



Product-News

New Precision OCXOs Provide Ultra Low Phase Noise (ULPN) and Low G-Sensitivity (LGS)

By the usage of self-manufactured noise-optimized SC-cut crystals and noise-minimized electronic circuits KVG's engineers succeeded in designing new OCXOs what provide beside a very high frequency stability an exceptional ULTRA low phase noise (ULPN) and in addition low G-sensitivity (LGS).

For high-frequency crystal oscillators locked to a frequency-reference – like GPS; Rubidium- or Cesium-Normal, the phase-noise (PN) in the frequency-range above the PLL-loop bandwidth is particularly important, because phase-noise is determined by the locked oscillator and not by the reference-signal.

The new 100 MHz OCXOs - **O-30-ULPN-100M** – gives a “Noise Floor” for better than -185 dBc/Hz at 100 kHz offset. At 10 kHz offset the phase-noise is already better than -180 dBc/Hz and near to the carrier **O-30-ULPN-100M** gives a very good performance with -135 dBc/Hz at 100 Hz offset (see also pic 1).

A very good robustness against vibration – also known as microphony – is very important for oscillators with very good phase-noise, to avoid a significant performance degradation due to “vibration-induced” phase-modulation. The dynamic G-sensitivity of the new OCXO is less than 1 ppb/g (1×10^{-9} /g) for all axes, which means ten-times better than standard-OCXOs.

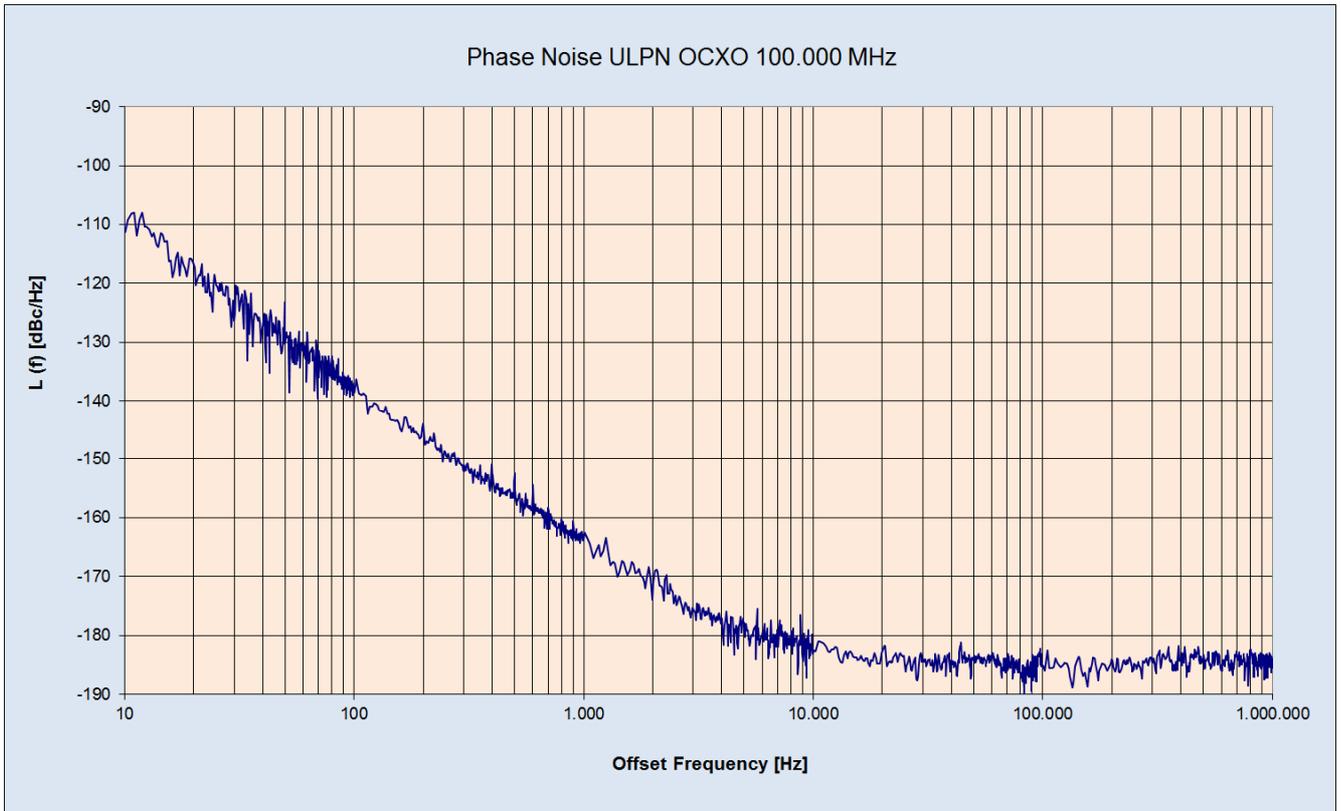
In addition to the excellent phase-noise and low G-sensitivity the **O-30-ULPN-100M** is characterized by a very good frequency stability vs. temperature of better than ± 50 ppb ($\pm 5 \times 10^{-8}$) in the temperature-range from -20 °C to +70 °C. For the extended temperature range from -40 °C to +85 °C the frequency stability is better than ± 200 ppb ($\pm 2 \times 10^{-7}$).

The long term stability (aging) is typically better than ± 2.0 ppm within 15 years. The OCXO provides a voltage controlled frequency-tuning with a sufficiently large tuning-range. So for the full life-time it is guaranteed that the carrier-frequency could be adjusted to the nominal-frequency, this is crucial for synchronized systems.

These new high-frequency OCXOs are dedicated for application in Test & Measurement Systems as well as Medical-industry (e.g. Magnetic Resonance – or Computed Tomography) and reference clock for microwave signal sources or radar systems. In general all application in GHz-range where phase-noise of reference-source is the determining factor for the performance of the complete system.

The oscillators will be delivered in a small hermetically sealed metal can packages either (36 x 27 x 16 mm) or (25 x 25 x 12.7 mm) for thru-hole mounting (see also pic 2&3). Due to the hermetically sealed package the OCXOs is suitable for humid environmental conditions.

KVG Quartz Crystal Technology GmbH is the leading German manufacturer of crystals, crystal filters and oscillators and has been one of the industry's technology leaders for high precision quartz crystal products for more than 65 years.



Pic 1 Phase-Noise diagram O-30-ULPN 100.00 MHz



**Pic 2 Hermetically sealed package
36 x 27 mm**



**Pic 3 Hermetically sealed package
25 x 25 mm**