Band.
[2] Redundant with 750W C-Band; 400W Ku-Band.
[3] Not available with package options Y and Z.

System Configuration
X = Standalone

Block Up Converter
B = BUC (Custom)
M = Internal Reference ZBUC
P = External Reference ZBUC
X = N/A

Package
R = Rack Mount (Standalone)

Example - A standalone 750W C-Band high power rack mount SSPA with an optional input sample port and no block up converter is part number: **HPAC7750ARXXSXX**.