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Application Note

Portwell, Inc.

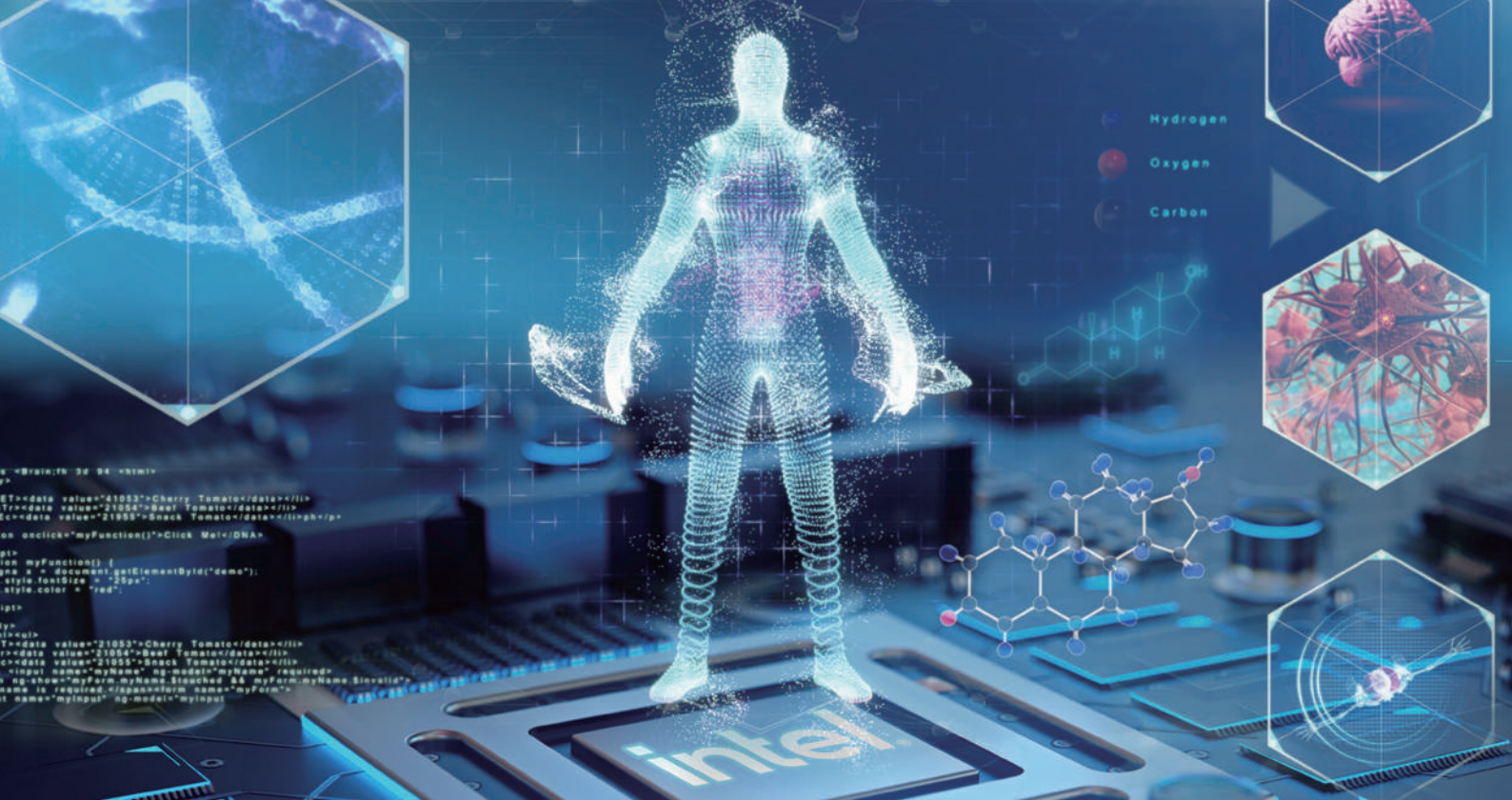


NANO-6064: A Nano-ITX Form Factor Embedded System Board Based on Intel Atom® x7000E Series Empowering Real-Time Computing for Edge Medical Devices

Over the last few years, we've all witnessed how a pandemic can reshape the dynamics of the medical industry as well as the healthcare landscape. Extra pressure has been put on hospitals and health systems to provide more patient care resources, while at the same time, healthcare organizations have been tackling labor shortage challenges aggravated by healthcare worker burnout and/or early retirement. And as the projected shortage of the healthcare workforce persists, it has become even more apparent that healthcare providers must find "innovative" ways in order to deliver more: more effectively; with fewer and more limited resources.

While the medical industry has adopted digitization for several years now, this relatively recent pandemic event has, undoubtedly, accelerated the process of this ever-evolving healthcare digitization, which, in turn, has revolutionized the way medical data is collected, stored, and utilized to deliver real-time health information, improved patient care and enhanced efficiency in hospitals, clinics, and across all healthcare institutions.

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Real-Time Healthcare Intelligence with AI-Enabled Edge Medical Devices

For each individual, from their first visit to diagnosis to treatment to returning home, intelligently connected medical devices can help healthcare providers increase not only productivity, but also the level of care delivered to each and every patient. To meet application-specific requirements of the hospital/clinic environments, an embedded computing solution utilized to power these connected medical devices must be optimally designed with real-time computing capabilities, low power consumption, sufficient I/O interfaces, quiet/fanless operation, long lifespan support, and of small size to fit in limited space. The Portwell NANO-6064 Nano-ITX embedded system board could be such ideal building block for embedded computing solutions that facilitate real-time computing between AI-enabled medical devices at the edge and, for example, the PIMS (Patient Information Management System).

More specially, to enhance real-time computing and processing capabilities, Portwell's NANO-6064, built with the Intel Atom® x7000E series processors and Intel® Core™ i3 N-series processors, is equipped with dual 2.5GbE LAN connectivity via two RJ-45 ports with Intel® Time Sensitive Networking (TSN) and Intel® Time Coordinated Computing (TCC) technologies. It also features Intel® UHD Graphics driven by the Intel® Xe architecture with up to 32 EUs, and triple independent displays via DisplayPort, HDMI and LVDS interfaces up to 4K resolution, taking AI performance and user experience to the next level. With four USB 3.2 Gen 2 ports, the NANO-6064 ensures efficient data transmission. Moreover, it is designed with one non-ECC DDR4 3200 MT/s SO-DIMM socket supporting up to 16GB capacity with In-Band ECC (IB ECC) feature. It also supports one M.2 E key and one M.2 B key sockets for simple and flexible system expansions, including wireless modules and storage devices. Additionally, it integrates a Nano SIM socket onboard to provide greater compatibility with a wider range of cellular modules.

Enhancing Agility in Healthcare Digital Transformation

The Portwell NANO-6064 Nano-ITX embedded system board features the low-power Intel Atom® processors x7000E series (2 cores~4 cores, 6W~12W TDP) and high-performance Intel® Core™ i3 N-series (8 cores/8 threads, 7W~15W TDP), making it suitable for fan-less applications. NANO-6064's flat/low-profile design allows space-saving system configuration in digital display and compact workstations, such as digital wayfinding signage/kiosk, digital signage in the patient waiting room, mobile Electronic Health Record (EHR) workstations, for example.

In addition, NANO-6064 supports onboard TPM (Trusted Platform Module) to strengthen system-level security providing greater data protection for sensitive information. Blended in with these Intel processors' optimized power efficiency, computing performance, deep-learning inference accelerators, and integrated Intel UHD graphics, Portwell's NANO-6064 enables an extensive array of embedded computing solutions for diverse applications in the fields of medical, including but not limited to, AI-assisted healthcare/medical imaging devices, telemedicine/telehealth systems, IoT edge gateway for remote health monitoring, healthcare facility automation, and many more.

Complete Product Design, Technical Expertise and Project Experience

Looking into the future, it is important to keep up on understanding how medical/healthcare digitalization will continue to evolve and the role technologies will be playing, hopefully, to facilitate this dynamic transformation. Portwell's customers, and future customers alike, can be assured to count on us as your trusted partner of embedded and industrial computing solutions. And simply for the record, Portwell has over 30 years of experience in delivering comprehensive project support, including product design, design guidelines, circuit diagram reviews, technical expertise, production, and certification processes. Portwell also offers customers the latest product roadmap to facilitate advanced planning for next-generation product upgrades and new projects.

Portwell's NANO-6064 is a versatile embedded system board solution on a compact Nano-ITX form factor footprint delivering scaled-up performance and value, plus it offers a long product lifespan support of 10+ years. NANO-6064 empowers IoT edge use cases with AI and real-time computing capabilities for applications in edge AI medical devices, and beyond.

NANO-6064, Nano-ITX Embedded System Board Featuring Intel Atom® x7000E Series Processors, Intel® Processor N Series and Intel® Core™ i3 N-Series Processors

- DDR4 3200 MT/s SO-DIMM up to 16GB with in-band ECC
- Supports triple displays via HDMI, DP, LVDS up to 4K resolution
- High speed I/Os with dual 2.5GbE and four USB 3.2 Gen 2
- Multiple expansions: M.2 E Key 2230 for wireless module; M.2 B Key 3052/2280 for wireless module or storage device; onboard Nano SIM socket
- Onboard TPM 2.0



NANO-6064

Embedded Board with Intel Atom® x7000E Series
Empowering Real-Time Computing for Edge Medical Devices



About Portwell

Portwell, Inc., founded in 1993, has focused herself towards a high-technology scope that brings company value through the state-of-the-art. For the past years, continuous leading product development and revenue growth have made Portwell a major Mission-Critical Application Platform Provider in the world. The in-house design of industrial computers and application platforms by Portwell has also been targeted to meet our customer needs for flexibility. Portwell, Inc., an IoT Solutions Titanium Partner of the Intel® Partner Alliance, a community of communications and embedded developers and solution providers, designs and manufactures Communication Appliances along with a full range of Industrial Platform Service (Computer on Module, Embedded Computing, Industrial Computer), Communication Appliance Service (Software Defined Wide Area Network, ANS series, AnnA ANS Network Associate), Vertical Market Service (Advanced Network Solutions, Gaming, Medical, industrial Automation, Smart Transportation, Energy, Smart Manufacturing, Internet of Things(IoT), AI Solutions, Mobility & Barcoding Solutions, EMS/DMS), Panel Device Service (Panel PC, LEAD Series) . With streamline access to the latest Intel technology, we paved the way with the broadest array of building blocks, delivering cutting-edge solutions to meet and even exceed the demanding needs of the ever-changing telecommunication, medical electronics, industrial automation, defense and life automation markets. Committed to supplying customers with a one-stop shopping approach of full product selection, competence and sophisticated customer support, Portwell helps all our customers pave the royal road to success and stay ahead of competition.



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Portwell, Inc., an IoT Solutions Titanium Partner of the Intel Partner Alliance, designs and manufactures a full range of IPC products (SBC, backplane, redundant power supply, rack mount & node chassis), embedded architecture solutions, DVR system platforms and communications appliances. We provide complete R&D and project management services to decrease customers' time to market, and reduce project risk and cost. Portwell is also an ISO 13485, ISO 9001 and ISO 14001 certified company that deploys quality assurance through product design, verification and manufacturing cycles.



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