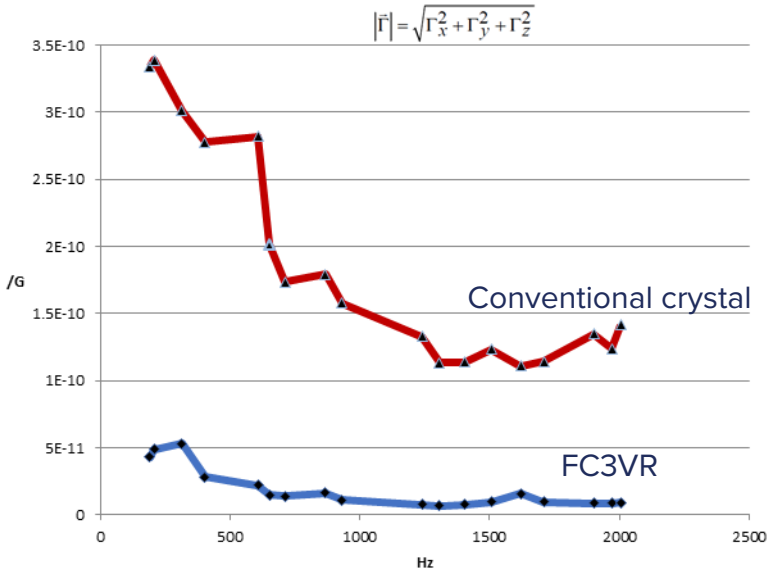
FC3VR LEO

VIBRATION RESISTANT CRYSTAL

OVERVIEW

Fox, powered by Abracon, introduced the FC3VR to improve system performance when exposed to modern world environmental conditions. The state-of-the-art resonator incorporates patented technology that allows the FC3VR to hold superior frequency stability when compared to conventional crystals. The low G-sensitivity makes it ideal for wireless communication applications operating in active surroundings in which signal lock and low data loss are of utmost importance.

Acceleration Sensitivity Comparison



FEATURES

- Low G-sensitivity
- Frequency tolerances down to ±10 ppm
- Patented technology
- Industry standard package size of 3.2 x 2.5mm
- Frequency range from 33 - 52 MHz
- Low ESR (60Ω Max.)

APPLICATIONS

5G

Industrial IoT

Mil/Aero

FC3VR LEO
WHITE PAPER

BACKGROUND

Fox introduced the FC3VR product series to improve customers' system performance when exposed to modern world environmental conditions. The state-of-the-art resonator incorporates patented technology that allows the FC3VR devices to hold system performance nearly uniform on all axes. The FC3VR often has the exact same form, fit and function as conventional crystals. No other circuit substitutions are required to try the low G-sensitivity crystal, and the benefits in performance and reliability begin immediately.

Low G-Sensitivity Crystal

Wireless communication applications benefit from a vibration-resistant crystal. The improvement under discussion is not about survivability; that is already satisfactory. The FC3VR is equal to the conventional devices for these conditions. Instead, the FC3VR advantage is about providing dynamic performance under vibration, specifically phase noise.

Today's communication devices require a clean and stable frequency source, but what happens when a train or large truck goes by the 5G base station? The resulting vibration is an acceleration event that can create a frequency shift in an otherwise stable source.

G-sensitivity is the change in frequency resulting from an acceleration force applied to a frequency control device. The less sensitive an application's frequency source is to acceleration, the better the operating phase noise will be. Improved phase noise enhances communication and reduces data loss.

The development of the FC3VR began several years ago when a telecommunications customer presented a problem: When a frequency control device in an application was exposed to vibration, the frequency of the vibration modulated the frequency and thereby degraded the phase noise. The traditional method to combat this problem is mechanical isolation, but this approach can introduce extra costs and require extra design work or larger package sizing.

Fox attacked the issue at the basic quartz structure, and the resulting solution was the patented vibration-resistant technology used in the FC3VR, which has a 0.2ppb/G acceleration sensitivity rating. The FC3VR crystal blank can be used without requiring mechanical isolation to maintain low phase noise at a desired operating temperature...

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