9700 SERIES TRI-BAND FREQUENCY CONVERTERS

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.

FEATURES

- **Extended RF bands**
- **RS485/RS422 remote control**
- **RF and IF signal monitor ports**
- **Automatic 5/10 MHz internal/external reference selection**
- **Low intermodulation distortion**
- **MIL-STD-188-164A compliant phase noise**
- **64 programmable memory locations**
- **30 dB level control**
- **External alarm input via contact closure**
- **CE Mark**
- **Phase perturbation per MIL-STD-188-164A using external reference**

OPTIONS

- **Higher stability reference**
- **Remote RS232, IEEE-488 or 10/100Base-T Ethernet**
- **140 MHz IF frequency**
- **Higher gain (downconverter)**
- **50 ohm IF impedance**

SPECIFICATIONS

UPCONVERTERS

RF Frequency (GHz)	1 kHz Step Size Model Number	125 kHz Step Size Model Number
5.845 – 6.725 7.9 – 8.4 13.75 – 14.5	U-97-37991M-1K	U-97-37991M
3.4 – 4.2 7.25 – 7.75 10.95 – 12.75	U-97-37991TST-1K	U-97-37991TST

DOWNCONVERTERS

RF Frequency (GHz)	1 kHz Step Size Model Number	125 kHz Step Size Model Number
3.4 – 4.2 7.25 – 7.75 10.7 – 12.75	D-97-37991M-1K	D-97-37991M
5.845 – 6.425 7.9 – 8.4 13.75 – 14.5	D-97-37991TST-1K	D-97-37991TST

PHYSICAL

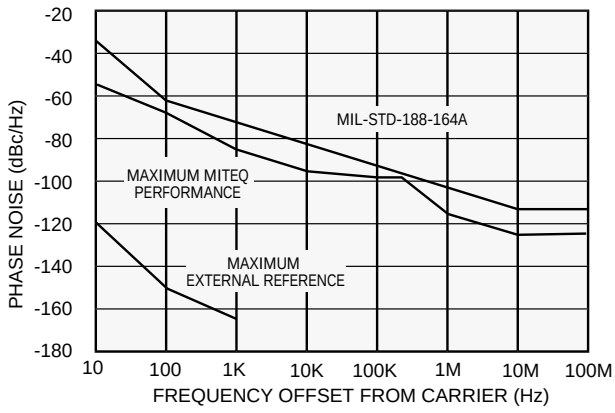
Weight ..... 18 pounds nominal
Chassis dimensions ..... 19" x 1.75" panel height x 20" maximum
Connectors
- RF ..... SMA female
- RF monitor ..... SMA female
- IF ..... BNC female
- IF monitor ..... BNC female
- LO monitors ..... SMA female
- Alarm DE-9P
- External reference ..... BNC female
- Remote interface ..... DE-9S for RS485, RS422 and RS232, IEEE-488 receptacle for GPIB, RJ-45 female for Ethernet
- Primary power input IEC-320

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

TYPICAL PHASE NOISE CHARACTERISTICS (1.0 Hz BANDWIDTH)



SPECIFICATIONS

	UPCONVERTER	DOWNCONVERTER
Type	Dual conversion	
Frequency step size	See model number table	
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 (70 ±20 MHz) 20 dB minimum (140 ±40 MHz)	17 dB minimum
Signal monitor	-20 dBc nominal	
LO leakage	N/A	-80 dBm maximum
Input level (nondamage)	+20 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	17 dB minimum	26 dB minimum (70 ±20 MHz) 20 dB minimum (140 ±40 MHz)
Signal monitor	-20 dBc nominal	
Power output	+10 dBm minimum at 1 dB compression point	
Transfer characteristics		
Gain	+30 dB minimum	+45 dB minimum +55 dB minimum (Option 16C)
Noise figure	20 dB typical, 25 dB maximum	12 dB maximum
Image rejection	80 dB minimum	
Level stability	±0.25 dB/day maximum at constant temperature	
Amplitude response		
70 ±20 MHz	±0.25 dB/±20 MHz, ±0.20 dB/±18 MHz	
140 ±40 MHz	0.75 dB/76 MHz	
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)	With two -10 dBm output signals, 60 dBc minimum	
AM/PM conversion	0.1°/dB maximum to 0 dBm output	
Gain slope		
70 ±20 MHz	0.03 dB/MHz maximum (10 MHz minimum)	
140 ±40 MHz	0.05 dB/MHz maximum (10 MHz minimum)	
Spurious outputs		
Signal related	60 dBc up to 0 dBm output	
Signal independent	-70 dBm maximum	-75 dBm maximum -65 dBm maximum (Option 16C)
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)	
Frequency error	±20 Hz not including reference frequency error	
Upconverter mute	60 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	
Remote interface	RS485/RS422 user selectable	

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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.

16. Higher gain option (downconverters).
- **C.** 55 dB nominal RF/IF gain.

17. Remote control.
- **C.** RS232 remote interface.
- **F.** IEEE-488 remote interface.
- **H.** 10/100Base-T Ethernet interface providing:
  Web-browser-based configuration
  SNMP 1.0 configuration
  Alarm reporting via SNMP Trap
  Telnet access
  Password protection

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

9700 SERIES CONVERTER REAR PANEL

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