

Artificial intelligence (AI) dates back as far as the 1940s, when a programmable digital computer, that was based on mathematical reasoning, was invented. This computer, and the ideas behind it, inspired several scientists to begin discussing the possibility of building an electronic brain.

What is AI?

AI is the intelligence of computer systems that possess the ability to simulate human thinking modes, logic and behavior. These self-learning systems obtain useful information from data and continue to correct and evolve that data through analysis. AI uses algorithms and programming technology to enable computer systems to replicate the cognitive abilities of the human brain.



The development of artificial intelligence can be divided into three stages:

- Stage one: 1950s and 1960s – Human thinking logic was put into computers.
- Stage two: 1980s and 1990s – Expert systems were developed to put human knowledge into computers but failed.
- Stage three: 2010 to the present – Domain experts put human experience into computers to provide historical records, allowing computers to perform inductions by themselves. This has created a breakthrough in AI and continues to evolve rapidly.

Advantages of AI

AI technology is advantageous because it uses machine learning and deep learning networks to solve complex problems with human-like intelligence. It can work around the clock, while maintaining a steady performance. AI uses machine learning to analyze big data sets faster than humans.

AI goes through stages of perception, learning, reasoning and correction. It delves into large amounts of data and performs complex and tedious tasks. It helps humans break through limitations and boundaries of research and application. It can be found in everything from facial recognition, smart voice assistants and machine translation to chatbots, automated product sales recommendations, and more. As AI begins to enter our daily lives, it is bound to significantly change things in various industries, such as industrial control, communications, smart home, as well as many others.

Why Frequency Control Is Important

In order for integrated circuits in electronic devices or systems to work correctly, they need to rely on accurate clock signals as a standard frequency source or pulse signal source to provide frequency reference. If the clock signal is wrong, it will cause the entire system to become chaotic or crash. The quartz frequency control component that provides the clock signal is like the heart which dominates the stability of the system. Therefore, the selection of quartz components with high accuracy and reliability is crucial for the stable operation of the electronic system.

Specifically for AI-based IoT applications, the server is a pivotal piece of hardware equipment. Not only does the server determine the speed and accuracy of AI algorithms, but it also controls the stability of AI systems.

To support greater data speeds and efficiency for AI servers, 400G and 800G optical modules are now key components. At the high frequencies that these devices operate, signal integrity becomes a major concern, since signals are more susceptible to attenuation, distortion and dispersion that can degrade transmission quality. Hence selecting the right frequency control device becomes one of the important factors in system design.

Categories	Model	Dimension (mm)
XTAL • SMD	CXAN-751, CXAN-631, CXAN-531, CXAN-421, CXAN-321, CXAN-221, CXAN-211, CXAN-161	7.0×5.0, 6.0×3.5, 5.0×3.2, 4.0×2.5, 3.2×2.5, 2.5×2.0, 2.0×1.6, 1.6×1.2
XO • HCMOS	SMBN-751, SMAN-531, SMAN-321, SMAN-221, SMAN-211	7.0×5.0, 5.0×3.2, 3.2×2.5, 2.5×2.0, 2.0×1.6
XO • LVPECL	SMEN-751, SMEN-531, SMEN-321, SMEN-221	7.0×5.0, 5.0×3.2, 3.2×2.5, 2.5×2.0
XO • LVDS	SMDN-751, SMDN-531, SMDN-321, SMDN-221	7.0×5.0, 5.0×3.2, 3.2×2.5, 2.5×2.0