TELEDYNE
PARADISE DATACOM
A Teledyne Technologies Company

Compact Outdoor SSPA

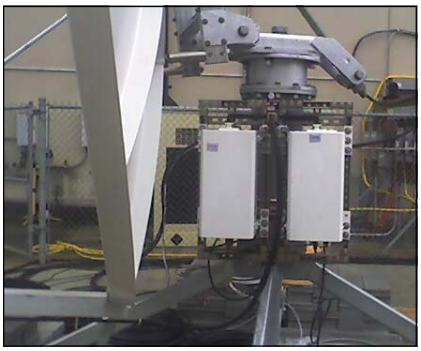
4th Generation Ku-Band SSPAs
150W, 200W & 250W Ku-Band

150W Ku-Band
Compact Outdoor SSPA

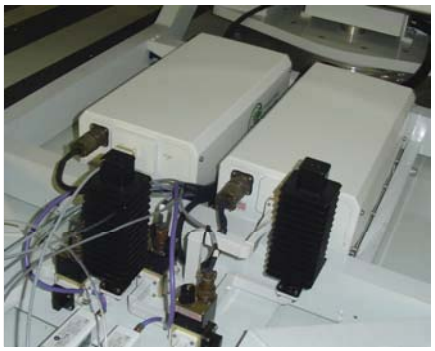
Description

The Fourth Generation of Ku-Band SSPAs from Teledyne Paradise Datacom provides state-of-the-art power density and industry leading linear output power. Built upon the legacy Compact Outdoor architecture, this new generation of SSPAs has seamless integration into systems previously using the Compact Outdoor SSPA. Among the many industry firsts include true rms output power detection for remote monitoring of RF output power. This series of SSPAs now has near power meter accuracy in the remote monitor of RF output power independent of the number of carriers or modulation techniques.

Ku-Band: 150W, 200W, 250W



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, 55 dB to 75 dB
- Extreme Environmental Testing
- RF Output Sample Port
- Maintenance Free Operation
- Universal, Power Factor Corrected Power Supply
- Built-in 1:1 Redundancy Control
- Ethernet, RS-485 remote control

OPTIONS

- Antenna Mounting Kit
- Remote Control Panel
- L-Band Input
- FSK monitor & control via IFL
- Phase Combined Systems
- Low line voltage operation
- Fiber Optic Input
- 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
  150W: 36 lbs. (16.4 kg)
- White powder coat finish
- Operating temperature: -40 to +60 °C

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4th Generation Ku-Band SSPAs
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Specifications, Ku-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range		14.00 to 14.50	GHz
Output Power Saturated / Linear P_{sat} (typical) / P_{Linear} (guaranteed)	 HPAK4150ACXXXXX HPAK4200ACXXXXX HPAK4250ACXXXXX	P_{sat} / P_{Linear} 52.0 (158) / 49.0 (80) 53.0 (200) / 50.0 (100) 54.0 (250) / 51.0 (125)	 dBm (W) dBm (W) dBm (W)
Power Requirements Line Voltage Line Frequency Line Power (P_{sat}/P_{Linear})	power factor Line voltage Line frequency HPAK4150ACXXXXX HPAK4200ACXXXXX HPAK4250ACXXXXX	.98 90 to 265 47 to 63 1200 / 920 1600 / 1100 2100 / 1500	 VAC Hz W W W

PARAMETER	NOTES	LIMITS	UNITS
Gain Gain Flatness Gain Slope Gain Variation vs. Temperature Gain Adjustment	range full band per 40 MHz -40 °C to +55 °C 0.1 dB resolution	55-75 ± 1.0 ± 0.3 ± 1.5 20	dB dB dB/40 MHz dB dB
Linear Output Power	3 dB back off from P_{sat}	-25	dBc
Intermodulation	3 dB back off from P_{sat}	-25	dBc
Spectral Regrowth	2 dB back off from P_{sat}	-30	dBc
AM/PM Conversion	@ rated P_{Linear}	< 3.5	°/dB
Spurious Harmonics	(@ rated P_{Linear}) (@ rated P_{Linear})	-60 -50	dBc dBc
Input/Output VSWR		1.30:1	-
Noise Figure	at maximum gain	10	dB
Group Delay (per 40 MHz segment)	Linear Parabolic Ripple	0.01 0.003 1.0	ns/MHz ns/MHz^2 ns p-p
Transmit Band Noise Output Power Density	TX Band RX Band	-75 -150	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 (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
RMS RF Power Detector	Range Accuracy	P_{sat} to (P_{sat} - 20) ± 0.5	dB dBm

True RMS Output Power Measurement

Historically, Satcom SSPAs have utilized simple diode peak detectors for the measurement of RF output power. This results in considerable error depending on the type of modulation and number of carriers that are being amplified. The new generation of Ku-Band SSPAs include true RMS output power detection. This means that the RF output power that is reported over the remote control is very near power meter accuracy.

L-Band Operation

- zBUC™ converter can detect and switch to an extenally supplied reference.
- Optional internal high stability (10MHz) reference.
- zBUC converter can lock to an externally supplied reference of 5, 10, 20, 25, or 50 MHz without modification.
- 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 amplifer remote control.

Available Frequency Plans

Band	Frequency Band	IF Input	LO Frequency	RF Output	Gain Change
Ku	Standard Ku-Band	950 - 1450 MHz	13.050 GHz	14.00 - 14.50 GHz	0-2 dB
Ku	Extended Ku-Band	950 - 1700 MHz	12.800 GHz	13.75 - 14.50 GHz	0-2 dB

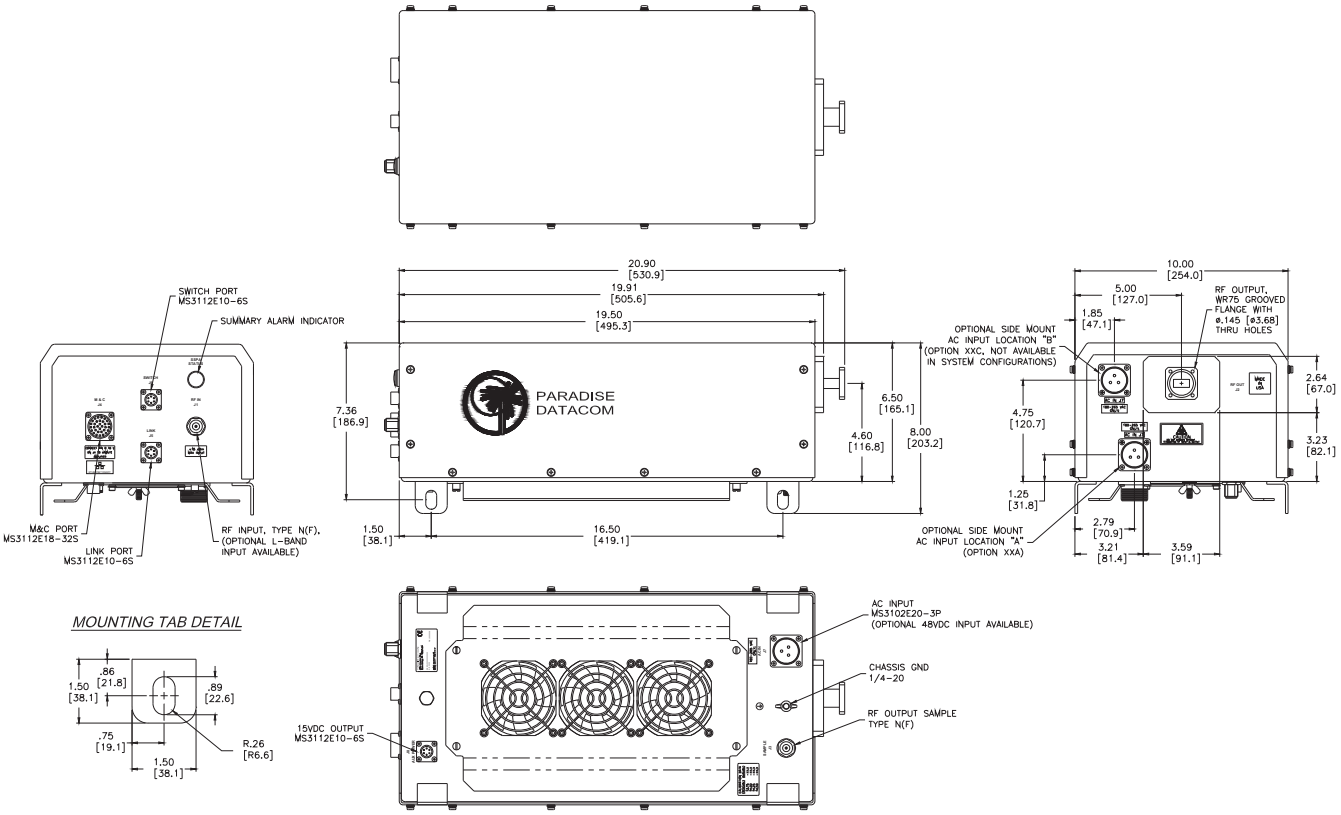
Electrical Specifications for Compact Outdoor with zBUC converter

PARAMETER	NOTES	LIMITS		UNITS
Gain Gain Flatness Gain Slope Gain Adjusted Range Gain Stability	Nominal setting full band per 40 MHz -40 to +55 °C	75 ± 2.0 ± 0.5 20 ± 1.5		dB dB dB/40 MHz dB dB
Phase Noise	Offset frequency from carrier 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz 1 MHz	Absolute max. -30 -60 -70 -80 -90 -90	Ku-band (typ.) -50 -65 -72 -90 -110 -120	 dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz
Spurious	In-Band Signal Related Close to Carrier Spurious (≤ 20 MHz) Local Oscillator		-50 -50 -30	dBc dBc dBm
Noise Figure	At 75 dB gain setting		20	dB
Input VSWR	L-Band		1.5 : 1	
Internal Reference Option	Reference accuracy @ 25 °C Reference Stability over Temperature (-40 to +90 °C)		$\pm 1 \cdot 10^{-7}$ $\pm 1 \cdot 10^{-8}$	

Compact Outdoor SSPA

4th Generation Ku-Band SSPAs
150W, 200W & 250W Ku-Band

Outline Drawing, Ku-Band Compact Outdoor SSPA



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	150W Base Unit 200W, 250W Base Unit With Internal zBUC	36 (16.4) ± 3% 44 (20.0) ± 3% +1.7 (0.8)	lbs. (kg) lbs. (kg) lbs. (kg)
Finish		Paint	White; powder coat
Connectors	RF Input RF Output RF Output Sample Line Power Monitor and Control Link Port Redundancy Switch Auxiliary +15VDC LNB Power (500 mA)	Type N WR75 Waveguide Type N 3-pin MS-type 32-pin MS-type 6-pin MS type 6-pin MS-type 6-pin MS-type	Female Grooved flange (PBR-120) Female Plug Socket 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		

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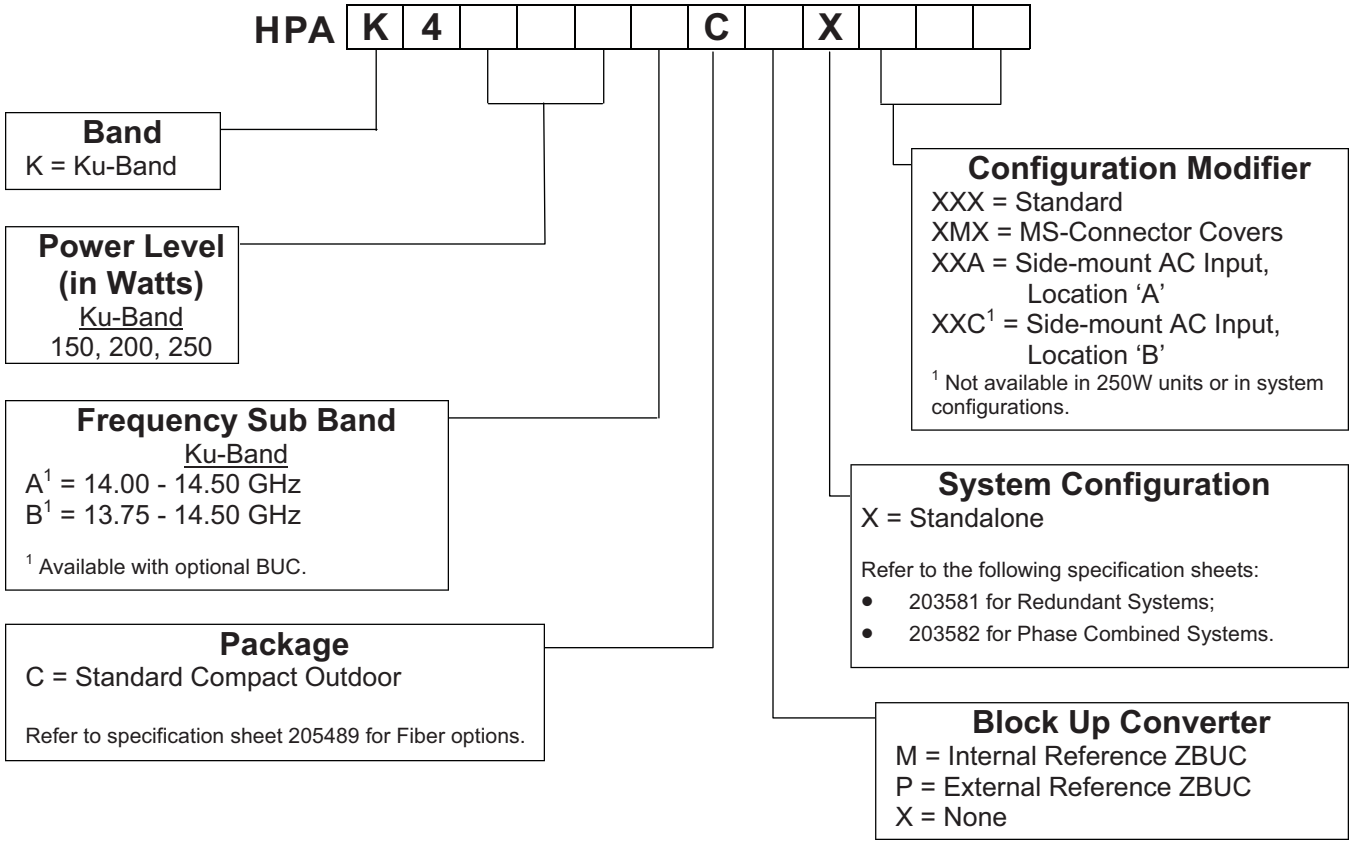
Part Number Configuration



Example: A standalone 4th Generation 150W Ku-Band Compact Outdoor SSPA with optional MS-Connector covers is part number: **HPAK4150ACXXXMX**.

Specifications listed in this document are subject to change without notice.