



Case Study

CITAQ PC 8852

ULV Intel® Celeron® Processor
Intel® 852GM & ICH4 Chipset

Intel Embedded Processor Platform Helps CITAQ Develop Small, Quiet and Dual-screen POS



Background

Intel's leadership, brand, and product influence are well known in the PC, server, network, and communication industries. However what is known to few are Intel's thirty-year efforts working in the embedded system industry in which great technological strides have been made to contribute to their dominance in the market. Such great accomplishments are not simply because Intel was the first to introduce the general-purpose computing platform into this field, but their insistence on customer-oriented improvement in products, as well as complete their support of software and hardware vendors in the embedded system industry chain that were important to their success. Through cooperation with Intel, these vendors have improved their embedded system products in performance, functionality and application modes to meet the diversified and changing demands of customers.

Challenges

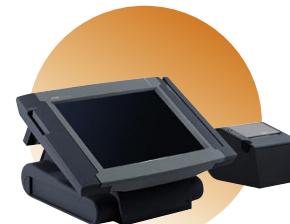
CITAQ created a new image of China POS in the international market via CITAQ series, redefined POS standards, and introduced Chinese products to a wider market. Despite such remarkable achievements, CITAQ continues to develop more advanced and valuable products, and introduce the world's leading technologies and concepts to the Chinese retail market.

Solutions

Intel, as the largest chip maker and upstream technical leader in embedded systems, has been committed to providing downstream partners with an energy-efficient, multi-purpose, and diversified embedded processor platform. Its 1GHz ULV Intel® Celeron® processor and Intel® 852GM & ICH4 chipset provided for CITAQ PC 8852 have been successfully applied in notebook PC and verified by numerous users worldwide in energy efficiency. The 1GHz ULV Intel Celeron processor completely meets the performance demands of the POS host at present. In the future, with only 5.5W power consumption, the 852GM & ICH4 chipset will integrate graphics and sound card functions that support LVDS and VGA signal output, and PC 8852's dual-screen display and output.



Opoz 3000



Opoz 5000



Opoz 8000



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Mr. Lin Zhe
CEO of CITAQ

Background

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The partnership between Guangdong CITAQ Technology Co., Ltd. (CITAQ) and

Intel is a great example of the cooperation with embedded system manufacturers using Intel’s new POS host, the PC 8852. Using Intel’s embedded processor platform consisting of a ULV Intel® Celeron® M processor and Intel® 852GM & ICH4 chipset, the reliable, compact, and high performance PC 8852 is quiet and consumes little power. Furthermore it supports functional interfaces such as a powered USB and a dual-screen display & output. With this new product, the industry will experience Intel’s support for embedded system manufacturers and the advancements in performance, function, and application value brought by Intel’s embedded solutions

About CITAQ

Founded in 1996, CITAQ has distinguished itself in the POS market through its innovative DIY-POS sales concept, and has achieved record sales of 100,000 DIY-POS, contributing to the popularity of POS in Chinese retailing. In 2003, CITAQ established an international design team for new product



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development based on the concept of openness in design. After three years of R&D it launched the CITAQ POS series.

In accordance with international quality standards, CITAQ products received ISO9001 quality management certification and China Compulsory Product Certification (CCC) from the China Quality Certification Center, as well as FCC, CE, UL, GUV and RoHS certifications. CITAQ has been awarded the prize of International Forum Design three times. From 2003 to 2006, it achieved 19 patents and other technical gains through independent R&D including fanless host, industrial motherboard controlling, POS peripherals, etc. CITAQ now sells its products in about 50 countries and regions worldwide, and its loyal users include many well-known vendors overseas such as Esprit, L’Oreal, Haagen-Dazs, MANGO, Saudi Post, and Carrefour.

As the key partner of Intel in the Chinese POS industry, CITAQ also cooperates with ELO, CHERRY, Samsung, Philips, and SIH.

Challenges

CITAQ created a new image of China POS in the international market via CITAQ series, redefined POS standards, and introduced Chinese products to a wider market. Despite such remarkable achievements, CITAQ continues to develop more advanced and valuable products, and introduce the world’s leading technologies and concepts to the Chinese retail market.

With this new generation POS host, CITAQ’s users will face more stringent requirements. First, there will be smaller size restrictions, simplified cable connections, as well as diversified placement forms and angles to cater to the limited retail space; second, a high



performance and power-efficient computing engine with a low-noise cooling system will meet users' performance demands while bringing considerable application experience; third, it will require products that are highly reliable, with durable components and efficient heat dissipation, to ensure a successful long term operation and life cycle; fourth, it will be configured with various functional interfaces for simultaneous access to the network and peripherals such as printers and displays.

CITAQ also takes into consideration support for dual-screen display & output in the functional interface design. Mr. Lin Zhe, CEO of CITAQ, said that in contrast with the dual-screen display of PC, this function targets screen redistribution, other than extensions, i.e. one screen for a cashier to display trade information and the other for advertisements to present multimedia commodity information. This provides some entertainment for customers as well as brings vendors more business opportunities.

In regards to the aforementioned requirements, CITAQ will proceed with designing the new POS host. An important requirement will be to select an efficient embedded processor platform integrating drawing functions for the computing engine. It's essential that the design meets the size, performance, sound, reliability, and functional interface, and dual-screen display & output requirements.

CITAQ would like to adopt Intel's processor platform. According to Mr. Lin Zhe, Intel's open, generic, modular, and industry standard based embedded processor's technological advancements in functionality, and manufacturing processes satisfies the various design demands of the new POS host. As the sole strategic partner of Intel in the Chinese POS industry, CITAQ will receive Intel's full support in product design and development to reduce difficulty, shorten product development period, improve speed to market time, and receive after-sales assistance.

The successful launch of PC 8852 demonstrates that CITAQ was the right choice. The Intel embedded processor platform utilizing the ULV Intel Celeron M processor and 852GM & ICH4 chipset achieved the fixed goals of the product.

Role of Intel

Intel, as the largest chip maker and upstream technical leader in embedded systems, has been committed to providing downstream partners with an energy-efficient, multi-purpose, and diversified embedded processor platform. Its 1GHz ULV Intel Celeron processor and 852GM & ICH4 chipset provided for CITAQ PC 8852 have been successfully applied in notebook PC and verified by numerous users worldwide in energy efficiency. The 1GHz ULV Intel Celeron processor



completely meets the performance demands of the POS host at present. In the future, with only 5.5W power consumption, the 852GM & ICH4 chipset will integrate graphics and sound card functions that support LVDS and VGA signal output, and PC 8852's dual-screen display and output.

According to Mr. Lin Zhe, a mini high-density POS board (170mm_170mm) was specially designed for PC 8852 on the basis of Intel's embedded processor platform. It employs notebook motherboard processing technology, mini components, and a non-aging solid capacitor to enhance the stability and reliability of PC 8852 while meeting the small size requirements of POS host.

Due to low power consumption of ULV Intel Celeron processor and 852GM & ICH4 chipset, PC 8852 only consumes 70W, which when converted from the DC 12V of its motherboard, and full load current of 6A in all peripherals. Thus it minimizes the internal components and volume of the power supply, and facilitates miniature design. With the low heating value of processor and chipset, CITAQ has installed a fanless aluminum alloy radiator, which releases heat in a strong aluminum alloy shell of the host and then to the air. This ensures the highest temperature of the processor within 69°C in a 50°C environment with 90% humidity. As a result, the PC 8852 is the first home-made POS with a fanless system design, helping it to achieve its quiet performance, dust-free

environment, and maintain oil lubrication. Examining dust prevention alone, POS hosts with fans drive away heat via airflow, while at the same time bringing in dust that adheres to components and absorb water from the air. As a result, it causes the components to short or face early oxidation and damage to the motherboard. However, this is not the case for the PC 8852 fanless system design, which improves the reliability and life cycle of the motherboard and PC, and reduces maintenance load.

In regards to 852GM & ICH4 chipset and further development of CITAQ, PC 8852 also integrates rich functional interfaces, including dual-screen LVDS and VGA display output interface, three standard USB interfaces, one Powered USB 24V interface, two Powered USB 12V interfaces, one 10/100M network adaptive interface, one 25-pin printer interface, three RS232 serial interface, one RS485 interface, etc. Among them, three standard USB interfaces can connect with bar code reader and programmable keyboard, etc. and three Powered USB interfaces can supply power and signal simultaneously. This will serve to relieve printer and ad screen's dependence on 24V and 12V power adapters, and simplify POS connection and decrease fault rate. In fact, PC 8852 also the first home-made POS host that successfully applies Powered USB interface.

Furthermore, PC 8852's motherboard has PCI expansion socket, one IDE 40-pin interface and one IDE 44-pin interface. Both interfaces can

connect with the hard disk of desktop and notebook PC, and the IDE 44-pin interface also has access to the shockproof, durable DOM electronic hard disk with power consumption of 0.15W, to reduce PC's power consumption and improve its reliability.

"The aforementioned technical advantages and characteristics of PC 8852 are inseparable from Intel's energy-efficient, multi-purpose embedded processor platform," said Lin Zhe, emphasizing the value on Intel's product and technical support in the POS host R&D. "Intel technicians not only communicate with our developers regularly and provide comprehensive product technology information, but also offer real-time technical support when we encounter difficulties. It was this intimate cooperation between Intel and CITAQ that made the launch of PC 8852 smooth."

Summary

The successful application of ULV Intel Celeron M processor and 852GM & ICH4 chipset in the CITAQ POS host, PC 8852, demonstrates the advantages that Intel's advanced embedded processor platform brings to CITAQ. The long-term and intensive cooperation with Intel helps sharpen the competitive edge of CITAQ brand POS product and enhance its influence in the POS industry around the world. This case is only a brief glimpse of the cooperation between CITAQ and Intel over the past years. In the future, we will bring retail users more surprises and products combining leading-edge technologies and advanced application concepts.

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