

Compact, Modular Block Upconverters

C, X, Ku, DBS, and Ka-bands



Ku-, DBS- and Ka-Band Models



C- and X-Band Models

Input Frequency (GHz)	Output Frequency (GHz)	LO Frequency (GHz)	Model Number
0.95 - 1.75	5.85 - 6.65	4.9	UPBA-6.25
0.95 - 1.45	7.9 - 8.4	6.95	UPBA-8.15
0.95 - 1.45	12.75 - 13.25	11.8	UPBA-13
0.95 - 1.45	14 - 14.5	13.05	UPBA-14.25-1
0.95 - 1.7	13.75 - 14.5	12.8	UPBA-14.125-1

DBS- and Ka-Band Models

0.95 - 2.05	17.3 - 18.4	16.35	UPBA-17.85
0.95 - 1.2	28.35 - 28.6	27.4	UPBA-28.475-1
0.95 - 1.2	29.25 - 29.5	28.3	UPBA-29.375-1
1 - 2	29 - 30	28	UPBA-29.5-1
0.95 - 1.7	29.25 - 30	28.3	UPBA-29.625-1
0.95 - 1.45	29.5 - 30	28.55	UPBA-29.75-1
1 - 2	30 - 31	29	UPBA-30.5-1

This series of block upconverters are ideal for use in modular system where small size and high performance are required. Status and control can be accomplished either by discrete lines for existing controllers or by RS485.

Features

- Small size: 3.5" [88.9mm] x 5.0" [127mm] x 1.36" [34.54mm]
- 32 dB attenuation control
- 10 MHz reference input on RF input or external reference input connector
- Analog and RS485 remote control
- RF output power detector
- Mute for external command or excess output power
- Low phase noise

Specifications		Block Upconverter
Type		Single conversion
Frequency sense		No inversion
Input characteristics		
Impedance		50 ohms
VSWR		1.25:1 maximum
Non-damage		+15 dBm minimum
External reference characteristics		
Location		Input center conductor or reference connector
Frequency		10 MHz
Level		-5 to +7 dBm
Output characteristics		
Impedance		50 ohms
VSWR		1.25:1 maximum
Power output (1 dB compression)		+13 dBm minimum at minimum attenuation
Ka-Band models		+15 dBm minimum at minimum attenuation
Transfer characteristics		
Noise figure		15 dB typical (minimum attenuation)
Gain		26 ±1 dB at 23°C
Gain flatness		±0.2 dB/any 40 MHz, ±0.25 dB/any 80 MHz, ±0.5 dB/RF-band
Gain stability		
Constant temperature		±0.25 dB/24 hours
-40 to +80°C		2 dB maximum after 1/2 hour warm-up
Attenuation control		32 dB/0.1 dB step remote control or 0 to 10 volts DC
Group delay		
Slope (any 80 MHz segment)		0.0125 ns/MHz
Parabolic (any 80 MHz segment)		0.000625 ns/MHz ²
Ripple (any 80 MHz segment)		0.5 ns
Total		1 ns peak-to-peak over RF-band
Spurious output		
Signal related		65 dBc minimum
IF signal second harmonic (DBS- and Ka-Band models)		60 dBc maximum at 0 dBm output power
Signal independent (in-band)		-100 dBm maximum
Signal independent (out-of-band)		-70 dBm maximum
Image rejection		60 dB minimum
Second harmonic output (P1 dB)		-40 dBc maximum
Intermodulation distortion		With two inband output signals at 0 dBm, third order intermodulation products are less than 46 dBc
Mute		60 dB minimum
Maximum phase noise		See table below
Output power monitor		See table below
Control/monitor		Discrete analog and RS485 provided, refer to MITEQ's Technical Note 25T058 for details.

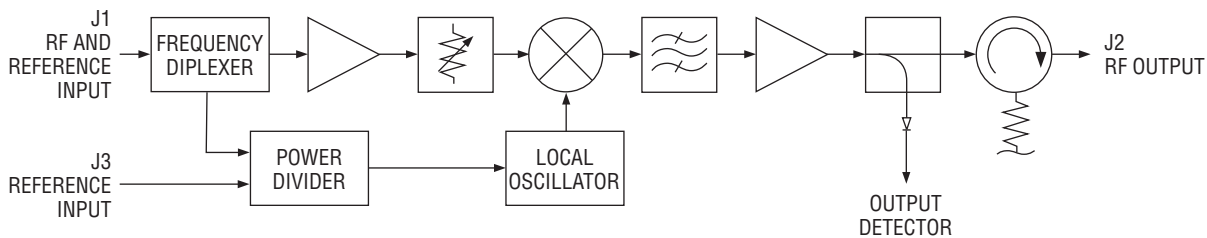
Maximum Phase Noise

Offset (Hz)	Local Oscillator (dBc/Hz)			
	10 MHz	Below 10 GHz	Above 10 GHz	Above 27 GHz
10	-113	-51	-45	-34
100	-135	-73	-67	-64
1K	-145	-83	-77	-74
10K	-150	-93	-87	-84
100K	-150	-103	-97	-94
1M	-150	-103	-97	-104

Output Power Monitor

DC voltage based on output level typical	
Output Power (dBm)	Monitor Level (VDC)
13	0.85 – 1.50
10	0.60 – 0.84
7	0.38 – 0.59
3	0.12 – 0.28
No input signal	0.01 maximum

Representative Block Diagram



General Specifications

Primary Power Requirements

Voltage	12–15 VDC
Voltage ripple/noise	50 mV peak-to-peak, typical (20 MHz BW)
Current	650 mA typical, 1A maximum
Ka-Band models	1.3A typical, 1.6A maximum

Physical

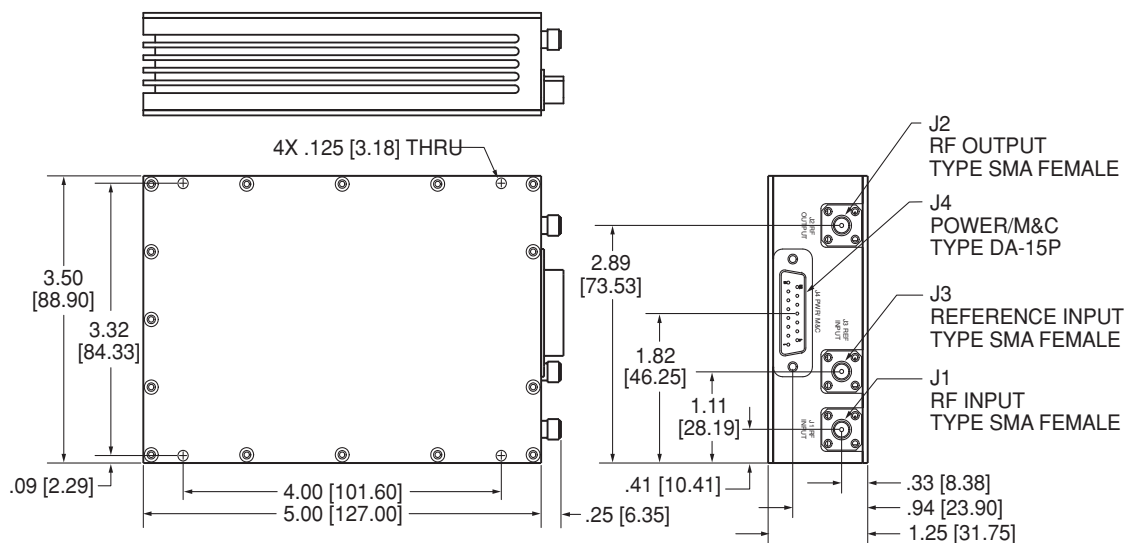
Weight	1.5 pounds (0.68 kg) nominal
Connectors	
RF	SMA female
RF (Ka-Band)	2.92 mm female
Power/monitor and control interface	15 pin D-type male

Environmental

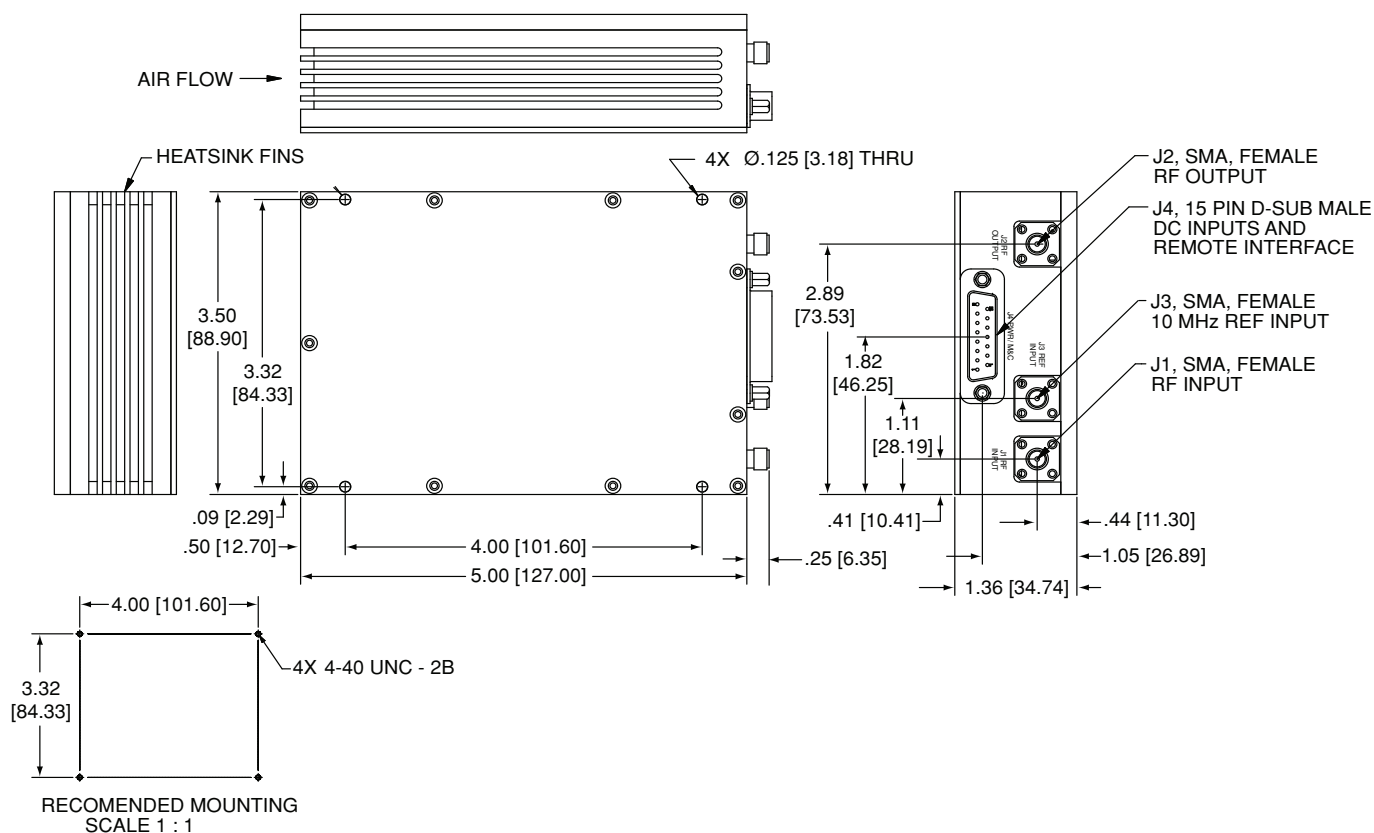
Operating	
Ambient temperature	-40 to +60°C
Relative humidity	Up to 95% at 30° C
Atmospheric pressure	Up to 10,000 feet
Nonoperating	
Ambient temperature	-40 to +85°C
Relative humidity	Up to 95% at 40°C
Atmospheric pressure	Up to 50,000 feet
Shock	30 g's, 10 rms
Vibration	20 to 2000 Hz random to 0.04G ² /Hz

Outline Drawings

C- and X-Band



Ku-, DBS- and Ka-Band



NOTE: Dimensions shown in brackets [] are in millimeters.



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