



# 1050A

## Quartz Frequency Standard

### KEY FEATURES

- Low Aging, to  $<5.0E-11$  Per Day
- 1 MHz, 5 MHz and 10 MHz Outputs;
- Front Panel Monitors and Function Meter
- Precise Frequency Tuning Via Front Panel Control
- Low Phase Noise,  $-160\text{dBc}$  @ 10 kHz
- Internal Battery and Automatic Charger

### OPTIONAL FEATURES

- External Disciplining
- 1PPS Output

Symmetricom's 1050A Quartz Frequency Standard is a multiple output instrument suitable for 19" rack mounting. The instrument features a selected third overtone SC-cut precision quartz crystal with drive levels optimized for very low aging, excellent short and long term frequency stability, and retrace characteristics.

The quartz crystal oscillator exhibits unusually high spectral purity at frequencies close to the carrier frequency permitting multiplication to millimeter-wave frequencies with excellent signal-to-noise ratio. A single stage solid-state oven, advanced design and careful component selection techniques ensures the instrument's highly stable operation and ruggedness. Normally operated from a 115 or 230 VAC, 47 to 400 Hz power source, the instrument also offers a built-in standby battery and internal battery charger. Switch over to this internal battery is automatic in the event of external power failure.

Operating controls and monitors are conveniently located on the front panel. LED status monitors indicate Power On, Power Alarm, Oven Ready (oscillator at operating temperature) Battery On and Battery Charge. A built-in meter and thumb wheel switch permit monitoring of supply voltage, control voltage, oscillator oven and battery voltage and battery charging current. Five digital thumb wheel switches permit offset of the frequency over a range of  $4E-7$ . Rear panel connections include fused power input connections and 1 MHz, 5 MHz and 10 MHz output BNC connectors. 1 PPS outputs are also available. A frequency-control voltage can be applied through a BNC connector for external tuning of the crystal oscillator.

The 1050A satisfies a wide variety of applications with stringent requirements for precision time and frequency in radar systems, missile range timing systems, deep space communications, satellite command terminals, GPS monitoring stations, calibration labs and test equipment.



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# 1050A SPECIFICATIONS

## ELECTRICAL SPECIFICATIONS

- Outputs
  - Frequency: 1 MHz, 5 MHz, and 10 MHz
  - Output amplitude: 0.9 Vrms to 1.5 Vrms into 50Ω
  - Harmonic distortion: -40 dB
  - Spurious signals
    - 5 MHz: -80dB
    - 1 MHz, 10 MHz: -70db
- Aging per day:\* 1.0E-10
- Short term stability:
 

Averaging Time	Allan Deviation
1 s	1.0E-12
10 s	1.0E-12
100 s	1.0E-12
- SSB phase noise (bandwidth = 1 Hz)
 

Offset from signal	5 MHz
1 Hz	-116dBc
10 Hz	-140dBc
100 Hz	-150dBc
1000 Hz	-157dBc
10000 Hz	-160dBc
- Frequency adjustment range
  - Front panel 5 digit: 4.0E-7
- Maximum frequency change
  - Overoperating temperature: 1.0E-9
  - Due to load change (50Ω ± 10%): 5.0E-11

## ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

- Temperature ranges
  - Operating: 0°C to 50°C
  - Storage: -60°C to 80°C
  - Storage with battery: -40°C to 60°C
- Power requirements
 

	Standard	Disciplined
DC input:	26 to 30V, 8W @ 25°C	26 to 30V, 13W @ 25°C
AC input:	115 or 230V±10%, 47 to 400Hz, 20W @ 25°C	115 or 230V±10%, 47 to 400Hz, 30W @ 25°C

- Internal battery and automatic charger
 

	Standard	Disciplined
Charge capacity @ 25° C:	~10 hours	~6 hours
- Dimensions
 

Height:	3.5" (89 mm)
Width:	19" (483 mm)
Depth:	18" (457 mm)
- Weight: 33 lbs. (15 kg)
- OPTIONS
 

015 External Disciplining Option	
Warm-up time to lock:	30 minutes
External phase lock	
External oscillator frequency:	5 MHz
External oscillator level:	1 V rms
Resolution:	±2.5E-12
Loop time constant (switch selectable):	1 s or 100 s
Digital tuning range:	2.0E-8
Automatic acquisition:	2.0E-8

## ORDERING INFORMATION

- |  | Part No.  |
|--|-----------|
| • 1050A Standard Configuration                     | 02507-103 |
| • 1050A Standard Configuration with 1PPS Option    | 02507-107 |
| • 1050A with 015 Disciplining Option               | 02492-103 |
| • 1050A with 015 Disciplining Option & 1PPS Option | 02492-107 |



1050A connections

\* Aging typically improves to a level of parts in E-11 per day. Observed aging rates as low as 1.0E-12 reported after years of unperturbed operation.



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