



9700

Ultra-miniature Space-Qualified OCXO Series

KEY FEATURES

- Output Frequency: 4 MHz - 60 MHz
- Warm-up Time: ≤ 5 minutes from 25°C
- Fast Warm-up Option Available
- 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
 - 10 MHz: $< 3.0E-10$ /day
- Frequency Change vs. Temperature: $\pm 4.0E-9$ (-40°C to +65°C)
- Radiation Rated: 100 krad (Si)

OPTIONS

Available options for this product include:

- Output frequency (4 MHz to 60 MHz available)
- Output format (Sine wave, TTL, or LVDS)
- Panel-mount or PCB-mount package style
- Fast warm-up time: ≤ 5 minutes to within $2.0E-8$ of final frequency from -40°C (+25°C is standard). Warm-up power increases to approx. 14 W.
- Crystal radiation preconditioning

Contact Symmetricom to configure a 9700-series oscillator that will meet your specific needs.

Symmetricom's 9700 is an ultra-miniature ovenized crystal oscillator designed to provide a high stability output for a wide variety of space-qualified applications.

The use of hybrid circuitry allows for the greatest possible reduction in size without compromises in 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 1 requirements per MIL-STD-975.

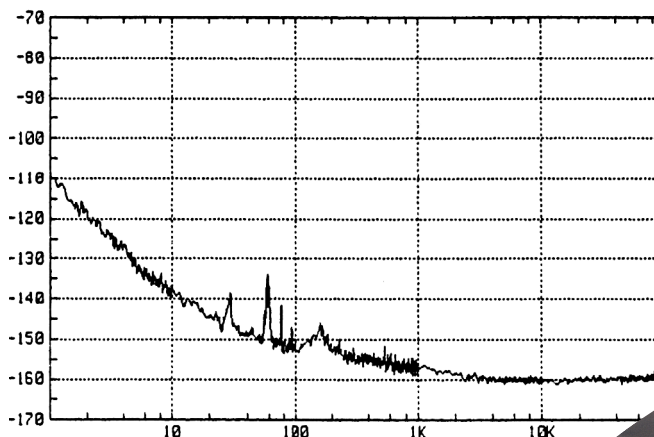
The rugged 9700 features an SC-cut quartz resonator and sustaining electronics that are controlled at a precise temperature to achieve temperature insensitive performance, and excellent short term stability, phase

noise, and aging characteristics. This allows it to meet the challenges of space specifications for time and frequency standards, even under the most adverse environmental conditions.

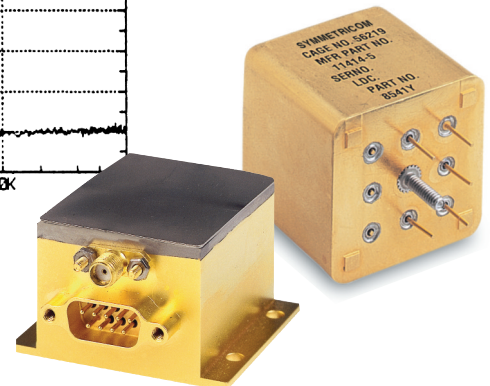
Backed by an extensive oscillator legacy the 9700 series can be customized in output frequency, warm-up time, g-sensitivity, and other characteristics, making it useful for applications such as:

- Radio navigation
- Satellite transmission
- Satellite tracking and guidance

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



Typical phase noise test results for the 10MHz oscillator



9700 SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

	5 MHz	10 MHz
• Standard Output Frequency	±5.0E-8	±5.0E-8
• Initial Accuracy	Sine wave (TTL or LVDS optional)	Sine wave (TTL or LVDS optional)
• Format	7.0 dBm ±1 dB	7.0 dBm ±1 dB
• Amplitude	<-30 dBc	<-30 dBc
• Harmonic distortion	<-90 dBc	<-90 dBc
• Non-harmonic distortion	50 Ω	50 Ω
• Load impedance	1.5:1	1.5:1
• VSWR		

PERFORMANCE PARAMETERS

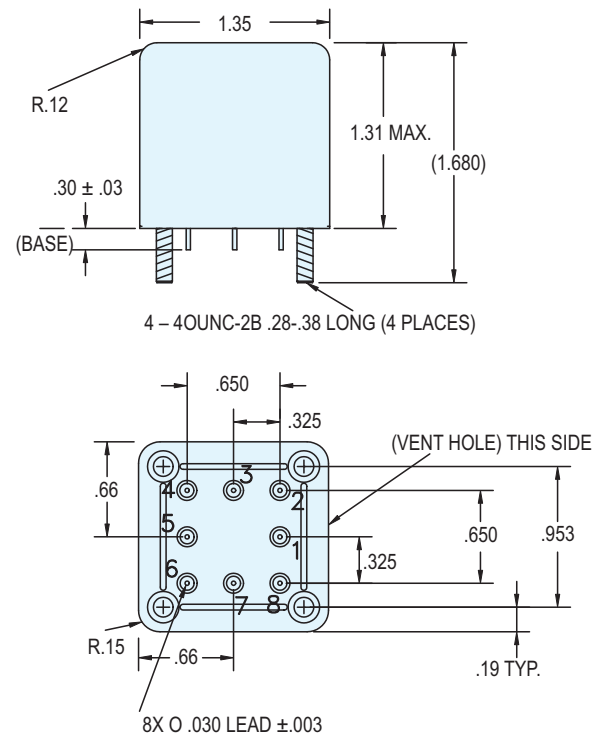
• Short-term stability		
1 second (Allan deviation):	<2.0E-12	<5.0E-12
10 second (Allan deviation):	<2.0E-12	<5.0E-12
100 second (Allan deviation):	<5.0E-12	<1.0E-11
• SSB phase noise (static)		
1 Hz	-112 dBc	-100 dBc
10 Hz	-140 dBc	-125 dBc
100 Hz	-150 dBc	-145 dBc
1 kHz	-157 dBc	-150 dBc
10 kHz	-160 dBc	-155 dBc
100 kHz	-160 dBc	-155 dBc
• Aging		
Per day:	<5.0E-11	<3.0E-10
Per year:	<1.5E-8	<4.0E-8
10 years:	<2.0E-7	<1.0E-6
• Frequency Retrace (after up to 24 hrs. off and 1 hour on at 25° C):	±1.0E-8	
• Acceleration sensitivity		
Per g, total gamma:	≤3.0E-9	≤1.5E-9
• Frequency change vs. Temperature		
-40° C to +65° C:	±4.0E-9	
• Warm-up time from +25° C:	≤5 minutes to within 2.0E-8 of final frequency	
• Input Voltage		
Range:	12 to 15 Vdc	
Sensitivity:	<5.0E-10 for ±5% voltage change	
• Steady-state power consumption at 25° C:	<1.3 W in vacuum	
• Warm-up power consumption:	4 to 8 W	
• Electronic Frequency Control (EFC) Range	±4.0E-7 minimum	
EFC Input	0 to 5 Vdc, (+) sensing	
EFC Linearity	10% typical	
• Load change sensitivity:	±1.0E-9 for ±5% load change	

ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

• Operating Temperature:	-40° C to +65° C
• Storage temperature:	-55° C to +100° C
• Random vibration	
Operating (endurance):	35 g rms
• Pyrotechnic shock:	3000 g
• Radiation Performance:	
Total Dose:	100 kRad (Si)
ELDRS:	Compliant
SEL:	Compliant
Neutron Fluence:	Contact Factory
Prompt Dose Rate:	Contact Factory
• EMI/EMC Performance:	Contact Factory
• EEE Parts Screening Level	NASA Grade 1 equivalent
• MTBF	>6,000,000 hours
• Reliability specification:	MIL-HDBK-217F
• Weight:	0.10 kg

9700 OUTLINE DRAWING

PCB-MOUNT PACKAGE STYLE



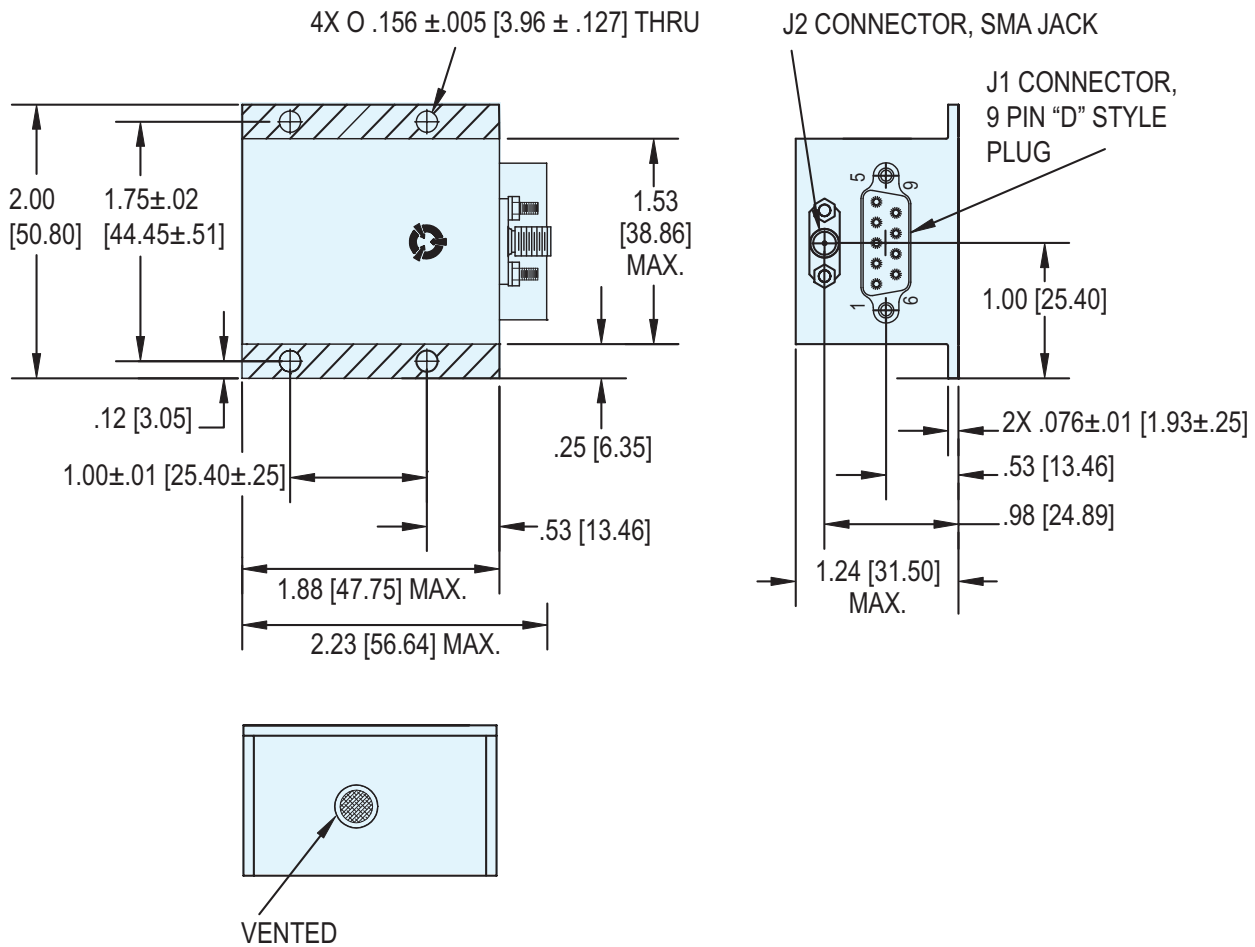
CONNECTION DESCRIPTIONS

PCB-MOUNT PACKAGE STYLE

PIN NO.	DESCRIPTION
1	RF OUTPUT
2	N/C
3	N/C
4	GROUND/CHASSIS GROUND
5	+12 VDC TO +15VDC
6	EFC TUNING VOLTAGE INPUT
7	N/C
8	+12 VDC TO +15VDC

9700 OUTLINE DRAWING

PANEL-MOUNT PACKAGE STYLE



CONNECTION DESCRIPTIONS

PANEL-MOUNT PACKAGE STYLE

PIN NO.	FUNCTION
J1-1	POWER +12VDC TO +15VDC
J1-2	N/C
J1-3	N/C
J1-4	GROUND/CHASSIS GROUND
J1-5	EFC TUNING VOLTAGE INPUT
J1-6	GROUND/CHASSIS GROUND
J1-7	POWER +12VDC TO +15VDC
J1-8	N/C
J1-9	N/C
J2-1	RF OUTPUT



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