

KEYSIGHT TECHNOLOGIES (AGILENT HP)

70310A

The Keysight 70310A (formerly HP / Agilent) is a 1-slot wide Modular Measurement System (MMS) precision frequency reference plug-in module. Designed to provide extremely stable 10 MHz and 100 MHz reference signals for HP/Agilent 70000 modular systems and other test setups, it features a high-stability internal ovenized crystal oscillator (OCXO) to improve overall system aging rate, frequency accuracy, and tuning efficiency. Option 002 is available to delete the internal OCXO for setups utilizing an existing house reference.

SPECIFICATIONS

General

Interfaces	HP-MSIB, Front Panel BNC Connectors (10 MHz Out, 100 MHz Out, Ext Ref In)
Display	None (status LED indicators only)

Physical

Power Supply	Powered via Agilent 70001A mainframe backplane; auxiliary power pack for standby oven power during system shutdown
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	73.9 mm × 133.4 mm × 423 mm mm
Weight	3.2 kg
MMS Slot Width	1 slot

Frequency & Output Specifications

Primary Output Frequencies	10 MHz and 100 MHz
Output Waveform Type	Sinewave
10 MHz Output Level	≥ +7 dBm into 50 Ω
100 MHz Output Level	≥ +7 dBm into 50 Ω
Output Impedance	50 Ω
External Reference Input Frequencies	1 MHz, 2 MHz, 5 MHz, or 10 MHz
External Reference Input Level	-10 to +20 dBm

Frequency Stability & Accuracy

Aging Rate (Daily)	< 5 × 10 ⁻¹⁰ / day (after 24 hours of continuous operation)
Aging Rate (Yearly)	< 1 × 10 ⁻⁷ / year
Temperature Stability	< 7 × 10 ⁻⁹ over 0 °C to 55 °C
Warm-up Time to Rated Accuracy	Within 5 × 10 ⁻⁹ of final frequency in 20 minutes (at 25 °C)
Retrace Stability	< 2 × 10 ⁻⁹ (after 24-hour power cycle)

Phase Noise

10 MHz Phase Noise @ 10 Hz	≤ -120 dBc/Hz
10 MHz Phase Noise @ 100 Hz	≤ -140 dBc/Hz
10 MHz Phase Noise @ 1 kHz	≤ -150 dBc/Hz
10 MHz Phase Noise @ 10 kHz	≤ -155 dBc/Hz
100 MHz Phase Noise @ 10 Hz	≤ -90 dBc/Hz
100 MHz Phase Noise @ 100 Hz	≤ -120 dBc/Hz
100 MHz Phase Noise @ 1 kHz	≤ -135 dBc/Hz
100 MHz Phase Noise @ 10 kHz	≤ -145 dBc/Hz
100 MHz Phase Noise @ 100 kHz	≤ -145 dBc/Hz

Physical & Configuration

Form Factor	1-slot wide MMS (Modular Measurement System) plug-in
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System Connectivity

Control Interface	MSIB (Modular System Interface Bus) via MMS backplane
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External Reference Input

External Reference Input Impedance	50 Ω
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Environmental

Storage Temperature Range	-40 to +75 °C
Operating Altitude	4,600 m (15,000 ft)
Storage Altitude	15,200 m (50,000 ft)

Options

Option 001 Description	Deletes the internal high-stability ovenized oscillator (requires external reference)
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Power

+15 VDC Mainframe Current (Steady State)	110 mA
+15 VDC Mainframe Current (Warm-up)	410 mA
-15 VDC Mainframe Current	20 mA
+5 VDC Mainframe Current	210 mA

Performance

Short-Term Stability (1 s Allan Deviation)	$< 1 \times 10^{-11}$ (typical $< 5 \times 10^{-12}$)
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TECHNOLOGY

Ovenized Crystal Oscillator (OCXO)

APPLICATIONS

System Reference Distribution / Timebase Calibration

