5-Channel L- to V-Band Block Upconverter ODU

High performance outdoor unit designed to simultaneously translate up to five L-band input channels into V-band outputs using a robust triple-stage frequency conversion architecture. Five channels are provided as the standard configuration, with options to support configurations ranging from one to five channels.

The unit accepts L-band inputs (1150–2150 MHz per channel) via 50 Ω SMA or N-type connectors and delivers a combined V-band output through a standard WR19 waveguide interface. Each channel is independently upconverted to defined V-band frequency blocks spanning approximately 47.2 GHz to 52.4 GHz. Engineered for reliable field deployment, the unit is housed in an IP65-rated enclosure, providing protection against dust and water ingress, while maintaining stable RF performance across demanding environmental conditions.

RF Parameters (1/2)	
Capacity	5 L-band channels IN V-band OUT (Configuration options available for 1 to 5 L-band channels)
Input Ports	Five 50Ω SMA or N-type (L-band channels, DC blocked)
Output Port	Single Waveguide: UG383 – WR19
Input Frequency Range	Channel 1: 1150 - 2150 MHz Channel 2: 1150 - 2150 MHz Channel 3: 1150 - 2150 MHz Channel 4: 1150 - 2150 MHz Channel 5: 1150 - 2150 MHz
Output Frequency Range	Output Combined: Channel 1: 47200 - 48200 MHz Channel 2: 48200 - 49200 MHz Channel 3: 49200 - 50200 MHz Channel 4: 50400 - 51400 MHz Channel 5: 51400 - 52400 MHz

RF Parameters (2/2)		
Mean Conversion Gain		Max. 30 ± 2 dB Min. 0 ± 2 dB
Gain Steps		0.25 ± 0.15 dB
Gain Flatness		Full Band over 5GHz: ± 2.0 dB Over Each 1 GHz Channel: ± 1.5 dB Any 40 MHz in a Channel: ± 0.60 dB
Output Return Loss		Typ. -12 dB Max. -10 dB
Noise Figure (at max gain)		Typ. 12 dB Max. 14 dB
Operational Input Level (recommended)		-10dBm (-10dBm per L band 1GHz channel, equivalent to -3dBm across all 5 channels.
OP1dB (at max gain)		Typ. 6 dBm Min. 3 dBm
OIP3 (at max gain)		Typ. 16 dBm Min. 13 dBm
Group Delay (max pk-pk/1000MHz)		<5.5 ns
Internal Reference Stability		± 5 x 10^{-8} (Over -20 to 60°C)
Phase Noise (Typical values when supplied with a high quality external reference and measured at 0 dBm output)	@ 10Hz Offset	-40 dBc/Hz
	@ 100Hz Offset	-60 dBc/Hz
	@ 1kHz Offset	-80 dBc/Hz
	@ 10kHz Offset	-85 dBc/Hz
	@ 100kHz Offset	-90 dBc/Hz
	@ 1MHz Offset	-95 dBc/Hz
Spurs In-band (At -5 dBm output)	Carrier Related (> 1MHz offset)	< -60 dBc
	Non-carrier Related	< -75 dBm
Spurs Out-of-band (At -5 dBm output)	Carrier Related	< -50 dBc
	Non-carrier Related	< -65 dBm
Image Rejection		Typ. > 60 dB
LO Breakthrough		Max. -65 dBm
Number of Conversion Stages		Triple
External Reference Input Freq		10/100 MHz (Auto detection)
External Ref Input Level		+0 dBm ± 5 dB
Spectral Inversion		Non-inverting
Mute		60 dB
Isolation		50 dB (Min. between any two L band channels in.)
RF Power Detect		Range -75dBm to -30dBm total power across band

System Control & Monitoring	
RF Redundancy	Supported - Option for two units can be paired with redundancy switches to offer RF redundancy system
User Alarms	RF Power detect, PSUs
Remote Control & Monitoring	Ethernet via RJ45, 10BaseT/100BaseTx ETL TCP/IP protocol SNMP v3 Built-in Web Server (HTTPS)
Local Control & monitoring	No local control, power and summary alarm status LEDs on connector face.
LNB Power	None.

Physical & Environmental	
Dimensions	450mm x 450mm x 200mm maximum
Weight	15Kg
Unit Finish	RAL9003 (Signal White) Clear chemical conversion coating to MIL-DTL-5541F TypeII Class 3
Temperature	Operating: -20°C to 50°C / Storage: -30˚C to +75˚C
Location	Outdoor / Indoor - IP65 (Appropriate mating connectors used)
Humidity	40 to 90% non-condensing
Altitude	10,000ft AMSL (Operational) 30,000ft/10000m AMSL (Transport)
Spec. Version	0.4

Note 1: Typical parameters are guide figures and measured data may deviate from the quoted figures. ETL endeavours to exceed the quoted typical parameters where practically possible.

Note 2: Operation beyond the quoted limits stated above may cause instantaneous and permanent damage.

Note 3: The specification is subject to regular reviews and will be updated from time to time as part of our continuing product development and improved spec accuracy.