

INTRODUCTION

For several years, OSCILLOQUARTZ SA worked diligently to incorporate the basic « BVA CONCEPT » into a marketable industrial product. We are satisfied that we met this challenge successfully and are pleased to introduce you to BVA quartz crystal oscillators.

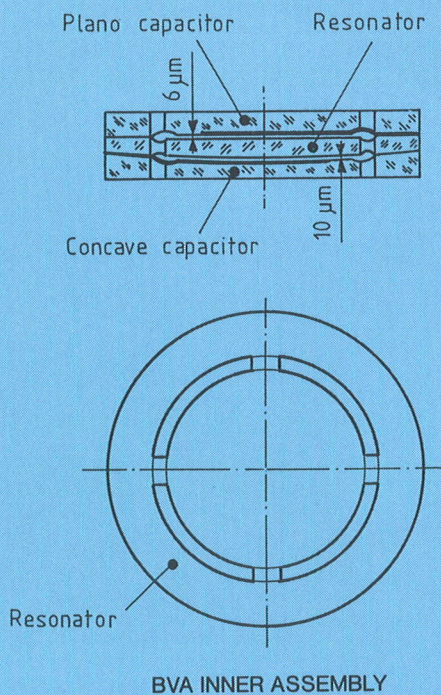
The BVA 5 MHz crystal-equipped frequency sources exhibit a new blend of remarkable qualities. They offer 10^{-11} daily stability, 5×10^{-13} short-term stability (0.2 to 30 s time intervals) and close-to-the-carrier low phase noise (1 Hz: -120 dBc, 10 Hz: -140 dBc), yet they retain the customary crystal oscillator benefits of small volume, reliability and low price. Ordinarily, a more sophisticated and costly frequency generator would be required to match the performance of the Oscilloquartz BVA OCXO.

APPLICATIONS

The Oscilloquartz BVA OCXO was designed for use as a stand-alone precision frequency source but also offers remarkable advantages when combined in the following units and systems:

- cesium frequency standards
- hydrogen frequency standards
- precision distribution sub-systems for satellite ground stations
- high hierarchy exchanges of digital networks, slaved to an external reference signal.

BVA RESONATOR



BVA INNER ASSEMBLY

The BVA unit consists of an electrodeless resonator at 5 MHz, 5th overtone, AT-cut, which is decoupled from its mounting structure by 4 bridges.

These bridges are precisely made and located. They serve the purpose of keeping the mounting stress away from the active center part (resonator) as much as possible.

The electrodes are evaporated on two counter-pieces, like condensers, also made of AT quartz blanks with the same cut-angle as the resonator blank.

The 3 parts are rigidly held together with stainless steel clips, and the whole sandwich is spring-mounted into a rigid cage.

The BVA assembly is mounted inside a cage consisting of a base plate and a cover plate fixed to four columns within a cold welded enclosure. In order to provide a clean environment for the resonator, the cage is baked-out at 250 degrees C while it is pumped to 10^{-8} mbar through the chimney with a cryo pumping system. The chimney is then sealed by a pinch-off process.

The structure offers the following substantial, novel features:

- electrodeless resonator eliminates most of the problems linked to surface perturbations and ion migrations
- the use of a crystal resonator rigid mounting made out of quartz material does away with the problems linked to discontinuities, relaxation and stress in the mounting points.
- the reduction of space around the active part eliminates problems associated with contamination

Some typical characteristics and operation conditions of the BVA 5 MHz AT-cut, 5th overtone resonator used in the 8600 / 8601 series:

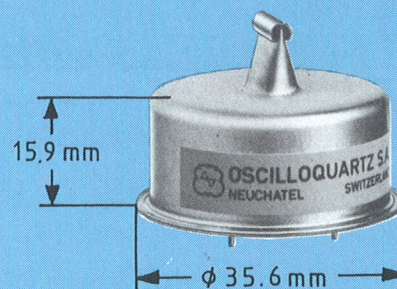
$$Q = 2.3 \times 10^6$$

$$R_1 \leq 80 \Omega$$

$$C_L = 100 \text{ pF} \pm 10 \%$$

$$P = 85 \mu\text{W} \text{ (drive level)}$$

$$P_i = 85^\circ \text{C} \pm 5^\circ \text{C} \text{ (-30} \div \text{+90}^\circ \text{C storage)}$$



BVA RESONATOR