

This series of Ka-band Outdoor Block upconverters and Downconverters are designed for antenna mounting.

A strong set of monitor and control functions support powerful remote control. A contact closure summary alarm is provided for fault monitoring.

The standard phase noise is compliant with IESS-308/309 and options are available for lower phase noise.

STANDARD FEATURES

- Small-sized weather resistant enclosure
- Amplitude slope adjust
- RS422, RS485 and 10/100 Base-T Ethernet
- Serial output for Redundancy Switchover units
- RF and L-band monitor ports
- Automatic 5/10 MHz internal/external reference selection
- Electronic adjust of internal reference frequency
- IESS-308/309 phase noise
- Low intermodulation distortion
- 64 programmable memory locations
- 45 dB of independent RF and L-band level control
- Mute function on alarm or external mute input command
- Elapsed time and event log after power turn on
- CE Mark

BLOCK DOWNCONVERTERS

RF Input (GHz)	L-Band (GHz)	LO (GHz)	Model Number
17.7-18.7	0.95-1.95	16.75	DBE-18.2-1.45
18.3-18.8	0.95-1.45	17.35	DBE-18.55-1.2
19-20	0.95-1.95	18.05	DBE-19.5-1.45
19.7-20.2	0.95-1.45	18.75	DBE-19.95-1.2
19.7-20.45	0.95-1.7	18.75	DBE-20.07-1.32
20.2-21.2	0.95-1.95	19.25	DBE-20.7-1.45
20.2-21.2	1-2	19.2	DBE-20.7-1.5
25.5-25.9	0.95-1.35	24.55	DBE-25.7-1.15
26.2-27	0.95-1.75	25.25	DBE-26.6-1.35

REVERSE BAND BLOCK DOWNCONVERTERS

RF Input (GHz)	L-Band (GHz)	LO (GHz)	Model Number
28-29	0.95-1.95	27.05	DBE-28.5-1.45
29-30	0.95-1.95	28.05	DBE-29.5-1.45
30-31	0.95-1.95	29.05	DBE-30.5-1.45
30-31	1-2	29	DBE-30.5-1.5



OPTIONS

- High performance package
- Lower gain
- Reference clean-up loop and improved stability
- Lower phase noise
- MIL-STD-188-164 phase noise
- Waveguide connectors

BLOCK UPCONVERTERS

RF Output (GHz)	L-Band (GHz)	LO (GHz)	Model Number
27-27.55	0.95-1.5	26.05	UBE-1.22-27.27
27.5-28.6	0.95-2.05	26.55	UBE-1.5-28.05
27.6-27.9	0.95-1.25	26.65	UBE-1.1-27.75
28.35-28.85	0.95-1.45	27.4	UBE-1.2-28.6
28.75-29.75	0.95-1.95	27.8	UBE-1.45-29.25
29-30	0.95-1.95	28.05	UBE-1.45-29.5
29.25-29.5	0.95-1.2	28.3	UBE-1.075-29.375
29.5-30.25	0.95-1.7	28.55	UBE-1.32-29.87
29.75-30.75	0.95-1.95	28.8	UBE-1.45-30.25
30-31	0.95-1.95	29.05	UBE-1.45-30.5
30-31	1-2	29	UBE-1.5-30.5

REVERSE BAND BLOCK UPCONVERTERS

RF Output (GHz)	L-Band (GHz)	LO (GHz)	Model Number
17.7-18.3	0.95-1.55	16.75	UBE-18-1.2
18.3-18.8	0.95-1.45	17.35	UBE-1.2-18.55
18.5-19.5	0.95-1.95	17.55	UBE-1.45-19
19.5-20.5	0.95-1.95	18.55	UBE-1.45-20
20.2-21.2	0.95-1.95	19.25	DBE-1.45-20.7

SPECIFICATIONS

INPUT CHARACTERISTICS -	UPCONVERTER	DOWNCONVERTER
Return Loss (50 Ohms)	18 dB minimum	
Signal Monitor	-20 dBc nominal	
LO Leakage	N/A	-80 dB maximum
Input Level (Non-damage)	+10 dBm	

OUTPUT CHARACTERISTICS -

Return Loss (50 ohms)	18 dB minimum	
Signal Monitor	-20 dBc nominal	
Power Output (1 dB Compression)	+13 dBm minimum	+18 dBm

TRANSFER CHARACTERISTICS -

Gain	33 dB, ± 3 dB at center frequency		36 dB, ± 3 dB at center frequency				
L-band Level Control	30 dB in 0.2 dB steps						
RF-band Level Control	15 dB in 0.2 dB steps						
Level Stability	± 0.25 dB over any 20°C, ± 1.5 dB over -40° to 60°C						
Amplitude Response	± 0.25 dB/40 MHz maximum, ± 1 dB maximum over RF frequencyband						
Slope Adjust	0 to 6 dB minimum						
Noise Figure at Minimum Attenuation	15 dB maximum 18 dB maximum ≥ 1 GHz IF		15 dB maximum at maximum gain				
Image Rejection	70 dB minimum						
Third Order Intermodulation Distortion With two inband signals each at 0 dBm, measured at the output	50 dBc minimum (+25 dBm IP3)		60 dBc minimum (+30 dBm IP3)				
Spurious Outputs (Inband) –							
Signal Related up to 0 dBm output	65 dBc minimum						
Signal Independent	-75 dBm maximum						
Signal Harmonic Related up to -10 dBm output	65 dBc minimum (including 2 x 1 spurious on IF bandwidths ≥ 1 GHz)		55 dBc minimum (including 2nd harmonic)				
Maximum Phase Noise (dBc/Hz) –	Offset (Hz)						
With Maximum Reference Phase	LO Frequency	10	100	1K	10K	100K	1M
10 Hz: -120 dBc/Hz	16 to 20 GHz	-50	-68	-85	-87	-94	-118
100 Hz: -145 dBc/Hz	Up to 30 GHz	-47	-65	-82	-85	-92	-115
1 kHz: -160 dBc/Hz							
Frequency Stability	$\pm 5 \times 10^{-8}$, -40° to +60°C (reference 25°C)						
Frequency Aging	5×10^{-9} /day after 24 hours on time						
Automatic Reference Configuration	External 5 or 10 MHz at +4 ± 3 dBm. If external reference is below +1 dBm nominal, the converter will automatically lock to the internal reference.						
Converter Mute	60 dB minimum on summary alarm or mute command.						

REMOTE CONTROLS

Serial Interface	RS485/RS422
Ethernet Interface	10/100Base-T Ethernet <ul style="list-style-type: none"> • HTTP-based web server • SNMP 1.0 configuration • Alarm reporting via SNMP Trap • Telnet access • Password protection

INDICATORS and ALARMS

Status Indicator	Red LED: Alarm, Yellow LED: External Reference
Power ON Indicator	Green LED
Summary Alarm	Contact closure/open for DC voltage and local oscillator (programmable LNA current alarm on downconverters +12VDC at 250 mA)

Note: All specifications are at maximum gain unless otherwise noted.

OPTIONS

26-1. High Performance Package -

Power Output (1 dB Compression)	+15 dBm minimum
Gain Slope	0.03 dB/MHz maximum
Level Stability	±0.25 dB/day maximum at constant temperature, ±1.0 dB maximum/-40 to 60°C
Group Delay	1 ns peak-to-peak maximum
Spurious Outputs (Inband)	
Signal Related	-65 dBc minimum at 0 dBm output
Signal Independent	-80 dBm maximum
Local Oscillator Leakage	-70 dBm maximum (upconverters only)
Image Rejection	80 dB minimum
Intermodulation Distortion (Third Order)	With two inband signals at 0 dBm output, third order intermodulation products are less than 60 dBc minimum.

High Performance Phase Noise (dBc/Hz) (Maximum) -

LO Frequency	Offset(Hz)					
	10	100	1K	10K	100K	1M
≤ 20 GHz	-52	-67	-98	-106	-109	-126
≤ 30 GHz	-50	-64	-94	-102	-107	-124

AM/PM Conversion (at 0 dBm Output)	0.1°/dB maximum
Upconverter Mute	80 dB minimum on summary alarm, external mute input control or remote command

26-1A High Performance Phase only. Standard IF/RF performance.

Note: Consult factory for lower phase noise options.

26-2. Lower Gain	20 ±3 dB at 23°C, 18 dB noise figure (20 dB noise figure for upconverters with 1 GHz bandwidth) (2 x 1 signal related, 65 dBc at -10 dBm output)
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26-3. Lower Gain	10 ±3 dB at 23°C, 20 dB noise figure (22 dB noise figure for upconverters with 1 GHz bandwidth) (2 x 1 signal related, 65 dBc at -10 dBm output)
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26-4. Reference Clean-up Loop and Improved Frequency Stability	Reference oscillator acts as an analog phase lock with a 0.1 Hz nominal loop bandwidth. Typical loop suppression of the external reference is as follows: 28 dB at 1 Hz offset; 65 dB at 10 Hz offset and 100 dB at 100 Hz offset Frequency Stability: ±5 x 10 ⁻⁹ , -40 to 60°C Frequency Aging: 1 x 10 ⁻⁹ per day after 24 hours operation preceded by 10 days operation
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26-5. Waveguide Connector	WR-28 O-Ring located on front panel. Upconverters only
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26-6. MIL-STD-188-164B Compliant Phase Noise

PRIMARY POWER REQUIREMENTS

Voltage..... 90-250 VAC
 Frequency..... 47-63Hz
 Consumption 16W typical
 Fuse..... T1.25A

PHYSICAL

Weight 6 pounds (2.7 kg) nominal

Connectors-

RF 2.92 mm female
 (waveguide optional)

L-band N female

RF Monitor SMA female compatible

L-band Monitor SMA female

External Reference SMA female

Status/Control Interface MS3116F14-18P type for
 summary alarm, RS422,
 RS485, and LNA power

Remote Interface RJ-45 female for
 Ethernet RS485 available
 on Status connector

Primary Power FCI clipper series
 CL1M1102

ENVIRONMENTAL

Enclosure Rating IP-65

Operating-

Ambient Temperature -40 to 60°C

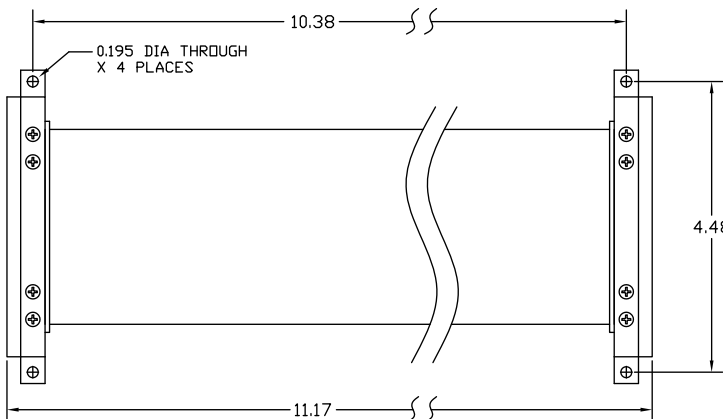
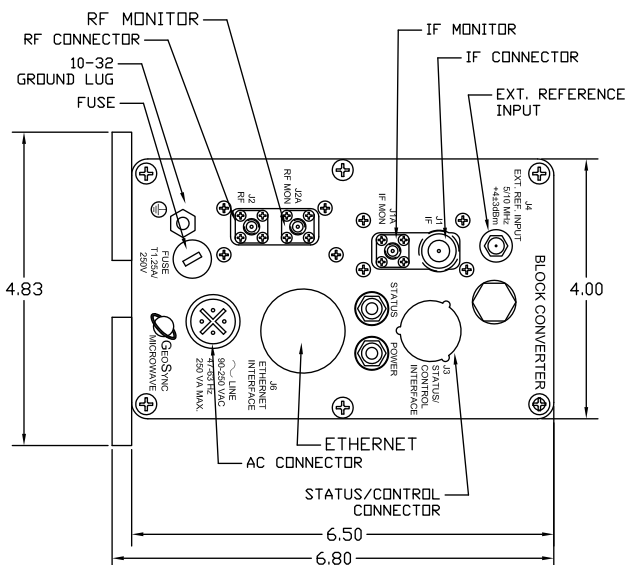
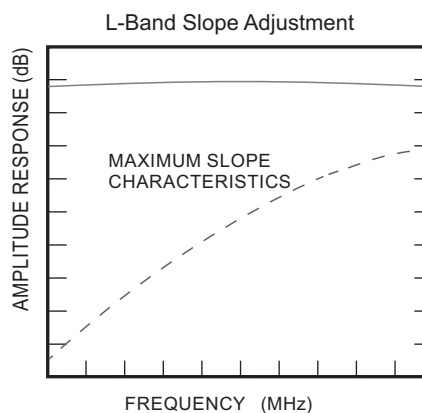
Altitude Up to 10,000 feet

Non-operating-

Ambient Temperature -50 to 70°C

Altitude..... Up to 40,000 feet

Shock and Vibration Normal handling by
 commercial carriers



NOTE:
 1. MOUNTING LEGS CAN BE DISASSEMBLED AND REINSTALLED ON WIDE SIDE OF ENCLOSURE (SHOWN INSTALLED ON NARROW SIDE.)
 2. TAPPED 10-32 HOLES AVAILABLE ON SUPPLIED MOUNTING LEGS. FOR DIMENSIONS OF THIS CONFIGURATION PLEASE CONSULT TECH-NOTE.