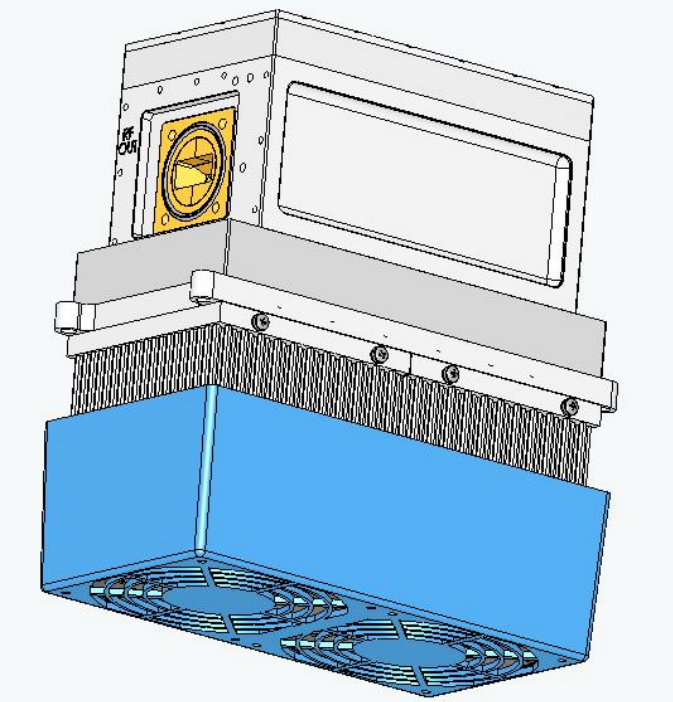
UE-BUC4-1315

Signature Series UE-BUC4-1315 Family

Ultra-compact 40 Watt (50 Watt Sat.) Ku band Block Upconverter w/Integrated SSPA

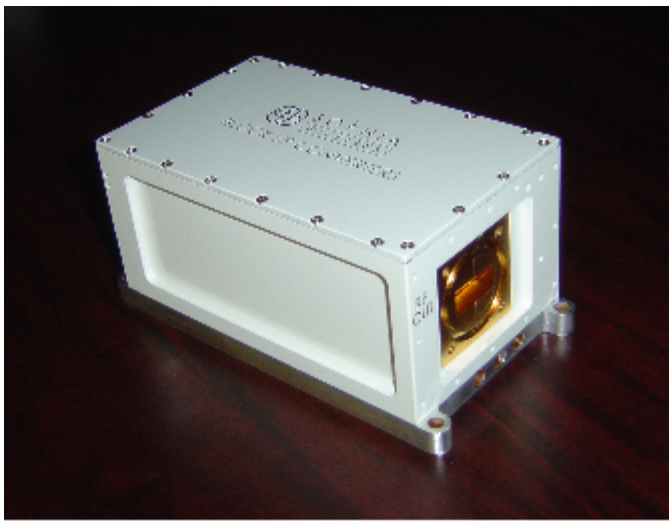
14.0-14.5 GHz and 13.75-14.5 GHz BUC Outdoor and Component Unit



KEY FEATURES:

- **Remarkably Small Size: 6.3”x3.1”x3.5”, 3.9 lbs. (component configuration) 6.3” x 3.15” x 7.40”, 6.0 lbs. (outdoor configuration)**
- **Integrated L-Band to Ku-Band Upconverter plus Power Amplifier**
- **Ku (14.0-14.5 GHz) or extended Ku (13.75-14.5 GHz)**
- **Ultra efficiency:**
  - *240W consumption (@40W RF out)*
- **Forward/Reverse Power Monitor & Control processor**
- **Gain vs. Temp. compensation**
- **Integrated heat-pipe baseplate**
- **Fully environmentally sealed**
- **Internal 10MHz reference; has internal OCXO**
- **Optional internal power supply**

Outdoor configuration (Order as Opt. FA)



Component configuration (no fan - conduction cooled through base plate)

Product Description:

Sophia Wireless’ new Signature Series Family of products are a breakthrough in size and weight reduction for high-powered Block Upconverters (BUC) with integrated Solid State Power Amplifier.
This new series takes Sophia Wireless’ already industry-leading size and weight and further reduces it by a large factor. This allows very compact systems for feedmount, satellite on-the-move, UAV, or other size/weight-constrained systems.

Furthermore, the industry-leading efficiency greatly reduces heat generation and power consumption, greatly simplifying system integration challenges.

The integrated BUC with SSPA eliminates all calibration and coordination challenges of mounting, powering, communicating with, and coordinating two separate BUC and SSPA units. Even for non-size-constrained systems, the smaller size, lower power, less heat management can lead to significant reductions in system cost and development effort.

Fan cooling and integrated power supply options - perfectly flexible in application:

The base component-type configuration is a component-only configuration which requires external cooling and power supply. Option FA is an optional fan-cooling accessory; when combined with the integrated 18V-60VDC power supply, this forms a complete, plug-and-play outdoor unit. In all cases this component unit is also fully environmentally sealed and ready for outdoor use.

Due to the extremely low power consumption and heat dissipation, the cooling and power supply are tiny and very low cost. Total weight with these all accessories is still under 6.0 pounds, less than any competitive solution.

1 x 1 redundancy system

Because of the remarkably small size and low weight of the Sophia BUC, it is perfect for redundant systems, where multiple units can be fit into the same space normally reserved for one conventionlal-sized unit.

This unit is available as a 1 x 1 redundancy system, please see the data sheet for the Sophia RDY-1100 rack mounted redundancy controller, which includes system diagrams and mounting instruction and dimensions. 2 x1 and more complex systems are available, please contact factory for details.

Features:

These units offer 50dB minimum gain with temperature compensation, output power monitor with RS422 (serial communication) readout, monitor & control processor, discrete transmit/mute control, **optional** internal OCXO/external 10MHz reference, fault protection and reporting for over-temperature, over-voltage or over-current**,** or loss of phase lock.

Performance Features:

The temperature compensation circuitry minimizes gain & linear power variations, and the forward & reverse power monitor simplifies system power settings & reverse power protection.
Safety controls include thermal & bias protection to ensure reliable performance from initial system integration to harsh field environments.

Monitor & Control Functions:

The monitor & control processor interfaces with a host computer over a serial communications link. All voltage, current, power, and temperature sensors are read through this interface, including output power monitoring. The transmit/mute control is opto-isolated for trouble-free system integration. The RS422 port communications run at 9600 baud, 8-bit word, no parity, and 1 stop bit.

The monitor & control also provides safety features such as over-temperature and loss of lock fault modes, automatically shutting down the SSPA and reporting these fault conditions over the serial link.

Internal 10 MHz frequency reference:

Internal frequency reference is provided by an integrated Ovenized Compensated Crystal Oscillator (OCXO). For extended band models, the internal 10MHz can also be exported on the L-band line to be used to provide reference to other components, further saving system integration effort.

Simplifying Heat Management:

The industry-leading efficiency greatly reduces power dissipation, thereby reducing heat generation.

With the component base, an integrated heatpipe baseplate provides even distribution of the heat load over the entire baseplate surface, eliminating hotspots and greatly simplifying the system thermal management. The optional fan cooler accessory then evenly distributes this heat to the fins, giving extremely low temperature rise above ambient.

Environmental Sealing:

Unlike many component-style (“indoor”) amplifiers, the core component unit is fully o-ring sealed, providing a higher level of reliability and immunity to moisture and dust. The unit may be mounted outdoors or exposed outside a radome and is fully qualified for all-weather operation, and has been proven in the most difficult of environments, from Arctic to Middle Eastern desert.

Understanding "Component" vs. "Outdoor" units:

Sophia's BUCs and SSPAs blur some of the traditional lines between indoor and outdoor units. The core BUC and SSPA are integrated together into a tiny, 6.3”x3.1”x3.5”, 3.9 lbs. package, which is completely water-tight and self-contained and ready to be used outdoors in all weather conditions. This may optionally incorporate an integrated 28VDC or 48VDC power supply, which increases the height of the unit from 3.5" to 4.0". Also, the optional fan-cooler accessory may be used.

The component version is typically used by more sophisticated system integrators. This component unit requires cooling. Cooling must be provided by removing heat from the bottom surface of the component. Due to the very low thermal dissipation of the unit, this heat engineering is much easier than with a typical BUC, and in many cases simply bolting to an aluminum frame member which has exposed area for convective and radiative cooling may be sufficient.

Some customers elect to engineer these cooling and/or power systems themselves. To provide maximum flexibility, Sophia offers the component with or without the integrated power supply and fan-cooling accessories. In some highly space- or weight- constrained applications, separating the power supply brings some advantages, such as reduction of feedarm weight, smaller size and weight in critical areas, and separation of the waste heat from the power supply.

For more traditional satcom applications, the fully self-contained configuration with integrated power supply and fan cooling accessory is recommended. Please specify option PS28 (for 24 or 28VDC systems) or option PS48 (for 48VDC systems), and option FA fan cooling option at time of order.

Electrical & Mechanical Specifications:

RF Parameters	**Specification**			
Output Frequency Band	14.0-14.5 GHz (13.75-14.5 GHz for extended Ku model). Other bands available from 12.6 GHz to 18.5 GHz; contact factory			
Input Frequency Band	950-1450 MHz (950-1700 MHz for extended Ku model)			
Power Output P1dB	40 Watts			
AM/PM Conversion @ 2dB below rated power	2.5°/dB			
F & R Power Monitor (15 dB Range)	+/- 0.25 dB			
Conversion Gain	50 dB min., 56 dB typ.			
Gain Variation over Frequency Band	6 dB max.			
Gain Variation over any 40MHz	1.5 dB max.			
Gain Variation over Temperature	3 dB max.			
Noise Figure	15 dB			
Input VSWR	1.5:1			
Output VSWR	2:1			
Spurious	-50dBc			
2nd Harmonic @ 3dB below rated pwr.	-45dBc			
Phase Noise	Offset	dBc/Hz	Offset	dBc/Hz
	1kHz	-72	100KHz	-92
	10kHz	-82	1MHz	-102
Internal 10 MHz Reference	**Specification**			
Internal 10 MHz reference	OCXO			
Stability	contact factory			
Aging	1e-7/year standard, call for low-aging options			
Selectable output of internally-generated 10 MHz reference, diplexed on N connector (external diplexer available as accessory)	Selectable by RS422 or factory preset -3dBm typ. , -8dBm minimum (only available on extended band version)			

Monitor & Control Parameters	Specification
Discrete Mute Control Voltage ranges	mute:0-1.0V; enable:4.0-5.0V; has internal 10kohm pull-up to +5V
Thermal Shutdown Control threshold	+85 °C
Temperature Monitor Accuracy	+/- 3 °C
Summary Fault Monitor	
Input Power Parameters	**Specification**
With 28VDC integrated power supply With 48VDC integrated power supply Without integrated power supply	20-36 VDC 36-56 VDC 7.1 Volts to achieve rated performance
Power consumption: Without integrated power supply With integrated power supply	 240 Watts at 40W out, 210 Watts at 3dB backoff 265 Watts at 40W out, 235 Watts at 3dB backoff
Environmental/Physical Parameters	**Specification**
Operating Temperature	-40 to +70°C baseplate internal temp in component configuration -40 to +60°C ambient air in fan-cooled configuration
Storage Temperature	-54 to +105°C
RF input connector	Type N
RF output connector	WR-75
Power Connector	MIL-26482 Series 1 receptacle, Shell size 12, 4 pins
Monitor/Control Connector	MIL-26482 Series 1 receptacle, Shell size 12, 10 pins
Outline Dimensions	6.3” x 3.15” x 3.5” component configuration 6.3” x 3.15” x 4.0” with integrated power supply 6.3” x 3.15” x 7.4” with supply and fan cooling
Weight	3.9 lbs. component configuration 4.4 lbs. with integrated power supply 6.0 lbs. with supply and fan cooling

Specifications subject to change without notice 5/17/08

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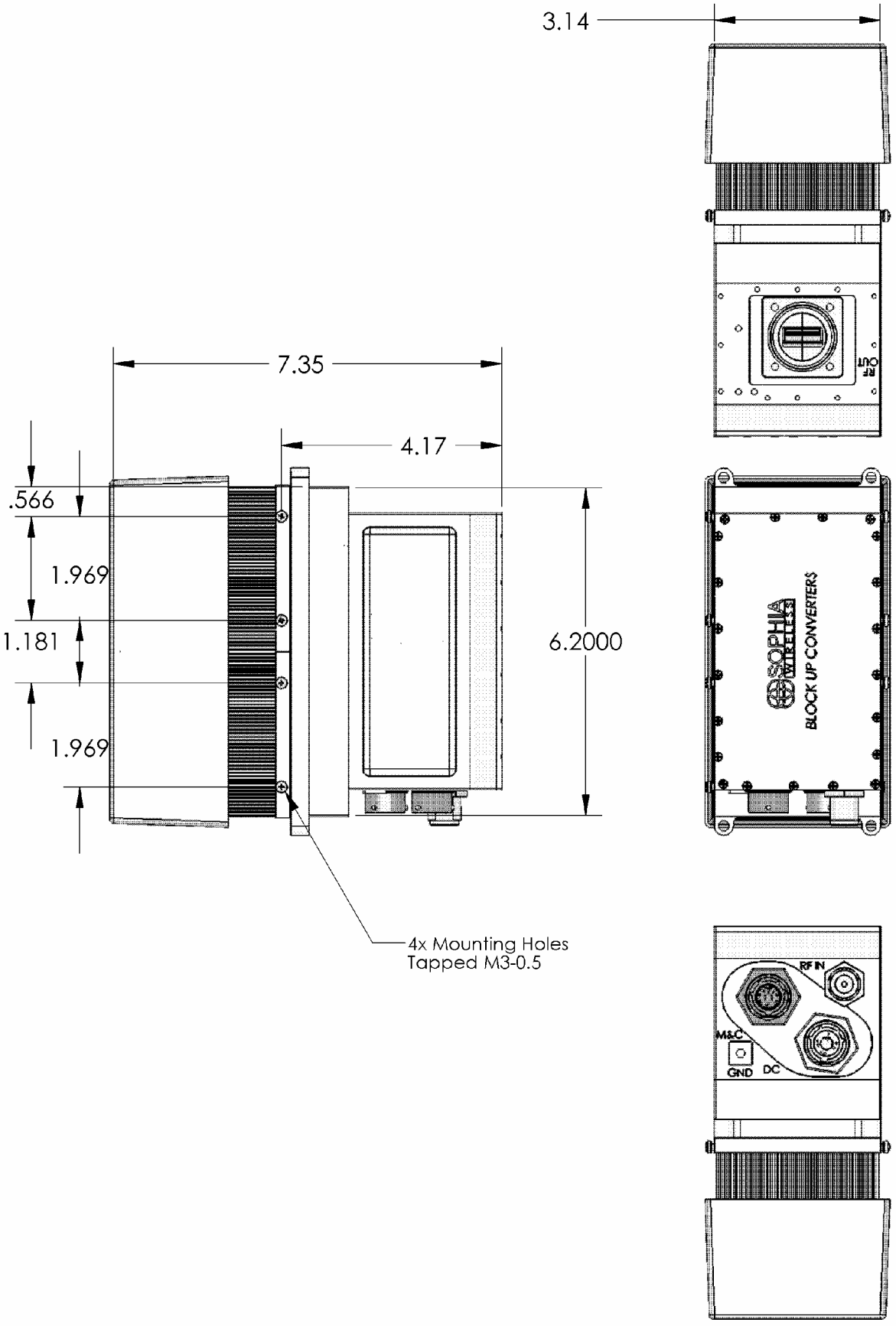
3.14
7.35
4.17
.566
1.969
1.181
1.969
6.2000
4x Mounting Holes
Tapped M3-0.5
RF OUT
SOPHIA WIRELESS
BLOCK UP CONVERTERS
RF IN
M&C
GND
DC