



9700 SERIES FREQUENCY CONVERTERS



FEATURES

- RS485/RS422 remote control
- RF and IF signal monitor ports
- Automatic 5/10 MHz internal/external reference selection
- Low intermodulation distortion
- IESS-308/309 compliant phase noise
- 64 programmable memory locations
- 30 dB level control
- External alarm input via contact closure
- 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, 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
0.95 – 1.75	U-9788-1-1K	U-9788-1
5.725 – 6.725	U-9793-6-1K	U-9793-6
6.7 – 7.1	U-9793-2-1K	U-9793-2
7.9 – 8.4	U-9794-1K	U-9794
12.75 – 13.25	U-9795-2-1K	U-9795-2
12.75 – 14.5	U-9796-7-1K	U-9796-7
13.75 – 14.8	U-9796-6-1K	U-9796-6
17.3 – 18.4	U-9797-2-1K	U-9797-2

DOWNCONVERTERS

RF Frequency (GHz)	1 kHz Step Size Model Number	125 kHz Step Size Model Number
0.95 – 1.75	D-9740-3-1K	D-9740-3
3.4 – 4.2	D-9741-1-1K	D-9741-1
4.5 – 4.8	D-9742-2-1K	D-9742-2
7.25 – 7.75	D-9745-1K	D-9745
10.7 – 12.75	D-9748-6-1K	D-9748-6

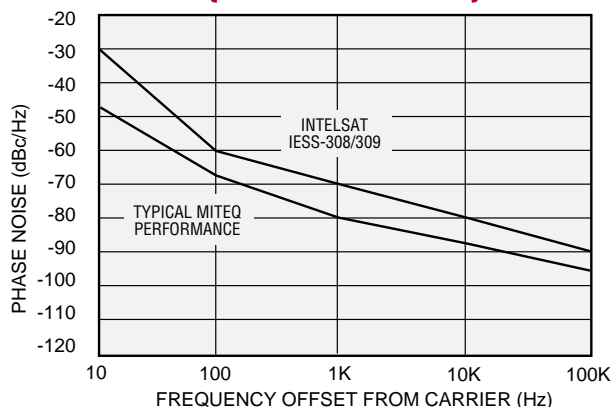
PHYSICAL

- 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		
70 ±20 MHz	26 dB minimum	20 dB minimum
140 ±40 MHz	20 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		
70 ±20 MHz	20 dB minimum	26 dB minimum
140 ±40 MHz	20 dB minimum	
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)	
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	

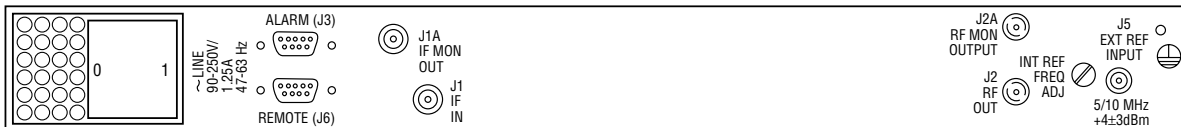
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OPTIONS

- 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.
- 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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9400, 9600 and 9700 Series Status Statement

The 9400, 9600 and 9700 series converters were introduced in 1996, 1994 and 1999 respectively. The 9800 and 9900 series converters were first launched in 2007 and 2006 respectively. As a group, the 9400, 9600 and the 9700 series converters have reached the end of their manufacturing because they utilize an Intel 186 microprocessor as well as other obsolete components. MITEQ did make a last time buy of many of these obsolete components to support the product line and based on our present consumption, we estimate a three year maximum support life for the 9400, 9600 and the 9700 series converters.

Standard Features on the 9800 and 9900 converters versus the older converters are:

- Synthesizer step size 1KHz,
- 10/100Base-T Ethernet,
- Compatibility with NSUN switch-over unit,
- Amplitude Slope Adjustment,
- HPA monitor and control,
- Noise power density,
- Accepts the new NSU series redundant switches.

MITEQ is instituting an end of product life for all of the 9400, 9600 and 9700 series converters after July 31, 2008 and as such none of these converters will be available for purchase.

MITEQ will repair and or replace subassemblies whenever possible as per our standard Warranty and Return Materials Authorization (RMA) policies during the end of product life cycle.

After July 31, 2011 the 9400, 9600 and 9700 series converters will be obsolete and as such maintenance and support cannot be assured.