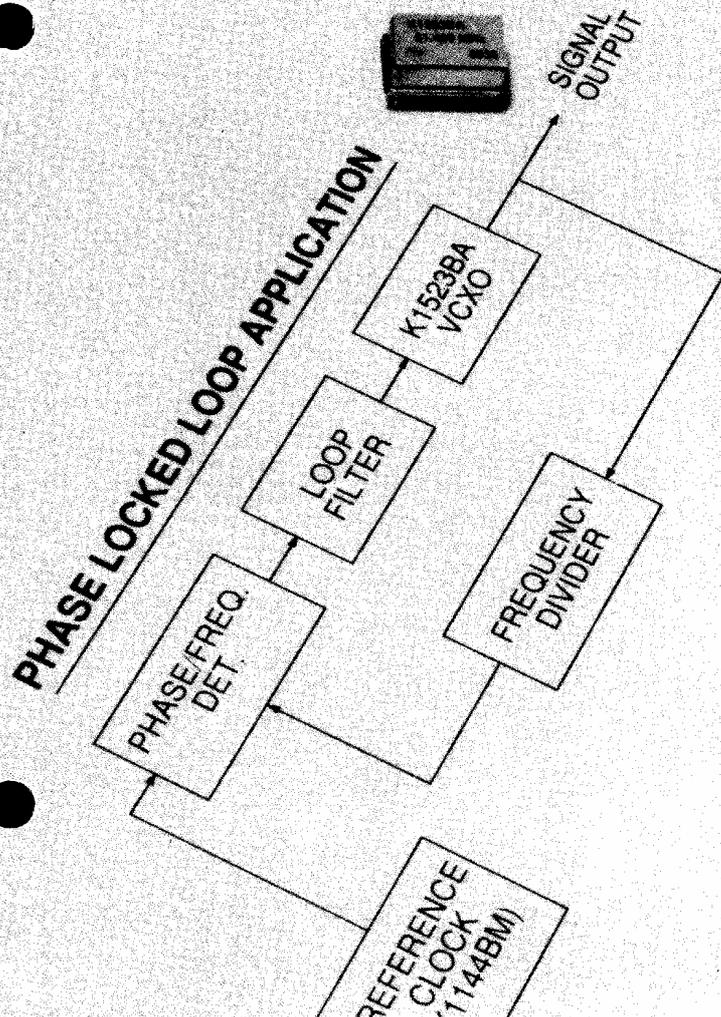
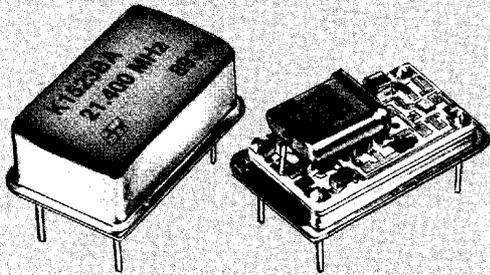


# K1523BA

## Voltage Controlled Crystal Oscillator

- Frequency Range 2.0 MHz to 35.0 MHz
- Frequency Stability of  $\pm 25$  PPM
- TTL/CMOS Compatible
- Sensitivity: +50 to +75 PPM/Volt  $\leq 25$  MHz  
+50 to +95 PPM/Volt  $\leq 35$  MHz
- Linearity:  $\pm 5\%$  max  $\leq 25$  MHz  
 $\pm 10\%$  max  $\leq 35$  MHz
- 14-Pin DIP Resistance-Welded Case



**Applications**—The K1523BA Voltage Controlled Crystal Oscillator allows the system designer to phase lock to a reference standard to correct for frequency errors between different timing signals in his system. VCXOs are predominantly used in local area networks or in any other form of computer-shared management system as well as in all phase locked loop applications for communications equipment and analog/digital interface.

**Deviation**—The K1523BA offers a minimum frequency control deviation of  $\pm 100$  ppm/V, operating from a nominal modulation voltage of 2.5V dc over a modulation range of 0.5V dc to 4.5V dc, while maintaining monotonic linearity specification of less than  $\pm 5\%$  for frequencies under 25 MHz and less than  $\pm 10\%$  for frequencies above 25 MHz.

**TTL/CMOS Output**—Operating from a supply voltage of +5V dc, the K1523BA Voltage Controlled Crystal Oscillator drives standard TTL/CMOS logic.

**High Density Packaging** — The cost-effective combination of hybrid and discrete component technologies gives the K1523BA optimum performance in a 14-pin DIP package measuring only .820" x .520" with .335" seated height. This allows the designer to achieve considerable reduction in size and helps solve space limitation problems.

**Maximum Reliability**—The K1523BA uses a custom integrated circuit and a hermetically-sealed, resistance welded quartz crystal, combined with proprietary thick-film hybrid techniques to obtain an oscillator design with reduced parts count while providing uniform high quality and field reliability.

**Volume Production**—Modern, automated production techniques are used to provide and assure volume production capability.

**FREQUENCY RANGE:** 2.0 MHz TO 35 MHz

**FREQUENCY STABILITY:**

±0.0025% (0°C to +70°C)

±0.0050% (-40°C to +85°C)

(Inclusive of calibration tolerance at 25°C, operating temperature range, supply input voltage change, load change, aging, shock, and vibration, with control voltage = 2.5V dc)

**TEMPERATURE RANGE:**

**OPERATING:** 0°C to +70°C (25 ppm)

-40°C to +85°C (50 ppm)

**STORAGE:** -55°C to +125°C

**PHASE JITTER:** <100 ps

**SUPPLY VOLTAGE:** +5V dc ±5%

**SUPPLY CURRENT:** (CL = 15 pF)

**INPUT:** ≤10 MHz: 13 mA

≤20 MHz: 17 mA

≤25 MHz: 19 mA

≤35 MHz: 26 mA

**OUTPUT**

**SHORTED (1 sec. max):** -30 mA min., -140 mA max.

**OUTPUT:**

**SYMMETRY:** 45/55% @ CMOS/TTL levels (<16.0 MHz)

40/60% @ CMOS/TTL levels (16.0 - 35.0MHz)

**TR & TF (max):** TR TF (CL=15 pF)

CMOS (20 to 80% Vdd) 5 ns 5 ns

TTL (0.5V to 2.5V dc) 4 ns 4 ns

**LOAD:** 10 TTL gates, CMOS compatible

**START UP TIME:** <10 ms max.

**FREQUENCY CONTROL:**

**CONTROL VOLTAGE:** 0.5V — 2.5V — 4.5V dc

**DEVIATION:** ±100ppm min. ±150 ppm max. ≤25 MHz

±100ppm min. ±190 ppm max. ≤35 MHz

**SENSITIVITY:** +50 to +75 ppm/V ≤25 MHz

+50 to +95 ppm/V ≤35 MHz

**LINEARITY:** <±5% at ≤25 MHz

≤±10% at ≤35 MHz

**INPUT IMPEDANCE:** ≥ 50K Ohms at ≤10 kHz

**MODULATION BW:** ≤20 kHz (-3dB, Vc = 2.5V)

**ENVIRONMENTAL;**

**TEMPERATURE**

**CYCLE:** MIL-STD-883B Method 1010.2 Level B

**SHOCK:** 5,000 G's 0.35 millise. 1/2 sine wave; 3 shocks each plane

**VIBRATION:** 10-55 Hz, .060" D.A., 55 Hz - 2000 Hz

35 G's. Duration time - 12 hours

85% Relative humidity @ +85°C, 500 hours

**HUMIDITY:**

**ELECTROSTATIC**

**DISCHARGE** MIL-STD-883B, Method 3015

**SENSITIVITY:** Class B; >2 KV

**MECHANICAL:**

**GROSS LEAK**

**TEST:** Leak test in de-ionized H<sub>2</sub>O

**HERMETICALLY**

**SEALED** Mass spectrometer leak rate less than

2 x 10<sup>-9</sup> atmos. CC/sec of helium

**SEAL** 20 lbs max. force perpendicular to

**STRENGTH:** top and bottom

**BEND TEST:** Pins will withstand maximum bend of 90°

reference to base for 2 bends

**MARKING INK** Epoxy, heat cured

**SOLVENT** Isopropyl alcohol, Trichloroethane,

**RESISTANCE:** Freon TMC

No marking or seal destruction, dipped in

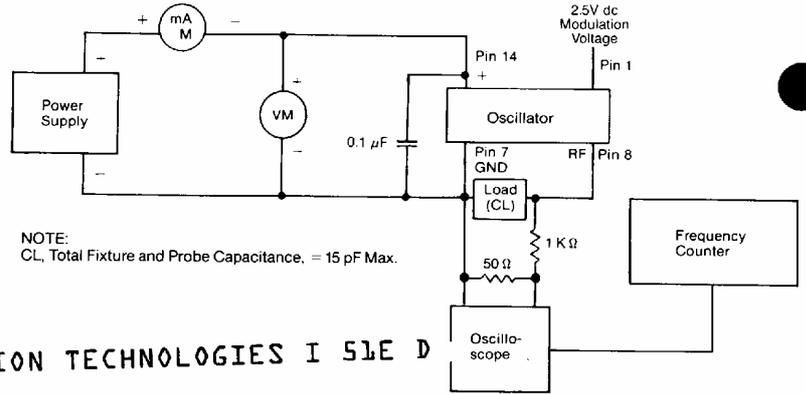
solvent 1 minute @ +25°C ±5°C

Note (1): Unit can be cleaned by only one type solvent listed.

Note (2): Ultrasonic degreaser not to be used.

# K1523BA VCXO Specifications

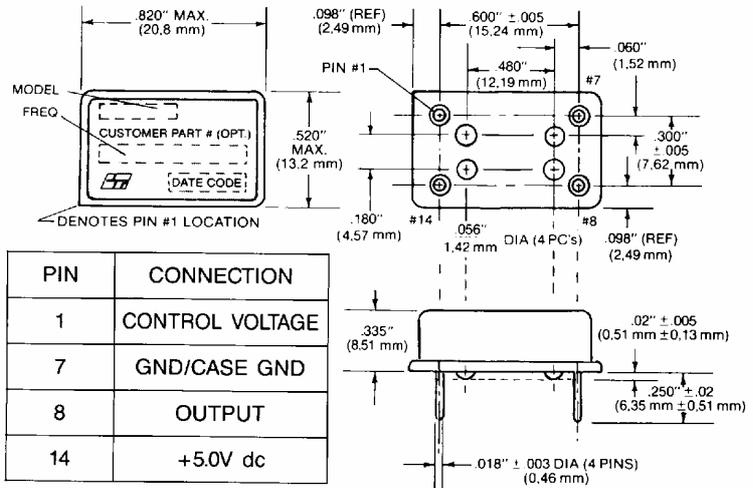
Product covered by U.S. Patent No. 4,710,730



NOTE:  
CL, Total Fixture and Probe Capacitance. = 15 pF Max.

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## TEST CIRCUIT DIAGRAM



## Solderability Specifications

**MATERIALS:**

**SOLDER:** 60% tin and 40% lead

**FLUX:** Mildly activated rosin base type such as Alpha 611.

**PROCEDURE:**

**PREPARATION:** No wiping, cleaning, scraping, or abrading shall be performed on the leads.

**SOLDER BATH:** The solder bath shall be maintained at 265 ± 5°C.

**SOLDERABILITY:** Dip the terminals into room temperature flux, to a maximum of .020" from the unit base, for 5 to 10 seconds. Withdraw from the flux and dip the terminals to the same depth in the molten solder from 5 to 7 seconds. Flux residue may be removed with Freon rinse, or with soft swab moistened with isopropyl alcohol or Freon.

**REQUIREMENTS:**

**EVALUATION:** All leads must exhibit a minimum of 90% continuous solder coating over their entire length beyond .020" from the unit base. Pin-holes or voids may not be concentrated in any one area and are not to exceed 10% of the total area under examination.



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