



9600

Aerospace Oscillators Series

KEY FEATURES

- Output Frequency: 4 MHz - 60 MHz
- Fast Warm-Up: 5 Minutes From -55°C
- Low Power Consumption: 1.3W @ 25°C (In Vacuum)
- Compact Sizes -Typical:
1.33" x 1.33" x 1.33"
- Frequency Aging:
5 MHz: 5.0E-11/day, 1.5E-8/year
10 MHz: 3.0E-10/day, 4.0E-8/year
- Temperature Coefficient: $\pm 4.0E-9$
(-20° C to 60° C)
- Fast Warm-Up Option Available

Symmetricom's 9600 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 are produced at facilities qualified to MIL-PRF-38534C. All discrete components are manufactured and tested to grade 2 requirements per MIL-STD-975.

The environmentally rugged 9600 features a 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 9600 series meets the challenges of military specifications for time and frequency, even under the most adverse environmental conditions.

The 9600 oscillator series delivers high end crystal oscillator precision required for both time and frequency in a wide variety of applications such as:

- Radio navigation
- Radar warning receiver
- Satellite transmission
- Satellite tracking and guidance

This rugged, compact crystal oscillator is especially advantageous when utilized in mobile transportable and portable applications where fast warm-up, low power consumption and small size is required.



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9600 Specifications

ELECTRICAL SPECIFICATIONS

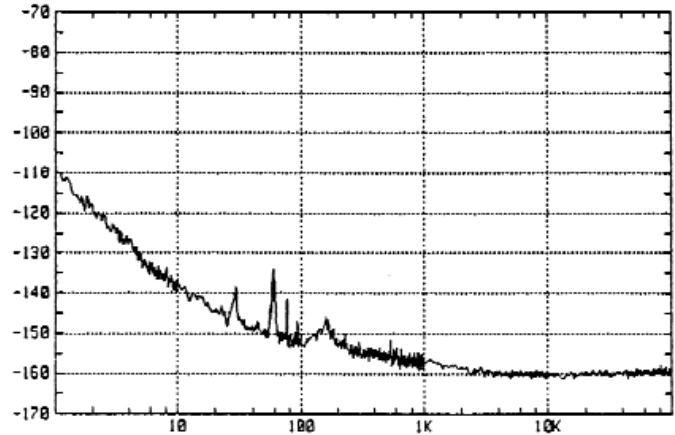
• Output level (TTL option):	7.0dBm	
• Short-term stability	5 MHz	10 MHz
1 second (Allan Deviation):	2.0E-12	5.0E-12
10 second (Allan Deviation):	2.0E-12	5.0E-12
• Frequency aging	5 MHz	10 MHz
Per day:	5.0E-11	3.0E-10
Per year:	1.5E-8	4.0E-8
• Phase noise (dBc/√Hz)	5 MHz	10 MHz
1	-112dBc/Hz	-100dBc/Hz
10	-140dBc/Hz	-125dBc/Hz
100	-145dBc/Hz	-145dBc/Hz
1,000	-157dBc/Hz	-150dBc/Hz
10,000	-160dBc/Hz	-155dBc/Hz
100,000	-160dBc/Hz	-155dBc/Hz
• Frequency vs. temperature:	±4.0E-9	
• Harmonic distortion:	-30dBc	
• Non-harmonic distortion:	-90dBc	
• Frequency retrace:	±1.0E-8	
(After up to 24 hrs. off & 1 hour's use at 25°C)		
• Input voltage		
Range:	12 to 24 Vdc	
Sensitivity:	5.0E-10, ±5%	
• Power, steady state:	1.3 Watts @25° C (In Vacuum)	
• Warm-up power:	4-8 Watts	

• Load change sensitivity:	±1.0E-9, ±5%	
• Warm-up time from -40° C:	≤5 minutes to 2.0E-8*	
• Electrical frequency control (EFC) range:	±4.0E-7 minimum	
• EFC voltage input:	0 to +5Vdc, (+) Sensing	
• Operating temp. range:	-54° C to +76° C	
• Storage temperature:	-55° C to +100° C	
• Acceleration sensitivity		
Typical:	4.0E-9 per g	
Option 1:	≤2.0E-9 per g (worst case axis)	
• Random vibration:	20 grms	
• Pyrotechnic shock:	3000 gs	
• Radiation rated:	100 krad (Si)	
• EMI/EMC specification:	For performance levels contact the factory	
• Reliability specification:	MIL-HDBK-217E	
• Mean time between failure:	>4 million hrs. @55° C	
• Physical		
Option 1	Option 2	
Size:	1.33" x 1.33" x 1.33" (3.37 cm x 3.37 cm x 3.37 cm)	1.9" x 1.5" x 1.0" (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 (38.54 cubic cm)	2.55 cu inches (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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