



100W Ku-Band Compact
Outdoor SSPA

DESCRIPTION

Paradise Datacom's **Compact Outdoor (-CO)** series SSPAs finally bring high power solid state transmit amplifiers right to the antenna's feed. Designed for antenna-mount applications the **-CO** series SSPAs deliver the highest uplink powers available per unit volume and weight offered anywhere in solid state technology. Packaged for outdoor use, these amplifiers are entirely self-contained with on board power supply, cooling and monitor and control systems.

Designed for convenient integration and long-term, reliable, uninterrupted service, these units are loaded with innovative engineering. From unique RF power combining techniques and a novel approach for thermal management to a proven robust power supply and comprehensive M&C, the **Compact Outdoor** SSPA offers new utility in the world of transmit amplifiers.

Weighing in at just 36 lbs. (16.4 kg), and only slightly larger than a shoe box, the **-CO** series of SSPAs is available in power levels ranging from 50 through 300 watts at S-Band frequencies; 30 through 300 watts at C-Band; 60 through 250 watts at X-Band; and 10 through 125 watts at Ku-Band frequencies. Extended frequency band operation and L-band input are supported as well.

FEATURES

- Power levels to:
300W S-Band;
300W C-Band;
250W X-Band;
125W Ku-Band
- 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

OPTIONS

- Antenna Mounting Kit
- DC Operation (48VDC)
- Remote Control Panel
- L-Band Input
- FSK monitor & control via IFL
- Phase Combined Systems
- Wireless local interface - Bluetooth™ enabled
- 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
36.0 lbs. / 16.4 kg;
44.0 lbs. / 20.0 kg for higher powered units
- White powder coat finish
- Operating temperature:
-40 to +60 °C



Table 2-1: Specifications, HPAS2000 Series, S-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range	A Series Sub-band B Series Sub-band	2.020 to 2.120 2.200 to 2.300	GHz GHz
Output Power @: Saturation/P _{1dB} (Typical/Guaranteed minimum)	A Series HPAS2050ACXXXXX (2.020 - 2.120 GHz) HPAS2100ACXXXXX (2.020 - 2.120 GHz) HPAS2200ACXXXXX (2.020 - 2.090 GHz) HPAS2200ACXXXXX (2.095 - 2.120 GHz) HPAS2300ACXXXXX (2.020 - 2.090 GHz) HPAS2300ACXXXXX (2.095 - 2.120 GHz) B Series HPAS2050BCXXXXX (2.200 - 2.300 GHz) HPAS2100BCXXXXX (2.200 - 2.300 GHz) HPAS2200BCXXXXX (2.200 - 2.300 GHz) HPAS2300BCXXXXX (2.200 - 2.300 GHz)	P _{sat} / P _{1dB} 47.5/47.0 (56/50) 50.5/50.0 (112/100) 53.5/53.0 (223/200) 53.0/52.5 (200/178) 55.0/54.5 (316/280) 54.4/54.0 (280/250) 47.5/47.0 (56/50) 50.5/50.0 (112/100) 53.5/53.0 (223/200) 55.0/54.5 (316/280)	dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W)
Power Requirements Line Voltage Line Frequency Line Power	power factor corrected HPAS2050ACXXXXX HPAS2100ACXXXXX HPAS2200ACXXXXX HPAS2300ACXXXXX	90 to 265 47 to 63 425 650 1000 (180 - 265 VAC only) 1600 (180 - 265 VAC only)	VAC Hz W W W W

Table 2-2: Specifications, HPAC2000 Series, C-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range	(see options for extended band)	5.850 to 6.425	GHz
Output Power @: Saturation/P _{1dB} (Typical/Guaranteed minimum)	HPAC2030ACXXXXX HPAC2040ACXXXXX HPAC2050ACXXXXX HPAC2075ACXXXXX HPAC2100ACXXXXX HPAC2140ACXXXXX HPAC2200ACXXXXX HPAC2250ACXXXXX HPAC2300ACXXXXX	P _{sat} / P _{1dB} 45.0/44.8 (32/30) 46.0/45.8 (40/38) 47.0/46.8 (50/48) 48.8/48.5 (76/70) 50.0/49.5 (100/89) 51.5/51.0 (141/126) 53.0/52.3 (200/170) 53.9/53.0 (250/200) 54.7/54.0 (300/251)	dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W)
Power Requirements Line Voltage Line Frequency Line Power	power factor corrected HPAC2030ACXXXXX HPAC2040ACXXXXX HPAC2050ACXXXXX HPAC2075ACXXXXX HPAC2100ACXXXXX HPAC2140ACXXXXX HPAC2200ACXXXXX HPAC2250ACXXXXX HPAC2300ACXXXXX	90 to 265 47 to 63 250 300 400 450 700 850 (180 - 265 VAC)* 1000 (180 - 265 VAC)* 1300 (180 - 265 VAC)* 1700 (180 - 265 VAC)* *90-265 VAC option available	VAC Hz W W W W W W W W



Table 3-1: Specifications, HPAX2000 Series, X-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range	(see options for extended band)	7.900 to 8.400	GHz
Output Power @: Saturation/P _{1dB} (Typical/Guaranteed minimum)	HPAX2060ACXXXXX HPAX2075ACXXXXX HPAX2100ACXXXXX HPAX2140ACXXXXX HPAX2200ACXXXXX HPAX2250ACXXXXX	P _{sat} / P _{1dB} 47.5 / 47.3 (60 / 54) 48.8 / 48.3 (76 / 68) 50.0 / 49.5 (100 / 89) 51.4 / 50.8 (140 / 120) 53.0 / 51.8 (200 / 170) 54.0 / 53.0 (250 / 200)	dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W)
Power Requirements Line Voltage Line Frequency Line Power	power factor corrected HPAX2060ACXXXXX HPAX2075ACXXXXX HPAX2100ACXXXXX HPAX2140ACXXXXX HPAX2200ACXXXXX HPAX2250ACXXXXX	90 to 265 47 to 63 650 700 750 1225 (180-265 VAC)* 1370 (180-265 VAC)* 1550 (180-265 VAC)* *90-265 VAC option available	VAC Hz W W W W W W

Table 3-2: Specifications, HPAK2000 Series, Ku-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range	(see options for extended band)	14.00 to 14.50	GHz
Output Power @: Saturation/P _{1dB} (Typical/Guaranteed minimum)	HPAK2010ACXXXXX HPAK2020ACXXXXX HPAK2025ACXXXXX HPAK2035ACXXXXX HPAK2040ACXXXXX HPAK2050ACXXXXX HPAK2070ACXXXXX HPAK2100ACXXXXX HPAK2125ACXXXXX	P _{sat} / P _{1dB} 40.0/39.0 (10/8) 43.0/42.0 (20/16) 44.0/43.0 (25/20) 45.5/44.5 (35/28) 46.0/45.0 (40/31) 47.0/46.0 (50/40) 48.5/47.5 (70/56) 50.0/49.0 (100/80) 51.0/50.0 (125/100)	dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W) dBm (W)
Power Requirements Line Voltage Line Frequency Line Power	power factor Line voltage Line frequency HPAK2010ACXXXXX HPAK2020ACXXXXX HPAK2025ACXXXXX HPAK2035ACXXXXX HPAK2040ACXXXXX HPAK2050ACXXXXX HPAK2070ACXXXXX HPAK2100ACXXXXX HPAK2125ACXXXXX	.98 90 to 265 47 to 63 220 250 320 350 550 600 650 1000 (180-265 VAC)* 1150 (180-265 VAC)* *90-265 VAC option available	VAC Hz W W W W W W W W

Table 4-1: Common Electrical Specifications

PARAMETER	NOTES	LIMITS	UNITS
Gain	range	55-75	dB
Gain Flatness	full band (C-,X-,Ku-bands)	±1.0	dB
	full band (S-band)	±0.5	dB
Gain Slope	per 40 MHz (C-,X-,Ku-bands)	±0.3	dB/40 MHz
	Per 40 MHz (S-band)	±0.1	dB/40 MHz
Gain Variation vs. Temperature	-40°C TO +60°C	±1.0	dB
Gain Adjustment	0.1 dB resolution adjustable by either serial or analog voltage input: 0.5 to 2.5 VDC	20	dB
Intermodulation Distortion	3dB back off relative to P _{1dB}	-25	dBc
AM/PM Conversion	(@ rated P _{1dB})	3.5	°/dB
Spurious	(@ rated P _{1dB})	-60	dBc
Harmonics	(@ rated P _{1dB-3dB}) (C-,X-,Ku-bands)	-50	dBc
	(@ rated P _{1dB-3dB}) (S-band)	-30	dBc
Input/Output VSWR		1.30:1	
Noise Figure	at maximum gain (C-,X-,Ku-bands)	10	dB
	at maximum gain (S-band)	8	dB
Group Delay (per 40 MHz segment)	Linear	0.01	ns/MHz
	Parabolic	0.003	ns/MHz ²
	Ripple	1.0	ns p-p
Noise Output	TX Band	-75	dBW/4 KHz
	RX Band (C-,X-,Ku-bands)	-150	dBW/4 KHz
	RX Band (S-band)	See options	
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	Offset frequency from carrier		
	10 Hz	-90	dBc/Hz
	100 Hz	-100	dBc/Hz
	1 KHz	-110	dBc/Hz
	10 KHz	-120	dBc/Hz
	100 KHz	-125	dBc/Hz
	1 MHz	-130	dBc/Hz

Table 4-2: M&C Interface, HPA_2000 Series, Compact Outdoor SSPA

Monitor & Control User Interface	Interface includes:	Summary alarm (out) Auxiliary alarm (out) Summary alarm (out) Auxiliary alarm (out) Voltage alarm (out) Current alarm (out) Temperature alarm (out) Remote mute (in) Auxiliary alarm (in) RF power monitor (out) Analog gain adjustment BUC alarm (option) M&C Host PC Link	Form C relay Form C relay Open collector output Open collector output Open collector output Open collector output Open collector output Open collector output Closure to ground Closure to ground + 4vdc @ P _{sat} 0.5 to 2.5 VDC Open collector output RS232 – RS485
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Table 5-1: Mechanical Specifications, HPA_2000 Series, Compact Outdoor SSPA

Size	width X length X height	10.0 X 19.5 X 6.50 254 X 495 X 165	inches mm
Weight	S-/C-/X-Band to 200W / Ku-Band to 70W 250W C-Band / 100, 125 W Ku-Band 250W X-Band	36 (16.4) 44 (20.0) 46 (20.9)	lbs.(kg) lbs.(kg) lbs.(kg)
Finish		Paint	White; powder coat
Connectors	RF Input RF Output HPAS2XXXACXXXXX HPAK2XXXACXXXXX HPAC2XXXACXXXXX HPAX2XXXACXXXXX RF Output Sample Line Power Monitor and Control Link Port Redundancy Switch Auxiliary +15VDC LNB Power (500 mA)	Type N Type N WR75 Waveguide WR137 Waveguide WR112 Waveguide Type N 3-pin MS-type 32-pin MS-type 6-pin MS type 6-pin MS-type 4-pin MS-type	Female Female Grooved flange (PBR-120) CPR137G flange (PDR-70) CPR112G flange (PDR84) Female Plug Socket Socket Socket Socket

Table 5-2: Environmental Specifications

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		

Table 5-3: Options

Extended Frequency Band Ku-Band: 13.75 to 14.50 GHz C-Band: 5.850 to 6.725 GHz C-Band: 5.750 to 6.670 GHz C-Band: 6.425 to 6.725 GHz C-Band: 6.725 to 7.025 GHz X-Band: 7.50 to 8.50 GHz X-Band: 7.70 to 8.40 GHz X-Band: 7.75 to 8.50 GHz	De-rate power by 1.0dB linearly from 14.00 to 13.75 GHz De-rate power by 1.0dB linearly from 6.425 to 6.725 GHz De-rate power by 1.0dB linearly from 6.425 to 6.670 GHz and by 0.5 dB from 5.850 to 5.750 GHz	Model: HPAK2XXXBCXXXXX Model: HPAC2XXXBCXXXXX Model: HPAC2XXXCCXXXXX Model: HPAC2XXXECXXXXX Model: HPAC2XXXFCXXXXX Model: HPAX2XXXBCXXXXX Model: HPAX2XXXDCXXXXX Model: HPAX2XXXECXXXXX
48 VDC operation	42-60	VDC
Remote Control Panel	Consult the factory	
L-Band Input		
FSK M&C via IFL		
Wireless Local Interface		
Fiber Optic Interface		
Optional Side-mount AC Input		Model: HPA_2XXXXCXXXXA

Specifications are subject to change.

Table 5-4: S-Band Receive Band Noise and Filter Option

Receive Band Reject Filter External filter for sub-band A SSPAs only	Insertion Loss Rx Reject @ 2.200 GHz	- 0.3 - 60	dB dB
Receive Band Noise Power Density For sub-band A SSPAs only	Without optional filter With optional filter	-95 -155	dBw/4 KHz dBw/4 KHz

Local and Remote Interfaces



RCP2-1000 Remote Control Panel

The RCP2-1000 provides easy remote monitor and control of the Compact Outdoor SSPA. Control of the RCP2-1000 can be handled through front panel operation or remotely via parallel or serial communication to a remote computer.

The RCP2-1000 front panel includes 10 LEDs that indicate the internal state of the Compact Outdoor SSPA. Five fault condition LEDs on the left side of the front panel indicate any SSPA major faults, in addition to a summary fault state. A 2 line by 40 character LCD provides an extremely user friendly interface. Virtually all of the controller's setup and adjustments are accessible from the LCD. Four navigation buttons and a separate Enter key allow the user to navigate the firmware menu on the LCD.

Separate buttons have been provided for frequently used functions. A range of RF hardware options is offered to meet specific system requirements.

Compact Outdoor Wireless M&C Unit

The Paradise Datacom Wireless M&C Unit is a unique Monitor and Control option for the Compact Outdoor SSPA. By incorporating *Bluetooth™* technology, the unit allows the Compact Outdoor SSPA to be controlled from up to 10 meters away by a handheld device. The full featured Wireless M&C software that is included with the module can be installed on any Bluetooth enabled device running the Microsoft Pocket™ PC operating system.

Packaged for outdoor use, this module is back-powered from the Compact Outdoor SSPA through the M&C connector. The rugged Nema 4x enclosure protects the device from harsh environments such as rain, snow, and extended UV exposure. An existing RS232/RS485 M&C cable can remain connected to the unit for remote monitor and control.



As an added measure of security, the Wireless M&C Unit can be internally disabled. When the unit is disabled or is not in use, the unit acts as a M&C cable feed-through, which extends all functions of the Compact Outdoor's M&C Port.

Optional side-mounted AC input

To better facilitate compact storage in fly-away and SNG vehicle installations, Paradise Datacom offers an option for a side-mounted AC Mains connector.

This connector is relocated to the same face as the RF Output port on the Compact Outdoor SSPA.



Operation with optional FSK ZBUC™

Paradise Datacom offers C-, Ku- and X-Band L-Band Block Up Converters (ZBUCs) which offer the capability of FSK communication. These ZBUCs add no additional gain to the Compact Outdoor SSPA's nominal gain setting. The only specification deviation is the obvious input frequency band and the full-band gain flatness, which becomes ± 1.5 dB. The reference input is diplexed onto the L-Band input. The block up converter's local oscillator is autosensing, and will phase lock to a 5 MHz, 10 MHz, 20 MHz, 25 MHz or 50 MHz external reference signal. The SSPB local oscillator's phase noise is Intelsat/ Eutelsat compliant when locked to an appropriate reference signal.

Table 7-1: Frequency Bands

Band	SSPB Model Number*	IF Input	LO Frequency	RF Output
C	HPAC2###ACPXXXX	950 - 1525 MHz	4.900 GHz	5.850 - 6.425 GHz
C	HPAC2###BCPXXXX	950 - 1825 MHz	4.900 GHz	5.850 - 6.725 GHz
C	HPAC2###ECPXXXX	950 - 1250 MHz	5.475 GHz	6.425 - 6.725 GHz
C	HPAC2###FCPXXXX	950 - 1250 MHz	5.775 GHz	6.725 - 7.025 GHz
X	HPAX2###ACPXXXX	950 - 1450 MHz	6.950 GHz	7.900 - 8.400 GHz
Ku	HPAK2###ACPXXXX	950 - 1450 MHz	13.050 GHz	14.00 - 14.50 GHz
Ku	HPAK2###BCPXXXX	950 - 1700 MHz	12.800 GHz	13.75 - 14.50 GHz

* Listed model numbers indicate an external reference; ### indicates the power level of the SSPA.

Table 7-2: Local Oscillator Phase Noise

Offset	Intelsat Mask	C-Band (Typical)	X-Band (Typical)	Ku-Band (Typical)	Units
10 Hz	-30	-60	-60	-50	dBc/Hz
100 Hz	-60	-80	-75	-65	dBc/Hz
1 KHz	-70	-80	-75	-72	dBc/Hz
10 KHz	-80	-85	-100	-90	dBc/Hz
100 KHz	-90	-120	-110	-110	dBc/Hz
1 MHz	-90	-125	-122	-120	dBc/Hz

Optional fiber-optic interface

Paradise Datacom offers a variety of fiber-optic interface options to the popular Compact Outdoor Solid-State Power Amplifier. The interface allows protocol transparent transmission of block down-converted C-, X-, and Ku-Band signals for distances of up to 10 km.

Full asymmetric up/downlink can be integrated with the Compact Outdoor SSPA, or via an external conversion box (OFM-1000). Both configurations require the low-cost 1RU RCPF-1000 Remote Control Panel. Paradise Datacom's Universal M&C software allows full control of the unit over the fiber connection.

Fiber-optic configurations include:

- Add-on L-Band to Fiber Transceiver ODU, OFM-1000;
- Integrated L-Band to Fiber Transceiver inside Compact Outdoor SSPA.



**Compact Outdoor SSPA with
integrated fiber-optic interface**

Operation with optional Block Upconverter

An L-band block upconverter can be integrated into a Compact Outdoor SSPA assembly to permit operation directly from a modem. C-, X- & Ku-Band SSPAs may be fitted with an appropriate converter module.

The block upconverter adds no additional gain to the Compact Outdoor SSPA's nominal gain setting. The only specification deviation is the obvious input frequency band and the full-band gain flatness, which becomes ± 1.5 dB. The reference input is diplexed onto the L-Band input. The block upconverter's local oscillator is phase locked to a 10 MHz or 50 MHz reference signal. The SSPB local oscillator's phase noise is Intelsat/ Eutelsat compliant when locked to an appropriate reference signal. Table 8-1 shows the SSPB frequency plan options. The local oscillator phase noise and required reference signal phase noise are given in Tables 8-2 and 8-3.

Table 8-1: Standard SSPB Frequency Plan Options for Compact Outdoor SSPA

Model Number	Input Frequency	Output Frequency	LO Frequency	Ref. Freq.	Ref. Source
HPAC2XXXACCXXXX	950 - 1525 MHz	5.850 - 6.425 GHz	4.90 GHz	10 MHz	External
HPAC2XXXACDXXXX	950 - 1525 MHz	5.850 - 6.425 GHz	4.90 GHz	50 MHz	External
HPAC2XXXACEXXXX	950 - 1525 MHz	5.850 - 6.425 GHz	4.90 GHz	10 MHz	Internal
HPAC2XXXACFXXXX	950 - 1525 MHz	5.850 - 6.425 GHz	4.90 GHz	50 MHz	Internal
HPAC2XXXBCCXXXX	950 - 1825 MHz	5.850 - 6.725 GHz	4.90 GHz	10 MHz	External
HPAC2XXXBCDXXXX	950 - 1825 MHz	5.850 - 6.725 GHz	4.90 GHz	50 MHz	External
HPAC2XXXBCEXXXX	950 - 1825 MHz	5.850 - 6.725 GHz	4.90 GHz	10 MHz	Internal
HPAC2XXXBCFXXXX	950 - 1825 MHz	5.850 - 6.725 GHz	4.90 GHz	50 MHz	Internal
HPAX2XXXACCXXXX	950 - 1450 MHz	7.90 - 8.40 GHz	6.95 GHz	10 MHz	External
HPAX2XXXACDXXXX	950 - 1450 MHz	7.90 - 8.40 GHz	6.95 GHz	50 MHz	External
HPAX2XXXACEXXXX	950 - 1450 MHz	7.90 - 8.40 GHz	6.95 GHz	10 MHz	Internal
HPAX2XXXACFXXXX	950 - 1450 MHz	7.90 - 8.40 GHz	6.95 GHz	50 MHz	Internal
HPAK2XXXACCXXXX	950 - 1450 MHz	14.00 - 14.50 GHz	13.05 GHz	10 MHz	External
HPAK2XXXACDXXXX	950 - 1450 MHz	14.00 - 14.50 GHz	13.05 GHz	50 MHz	External
HPAK2XXXACEXXXX	950 - 1450 MHz	14.00 - 14.50 GHz	13.05 GHz	10 MHz	Internal
HPAK2XXXACFXXXX	950 - 1450 MHz	14.00 - 14.50 GHz	13.05 GHz	50 MHz	Internal
HPAK2XXXBCCXXXX	950 - 1700 MHz	13.75 - 14.50 GHz	12.80 GHz	10 MHz	External
HPAK2XXXBCDXXXX	950 - 1700 MHz	13.75 - 14.50 GHz	12.80 GHz	50 MHz	External
HPAK2XXXBCEXXXX	950 - 1700 MHz	13.75 - 14.50 GHz	12.80 GHz	10 MHz	Internal
HPAK2XXXBCFXXXX	950 - 1700 MHz	13.75 - 14.50 GHz	12.80 GHz	50 MHz	Internal

Table 8-2: Reference Oscillator Requirements

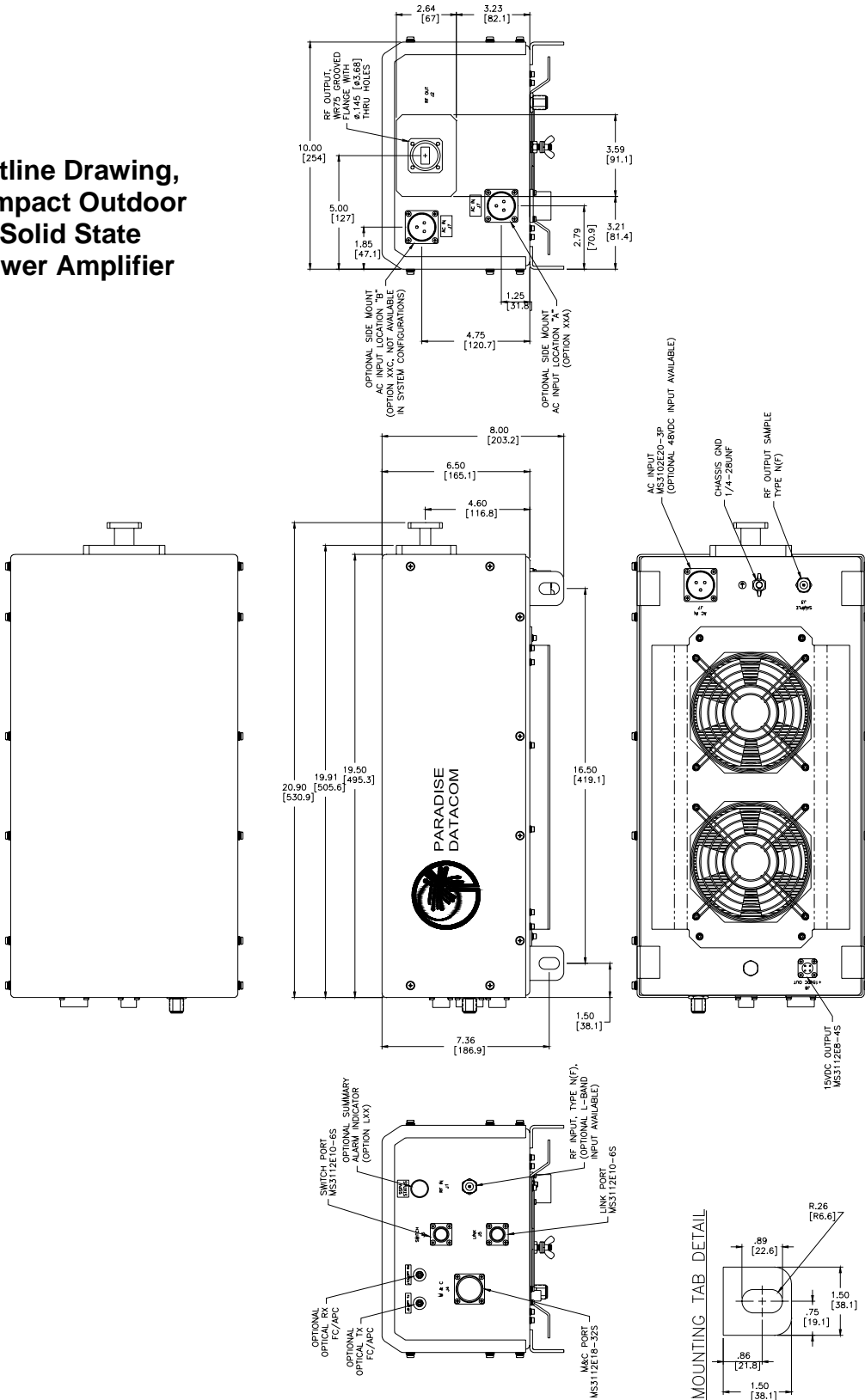
Parameter	Specification		Units	
Frequency	50	10	MHz	
Power	0 dBm +/- 5.0		dB	
Output Impedance	50		Ohms	
Phase Noise	10 Hz	-110	-124	dBc/Hz
	100 Hz	-131	-145	dBc/Hz
	1 KHz	-146	-160	dBc/Hz
	10 KHz	-151	-165	dBc/Hz
	100 KHz	-151	-165	dBc/Hz

Table 8-3: Local Oscillator Phase Noise

Offset	Phase Noise	Units
10 Hz	-45	dBc/Hz
100 Hz	-70	dBc/Hz
1 KHz	-82	dBc/Hz
10 KHz	-88	dBc/Hz
100 KHz	-94	dBc/Hz
1 MHz	-110	dBc/Hz



Outline Drawing, Compact Outdoor Solid State Power Amplifier





Part Number Configuration

HPA 2 X

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

Power Level (in Watts)
S-Band
050, 100, 200 or 300
C-Band
030, 040, 050, 075, 100, 140,
200, 250 or 300
X-Band
060, 075, 100, 140, 200, or 250
Ku-Band
010, 020, 025, 035, 040, 050,
070, 100, or 125

Frequency Sub Band
S-Band
A - 2.020 - 2.120 GHz
B - 2.200 - 2.300 GHz
C-Band
A* - 5.85 - 6.425 GHz
B* - 5.85 - 6.725 GHz
C** - 5.75 - 6.670 GHz
E* - 6.425 to 6.725 GHz (Palapa)
F* - 6.725 to 7.025 GHz (Insat)
X-Band
A* - 7.90 to 8.40 GHz
B - 7.50 to 8.50 GHz
D - 7.70 to 8.40 GHz
E - 7.75 to 8.50 GHz
Ku-Band
A* - 14.00 - 14.50 GHz
B* - 13.75 - 14.50 GHz

* Available with optional BUC
**Derate power by 1.0 dB from 6.425 to 6.670 GHz and
by 0.5 dB from 5.850 to 5.750 GHz

Package
C = Standard Compact Outdoor

Refer to specification sheet 204020 for Fiber options.

Configuration Modifier
XXX = Standard
BXX** = 110 VAC Option and
Summary Alarm Indicator
KXX** = 110 VAC Option
LXX = Summary Alarm Indicator
XXM = MS-connector Covers
XXA = Side-mount AC Input,
Location 'A'
XXC* = Side-mount AC Input,
Location 'B'
XXD = 48V Input
XXF = Side-mount 48V Input,
Location 'A'
XXG* = Side-mount 48V Input,
Location 'B'

* Not available with System Configurations
** Available in C-Band models $\geq 140W$,
X-Band models of 140W-200W and
Ku-Band models $\geq 100W$.

System Configuration
X = Standalone

See the following specification sheets for the
appropriate configuration:

- Outdoor Packaged Redundant SSPA
Systems (203581)
- Outdoor Packaged Phase Combined SSPA
Systems (203582)

Block Up Converter
B = BUC (Custom)
C = 10 MHz Ext. Ref. Std. LO
D = 50 MHz Ext. Ref. Std. LO
E = 10 MHz Int. Ref. Std. LO
F = 50 MHz Int. Ref. Std. LO
M = Internal Reference ZBUC (FSK)
P = External Reference ZBUC (FSK)
X = None

Example - A standalone 70W Extended Ku-Band Compact Outdoor SSPA with an optional 48 VDC input and no block up converter is part number: **HPAK2070BCXXXXD**.