



9700

Aerospace Oscillator Series

KEY FEATURES

- Output Frequency: 4 MHz - 60 MHz
- Low Power Consumption: 1.3W @ 25°C (Vacuum)
- Compact Sizes: 1.33" x 1.33" x 1.31"
- Frequency Aging:
5 MHz: 5.0E-11/day, 1.5E-8/year
10 MHz: 3.0E-10/day, 4.0E-8/year
- Temperature Coefficient: $\pm 4.0\text{E-}9$
- Radiation Rated: 100 krad (Si)

Symmetricom's 9700 is an ultra-miniature ovenized crystal oscillator designed to provide a high stability RF sine wave output.

The use of hybrid circuitry allows for the greatest reduction in size possible without compromise of the performance or reliability.

Assembly is performed by skilled operators certified to NASA approved workmanship standards. Hybrid circuits produced at facilities qualified to MIL-PRF-38534C. All discrete components are manufactured and tested to Grade 1 requirements per MIL-STD-975.

The environmentally rugged 9700 features an SC-cut quartz resonator and sustaining

electronics which are controlled at precise temperature to achieve temperature insensitive performance, excellent short term stability, phase noise and aging characteristics. Backed by an extensive oscillator legacy the 9700 series meets the challenges of aerospace specifications for time and frequency, even under the most adverse environmental conditions.

The 9700 series oscillator delivers high end crystal oscillator precision required for both time and frequency in a wide variety of applications including:

- Radio navigation
- Satellite transmission
- Satellite tracking and guidance



9700 Aerospace Oscillators Series

9700 Specifications

ELECTRICAL SPECIFICATIONS

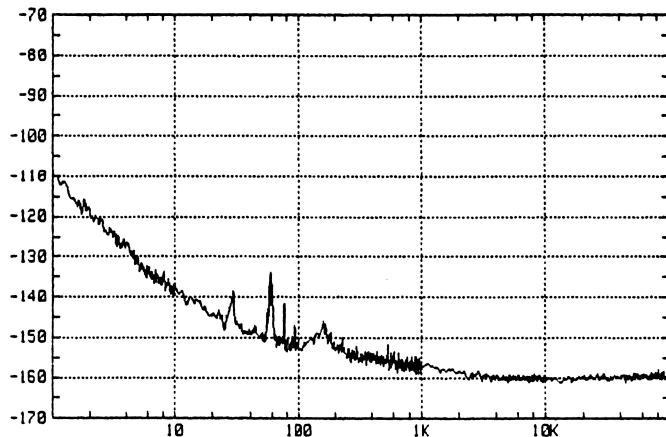
- Output level/load (TTL Option): 7.0dBm
TTL (40% to 60%)
- Short-term stability 5 MHz 10MHz
1 second (Allan Variance): 2.0E-12 5.0E-12
10 second (Allan Variance): 2.0E-12 5.0E-12
- Frequency aging 5 MHz 10MHz
Per day: 5.0E-11 3.0E-10
Per year: 1.5E-8 4.0E-8
- Phase noise ($\sqrt{\text{dBc}}/\text{Hz}$) 5 MHz 10MHz
1 -112dBc/Hz -100dBc/Hz
10 -140dBc/Hz -125dBc/Hz
100 -150dBc/Hz -145dBc/Hz
1,000 -157dBc/Hz -150dBc/Hz
10,000 -160dBc/Hz -155dBc/Hz
100,000 -160dBc/Hz -155dBc/Hz
- Frequency vs. temperature: $\pm 4\text{E-}9$
- Harmonic distortion: -30dBc
- Non-harmonic distortion: -90dBc
- Frequency retrace: $\pm 1.0\text{E-}8$
(After up to 24 hrs. Off & 1 hour's use at $\text{@ } 25^\circ\text{C}$)
- Input Voltage
Range: 12 to 24 Vdc
Sensitivity: 1.0E-10, $\pm 5\%$
- Power, steady state (mW): 1.3 Watts $\text{@ } 25^\circ\text{C}$ (Vacuum)
- Warm-up power: 4-28 Watts

- Load change sensitivity: $\pm 1.0\text{E-}9, \pm 5\%$
- Warm-up time from -40°C : ≤ 5 minutes to $2.0\text{E-}8^*$
- Elec. freq. cont. range (EFC): $\pm 4.0\text{E-}7$ minimum
- EFC voltage input: 0 TO +5Vdc, (+) Sensing
- Operating temp. range: -54°C to $+76^\circ\text{C}$
- Storage temp. (non-op): -55°C to $+100^\circ\text{C}$
- Acceleration sensitivity
Typical: 4.0E-9 per g
Optional 1: 2.0E-10 per g
(worst case axis)
- Random vibration: 20 grms
- Pyrotechnic shock: 3000 gs
- Radiation: 100 K Rad (Si)
- EMI/EMC specification: For performance levels contact the factory
- Reliability specification: MIL-HDBK-217E
- MTBF: >6 million hrs.
- Physical **Option 1** **Option 2**
Size: 1.33" x 1.33" x 1.31" 1.9" x 1.5" x 1.0"
(3.37 cm x 3.37 cm x 3.37 cm) (4.82 cm x 3.81 cm x 2.54 cm)
Weight: 3.5 ounces [0.09Kg] 5.5 ounces [0.15Kg]
Volume: 2.35 cu inches 2.55 cu inches
(38.54 cubic cm) (41.82 cubic cm)

OPTIONS

- Space qualified
- Low g-sensitivity

*Fast warm-up option available



Typical test results for the 10MHz oscillator



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