



40W Ka-Band Compact Outdoor SSPA

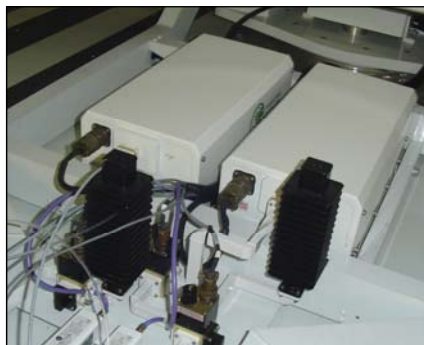
Description

The Paradise Datacom Compact Outdoor Solid State Power Amplifier (SSPA) is built for extreme environmental conditions and high reliability operation. Along with the robust construction exists the highest power density in the industry. This allows solid state technology to be used in applications that have long been reserved for TWTAs.

This Ka-Band SSPA weighs in at less than 44 lbs. (20.0 kg), and is only slightly larger than a shoe box.



Antenna-mount 1:1 system w/ mounting frame



SNG-mount 1:1 system w/ side-mount AC input

FEATURES

- Compact size and weight
- CE Compliance Tested
- Integrated forced-air cooling system
- Adjustable RF Gain, 50 dB to 60 dB with BUC
- Extreme Environmental Testing
- RF Output Sample Port
- Maintenance Free Operation
- Universal, Power Factor Corrected Power Supply
- Built-in 1:1 Redundancy Control
- Ethernet Interface
- RS-485

OPTIONS

- Custom Frequency Sub-Bands
- Antenna Mounting Kit
- Remote Control Panel
- L-Band Input
- FSK monitor & control via IFL
- Phase Combined Systems
- Low line voltage operation
- Optional side-mount AC input for SNG installations

SPECIFICATIONS

- Compact Outdoor housing
10.0 X 19.5 X 6.50 in
254 X 495 X 165 mm
44.0 lbs. / 20.0 kg
- White powder coat finish
- Operating temperature:
-40 to +60 °C

Specifications, Ka-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range		30.00 to 31.00	GHz
Output Power @: Saturation/ P_{Linear} (typical / minimum)	HPAKA020ACXXXXX HPAKA040ACXXXXX	P_{sat} / P_{Linear} 43.0 / 40.0 (20/10) 46.0 / 43.0 (40/20)	dBm (W) dBm (W)
Power Requirements Line Voltage Line Frequency Line Power	power factor Line voltage Line frequency HPAKA020ACXXXXX HPAKA040ACXXXXX	.98 90 to 265 47 to 63 280 520	VAC Hz W W

Electrical Specifications

PARAMETER	NOTES	LIMITS	UNITS
Gain w/BUC Gain Flatness Gain Slope Gain Variation vs. Temperature Gain Adjustment	range full band per 40 MHz -40°C to +60°C 0.1 dB resolution	50 - 60 ± 1.0 ± 0.3 ± 1.0 10	dB dB dB/40 MHz dB dB
Intermodulation Distortion	Two-Tone @ $P_{Linear} = 43.0$ dBm total output power (with linearizer)	-22	dBc
AM/PM Conversion	At P_{Linear} (43 dBm)	2.0	°/dB
Spurious Harmonics (SSPA only)	(@ rated P_{sat}) (@ rated $P_{sat}-3$ dB)	-60 -50	dBc dBc
Input/Output VSWR (Return Loss)	(30.0 - 31.0 GHz)	1.50:1 (13.9)	(dB)
Noise Figure	at maximum gain	20	dB
Group Delay (per 40 MHz segment)	Linear Parabolic Ripple	0.01 0.003 1.0	ns/MHz ns/MHz ² ns p-p
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 (SSPA only)	Offset frequency from carrier 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz 1 MHz	-90 -100 -110 -120 -125 -130	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz
RF Power Detector	P_{sat} to ($P_{sat}-20$ dBm)	20 ± 1.0	dBm

Specifications are subject to change.

L-Band Operation

Paradise Datacom offers Ka-Band amplifiers with an integrated L-Band Block Up Converter. The L-Band units utilize Paradise Datacom's proprietary ZBUC™ technology. The addition of a ZBUC™ to a Compact Outdoor SSPA typically increases the gain by 2-4 dB. The advantages of ZBUC™ technology include:

- ZBUC™ can detect and switch to an externally supplied reference.
- Optional internal high stability (10MHz) reference.
- ZBUC™ can lock to an externally supplied reference of 5, 10, or 50 MHz without modification.
- ZBUC™ can accept a wide range of external reference power (-10dBm to +5 dBm)
- ZBUC™ can accept FSK monitor and control signal via the IFL for complete amplifier remote control.

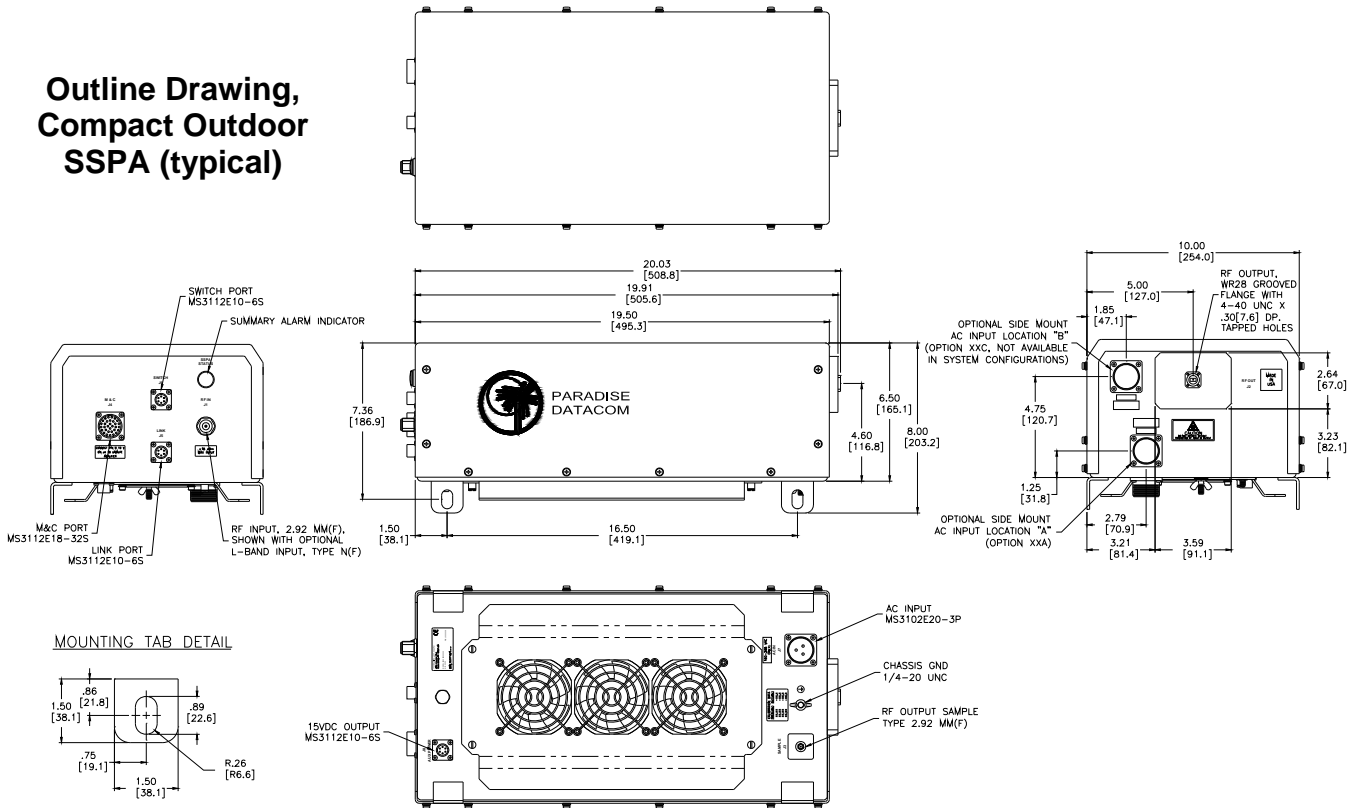
Available Frequency Plans

Band	Frequency Band	IF Input	LO Frequency	RF Output
Ka	Standard Ka-Band	1.0 - 2.0 GHz	29.0 GHz	30.00 - 31.00 GHz

Electrical Specifications for Compact Outdoor with ZBUC™

PARAMETER	NOTES	LIMITS		UNITS	
Gain	Nominal setting	60		dB	
Gain Flatness	full band	±2.0		dB	
Gain Slope	per 40 MHz	±0.5		dB/40 MHz	
Gain Adjusted Range		10		dB	
Gain Stability	Typical Ka-Band Adj. Range -40 to +60 °C	50 - 60 ±2.0		dB dB	
Phase Noise	Offset frequency from carrier	<u>Absolute max.</u>	<u>Ka-band (typ.)</u>		
		10 Hz	-30	-50	dBc/Hz
		100 Hz	-60	-65	dBc/Hz
		1 KHz	-70	-76	dBc/Hz
		10 KHz	-80	-85	dBc/Hz
		100 KHz	-90	-105	dBc/Hz
		1 MHz	-90	-120	dBc/Hz
Spurious	In-Band Signal Related Close to Carrier Spurious (≤ 20 MHz) Local Oscillator Non-Signal Related			-50	dBc
				-50	dBc
				-30	dBm
				-40	dBm
Noise Figure	At 60 dB gain setting	20		dB	
Input VSWR (Return Loss)	L-Band	1.5 : 1 (13.9)		(dB)	
Internal Reference Option	Reference accuracy @ 25 °C	±1 • 10 ⁻⁸			
	Reference Stability over Temperature (-40 to +40 °C)	±1 • 10 ⁻⁹			

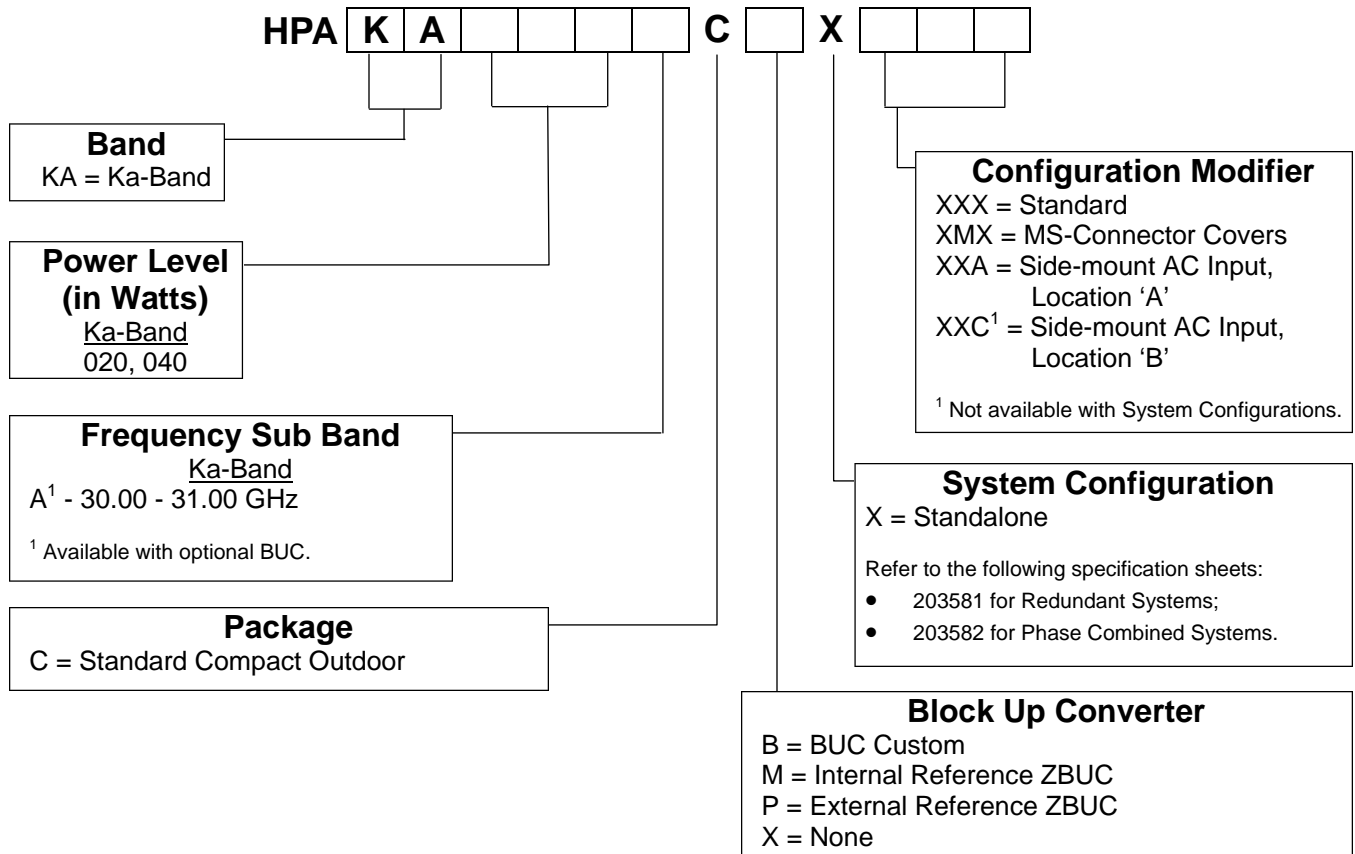
Outline Drawing, Compact Outdoor SSPA (typical)



Mechanical & Environmental Specifications

PARAMETER	NOTES	LIMITS	UNITS
Size	width X length X height	10.0 X 19.5 X 6.50 254 X 495 X 165	inches mm
Weight	40 W Ka-Band With Internal zBUC	44 (20) ±3% +1.7 (0.8)	lbs. (kg) lbs. (kg)
Finish		Paint	White; powder coat
Connectors	RF Input L-Band Input RF Output RF Output Sample Line Power Monitor and Control Link Port Redundancy Switch Auxiliary +15VDC LNB Power (500 mA)	2.92 mm Type N WR28 Waveguide 2.92 mm 3-pin MS-type 32-pin MS-type 6-pin MS type 6-pin MS-type 6-pin MS-type	Female Female Grooved Flange Female Plug Socket Socket Socket
Operating Temperature	Ambient	-40 to +60	°C
Relative Humidity	Condensing	100	%
Cooling System	Integrated	Forced air	
Altitude	No temperature de-rating up to 10,000 ft, (3000 m) De-rate maximum temperature by 2°C per 1,000 ft (300 m) beyond 10,000 ft.		
Shock		50 g p-p, 11 msec pulses	
Vibration		3g rms 30 min. 5-2000 Hz	

Part Number Configuration



Example: A standalone 40W Ka-Band (30.0 - 31.0 GHz) Compact Outdoor SSPA with optional MS-Connector covers is part number: **HPAKA040ACXXXMX**.