



25W C-Band BUC

Paradise Datacom's second generation **VSAT Block Up Converters** is a completely new design based on the new ZBUC™ intelligent technology and the reliability of the Paradise Datacom SSPA product line.

For system compatibility, the package size and footprint have been maintained from the first generation VSAT BUC.

A wide range of monitor and control is standard and includes:

- Legacy FSK protocol
- Standard Paradise Datacom RS485
- Ethernet Interface supporting:
  - UDP
  - SNMP
  - Internal Web Browser

The vBUC is available in 1:1 redundant configurations, 1:2 redundant configurations with the addition of a RCP2-1200 Redundant System Controller. Chain 1:1 redundancy is available with the use of a RCPD-1100 Dual Redundant Controller.

#### FEATURES

- Single box BUC output power levels to:
  - 50W C-Band
  - 35W X-Band
  - 50W Ku-Band
- Wide Range of Interface Capability including:
  - FSK Control
  - RS 485
  - Ethernet
- Output Power Detection
- Adjustable Gain
- Automatic detection of external reference power and frequency
- Multiple external reference frequency operation including:
  - 5, 10, 20, 25 & 50 MHz
- 11 lbs (5.0 kg)  
12.00 x 5.68 x 6.57 in  
305 x 144 x 167 mm

#### OPTIONS

- 6 Amp External Bias Tee for IFL Bias feed
- High Stability internal 10 MHz reference
- AC Power Supply
- 24 VDC operation on selected models
- System Options including:
  - 1:1 & 1:2 and 1:1 Chain Redundancy
  - TX & RX Reject Filters

#### ENVIRONMENTAL LIMITS

- -40 to +60 °C
- Humidity:
  - 100% condensing

**C-Band Output Power Levels**

PARAMETER	MODEL NUMBER	NOTES	LIMITS	UNITS
Frequency Range		*	5.850 to 6.425	GHz
Output Power @: Saturation/P <sub>1dB</sub> (Typical/Guaranteed minimum)	VBUCC25AAXXXXX VBUCC50AAXXXXX	<u>Gain</u> 74 dB 77 dB	P <sub>sat</sub> / P <sub>1dB</sub> 44.5/44.0 (28/25) 47.5/47.0 (56/50)	dBm (W) dBm (W)
Power Requirements 48 VDC Input @ max current draw	VBUCC25AAXXXXX VBUCC50AAXXXXX	<u>24 VDC current</u> 6.5 11.5	<u>48 VDC current</u> 3.0 5.6	Amps Amps

**X-Band Output Power Levels**

PARAMETER	MODEL NUMBER	NOTES	LIMITS	UNITS
Frequency Range			7.90 to 8.40	GHz
Output Power @: Saturation/P <sub>1dB</sub> (Typical/Guaranteed minimum)	VBU CX10AAXXXXX VBU CX25AAXXXXX VBU CX35AAXXXXX	<u>Gain</u> 70 dB 74 dB 75 dB	P <sub>sat</sub> / P <sub>1dB</sub> 40.5/40.0 (11/10) 44.5/44.0 (28/25) 45.5/45.0 (35/32)	dBm (W) dBm (W) dBm (W)
Power Requirements 48 VDC Input @ max current draw	VBU CX10AAXXXXX VBU CX25AAXXXXX VBU CX35AAXXXXX	<u>24 VDC current</u> 4.2 9.6 11.0	<u>48 VDC Current</u> 2.0 4.7 5.2	Amps Amps Amps

**Ku-Band Output Power Levels**

PARAMETER	MODEL NUMBER	NOTES	LIMITS	UNITS
Frequency Range		*	14.0 to 14.5	GHz
Output Power @: Saturation/P <sub>1dB</sub> (Typical/Guaranteed minimum)	VBU CK10AAXXXXX VBU CK16AAXXXXX VBU CK25AAXXXXX VBU CK50AAXXWXX	<u>Gain</u> 70 dB 72 dB 73 dB 77 dB	P <sub>sat</sub> / P <sub>1dB</sub> 40.5/40.0 (11/10) 43.0/42.0 (20/16) 44.0/43.0 (25/20) 47.0/45.0 (50/32)	dBm (W) dBm (W) dBm (W) dBm (W)
Power Requirements 48 VDC Input @ max current draw	VBU CK10AAXXXXX VBU CK16AAXXXXX VBU CK25AAXXXXX VBU CK50AAXXWXX	<u>24 VDC current</u> 6.2 9.1 10.1 N/A	<u>48 VDC Current</u> 3.0 4.5 5.0 6.0	Amps Amps Amps Amps

\* Units available with Extended band frequencies.

For C-Band units, de-rate output power by 1 dB over 6.425 - 6.725 GHz.

For Ku-Band units, de-rate output power by 1 dB over 13.75 - 14.0 GHz.

**Specifications**

PARAMETER	NOTES	LIMITS	UNITS
Gain Flatness	full band	$\pm 2.0$	dB
Gain Slope	per 40 MHz	$\pm 0.75$	dB
Gain variation vs. Temperature		$0 \pm 1.0$	dB
Intermodulation Distortion	3dB back off relative to $P_{1dB}$	-25	dBc
Spurious	In-Band Signal Related (C-/Ku-Band)	-50	dBc
	(Extended C-Band)	-40	dBc
	Close to Carrier Spurious ( $\leq 20$ MHz)	-70	dBc
	Local Oscillator	-70	dBm
	Non-Signal Related	-50	dBm
Harmonics	2 <sup>nd</sup> harmonic measured at $P_{1dB}$	-40	dBc
Output Spectrum	Low side Local Oscillator	Non Inverted	
Input VSWR		1.43:1	
Output VSWR		1.67:1	
Noise Figure		15	dB
Group Delay (per 40 MHz segment)	Linear	0.02	ns/MHz
	Parabolic	0.005	ns/MHz <sup>2</sup>
	Ripple	1.0	ns p-p
User Adjustable Gain	In 0.1 dB steps	+15	dB
Reference Input Frequency	Diplexed on L-Band Input Connector	5, 10, 20, 25, 50 MHz	MHz
Reference Input Power	Diplexed on L-Band Input Connector	-10 to +5	dBm
Input Voltage	+48 VDC nominal	+36 to +60	VDC
FSK Communication <sup>1</sup> Diplexed on L-Band Input	Center Frequency	650	KHz
	Deviation	$\pm 60$	KHz
	Locking Range	$\pm 32.5$	KHz
	Input Power Range	-15 to -5	dBm
	Start Tone Time	10	msec
Alarm Output	Phase Lock Alarm Internal BUC Voltages BUC Current +48 or +24 VDC Input Voltage Case Temperature LNB Current	Form C Summary Contacts	
Internal Reference Option <sup>2</sup>	Reference Frequency	10	MHz
	Freq. Stability over temperature range	$< \pm 1 \cdot 10^{-8}$	
	Aging per day	$< \pm 1 \cdot 10^{-9}$	
	Aging per year	$< \pm 5 \cdot 10^{-8}$	
	Frequency Accuracy	$\pm 1 \cdot 10^{-8}$	
Warm up time	20 minutes	$< \pm 1 \cdot 10^{-8}$	
Internal Reference Phase Noise	10 Hz	-120	dBc/Hz
	100 Hz	-140	dBc/Hz
	1 kHz	-145	dBc/Hz
	10 kHz	-152	dBc/Hz
	100 kHz	-155	dBc/Hz

<sup>1</sup> FSK Communication protocol, document # 201410

<sup>2</sup> Internal reference option units will automatically detect and switch to an applied external reference.

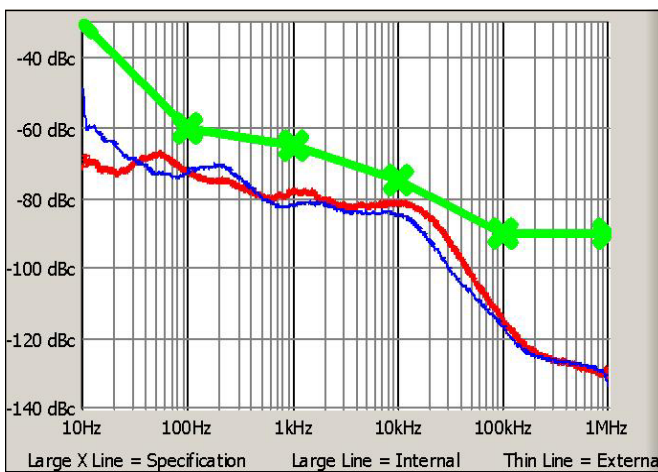
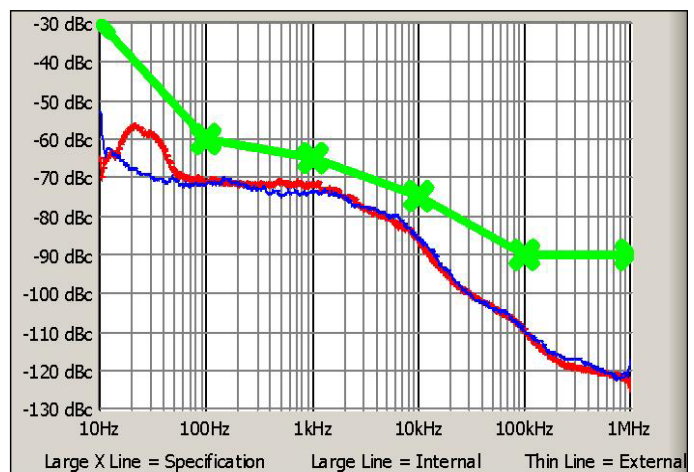
**Frequency Bands**

Band	Frequency Plan*	IF Input	LO Frequency	RF Output
C	Standard C-Band	950 - 1525 MHz	4.900 GHz	5.850 - 6.425 GHz
C	Extended C-Band	950 - 1825 MHz	4.900 GHz	5.850 - 6.725 GHz
C	Palapa Band	950 - 1250 MHz	5.475 GHz	6.425 - 6.725 GHz
C	Insat Band	950 - 1250 MHz	5.775 GHz	6.725 - 7.025 GHz
X	Standard X-Band	950 - 1450 MHz	6.950 GHz	7.900 - 8.400 GHz
Ku	Standard Ku-Band	950 - 1450 MHz	13.050 GHz	14.00 - 14.50 GHz
Ku	Extended Ku-Band	950 - 1700 MHz	12.800 GHz	13.75 - 14.50 GHz

\* Custom frequency plans available upon request.

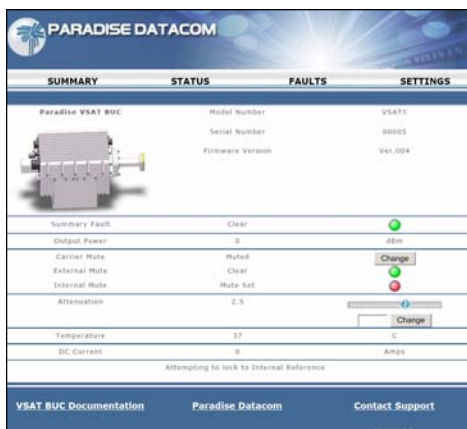
**Local Oscillator Phase Noise**

Offset	Guaranteed Max.	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	-65	-80	-75	-72	dBc/Hz
10 KHz	-75	-85	-100	-80	dBc/Hz
100 KHz	-90	-120	-110	-100	dBc/Hz
1 MHz	-90	-125	-122	-115	dBc/Hz


**Typical C-Band Phase Noise Plot**

**Typical Ku-Band Phase Noise Plot**

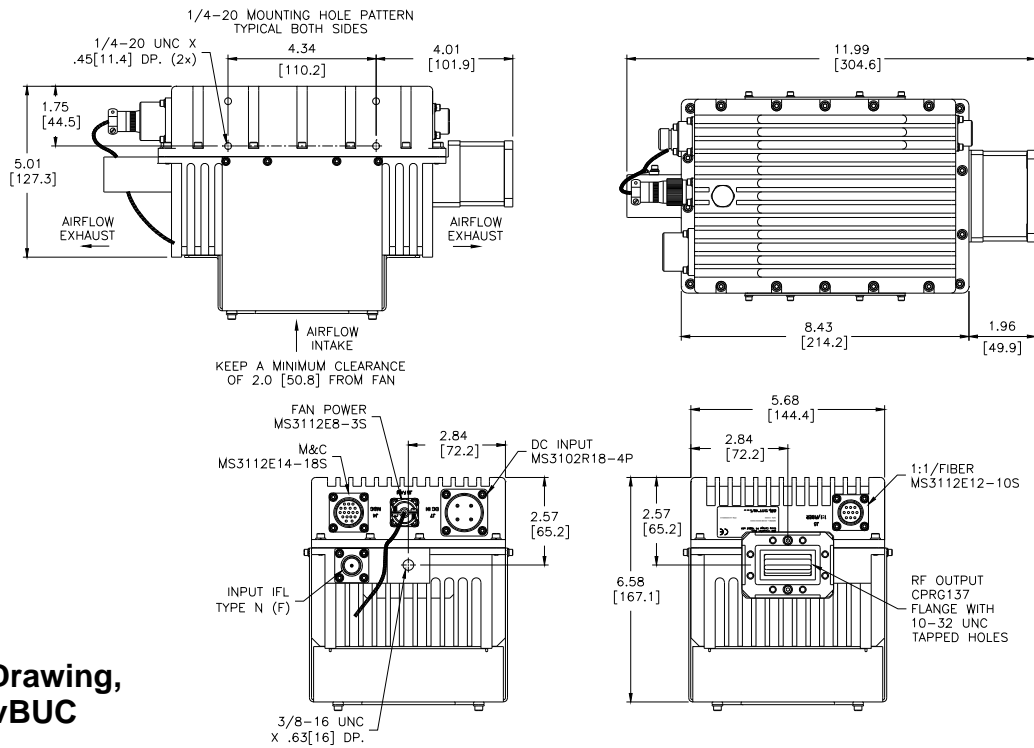
**Interfaces**

Port	Connector	Description	Details	
J1	L Band Input	IF, 10 MHz, FSK Input DC must be tapped off using external Bias Tee	Type N	female
J7	DC Input MS3102R18-4P	+48 VDC Optional +24 VDC	A B C D	+ VDC + VDC - VDC - VDC
J4	Monitor & Control MS3112E14-18S	Serial Communication Serial Communication Serial Communication Summary Alarm Contacts Summary Alarm Contacts Summary Alarm Contacts TX Inhibit Ethernet Ethernet Ethernet Ethernet Ethernet Ground Ground Ground Serial Override Ethernet Override	U R L B F D J H G C A E K M S N	RS-485 (-) RS-485 (+) Isolated Ground Form C - Closed on Fault Form C - Common Form C - Open on Fault Ground Enable TX TX - TX + RX - RX + Chassis Ground Chassis Ground Chassis Ground Ground resets to Serial Comms Ground resets to Ethernet Comms
J5	Link Connector MS3112E12-10S	Reserved Ground Ground +15 VDC for LNB Reserved Redundancy Switch Drive Link In Link Out Redundancy Switch Common	J C H A B G E F K	Closure to Ground Ground Ground Ground Current Sensed +15 VDC +15 VDC @ 1A +48 or +24 Current Sink  +48 or +24 VDC (Vin+)
J8	Fan Voltage MS3112E8-3S	V+ V-	A B	+48 or +24 VDC Return


**Universal M&C Software**

The Paradise Datacom Universal Monitor & Control software provides a remote view of the state of the vBUC via a web browser.

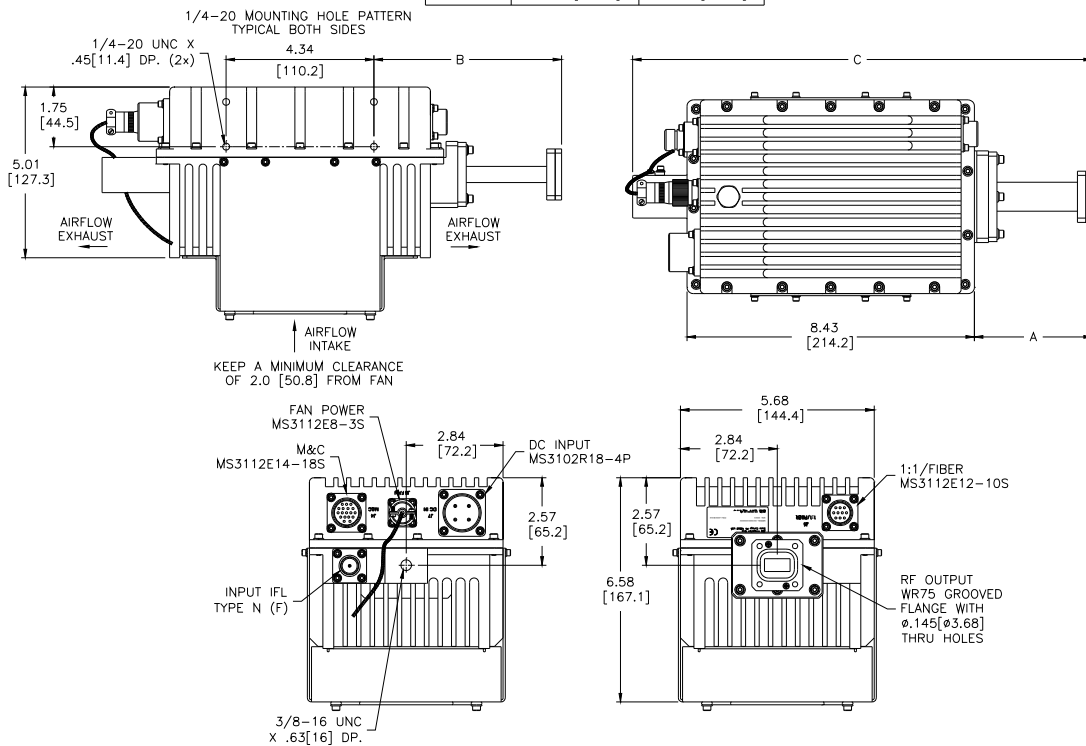
The user may adjust the attenuation of the vBUC and mute/unmute the unit. In addition, the web-based status screen shows the fault condition, mute state, current and temperature.



**Outline Drawing,  
C-Band vBUC**

**Outline Drawing,  
Ku-Band vBUC**

KU-BAND WAVEGUIDE OUTPUT LENGTHS		
DIMENSION	STANDARD BAND	EXTENDED BAND
A	3.46 [87.9]	2.91 [73.9]
B	5.51 [139.9]	4.96 [125.9]
C	13.49 [342.6]	12.94 [328.7]

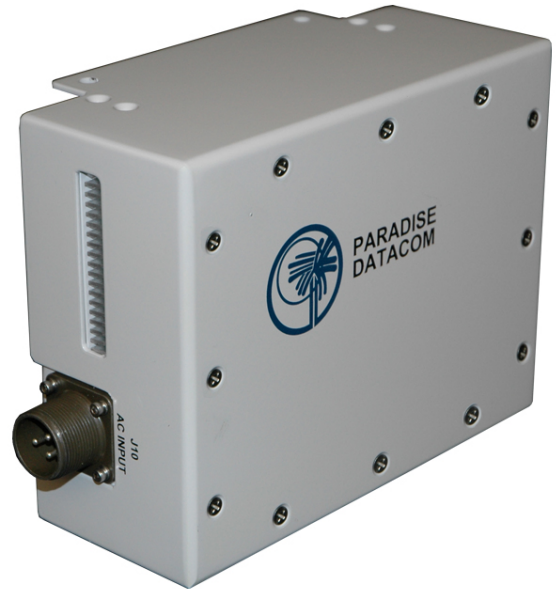


### AC Power Supply option

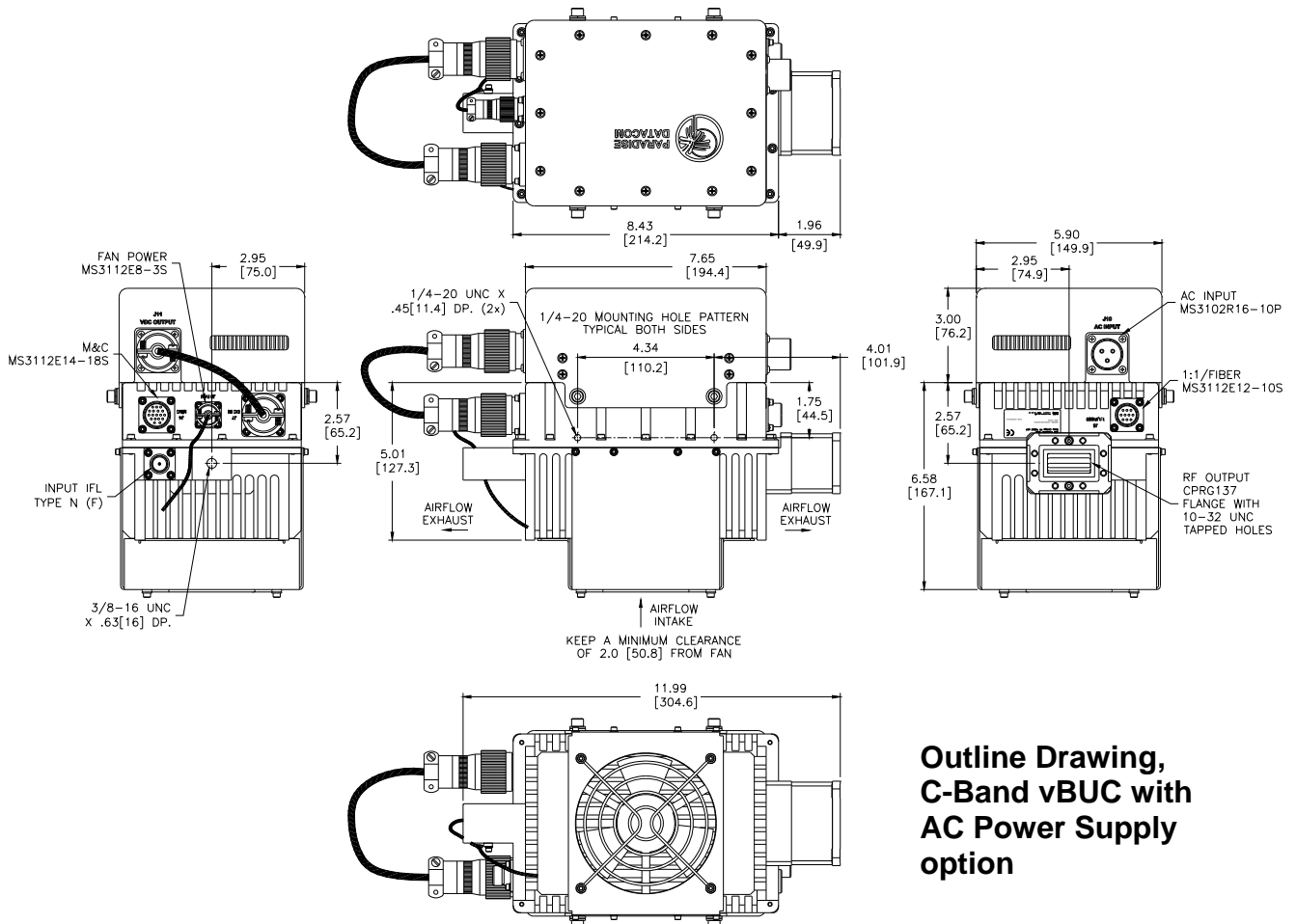
The vBUC is available with an optional AC Power Supply, which attaches to the top of the BUC, opposite the fan. An optional stand-alone mounting assembly is also available.

The AC Power Supply provides up to 500 Watts of power at 48VDC output.

Input power requirements: 85-265VAC, 47-63Hz.

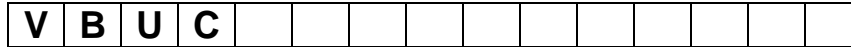


	Pin-outs			
	A	B	C	D
AC Input	Line	GND	Neutral	--
DC Output	+48V	+48V	48V Return	48V Return



**Outline Drawing,  
C-Band vBUC with  
AC Power Supply  
option**

**Part Number Configuration**



**Band**  
 C - C-Band  
 X - X-Band  
 K - Ku-Band

**Power Level  
(in Watts)**

C-Band  
 25, 50

X-Band  
 10, 25, 35

Ku-Band  
 10, 16, 25, 50

**Frequency Sub Band**

C-Band  
 A - 5.85 - 6.425 GHz  
 B - 5.85 - 6.725 GHz  
 C - 5.75 - 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

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

**Input Voltage**

A = +48 V  
 B<sup>1</sup> = +24 V

<sup>1</sup> Not available with 50W Ku-Band units

**Configuration Modifier**

XXX = Standard  
 WXX<sup>1</sup> = Waveguide Isolator

<sup>1</sup> Required for 50W Ku-Band units

**System Configuration Options**

X = Single Thread (Stand Alone)

See Drawing Number 203614 for redundant system configurations.

**Block Up Converter**

X = Standard External Reference  
 R = Internal 10 MHz Reference Oscillator

**Input Power Configuration**

X = Input Voltage on Circular Connector (Standard)  
 A\* = AC Power Supply mounted to BUC  
 B\* = AC Power Supply with DC connectors only  
 C\* = AC Power Supply with custom-length DC cable  
 T\* = External IFL Bias Tee

\* Available with +48V Input Voltage only