



MODELS

U-99-9502150-1K

and D-99-9502150-1K

HIGH PERFORMANCE EXTENDED L-BAND FREQUENCY CONVERTERS



FEATURES

- Complete 950-2150 MHz RF Band
- MIL-STD-188-164A compliant
 - Phase perturbation (external reference)
 - Harmonics (upconverter)
- Supports expandable NSU 1:N Switch-over Series (D-323)
- 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 alternative remote interface (useful with Option 17C or 17H)
- Automatic 5/10 MHz internal/external reference selection
- Low intermodulation distortion
- IESS-308/309 compliant phase noise
- 64 programmable memory locations
- 30 dB RF input level control (downconverter)
- 55 dB RF output level control (upconverter)
- External alarm input via contact closure
- CE Mark

The MITEQ frequency converters are designed for advanced satellite communication systems. 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
- Fiber optic L-band interface
- LNB/BUC DC power and 10 MHz located on RF center conductor
- 50 ohm IF impedance

SPECIFICATIONS

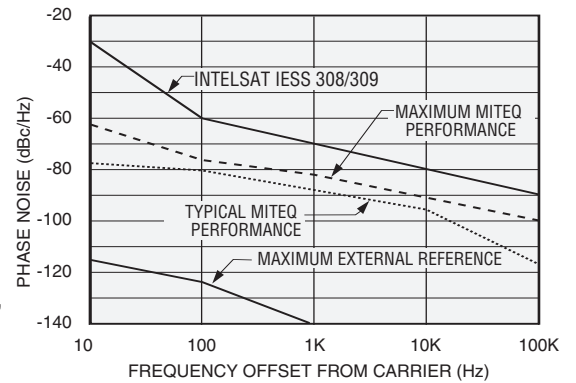
PHYSICAL

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
HPA interface	DE-9S

ENVIRONMENTAL

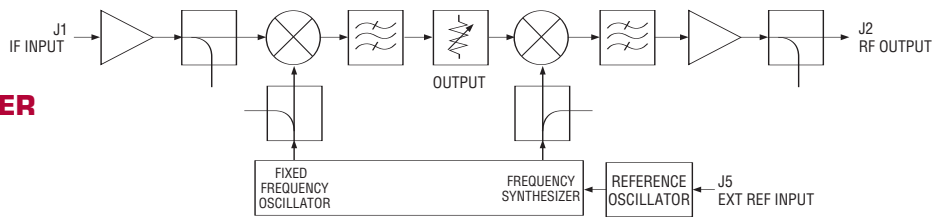
Operating	
Ambient temperature	0 to 50°C
Relative humidity	Up to 95% at 30°C
Atmospheric pressure	Up to 10,000 feet
Nonoperating	
Ambient temperature	-50 to +70°C
Relative humidity	Up to 95% at 40°C
Atmospheric pressure	Up to 40,000 feet
Bench handling shock	MIL-STD-801E, Method 516.4, Procedure VI, Bench handling
Packaged shock	20g, 11ms nominal duration tested, MIL-STD-801E, Method 516.4, Procedure I, functional shock
Vibration	1.6 Grms/7–200 Hz

PHASE NOISE CHARACTERISTICS (1.0 Hz Bandwidth)

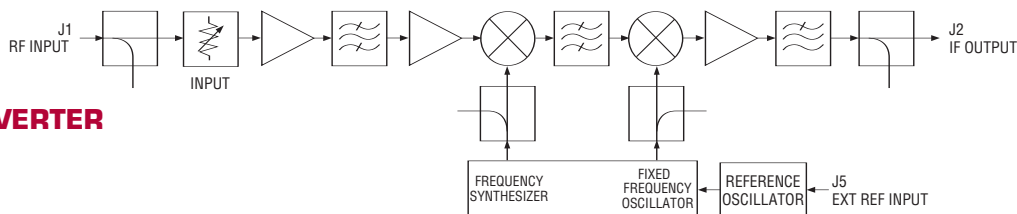


REPRESENTATIVE BLOCK DIAGRAMS

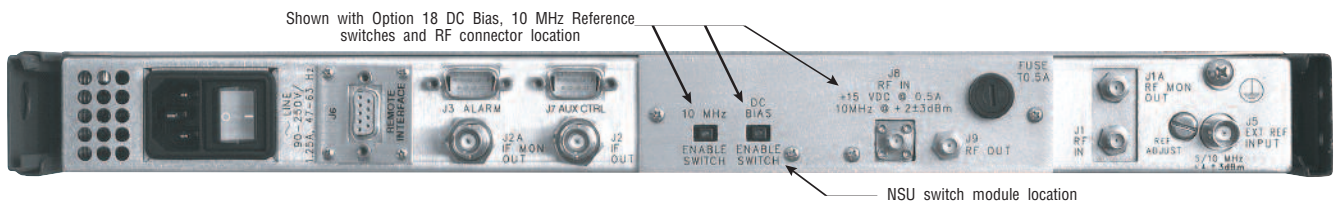
UPCONVERTER



DOWNCONVERTER



REAR PANEL VIEW



SPECIFICATIONS (CONT.)

	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)	950–2150 MHz
Impedance	75 ohms (50 ohms Option 15)	50 ohms
Return loss	26 dB minimum (70 ±20 MHz), 20 dB minimum (140 ±40 MHz)	14 dB minimum
Signal monitor	-20 dBc nominal	-20 dBc nominal
LO leakage (re-radiation)	N/A	-80 dBm maximum
Input level (nondamage)	+15 dBm maximum	
Output characteristics		
Frequency	950–2150 MHz	70 ±20 MHz (140 ±40 MHz Option 4)
Impedance	50 ohms	75 ohms (50 ohms Option 15)
Return loss	14 dB minimum	26 dB minimum (70 ±20 MHz)
Signal monitor	-20 dBc nominal	
Power output (P1dB)	+15 dBm minimum	+16 dBm minimum
Transfer characteristics		
Gain at 23°C	31–34 dB	44–49 dB
Noise figure at maximum gain	15 dB maximum	14 dB maximum
Image rejection	80 dB minimum	
Level stability	0.5 dB peak-to-peak maximum/day/10°C 1 dB peak-to-peak typical/0 to 50°C	
Amplitude response	±0.35 dB maximum/IF bandwidth, ±1.0 dB maximum/RF band	
Group delay (70 ±18 MHz)		
Linear	0.03 ns/MHz maximum	
Parabolic	0.01 ns/MHz ² maximum	
Ripple	1 ns peak-to-peak maximum	
Group delay (140 ±36 MHz)		
Linear	0.025 ns/MHz maximum	
Parabolic	0.0035 ns/MHz ² maximum	
Ripple	1 ns peak-to-peak maximum	
Intermodulation distortion (third order) at 0 dBm output	55 dBc minimum (+27.5 dBm IP3 pt.)	60 dBc minimum (+30 dBm IP3 pt.)
AM/PM conversion	0.1°/dB maximum to 5 dBm output	
Gain slope	0.05 dB/MHz maximum (10 MHz minimum)	
Spurious outputs (inband)		
Signal related	65 dBc up to 0 dBm output	
Signal independent	-70 dBm maximum	
Harmonic emissions	-60 dBc maximum up to 0 dBm output	N/A
Gain adjustment	55 dB in 0.2 dB steps	30 dB in 0.2 dB steps
Frequency accuracy	±100 Hz maximum using external reference	
Noise power density	-123 dBm/Hz maximum at all gain settings	N/A
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)	
Option 10B	±5 x 10 ⁻⁹ , 0 to 50°C, 1 x 10 ⁻⁹ /day typical (fixed temperature after 24 hour on time)	
Option 10C	±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 at 35 watts typical	
Fuse	T1.25A	
Remote interface	RS485/RS422 user selectable	
MTBF	100,000 hours minimum calculated per Telcordia, Issue 1	

HIGH PERFORMANCE EXTENDED L-BAND FREQUENCY CONVERTERS

OPTIONS

- 4.** 140 MHz IF frequency.
- 10.** Higher frequency stability reference.
- B.** $\pm 5 \times 10^{-9}$, 0 to 50°C,
1 x 10⁻⁹/day typical (fixed temperature after 24 hour on time).
 - C.** $\pm 2 \times 10^{-9}$, 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
- 18.** External block converter reference and DC power on RF center conductor (not compatible with NSU).
DC power: 15 \pm 1 VDC at 400 mA maximum (downconverter)
22 \pm 2 VDC at 2A maximum
Reference: 10 MHz at +2 \pm 3 dBm
Reference phase noise:
- | Offset (Hz) | Level (dBc/Hz) |
|-------------|----------------|
| 10 | -114 |
| 100 | -150 |
| 1K | -165 |
- 19.** L-band fiber optic interface (not compatible with NSU).
- A.** Upconverter output transmitter
 - Fiber: 9/125 (single mode fiber)
 - Wavelength: 1540–1560 nm
 - Optical power in fiber: 4 mW typical
 - Connector: FC/APC
 - B.** Downconverter input receiver
 - Fiber: 9/125 (single mode fiber)
 - Wavelength: 1300–1560 nm nominal
 - Connector: FC/APC

Refer to MITEQ's Fiber Optic datasheet D-306B for indoor and outdoor mating fiber options.

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



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