



# HIGH PERFORMANCE RACK-MOUNTED BLOCK CONVERTERS



Input Frequency (GHz)	Output Frequency (GHz)	LO Frequency (GHz)	Model Number
<b>BLOCK UPCONVERTERS</b>			
0.95 - 1.25	5.85 - 6.425	7.375	UPB-1B-6.1-IN*
0.95 - 1.75	5.85 - 6.65	4.9	UPB-1B-6.25
0.95 - 1.35	6.7 - 7.1	5.75	UPB-1B-6.9
0.95 - 1.45	7.9 - 8.4	6.95	UPB-1B-8.15
0.95 - 1.45	12.75 - 13.25	11.8	UPB-1B-13
0.95 - 1.7	13.75 - 14.5	12.8	UPB-1B-14.125
0.95 - 1.45	14 - 14.5	13.05	UPB-1B-14.25
0.95 - 1.75	17.3 - 18.1	16.35	UPB-1B-17.7
0.95 - 2.05	17.3 - 18.4	16.35	UPB-1B-17.85
0.95 - 1.25	18.1 - 18.4	17.15	UPB-1B-18.25
<b>Ka-Band</b>			
0.95 - 1.2	28.35 - 28.6	27.4	UPB-1B-28.475
0.95 - 1.45	29 - 29.5	28.05	UPB-1B-29.25
0.95 - 1.2	29.25 - 29.5	28.3	UPB-1B-29.375
0.95 - 1.7	29.25 - 30	28.3	UPB-1B-29.625
0.95 - 1.95	30 - 31	29.05	UPB-1B-30.5
1 - 2	30 - 31	29	UPB-1B-30.5-1
<b>BLOCK DOWNCONVERTERS</b>			
3.4 - 4.2	0.95 - 1.75	5.15	DNB-1B-3.8-IN*
3.4 - 4.2	0.95 - 1.75	8.55/11	DNB-1B-3.8
3.7 - 4.2	0.95 - 1.45	8.55/11.3	DNB-1B-3.95
7.25 - 7.75	0.95 - 1.45	6.3	DNB-1B-7.5
10.7 - 11.7	0.95 - 1.95	9.75	DNB-1B-11.2
10.95 - 11.7	0.95 - 1.7	10	DNB-1B-11.325
11.2 - 12	0.95 - 1.75	10.25	DNB-1B-11.6
11.45 - 12.25	0.95 - 1.75	10.5	DNB-1B-11.85
11.7 - 12.5	0.95 - 1.75	10.75	DNB-1B-12.1
11.7 - 12.75	0.95 - 2	10.75	DNB-1B-12.225
12.2 - 12.75	0.95 - 1.5	11.25	DNB-1B-12.475
<b>Ka-Band</b>			
18.3 - 18.8	0.95 - 1.45	17.35	DNB-1B-18.55
19.7 - 20.2	0.95 - 1.45	18.75	DNB-1B-19.95
20.2 - 21.2	0.95 - 1.95	19.25	DNB-1B-20.7
20.2 - 21.2	1 - 2	19.2	DNB-1B-20.7-1
28.3 - 28.8	0.95 - 1.45	27.35	DNB-1B-28.55
29.25 - 29.5	0.95 - 1.2	28.3	DNB-1B-29.375
29.25 - 30	0.95 - 1.7	28.3	DNB-1B-29.625

\* Model includes frequency inversion.

This equipment is designed for applications where frequency translation is needed between L-band and transponder frequencies.

## FEATURES

- Supports expandable NSU 1:N switchable series (D-323)
- Three monitor and control ports:
  1. Standard RS485/RS422 remote interface which can be substituted with RS232
  2. RS485/RS422 control interface (J7) which can be configured to control an external HPA or as an alternate remote interface
  3. 10/100Base-T Ethernet interface
- Automatic 5/10 MHz and internal/external reference selection
- IF and RF signal monitor port
- 30 dB gain control
- Low phase noise
- Low intermodulation distortion
- 64 memory locations
- High frequency stability
- Summary alarm
- Mute function on alarm or external mute input control
- Test points
- CE mark

## OPTIONS

- Higher frequency stability
- RS232
- Lower phase noise



## SPECIFICATIONS

### INPUT CHARACTERISTICS

Return loss (50 ohms).....	18 dB minimum (upconverters), 20 dB minimum (downconverters)
LO leakage.....	-80 dBm maximum (downconverters)
Signal monitor .....	-20 dBc nominal

### OUTPUT CHARACTERISTICS

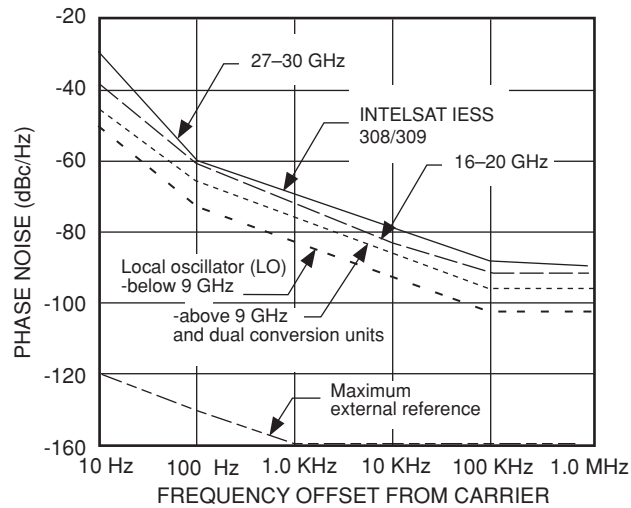
Return loss (50 ohms).....	18 dB minimum (downconverters), 20 dB minimum (upconverters)
Power output (1 dB compression) .....	+13 dBm minimum (upconverters), +18 dBm minimum (downconverters)
Signal monitor .....	-20 dBc nominal

### TRANSFER CHARACTERISTICS

Gain (at minimum attenuation)	
Upconverters.....	33 dB, $\pm 3$ dB at 23°C
Downconverters .....	38 dB, $\pm 3$ dB at 23°C
Gain slope .....	0.03 dB/MHz
Gain control.....	30 dB in 0.2 dB steps
Gain stability.....	$\pm 0.25$ dB/day maximum at constant temperature
Amplitude response .....	$\pm 0.25$ dB/40 MHz maximum, $\pm 1$ dB maximum over RF frequency band
Image rejection.....	80 dB minimum
Noise figure (at minimum attenuation).....	15 dB maximum
Intermodulation distortion (third order) .....	With two inband signals at 0 dBm output, third order intermodulation products are less than 60 dBc minimum (downconverters) and 50 dBc minimum (upconverters)
Group delay.....	1 ns peak-to-peak maximum
Spurious outputs (inband)	
Signal related .....	65 dBc minimum at 0 dBm output
Signal independent.....	-75 dBm maximum
Phase noise .....	See graph
Noise spectral density.....	-82 dBm/4 kHz maximum (upconverters), -87 dBm/4 kHz maximum (downconverters)
AM/PM conversion (at 0 dBm output).....	0.1°/dB maximum (upconverters), 0.05°/dB maximum (downconverters)
Frequency stability .....	$\pm 2 \times 10^{-8}$ , 0 to 50°C (higher stability options available), $\pm 5 \times 10^{-9}$ /day typical (fixed temperature after 24 hour on time)
Automatic reference configuration .....	External 5 or 10 MHz at +4 $\pm 3$ dBm. If external reference is below +1 dBm nominal, the converter will automatically lock to the internal reference.
Upconverter mute.....	80 dB minimum on summary alarm, external mute input control or remote command
Remote interface.....	10/100Base-T Ethernet interface providing: HTTP-based web server SNMP 1.0 configuration Alarm reporting via SNMP trap Telnet access Password protection and selectable RS485/RS422

## PHASE NOISE

### PHASE NOISE CHARACTERISTICS (1.0 Hz BANDWIDTH)



## OPTIONS

1. High performance phase noise (dBc/Hz) (maximum/typical).

LO Frequency	OFFSET (Hz)					
	10	100	1K	10K	100K	1M
Up to 6.7 GHz	54/56	78/82	108/114	116/121	119/127	136/145
6.7 ≤ LO ≤ 8 GHz	53/55	77/80	107/112	114/119	117/125	134/143
8 ≤ LO ≤ 12 GHz	48/50	73/77	103/110	112/117	115/123	132/141
12 ≤ LO ≤ 13.4 GHz	48/50	72/76	102/108	110/115	113/121	130/139
13.4 ≤ LO ≤ 16 GHz	47/49	70/74	100/106	108/113	111/119	128/137
16 ≤ LO ≤ 24 GHz	42/44	67/71	97/104	106/111	109/117	126/135
24 ≤ LO ≤ 29.05 GHz	41/43	64/68	94/100	102/107	107/116	124/133

10. Higher frequency stability reference.
- B.  $\pm 5 \times 10^{-9}$ , 0 to 50°C,  
1 x 10<sup>-9</sup>/day typical (fixed temperature after 24 hour on time).
  - C.  $\pm 2 \times 10^{-9}$ , 0 to 50°C,  
1 x 10<sup>-9</sup>/day typical (fixed temperature after 24 hour on time).
17. Remote control.
- C. RS232.

Notes: Missing option numbers are not applicable for this product.

For literature describing local control (front panel) and remote control (bus control), refer to MITEQ's Technical Note 25T055.

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## GENERAL SPECIFICATIONS

### PRIMARY POWER REQUIREMENTS

Voltage .....	90–250 VAC
Frequency .....	47–63 Hz
Power consumption.....	30 W typical

### PHYSICAL

Weight .....	15 pounds nominal
Overall dimensions.....	19" x 1.75" x 20" (excluding connectors)
Connectors	
RF .....	SMA female
L-band.....	N female
RF monitor .....	SMA female
L-band monitor.....	SMA female
External reference input.....	BNC female
Summary alarm.....	DE-9P
Test points.....	SMA female for LO frequency
Remote interface.....	DEM-9S for RS485, RS422 and RS232, RJ-45 female for Ethernet
Primary power input.....	IEC-320

### ENVIRONMENTAL

Operating	
Ambient temperature .....	0 to 50°C
Relative humidity .....	Up to 95% at 30°C
Atmospheric pressure.....	Up to 10,000 feet
Nonoperating	
Ambient temperature .....	-50 to +70°C
Relative humidity .....	Up to 95% at 45°C
Atmospheric pressure.....	Up to 40,000 feet
Shock and vibration .....	Normal handling by commercial carriers

## REAR PANEL VIEW



RSM Switch Module Location  
(see D-323 for more information)