SOLUTION BRIEF

Retail Industry
Intel® Smart POS Module
(Intel® SPOSM)

Intel® Smart POS Module

Innovative integrated module reference design accelerates next-gen POS development and supports new retail use cases

"POS customization is the future of POS product development—supporting the maturity of the entire ecosystem and bringing benefits for R&D, maintenance, and product upgrades."

—Mr. Li (李昊旻), assistant general manager, Hisense

Executive summary

Current retail point-of-sale (POS) solutions often use retrofitted technology and may not be designed to support modern use cases. Intel® Smart POS Module (Intel® SPOSM) is an integrated module reference design enabling OEMs and ODMs to build POS solutions based on scalable, standardized hardware and reliable, high-performance Intel® processors. With Intel SPOSM, a wide range of POS solutions can be produced cost-effectively, creating new opportunities and improving customer service for in-store retailers.

Challenges

Brick-and-mortar stores are still relevant to retail, with 90 percent of sales completed in store[1], and 73 percent of consumers making in-store purchases after browsing online.[2] POS solutions are the backbone of in-store commerce.

However, many POS products rely on proprietary designs and motherboards, making them difficult to maintain and service. When faulty boards are shipped, they take time and skilled workers to repair. In order to circumvent these issues, older PCs are often repurposed and adapted for POS, but these solutions rely on monitors that take up space in small retail outlets, and cannot support new types of POS services or provide a foundation for the future of POS and responsive retail.

Retailers are encountering increased demand for smarter POS to support card and e-cash transactions, connected IoT features, and monetized advertisements.

In sum, OEMs and ODMs require more reliable, scalable POS architecture in order to innovate and speed time to market, as well as standardized specifications to help reduce development costs.

Solution

Intel SPOSM is an innovative integrated module reference design enabling next-gen POS solutions. It provides OEMs and ODMs with POS designs to optimize development costs and scale on Intel® platforms. The solution utilizes a low-power processor for sleek POS designs and allows system integrators to streamline service deployment.

Designed specifically for retail POS, Intel SPOSM benefits range from simplified, scalable development and integration to next-gen capabilities and workload consolidation. The solution allows for ease of maintenance, flexible product upgrades, and future innovations. In addition, POS systems powered by Intel processors gain the advantages of advanced performance, security, manageability, and reliability, along with a scalable road map.

The modular design helps lower design and development costs—meeting a wide range of requirements without requiring unique form factors for each type of smart POS. Options include all-in-one, fixed, and mobile POS devices; multiple displays; and integration with self-checkout POS, weight scales, and kiosks. Because the module specifies the connector "pins or pin-outs" which tie together the CPU and board, the solution can be used across the industry without requiring the development of different SKUs.

In addition, Intel SPOSM enables creation of new services, such as those based on facial detection and recognition, high-speed connectivity, or multiple displays. Workloads for integrated use cases such as POS weight scales, self-checkout, and kiosks can be consolidated.

INTEL® SPOSM BENEFITS FOR OEMS AND ODMS	
Speed development and integration	• Provides system designers with an easy-to-integrate complete processing building block to build solutions around • The Intel® SPOSM compute building block solves complex processor hardware and firmware design challenges • Standardization for development cost optimization • Modular design for scalability • Small and compact design with low-power Intel® Core™ processors U-series
Optimize POS solutions	• OEMs and ODMs can develop system-specific carriers or peripheral interface boards (PIBs) that are optimized for cost, features, and form factors to meet specific system requirements
Support diverse POS use cases	• Chipset and memory solutions provide a competitive, efficient solution for a range of applications and market segments
Scalable product road map	• Compute modules are aligned with the Intel® processors roadmap • Scalable foundation based on reliable Intel® architecture
Improve end customer experiences	• Simplify maintenance and management • Enhance security • Enable new services, such as self-service checkout

How it works in brief

The Intel SPOSM integrated module reference design provides the primary compute building block and connects to a docking board or peripheral interface board (PIB). The board completes platform implementation and provides the standard end user physical interfaces. Intel SPOSM streamlines product design across Intel platforms, in part by defining integrated module pin-outs mapped to POS requirements.

Because of the reference design provided by Intel, the integrated module is scalable with any Intel processor and the board can also be used consistently across various integrations and form factors. The design supports sleek design from big terminals to small tablet-based POS.

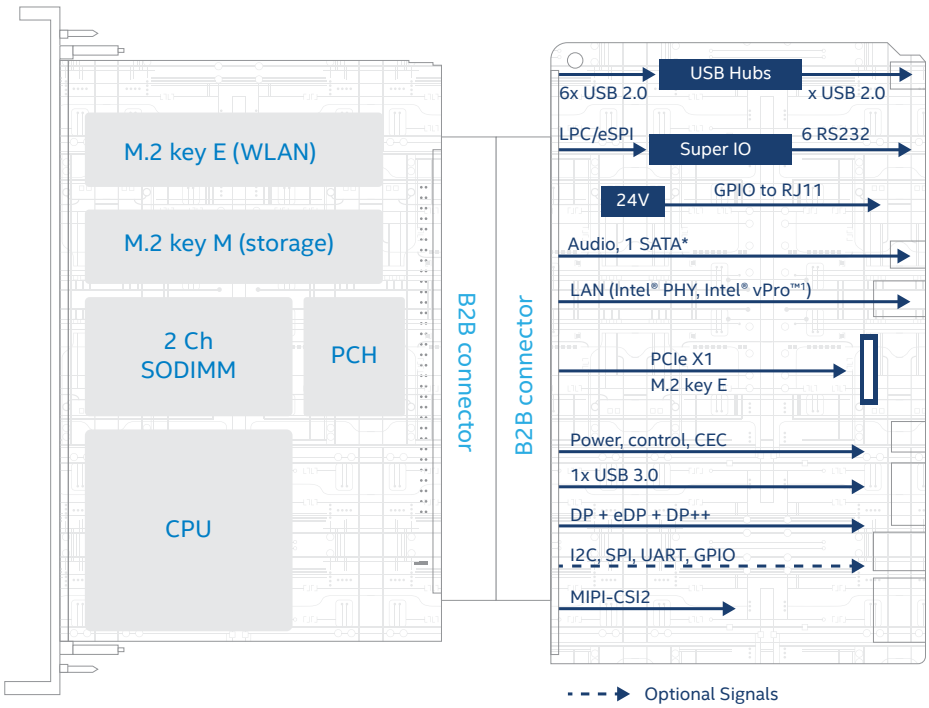
Intel SPOSM conceptually partitions the processing system into two domains:

1. **Compute module:** Contains the primary compute components (CPU, VR, memory, storage, etc.).
2. **Host system interface board:** Provides the mechanical mounting point and/or guide-rail mechanism and single +12V power, physical and electrical standard connectors, and interfaces (such as RS-232, DP, and USB3.0).

This partitioning helps reduce costs by reducing overhead when developing core compute functions on the platform and driving economies of scale.

"Modular products are a powerful platform for a variety of POS solutions and exceptionally valuable for seamless services."

—Mr. Xue (薛志利), President, Ejeton



Avery Lake compute module

SOC:	7th Gen Intel® Core™ processor
Form Factor:	140 mm x 100 mm
Memory:	DDR4 SODIMM two-channel
Expansion:	1 M.2 key E, 1 M.2 key M

1. Intel® vPRO™ technology-capable SKUs

Required IO module

3 displays (DDI, DP and eDP)
1 USB 3.0
1 PCIE x1 (M.2 key E)
6 USB 2.0
6 serial ports
1 audio (in & out), SATA*
1 LAN

Intel® SPOSM modular architecture allows a PC to act as a point of sale (POS) without additional equipment, and provides a 1:1 connection between the CPU and I/O module boards

The reference design simplifies signaling by providing a defined number and the type of interfaces that are made available at the connector. The Intel SPOSM connector is defined to address commonly used signal types in POS applications, while optimizing for form factor and cost. Intel has assigned 170 pin-outs, with an additional 10 customizable pins available to help OEMs and ODMs differentiate their solutions.

Sample specified pin-outs include:

- Display (DP, DP++ and eDP)
- USB 2.0 and 3.0
- LAN
- PCIe* x1
- I2C
- UART
- GPIO
- SATA
- Audio
- LPC/Espi
- MIPI-CSI

Solution components

- Intel® CPU and platform controller hub (PCH)
- One-channel SODIMM memory (optional, two-channel SODIMM memory)
- Storage (M.2 key M)
- Connectivity (M.2 key E)
- Voltage regulator (VR)

Conclusion

Intel SPOSM is ready to meet performance, density, and high-volume manufacturing requirements and enable OEMs and ODMs to bring next-gen POS to market. The flexible, scalable reference design will support upcoming transformational technologies—from 5G to artificial intelligence (AI)—giving retailers new opportunities to reach customers, create new service offerings, and compete.

Start now

Contact your Intel representative to learn more, discuss your specific requirements, and see some of the solution providers enabling smart POS with the reference design.

For more information about Intel's solutions for retail, visit intel.com/retail.

"Intel® Smart POS Module (Intel® SPOSM) provides future-forward innovations to meet the evolving needs of customers for AI technology integration."

—Mr. Liu (刘福利), deputy general manager, Wintec

1. *On Solid Ground: Brick-and-Mortar Is the Foundation of Omnichannel Retailing*, A.T. Kearney, 2014, https://www.atkearney.com/documents/10192/4683364/On+Solid+Ground.pdf/f96d82ce-e40c-450d-97bb-884b017f4cd7

2. *The State of Retail 2017*, TimeTrade, timetrade.com/system/files/surveys/TimeTrade_Retail_Reality_Check_Survey_Brief2.pdf.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to www.intel.com/benchmarks.

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Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

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