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Titanium
IoT Solutions

DFI

Enhancing Defense Technology and Industrial Automation with DFI's MTH968 SoM

Powered by Intel® Core™ Ultra Processors

Background of Story

In recent decades, defense technology has made significant strides due to advancements in modern technology. As AI, sophisticated communication systems, and intelligence technologies become increasingly widespread, the development of modern defense technology has shifted towards an information-driven decision-making process rather than mere manufacturing. Consequently, handheld tablet devices have emerged as critical components of Internet of Military Defense Things (IoMDT) infrastructure, playing pivotal roles in intelligence gathering, command and control, and navigation.

Industry: **Defense Technology, Factory Automation**

Application: **Ruggedized Tablet**

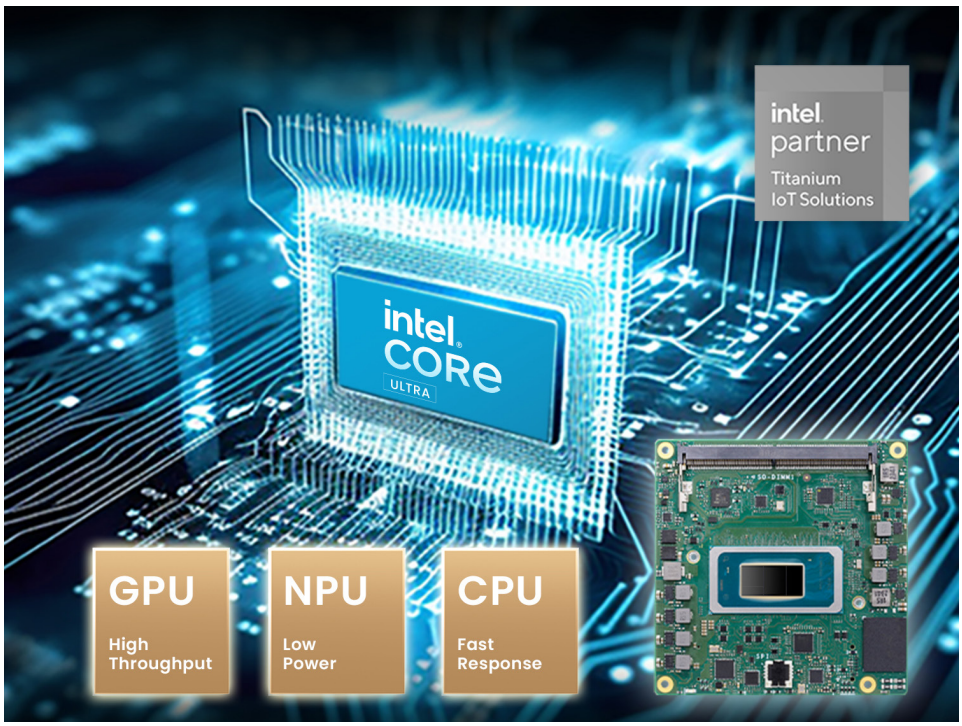
Solution: **DFI MTH968**

Background of Story

This is where DFI can provide invaluable support to its customers, enabling them to unleash the full potential of the MTH968 system on a module (SoM) in their military-grade handheld tablet applications. The objective of this article is to explore the rationale behind this product's applications in defense technologies and factory automation. It aims to elucidate the features of the current MTH968 SoM architecture and its advantages in the defense sector, while also highlighting the potential services that DFI can deliver in this regard.

The MTH968 SoM features a neural processing unit (NPU), enriching its AI processing capabilities with a single NPU capable of delivering up to 8 trillion operations per second (TOPS). Moreover, the built-in latest Xe LPG graphics architecture supports up to 128 execution units (EUs), yielding a remarkable 1.9x performance enhancement. Crucially, the 14th Gen Intel® Core™ Ultra processors integrate the NPU directly into the system on a chip (SoC), achieving 11 TOPS AI performance. With the combined CPU and GPU computing prowess, the entire 14th Gen Intel® Core™ Ultra processors' SoC can reach up to 32 TOPS.

This significant enhancement in processing power equips the MTH968 SoM with unparalleled performance for handling complex AI tasks, making it an ideal choice for defense applications requiring advanced intelligence processing capabilities.



Pain Points

Customers rely on DFI's BIOS optimization capability and MTH968 SoM key features including:

1. **Equipped with the latest Intel® Core™ Ultra processors.**
2. **Optimized BIOS settings ensure resume within 1 second.**
3. **Low-power standby (under 1W) and stress testing.**
4. **Secure development environment based on IEC 62443-4-1.**

Demands

Customers can access all standard PC functions within the ready core modules by integrating their self-developed carrier boards with the SoM. Our clientele has put forth several unmet requirements, including rapid boot-up times, minimal power consumption, resilience in extreme environments, enhanced security, and tailored solutions. To tackle these challenges, DFI offers value-added services such as hardware and firmware (BIOS) optimization for achieving one-second resume times. Additionally, we ensure that product development security complies with IEC 62443-4-1 standards and deliver robust performance guaranteed by rigorous testing.

DFI's Response & Results

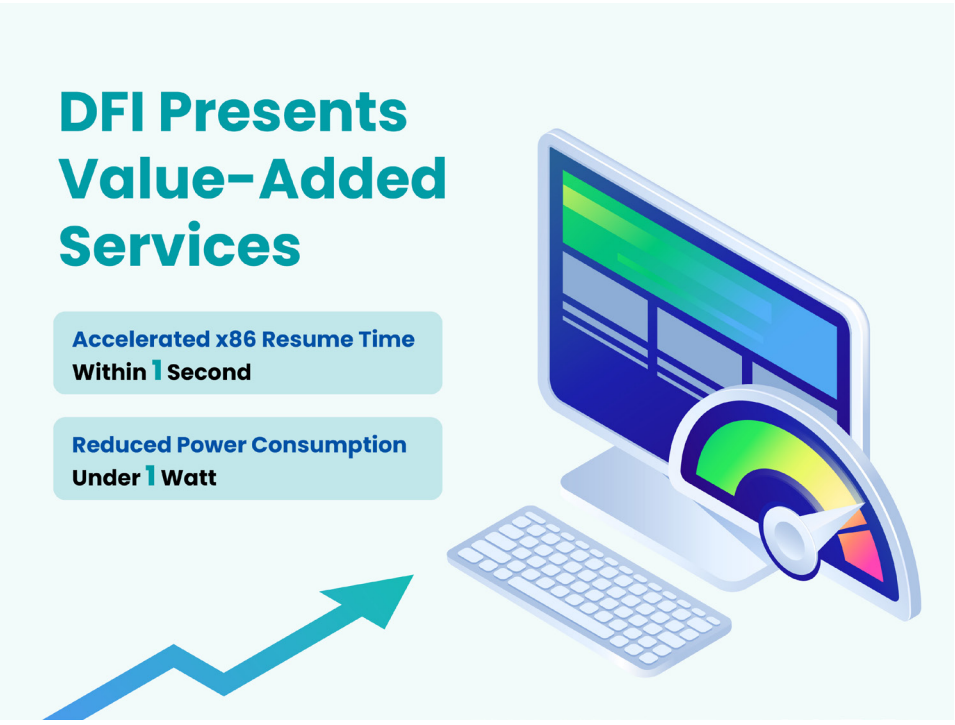
Intel® Core™ Ultra processors accelerate AI tasks and more

MTH968 SoM supports COM Express Type 6 R3.1 and is equipped with Intel's latest Intel® Core™ Ultra processors, allowing built-in AI acceleration. It supports dual-channel DDR5 memory of up to 64GB for more efficient responsiveness. Additionally, it supports NVMe SSDs to enable excellent access speed.

Standby power under 1W & Hardware resume within 1 second

DFI integrates design, manufacturing, and verification to achieve vertical integration, providing value-added services to accelerate the completion of customers' final products.

DFI offers value-added services to facilitate customers' swift solution implementation. Due to the demand for SoM's rapid response capability, customers have emphasized the necessity of one-second resume times, particularly in critical scenarios. Leveraging DFI's expert BIOS team, we can fine-tune the resume process to meet such goal. This enables users to quickly resume their devices under high-pressure situations, promptly commencing operations and saving valuable time. Addressing customers' application and environmental requirements, DFI can harness its technology on x86 modules COM with standby power consumption kept under 1 watt and hardware resume time within 1 second—the device can swiftly resume operation even from sleep mode, conserving energy resources effectively.



DFI's Response & Results

Constant consideration of customer applications

Considering the environmental conditions of customer terminal products, we provide a professional temperature protection mechanism that allows for relevant adjustable settings. We assist customers in optimizing heat dissipation and conduct thermal simulations to ensure optimal performance of the MTH968 SoM even under high temperatures and heavy loads. Through CPU/GPU full-load tests at temperatures of up to 85°C, we ensure the device maintains its highest computational capability without entering throttling mode. DFI's wide-temperature-range products offer configurability and flexibility to meet the requirements of most defense technology projects. Our rigorous quality assurance processes safeguard development resources and meet product launch timelines. Moreover, we offer the adjustability to quickly modify existing products or develop new solutions based on defined specifications to satisfy customer-specific needs.

Security is the utmost priority in product development

"Security" is paramount in the development of defense equipment. DFI holds IEC 62443-4-1 certification, ensuring adherence to the highest security standards in product development. Our security certifications guarantee compliance with the requirements of even the most demanding users, such as frontline factory control system suppliers. Through DFI's professional team, we offer a responsive and energy-efficient experience with COMe x86 architecture. Additionally, we can assist customers with other open-source products such as Slim Bootloader (also applicable to factory automation). If you are interested, please feel free to contact us.

MTH968 KEY FEATURES

DDR5

Dual Channel DDR5
5600MHz SODIMM up
to 64GB

4K High Resolution

Supports 4K / 2K resolution

Multiple Displays

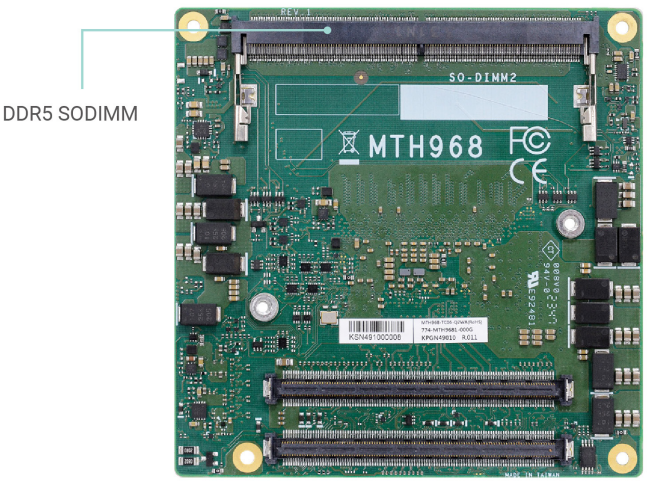
1 VGA, 1 LVDS/eDP,
3 DDI

Multiple Expansion

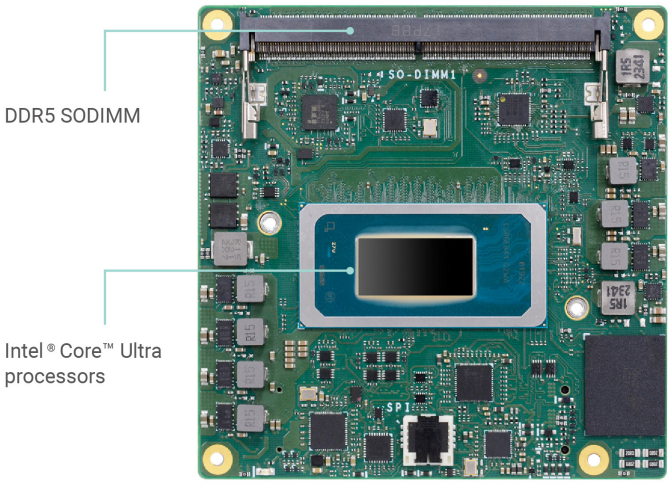
2 PCIe x4 (Gen4 from PEG),
5 PCIe x1 (Gen4),
1 PCIe x8 (Gen5, H-Line only),
1 I^2C, 1 SMBus

RICH I/O

1 Intel 2.5GbE,
2 USB 4.0, 4 USB 3.2,
8 USB 2.0,
2 SATA 3.0



Front View



Bottom View

DFI

Founded in 1981, DFI is a global leading provider of high-performance computing technology across multiple embedded industries. With its innovative design and premium quality management system, DFI's industrial-grade solutions enable customers to optimize their equipment and ensure high reliability, long-term life cycle, and 24/7 durability in a breadth of markets including factory automation, medical, gaming, transportation, smart energy, defense, and intelligent retail.

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