



1000B

Ultra-Stable Crystal Oscillator

KEY FEATURES

- Low Aging, 5.0E-11 Per Day
- Low Phase Noise, -160dBc at 10 kHz
- Independently Buffered Outputs
- Linearized Electronic Frequency Control
- Fast Warm-Up, 15 Minutes to 2.0E-8
- High Reliability Available
- 0° C to 55° C Operating Temperature Range

Symmetricom's 1000B achieves low aging rates by utilizing high performance SC-cut quartz crystal resonators. The specified aging is reached within 30 days of continuous operation, and typically continues to improve. Several users report observed aging rates as low as 1E-12 per day after years of continuous operation.

A dewar-insulated oven provides superior temperature stability over the full temperature range. The maximum frequency change over the operating temperature range is $<5E-9$. An oven temperature indicator (10mV per degree K) is provided at the power connector.

The oscillator circuit produces phase noise of -116 dBc at 1 Hz and -160 dBc at 10 kHz. Low noise, high isolation buffer amplifiers provide two or four independent outputs. The buffer amplifiers isolate outputs from load variations. An internal voltage regulator minimizes fluctuations due to power supply ripple.

Linearized electronic frequency control allows the use of servo loop techniques for fine frequency tuning. Linearity is better than 5% over the specified tuning range.

The 1000B crystal oscillator meets the demands of a wide range of applications for military and industrial environments. The oscillator is found in precision frequency counters and synthesizers, GPS receivers, microwave multiplier chains, phase noise calibration test equipment, Stratum II telecommunications applications, radar and tactical communications systems, secure communications systems, satellite ground terminals and space flight systems.



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1000B Specifications

ELECTRICAL SPECIFICATIONS

- Frequency
 - Option 1 (-503): Four 5MHz outputs
 - Option 2 (-507): One 5MHz, one 10MHz
- Amplitude
 - Option 1 (-503): 2 @ 1.0 Vms & 2 @ 0.5 Vms
 - Option 2 (-507): 1 each @ 1.0 Vms
- Harmonic distortion: -40dBc -40dBc
- Spurious signals: -80dBc -80dBc
- Connectors
 - RF (J1-J4): SMA
 - Power (J5): 9 pin D subminiature
- Frequency adjustment range

| | Option 1 | Option 2 |
|----------------|-----------|-------------|
| Mechanical: | None | 4.0E-7 |
| Electrical: | | |
| Tuning slope: | Positive | Negative |
| Control range: | 0 to 10 V | -10 to 10 V |
- Output frequency
 - Option 1 (-503): 5 MHz
 - Option 2 (-507): 10 MHz & 5 MHz
- Aging per day (see note 1) <math><1.0E-10</math>
- Short term stability $\sigma(\gamma)\tau$ for averaging time τ of:

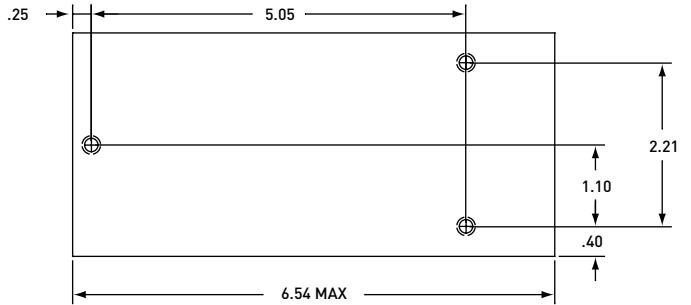
| | |
|-----|---------|
| 1s | 1.0E-12 |
| 10s | 1.0E-12 |
- Phase noise

| [-dBc/ Hz] | 5 MHz | 10MHz |
|------------|--------|--------|
| 1 | -116dB | -108dB |
| 10 | -140dB | -134dB |
| 100 | -150dB | -144dB |
| 1,000 | -157dB | -150dB |
| 10,000 | -160dB | -153dB |
| 100,000 | -160dB | -153dB |
- Maximum frequency change (peak-to-peak) as a function of operating temperature:

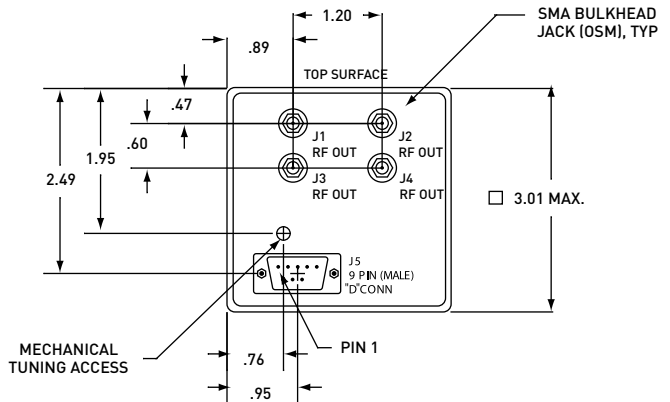
| | Option 1 | Option 2 |
|--|----------|----------|
| | 1.0E-9 | 5.0E-9 |
- Load change (50 Ω + 10%) 5.0E-11
- Input voltage
 - Oven supply: 18 to 30 Vdc
 - Electronics supply: 18 to 30 Vdc

ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

- Supply sensitivity
 - 1% V in 18 to 30V: <math><1.0E-11</math>
- EMI susceptibility (side bands)
 - 0.1 Vrms on power supply inputs 10 Hz to 104Hz: <math><-100dBc</math>
- Temperature
 - Operating: 0° C to 55° C
 - Non-operating: -28° C to 90° C
- Power requirement (typical 10%)
 - Warm up: 13W
 - Operating @ 25° C: 3.2W
- Warm up to 2.0E-8 of final frequency: 15 minutes
- Oven monitors temperature: 10 mV/ ° C
- Dimensions
 - Height: 3" (7.62 cm)
 - Width: 3" (7.62 cm)
 - Depth: 6.6" (16.76 cm)
- Weight: 1.5 lbs. (0.67 Kg)



Bottom View



Front View



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