9900 SERIES FREQUENCY CONVERTERS

FEATURES

- Supports expandable NSU 1:N Switchover Series (D-323)
- Amplitude slope adjust
- Two monitor and control ports-
  1. Standard RS485/RS422 remote interface which can be substituted with Ethernet (Option 17H) or RS232 (Option 17C)
  2. RS485/RS422 auxiliary control interface which can be configured to control an external HPA or as an alternate remote interface (useful with Option 17C or 17H)
- RF, IF and LO monitor ports
- Automatic switching to external 5/10 MHz reference and electronic adjust of internal reference frequency
- Low intermodulation distortion
- Better than IESS-308/309 compliant phase noise
- 64 programmable memory locations
- 30 dB level control
- External alarm input via contact closure
- Date and time-stamped event log
- CE Mark

The MITEQ frequency converters are designed for advanced satellite communication systems and are available for a wide variety of frequency plans. Phase noise, amplitude flatness and spurious outputs have been optimized to provide the user with a transparent frequency conversion for all video and data applications.

A strong feature set of monitor and control functions supports powerful local and remote control. Among the features are control of frequency, attenuation and 64 memory locations for each converter where various setups can be stored and recalled.

A continuously updated log of time-stamped records of activity is also provided.

OPTIONS

- Higher stability reference
- Remote RS232 or 10/100Base-T Ethernet
- 140 MHz IF frequency
- 50 ohm IF impedance

SPECIFICATIONS

	UPCONVERTER	DOWNCONVERTER
Type	Dual conversion	
Frequency step size	1 kHz	
Frequency sense	No inversion	
Input characteristics		
Frequency	70 ±20 MHz (140 ±40 MHz Option 4)	Refer to model number table
Impedance	75 ohms (50 ohms Option 15)	50 ohms
Return loss	26 dB minimum	21 dB minimum
Signal monitor	-20 dBc nominal	
Input level (nondamage)	+15 dBm maximum	
Output characteristics		
Frequency	Refer to model number table	70 ±20 MHz (140 ±40 MHz Option 4)
Impedance	50 ohms	75 ohms (50 ohms Option 15)
Return loss	21 dB nominal	26 dB minimum
Signal monitor	-20 dBc nominal	
Power output (P1dB)		
C-band	+16 dBm minimum/ 17 dBm typical	
Ku-band	+10 dBm minimum/12 dBm typical	+16 dBm minimum/17 dBm typical
Transfer characteristics		
Gain	+31-34 dB at 23°C	+44-48 dB at 23°C
Noise figure at min. atten.	14 dB maximum	11 dB maximum
Noise power density	-125 dBm/Hz maximum	N/A
Image rejection	N/A	80 dB minimum
Level stability	±0.25 dB/day maximum at constant temperature ±0.5 dB typical from 0 to 50°C	
Amplitude response	±0.3 dB maximum	
Slope adjust	±1 dB typical in 0.2 dB steps	
Group delay (70 ±18 MHz)		
Linear	0.03 ns/MHz maximum (15 to 50°C)	
Parabolic	0.01 ns/MHz^2 maximum (15 to 50°C)	
Ripple	1 ns peak-to-peak maximum	
Group delay (140 ±36 MHz)		
Linear	0.025 ns/MHz maximum (15 to 50°C)	
Parabolic	0.0035 ns/MHz^2 maximum (15 to 50°C)	
Ripple	1 ns peak-to-peak maximum	
Intermodulation distortion (third order) at 0 dBm output		
C-band	55 dBc minimum (+27.5 dBm IP3 pt.)	60 dBc minimum (+30 dBm IP3 pt.)
Ku-band	45 dBc minimum (+22.5 dBm IP3 pt.)	60 dBc minimum (+30 dBm IP3 pt.)
AM/PM conversion	0.1°/dB maximum to 0 dBm output	
Gain slope	0.03 dB/MHz typical, 0.05 dB/MHz maximum (10 MHz minimum)	
Frequency accuracy	C-band: ±10 Hz, Ku-band: ±22 Hz, maximum using external reference	
Spurious outputs		
Signal related	65 dBc up to 0 dBm output	
Signal independent	-80 dBm maximum	
LO leakage at RF	-75 dBm maximum	-80 dBm maximum
Gain adjustment	30 dB in 0.2 dB steps	
Frequency stability	±2 x 10^{-8}, 0 to 50°C (higher stability options available) ±5 x 10^{-9}/day typical (fixed temperature after 24 hour on time)	
Option10B	±5 x 10^{-9}, 0 to 50°C, 1 x 10^{-9}/day typical (fixed temperature after 24 hour on time)	
Option10C	±2 x 10^{-9}, 0 to 50°C, 1 x 10^{-9}/day typical (fixed temperature after 24 hour on time)	
Upconverter mute	80 dB minimum	N/A
External reference	5 or 10 MHz, +4 ±3 dBm Unit will automatically switch to internal reference if external reference level falls below +1 dBm nominal	
Phase noise	See graph	
Primary power	90–250 VAC	
Fuse	T1.25A	

SPECIFICATIONS

UPCONVERTERS		DOWNCONVERTERS	
RF Frequency (GHz)	**Model Number**	**RF Frequency (GHz)**	**Model Number**
5.725 – 6.725 13.75 – 14.8	U-9953-6-1K U-9956-6-1K	3.4 – 4.2 10.7 – 12.75	D-9901-1-1K D-9908-6-1K

PHYSICAL

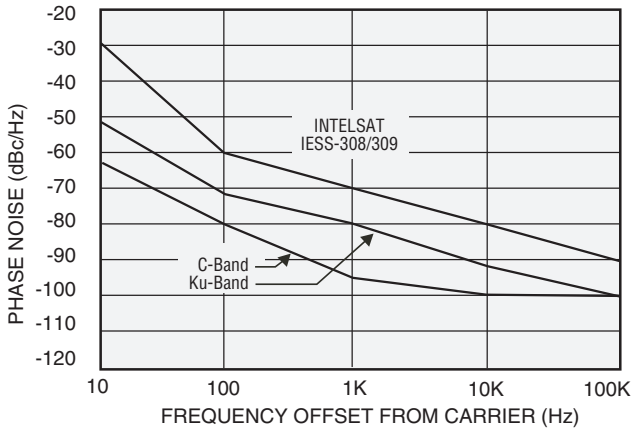
Weight..... 12 pounds nominal
Chassis dimensions..... 19" x 1.75" panel height x 20" maximum
Connectors
- RF ..... SMA female
- RF monitor ..... SMA female
- IF ..... BNC female
- IF monitor..... BNC female
- LO monitors ..... SMA female
- Alarm..... DE-9P
- External reference..... BNC female
- Remote interface..... DE-9S for RS485, RS422 and RS232, RJ-45 female for Ethernet
- Primary power input..... IEC-320
- Auxiliary control interface..... DE-9S

ENVIRONMENTAL

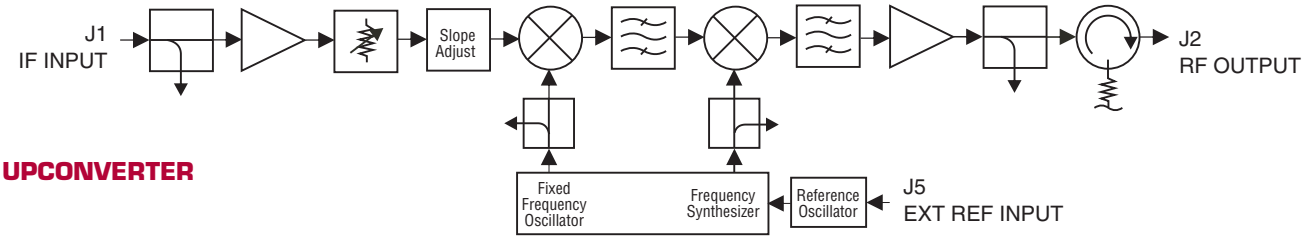
Operating
- Ambient temperature ..... 0 to 50°C
- Relative humidity..... Up to 95% at 30°C
- Atmospheric pressure..... Up to 10,000 feet

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

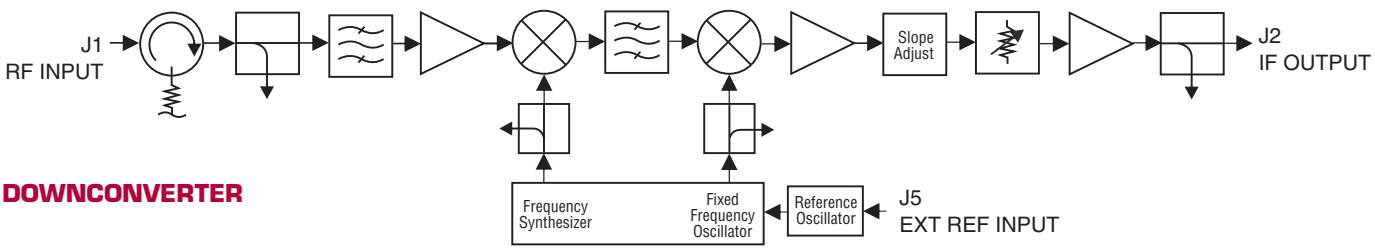
MAXIMUM PHASE NOISE CHARACTERISTICS (1.0 Hz BANDWIDTH)



REPRESENTATIVE BLOCK DIAGRAMS



UPCONVERTER



DOWNCONVERTER

9900 SERIES FREQUENCY CONVERTERS

OPTIONS

4. 140 MHz IF frequency.

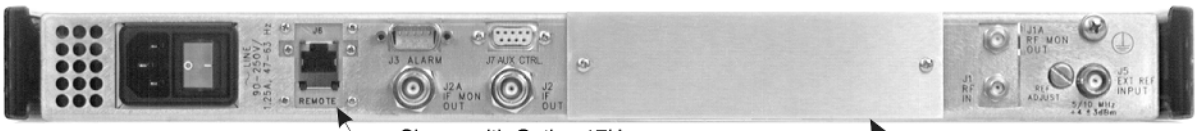
10. Higher frequency stability reference.
- **B.** ±5 x 10^{-9}, 0 to 50°C,
  1 x 10^{-9}/day typical (fixed temperature after 24 hour on time).
- **C.** ±2 x 10^{-9}, 0 to 50°C,
  1 x 10^{-9}/day typical (fixed temperature after 24 hour on time).

15. 50 ohm IF impedance.

17. Remote control.
- **C.** RS232 remote interface.
- **H.** 10/100Base-T Ethernet interface providing:
  HTTP-based web server
  SNMP 1.0 configuration
  Alarm reporting via SNMP Trap
  Telnet access
  Password protection

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

9900 SERIES CONVERTER REAR PANEL



Shown with Option 17H
Ethernet remote control

NSU Switch module location

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www.miteq.com