



SELECTABLE FREQUENCY BAND RACK MOUNTED BLOCK CONVERTERS FOR SATELLITE COMMUNICATION



These Selectable Band Block Converters are designed for applications where frequency translation is needed between the transponder and demodulator with a minimum of amplitude and group delay distortion.

STANDARD FEATURES

- Amplitude slope adjust
- RS422, RS485 and 10/100Base-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
- Low 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

OPTIONS

- High performance package
- Lower gain
- Reference clean-up loop and improved stability

CONVERTER MODELS

DOWNCONVERTERS (1/2)

Band	Input Frequency Band (GHz)	Output Frequency Band (GHz)	LO Frequency (GHz)	Model Number
1	10.7 - 11.45	0.95 - 1.7	9.75	DBR-3KuL
2	11.45 - 12.2	0.95 - 1.7	10.5	
3	12.2 - 12.75	0.95 - 1.5	11.25	
1	10.95 - 11.7	0.95 - 1.7	10	DBR-3KuL-1
2	11.7 - 12.2	0.95 - 1.45	10.75	
3	12.2 - 12.75	0.95 - 1.5	11.25	
1	10.7 - 11.7	0.95 - 1.95	9.75	DBR-3KuL-2
2	11.45 - 12.45	0.95 - 1.95	10.5	
3	12.2 - 13.25	0.95 - 2	11.25	
1	10.7 - 11.75	0.95 - 2	9.75	DBR-2KuL
2	11.7 - 12.75	0.95 - 2	10.75	
1	17.0 - 18.2	0.95 - 2.15	16.05	DBR-5KaL
2	18.2 - 19.2	0.95 - 1.95	17.25	
3	19.2 - 20.2	0.95 - 1.95	18.25	
4	20.2 - 21.2	0.95 - 1.95	19.25	
5	21.2 - 22.2	0.95 - 1.95	20.25	



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CONVERTER MODELS

DOWNCONVERTERS (2/2)

Band	Input Frequency Band (GHz)	Output Frequency Band (GHz)	LO Frequency (GHz)	Model Number
1	17.0 - 17.8	0.95 - 1.75	16.05	DBR-7KaL
2	17.7 - 18.5	0.95 - 1.75	16.75	
3	18.4 - 19.2	0.95 - 1.75	17.45	
4	19.1 - 19.9	0.95 - 1.75	18.15	
5	19.8 - 20.6	0.95 - 1.75	18.85	
6	20.5 - 21.3	0.95 - 1.75	19.55	
7	21.2 - 22.0	0.95 - 1.75	20.25	

UPCONVERTERS

Band	Output Frequency Band (GHz)	Input Frequency Band (GHz)	LO Frequency (GHz)	Model Number
1	12.75 - 13.25	0.95 - 1.45	11.8	UBR-2LKu
2	13.75 - 14.8	0.95 - 2	12.8	
1	10.7 - 11.7	0.95 - 1.95	9.75	UBR-2LKu-1
2	11.7 - 12.75	0.95 - 2	10.75	



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CONVERTER SPECIFICATIONS

	UPCONVERTER	DOWNCONVERTER				
INPUT CHARACTERISTICS						
Return Loss (50 Ohms)	18 dB minimum	18 dB minimum				
Signal Monitor	-20 dBc nominal					
LO Leakage	N/A	-80 dB maximum				
OUTPUT CHARACTERISTICS						
Return Loss (50 Ohms)	18 dB minimum	18 dB minimum				
Signal Monitor	-20 dBc nominal					
Power Output (1 dB Compression)	+13 dBm minimum	+18 dBm minimum				
TRANSFER CHARACTERISTICS						
Gain	30 dB, ±3 dB at 23°C	35 dB, ±3 dB at 23°C				
RF-band Level Control	15 dB in 0.2 dB steps					
L-band Level Control	30 dB in 0.2 dB steps					
Level Stability	±0.25 dB /day maximum constant temperature					
Amplitude Response	±0.25 dB/40 MHz maximum, ±1 dB maximum over RF frequency band					
Slope Adjust	0 to 6 dB					
Noise Figure at Minimum Attenuation	N/A	15 dB maximum				
Noise Power Density	-125 dBm/Hz maximum	N/A				
Image Rejection	60 dB minimum					
Third Order Intermodulation Distortion	50 dBc minimum	60 dBc minimum				
With two inband signals each at 0 dBm, measured at the output	(+25 dBm IP3)	(+30 dBm IP3)				
Spurious Outputs (Inband)						
Signal Related	65 dBc minimum up to 0 dBm output (including 2 x1 spurious on 1 GHz IF bandwidth units)					
Signal Independent	-75 dBm maximum					
Maximum Phase Noise (dBc/Hz)						
	Offset (Hz)					
	10	100	1K	10K	100K	1M
Ku band Multi-band units	-50	-70	-90	-95	-95	-115
Ka band Multi-band units	-47	-67	-87	-92	-92	-111
Maximum reference	-120	-145	-160			
Frequency Stability	±2 x 10 ⁻⁸ , 0° to 50°C					
Frequency Aging	5 x 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.					
Upconverter Mute	60 dB minimum on summary alarm or mute command.					



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OPTIONS

29-1. High Performance Package

Power Output (1 dB Compression)

Gain Slope

Level Stability

Group Delay

Spurious Outputs (Inband)

Signal Related

Signal Independent

+20 dBm minimum

0.03 dB/MHz maximum

±0.25 dB/day maximum at constant temperature,

1.0 dB peak-to-peak maximum, 0 to 50°C

1 ns peak-to-peak maximum

65 dBc minimum at 0 dBm output

-80 dBm maximum

Image Rejection

Intermodulation Distortion (Third Order)

80 dB minimum

With two inband signals at 0 dBm output, third order

Intermodulation products are less than 60 dBc minimum.

Noise Spectral Density

AM/PM Conversion (at 0 dBm Output)

Upconverter Mute

-85 dBm/4 kHz maximum

0.1°/dB maximum

80 dB minimum on summary alarm, external mute input control or remote command

29-2. 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)

29-3. 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)

29-4. 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: $\pm 2 \times 10^{-9}$ 0 to 50°C

Frequency Aging: 1×10^{-9} per day after 24 hours operation preceded by 10 days operation

REMOTE CONTROLS

Serial Interface

RS485/RS422

Ethernet Interface

10/100Base-T Ethernet

- HTTP-based web
- SNMP 1.0
- Alarm reporting via SNMP
- Telnet access
- Password protection

INDICATORS and ALARMS

Remote Mode

Green LED (front panel)

Alarm

Red LED (front panel)

Summary Alarm

Contact closure/open for DC voltage and local oscillator





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PRIMARY POWER REQUIREMENTS

Voltage	90-250 VAC
Frequency	47-63 Hz
Consumption	40W typical
Fuse	T1.25A

PHYSICAL

Weight	10 pounds (4.5 kg) nominal with rack slides, 14 pounds (6.4 kg) nominal without rack slides
Chassis Dimensions	19" x 1.75" panel height x 20" maximum
Connectors	
RF	SMA female
L-band	SMA female
L-band Monitor	SMA female
External Reference	BNC female
Summary Alarm	DE-9P
Remote Interface	DE-9S for RS422, RS485 RJ-45 female for Ethernet
Primary Power	IEC-320

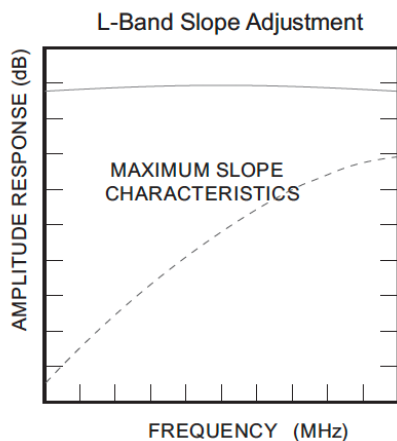
ENVIRONMENTAL

Operating

Ambient Temperature	0 to 50°C
Relative Humidity	Up to 95% at 30°C
Altitude	Up to 10,000 feet

Non-operating

Ambient Temperature	-50 to +70°C
Relative Humidity	Up to 95% at 45°C
Altitude	Up to 40,000 feet
Shock and Vibration	Normal handling by commercial carriers



EUROSATCOM
VSATECH ASSOCIÉ

3 avenue du Canada, bât. Zeta, 91940 Les Ulis, France

+33 1 69 18 19 30

www.eurosatcom.eu

