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Case Study
Portwell, Inc.
In-Vehicle Infotainment

Get to Market Quickly with the In-Vehicle Infotainment (IVI) Solution Customers Want Now

Portwell's after-market, single DIN board with dual display, Wi-Fi, Bluetooth* and GPS support enables you to put Intel® technology in the car with ease

Background

Consumers want their digital lifestyle to go everywhere they do: home, office, *and* car. They want seamless, integrated connectivity in all of these venues between all devices, including uninterrupted access to e-mail, the Internet, music, DVDs, news, and navigation information.

Challenge

Carmakers and automotive vendors face numerous challenges in their quest to bring out in-vehicle infotainment (IVI) solutions. Time and cost of development are always concerns. But the process is complicated by the need for systems that can support a number of different applications. These solutions must integrate seamlessly with the plethora of existing digital formats and devices (MP3 players, cell phones, GPS technology, Wi-Fi, Bluetooth,* DVDs, etc.) and be interoperable with common PC and networking technology. Consumers don't necessarily want to wait for new cars with these features; they want to add IVI systems to the cars they already own.

Solution

Intel and Portwell are taking some of the pressure off automotive vendors through the development of a standards-based IVI platform that fits most existing car audio slots. Based on the Intel® Single DIN In-Vehicle Infotainment (IVI) Reference Design, the Portwell PCS-8220* SBC provides a platform for the delivery of multiple IVI applications and allows developers to bring out a complete solution quickly without incurring high design costs. The Portwell product uses the tiny Intel® Embedded Compact Extended (Intel® ECX) form factor to address the low power, low thermal envelope of automobile dashboards. And because the solution is based on high-performance Intel® technology, it integrates seamlessly with most existing PC and networking technology, common operating systems and digital formats.

Demand for IVI Vexes the Automotive Industry

Consumer demand for seamless connectivity between the home, work, and car is quickly gaining speed, putting pressure on automakers and automotive vendors to accelerate development of in-vehicle infotainment (IVI) systems. But sorting through a long list of expectations to come up with the products and applications that will please the greatest number of consumers is vexing the industry.

On the consumer's side, they want IVI solutions that integrate seamlessly with their existing digital devices and formats, including cell phones, MP3 players, DVDs, CDs, and so forth. Consumers also want multi-purpose solutions that allow for the driver to engage in one kind of IVI experience while kids in the back seat enjoy something else. Scalability and interoperability among applications is critical so that the auto industry can more quickly develop solutions that incorporate the latest consumer electronics functionality.

From the automaker's point of view, it takes a great deal of time and money to develop such feature-rich, flexible solutions. And even then there is no guarantee that there will be a strong return on their investment. Like their automotive product lines, carmakers want to scale IVI solutions from low to high so that consumers find added value in paying for a top-end vehicle. But such scalability can add to the design and cost complexity of bringing out IVI solutions, especially since some industry leaders have significant investments in proprietary solutions. Automakers and vendors alike worry about compatibility over time, such that systems they deliver today will be interoperable with the next generation of digital devices and applications.

Based on the Intel® ECX form factor, the Portwell PCS-8220 uses a small footprint, compact I/O interfaces and an extremely efficient thermal design.

Intel and Portwell Develop a "Cure"

Although these challenges are by no means insignificant, they can be overcome. Automotive vendors can bring IVI systems to market quickly and cost effectively by leveraging the solutions and standards already developed by the technology industry. After all, this is the very same industry known for developing the digital devices, PCs and networks that power today's digital lifestyles, and can therefore offer valuable insight to the features and functions needed for seamless integration of the car.

One such example is the Portwell PCS-8220,* a single DIN IVI solution built in collaboration with Intel. The Portwell PCS-8220 comes with Softronix embedded software for multimedia applications, which allows vendors to quickly and easily integrate the digital lifestyle into existing cars and trucks. The PCS-8220 uses a small form factor that fits easily into the audio compartment on most vehicle dashboards. (Technical details about the Portwell IVI system are explained in the following section.)

During development, Portwell had to overcome the technical challenge of squeezing a high-performance system into a small form factor and a tight, fanless enclosure. They turned to Intel engineers to collaborate on these challenges and were able to come up with a reliable, efficient design. In this case, joint collaboration saved Portwell a lot of development time and cost.

Saving on both time to market and upfront development cost is important to both Portwell and their customers. By starting with Intel® architecture for many of their board designs, they have a standards-based hardware platform and eliminate a lot of the development time, integration and testing needed to build a new solution. This gives Portwell a big head start over comparable proprietary solutions. Portwell also selected the Softronix embedded multimedia application software as a foundation for the infotainment solution, which also helps them reduce design time and the complexity of delivering a vehicle-ready solution.

By studying the needs of the emerging IVI industry and the challenges faced by the industry, Portwell was able to collaborate with Intel to develop a cost-effective, marketable IVI solution that keeps their customers' investment risk low. At the same time, Portwell and Intel were able to deliver many of the IVI features and functions demanded by customers, allowing for a flexible, versatile solution that suits many different digital lifestyles.

Technical Features of the Portwell PCS-8220*

The Portwell PCS-8220 is based on the Intel® Single DIN In-Vehicle Infotainment (IVI) Reference Design, which is a complete prescription for delivery of a market-ready system. Intel collaborated with Portwell during development of the reference design. And now Portwell's IVI system is the first market-ready solution built with that design.

Based on the Intel® ECX form factor, the Portwell PCS-8220 uses a small footprint, compact I/O interfaces and an extremely efficient thermal design. The board will fit into a standard, single DIN slot, sliding perfectly into the dashboard space where most audio systems reside. The Intel ECX form factor measures just 105 mm x 146 mm — 75 percent smaller than micro-ATX boards.

The Portwell solution includes integrated support for Bluetooth,* Wi-Fi, and GPS, plus a DVB-T/FM tuner, standard audio and video features, and support for dual-display components including CRT, LVDS or TV-out. The open architecture of the standards-based board and the Intel processing components allow for easy customization so that vendors can differentiate their offerings. With the Softronix embedded software supporting multimedia applications, the Portwell PCS-8220 is ready for customers to add their own custom infotainment solutions and features to help differentiate the offering at market.

Low-power characteristics of the on-board Intel® Celeron® M processor Ultra Low Voltage 373△ and a fanless thermal solution help eliminate noise and reliability concerns often associated with the use of fans and heat sinks in dashboard-based computing systems. Yet the performance is comparable to desktop systems.

The Portwell PCS-8220 SBC also comes equipped with several technical features important to IVI solutions:

- PCI Express* ports support future I/O peripheral expansion and flexible connectivity

- Hardware building blocks can be coupled with third-party software solutions (for applications such as navigation, media player, office and gaming) to create a complete IVI system with a consistent user interface

- Extended operating temperatures (-20° C to 60° C) allow operation in extreme environments

- Dual independent display with the Mobile Intel® 915GME Express Chipset supports display for both front and rear seats

- Dual independent audio stream with Azalia* codec provides output to both front and rear seats

- Consolidated I/O connector supports ease of integration

- I/O expansion boards enable flexible connectivity, including Wi-Fi, Bluetooth GPS, TV and cellular

- DC-DC unit with ignition control is automotive-ready to provide a consistent power supply

Why Intel?

Because the Portwell PCS-8220 starts with Intel architecture as the base hardware platform, automotive vendors can add various layers of software as needed to enable exciting new infotainment usage models. This modular approach to solution development is much faster and more cost-effective than engineering a complete overhaul of hardware and software with every new design.

Future versions of IVI reference designs and Portwell IVI systems are planned using Intel architecture. And because the Intel architecture is scalable, vendors can choose the performance, I/O, and other features to suit the application, all without rewriting software code. This essentially allows existing solutions to integrate seamlessly with those yet to come.

Intel architecture also offers the benefits of powerful performance, longevity and interoperability with existing technologies and applications on desktop PCs, laptops and computing devices in the home and office.

Are You in the Race?

The race to deliver IVI is just getting started, and Portwell and Intel are providing the necessary fuel to ensure victory. If you serve the automotive industry think about your strategies for success. Are you in it to win?

For More Information

www.portwell.com.tw

www.intel.com/go/infotainment

www.softronix.com.tw/product_eng.htm

About Portwell, Inc.

Taiwan-based Portwell is an associate member of the Intel® Embedded and Communications Alliance, a community of communications and embedded developers and solution providers. Highly regarded around the world for its board design expertise, Portwell designs and manufactures communications appliances, as well as a full range of IPC products, including: single board computers, backplanes, redundant power supplies, rack mount and node chassis. Portwell also designs and manufactures embedded computing solutions and digital video recording (DVR) platforms.

Serving customers across a broad spectrum of industries and applications, Portwell is quickly becoming a leader in the development of industrial infotainment products suitable for commercial transportation. These traits made Portwell a logical choice to collaborate with Intel to develop an IVI solution for the consumer segment.