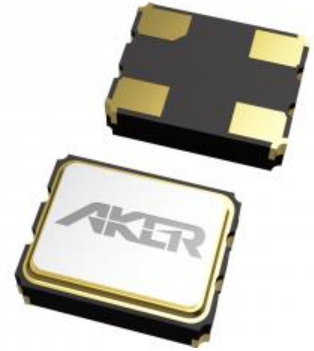


A Temperature Compensated Crystal Oscillator (TCXO) is a crystal oscillator specifically designed to provide a stable oscillation frequency in high temperatures. Their built-in temperature compensation circuitry enables them to automatically adjust frequency and maintain stability. TCXOs are used when temperature stability requirements are beyond reach of standard crystal clock oscillators or voltage-controlled crystal oscillators (VCXOs).



TCXOs have a frequency stability of ± 0.5 ppm or ± 1.0 ppm over the operating temperature range. Despite variations in ambient temperature, the temperature compensation of the TCXO allows it to produce a stable frequency reference signal, making it ideal for electronics that must maintain timing accuracy in changing real-world conditions that are often seen in portable and field-deployed devices. Because of their low jitter and phase noise, TCXOs provide the precision and reliability needed in today's sophisticated electronic systems and communication infrastructure.

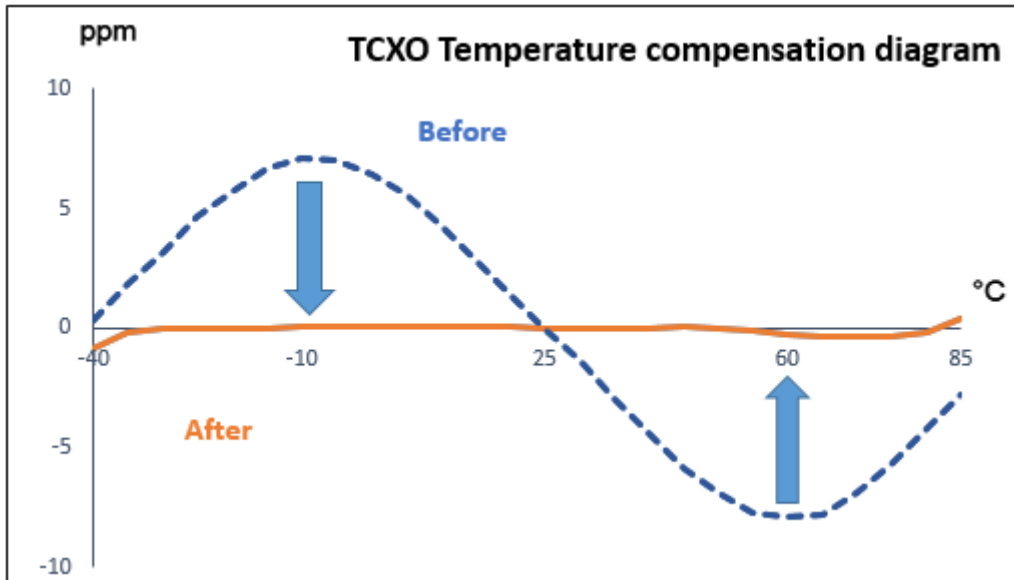
Keeping Precise Time in a Dynamic World: The Power of TCXO Stability

The advantage of a TCXO is its tight stability. Its temperature compensation circuitry helps correct temperature-induced changes in frequency output, improving the device's stability. When compared to traditional clock oscillators that rely on the cutting angle of the crystal and the discrete issues to function over the operating temperature range for an appropriate frequency curve, the TCXO design is far better as it compensates for this frequency curve.

How TCXO Delivers Precision Despite Temperature Shifts

A TCXO uses a temperature compensation circuit designed into the integrated circuit to reduce the change in oscillation frequency caused by ambient temperature change. Because of this, the temperature compensated quartz crystal resonator has the characteristics of high precision, producing an oscillator with precise and stable frequency. A TCXO differs from other types of oscillators in that it uses temperature compensation circuitry to correct for frequency changes caused by temperature changes (Diagram 1).

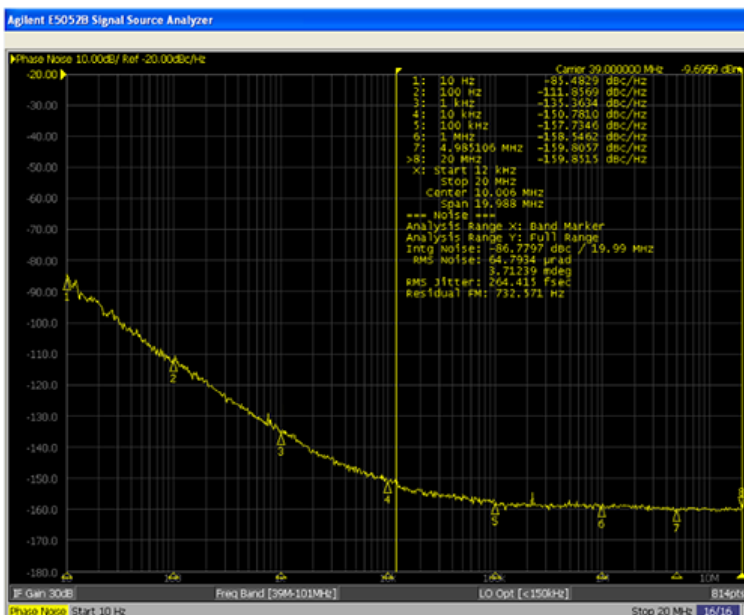
Diagram 1



Enhancing TCXO Performance: Exemplary Phase Jitter

At Aker, our TCXOs stand out not only for their overall performance, but also for their exceptional phase jitter characteristics. The oscillators produced by Aker consistently meet the high specifications demanded by our customers, as illustrated in the images below.

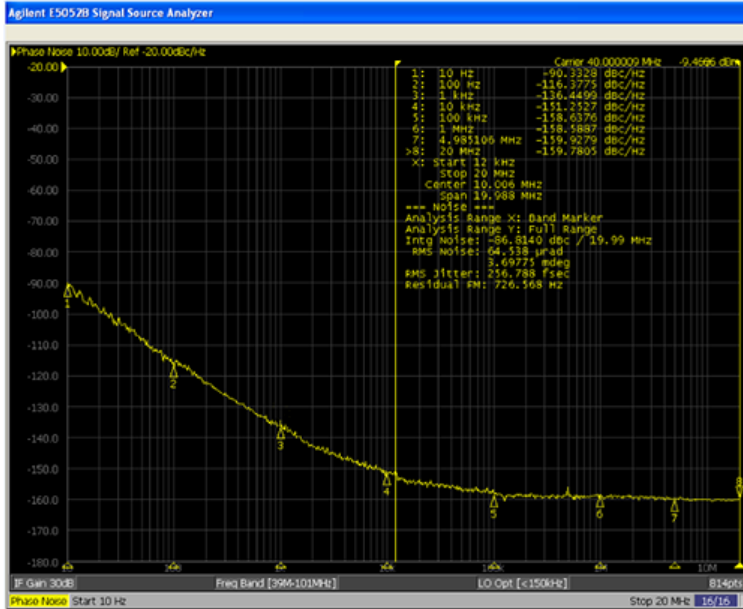
3225 TCXO 39 MHz, 3.3 V model



RMS Jitter(10KHz~20Mhz) 264fsec typ

10Hz	-85.4
100Hz	-111.8
1K	-135.3
10K	-150.7
100K	-157.7
1M	-158.5
5M	-159.8
20M	-159.8

3225 VCTCXO 40 MHz, 3.3 V model



RMS Jitter(10KHz~20MHz) 256fsec typ

10Hz	-90.3
100Hz	-116.3
1K	-136.4
10K	-151.2
100K	-158.6
1M	-158.5
5M	-159.9
20M	-159.7

Precision Across Every Industry: A Myriad of Applications

TCXOs are used in a variety of applications and scenarios that require highly precise clock references, including high-performance telecom and networking equipment, optical transport and small cell base stations, Ethernet synchronization, etc. TCXOs are also used in wearables, smartphones, navigation systems, automated meter reading systems, sensors, wearable medical devices, FTTx, POS machines, FRS/radio and more. Here's a breakdown of their applications by frequency:

Finding Your Frequency: Aker's Extensive TCXO Product Portfolio

Aker's products ensure dependable performance in real-world applications, accompanied by swift delivery for urgent lead time demands. Aker's commitment to superior quality, precision, and promptness remains unwavering in the ever-evolving landscape of frequency control solutions.

System	Application	Frequency (MHz)
Position	GPS, navigation system, ADAS, maritime locator, aviation system, high-precision positioning and navigation	16.368, 38.4, 40
Broadband	Cable modem, optical terminal or switch, optical fiber system, broadband communication system, Smart LNB, Netcom	24.576, 25
Medical	Heart monitors, electrocardiographs, medical wearable devices, medical IOT, thermal imaging sensors	16.384, 26
Equipment	Smart meters, oscilloscopes, water and electricity meters, security equipment, test car traffic flow counters	25, 32, 50
Communication	Wireless communication systems, mobile phones, communication modules, terminal walkie-talkies, base stations, industrial base stations, broadcast equipment	39, 26