Q-BAND RACK MOUNTED BLOCK CONVERTERS

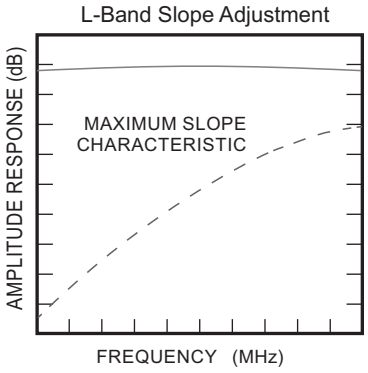
This equipment is designed for applications where frequency translation is needed between L-band and the Q-band transponder frequencies.

STANDARD FEATURES

- Amplitude slope adjust
- RS422, RS485 and 10/100 Base-T Ethernet
- Serial output for Redundancy Switchover units
- 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
- 30 dB of 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



BLOCK UPCONVERTERS

Band	Output (GHz)	Input (GHz)	Model Number
1	44-45	0.95-1.95	UBR-44.5/48-6001535
2	47.5-48.5	0.95-1.95	

BLOCK DOWNCONVERTERS

Input (GHz)	Output (GHz)	Model Number
37.5-38.5	0.95-1.95	DBR-38-6001535

SPECIFICATIONS

INPUT CHARACTERISTICS	UPCONVERTER	DOWNCONVERTER
Return Loss (50 Ohms)	18 dB minimum	15 dB minimum
Signal Monitor	-20 dBc nominal	N/A
LO Leakage	N/A	-80 dB maximum
Input Level (Non-damage)	+10 dBm	

OUTPUT CHARACTERISTICS –		
Return Loss (50 ohms)	15 dB minimum	18 dB minimum
Signal Monitor	N/A	-20 dBc nominal
Power Output (1 dB Compression)	-5 dBm minimum	+18 dBm minimum

TRANSFER CHARACTERISTICS -		
Gain	17 dB, ±3 dB at center frequency	21 dB, ±3 dB at center frequency
L-band Level Control	30 dB in 0.2 dB steps	
Level Stability	±0.25 dB over any 20°C, ±1.5 dB over 0° to 50°C	
Amplitude Response	±0.25 dB/40 MHz maximum, ±1.5 dB maximum over RF frequency	
Slope Adjust	0 to 6 dB minimum	
Noise Figure at Minimum Attenuation	18 dB maximum	25 dB maximum at maximum gain
Image Rejection	70 dB minimum	
Third Order Intermodulation Distortion With two inband signals each at -10 dBm, measured at the output	20 dBc minimum (0 dBm IP3)	70 dBc minimum (+25 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) – With Maximum Reference Phase Noise: 10 Hz: -120 dBc/Hz 100 Hz: -145 dBc/Hz 1 kHz: -160 dBc/Hz		Offset (Hz)					
		10	100	1K	10K	100K	1M
	Level (dBc/Hz)	-32	-60	-68	-78	-87	-87

Frequency Stability	±2 x 10^{-8}, 0° to 50°C (reference 25°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.
Converter Mute	60 dB minimum on summary alarm or mute command.

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

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

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

OPTIONS

57-1. High Performance Package -

Power Output (1 dB Compression)	+20 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.....	-65 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.
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
57-3. 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)
57-4. 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 Internal oscillator phase noise 10 Hz at -130 dBc/Hz; 100 Hz at -155 dBc/Hz and 1 KHz at -165 dBc/Hz Frequency Stability: ±2 $x10^{-9}$, 0 to 50°C Frequency Aging: 1 x 10^{-9} per day after 24 hours operation proceeded by 10 days operation
57-5. Waveguide connector	WR-22 located on rear panel. Flange requested.

PRIMARY POWER REQUIREMENTS

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

PHYSICAL

Weight	9 pounds (4.08 kg) nominal without rack slides 13 pounds (5.9 kg) nominal with rack slides
Chassis Dimensions	19” x 1.75” panel height x 20” maximum
Connectors-	
RF	2.4 mm female
L-band	SMA female
L-band Monitor	SMA female
External Reference	BNC female
Summary Alarm	DE-9S
Remote Interface	DE-9S for RS485, RS422 RJ-45 female for Ethernet
Primary Power	IEC-320
Redundancy Interface	DE-9P

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