9600

Ultra-miniature Space and Military 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: ±4.0E-9 (-40°C to +65°C)
- Low g-sensitivity Option Available

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
- Component screening to space (grade 1) requirements
- 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.
- Low acceleration sensitivity of ≤2.0E- 10 at 10 MHz
- Crystal radiation preconditioning

Contact Microsemi® to configure a 9600-series oscillator that will meet your specific needs.

Microsemi's 9600 is an ultra-miniature ovenized crystal oscillator designed to provide a high stability output for a wide variety of military and space applications.

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

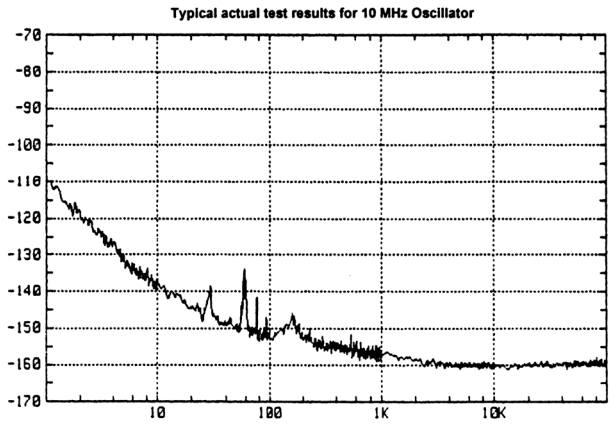
Assembly is performed by skilled operators certified to NASA approved workmanship standards. Hybrid circuits are produced at facilities qualified to MIL-PRF-38534C. All discrete components are manufactured and tested standard to grade 2 or optionally to grade 1 requirements per MIL-STD-975.

The rugged 9600 features a 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 many military and space specifications for time and frequency, even under the most adverse environmental conditions.

Backed by an extensive oscillator legacy, the 9600 series can be customized in output frequency, warm-up time, g-sensitivity, and other characteristics, making it useful for applications such as:

- Radio navigation
- Radar warning receivers
- 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 are required.



Typical phase noise test results for the 10MHz oscillator

9600 SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

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

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	±1.0E-8
• Acceleration sensitivity		
Per g. total gamma	≤3.0E-9	≤1.5E-9
Low g. option, total gamma	N/A	≤2.0E-10

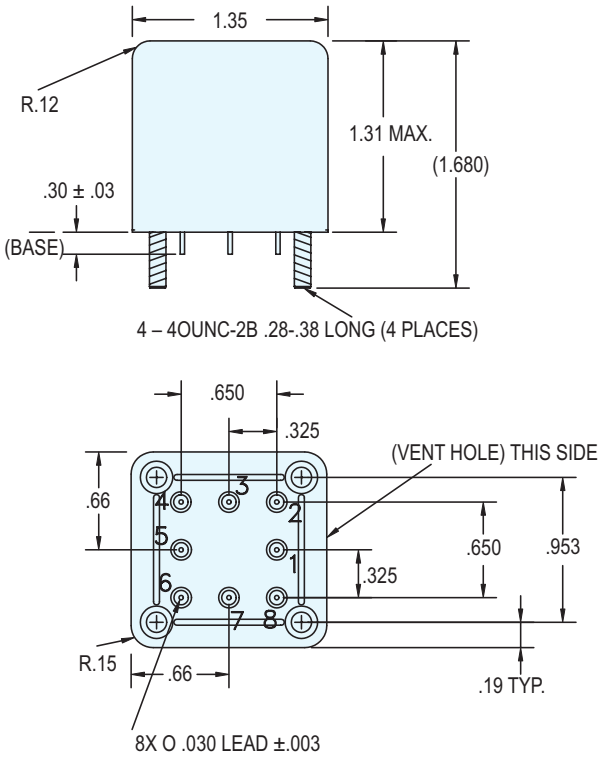
- Frequency change vs. Temperature: ±4.0E-9
  - -40° C to +65° C:
  - Warm-up time from +25° C: ≤5 minutes to within 2.0E-8 of final frequency
- Input Voltage
  - Range: 12 to 15 Vdc
  - Sensitivity: <5.0E-10 for ±5% voltage change
- Steady-state power consumption at 25° C: <1.3 W in vacuum
- Warm-up 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 2 equivalent
- MTBF: >6,000,000 hours
- Reliability specification: MIL-HDBK-217F
- Weight: 0.10 kg

9600 OUTLINE DRAWING

PCB-MOUNT PACKAGE STYLE



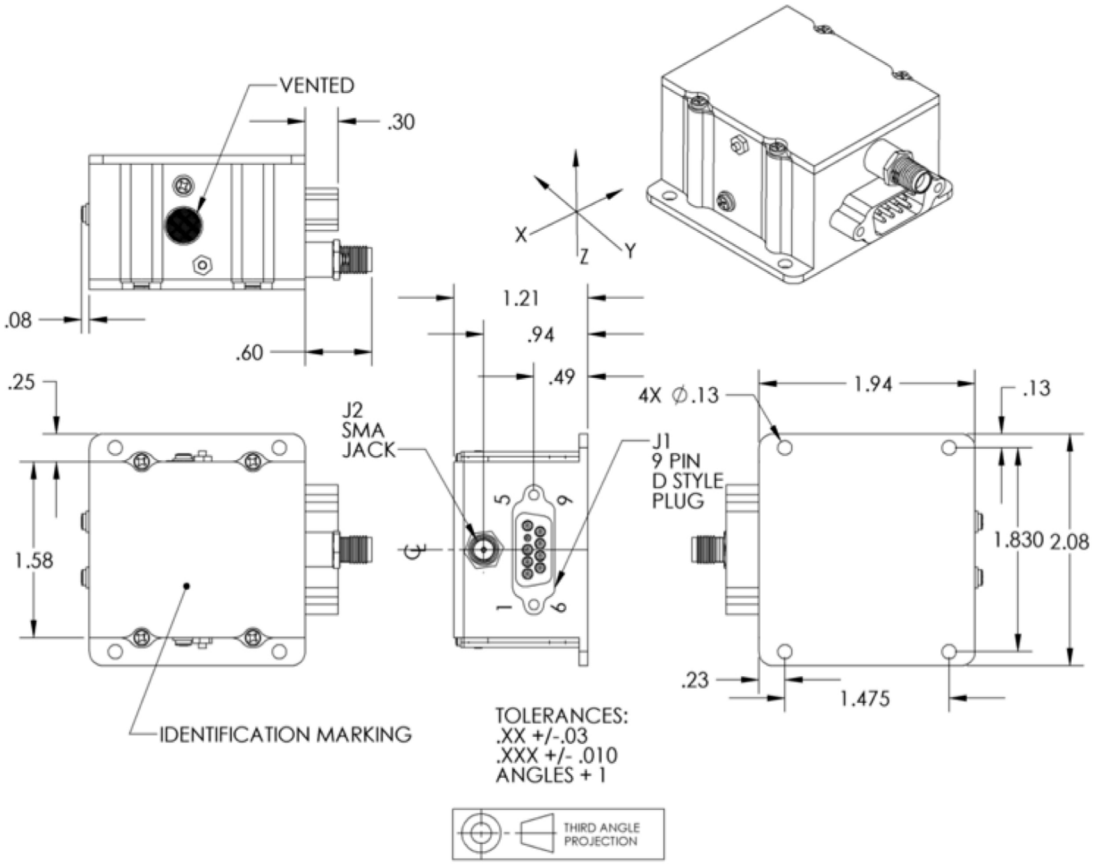
CONNECTION DESCRIPTIONS

PCB-MOUNT PACKAGE STYLE

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

9600 OUTLINE DRAWING

PANEL-MOUNT PACKAGE STYLE



CONNECTION DESCRIPTIONS

PANEL-MOUNT PACKAGE STYLE

PIN NO.	FUNCTION
J1-1	POWER +12 VDC TO +15 VDC
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 +12 VDC TO +15 VDC
J1-8	N/C
J1-9	N/C
J2-1	RF OUTPUT

Microsemi Corporate Headquarters
One Enterprise, Aliso Viejo,
CA 92656 USA

Within the USA: +1 (800) 713-4113
Outside the USA: +1 (949) 380-6100
Sales: +1 (949) 380-6136
Fax: +1 (949) 215-4996

E-mail: sales.support@microsemi.com

Microsemi Corporation (MSCC) offers a comprehensive portfolio of semiconductor and system solutions for communications, defense & security, aerospace and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif., and has approximately 3,600 employees globally. Learn more at www.microsemi.com.