

White Paper

MX67QM mini-ITX Motherboard for Digital Signage Applications



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Digital Signage systems have undergone rapid change in just a few short years. From what initially started as a digitized poster using a PC monitor or television set has transformed into remotely managed and dynamically networked display delivering rich content in an intelligent, interactive, and intuitive way creating not only a broadcast message to the target audience but also absorbing the audiences' reactions providing valuable feedback to the broadcaster. Today in general terms, digital signage systems can be revealed into three levels – (1) basic PC based digital signage system, (2) the mainstream networked digital signage system and (3) intelligent multi-core processor digital signage systems. This paper will focus on how BCM's MX67QM mini-ITX motherboard supports digital signage applications for today's market.

Introduction of BCM MX67QM mini-ITX Motherboard

BCM's MX67QM mini-ITX motherboard is designed using the Intel® mobile QM67 Express Chipset with socket G µPGA 989 supporting 2nd generation Intel® Core™

i3/i5/i7 processors. The motherboard supports dual channel DDR3 SO-DIMMs 1066/1333 MHz up to 16 GB system memory. The MX67QM motherboard also provides rich expansion and I/O interfaces such as 5 COM ports, 8 USB ports, HDMI, DVI, LVDS, VGA, dual Gigabit LAN ports, 2 SATAIII (6.0 G/bs), 2 SATAII (3.0 G/bs) connectors, PCIe x16, Mini PCIe, Compact Flash socket along with Intel® Active Management Technology 7.0, Intel® Trusted Execution Technology and Intel® Turbo Boost Technology to support additional devices required by digital signage systems. The motherboard is available in both ATX power (MX67QM) or DC power (MX67QMD) platforms.

Digital Signage Technology Evolution

Basic PC Based Digital Signage

offers single player screen and can only supports single source static video with limited content or blending between entry level 3D images, flash, video and RSS web access.

Mainstream Networked Digital Signage

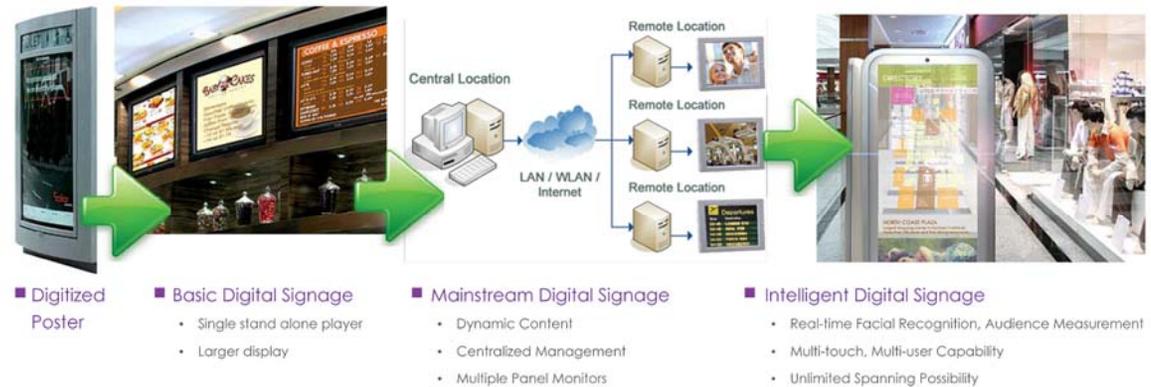
are more popular in the retail stores. These are more robust and can support wider variety of functions to interact with consumers. For example, the remote manageability enables administrator to update promotional messages to customers almost on the fly. The built-in camera on a digital signage system collaborating with anonymous video analytics tools together can capture valuable data about shopper behavior and demographics. An interactive store front provides store and product information or can enable shoppers to get instant e-coupons with mobile phones via Bluetooth technology connected to the store signage devices. Merchandise can be equipped with RFID tag and scanning the tag on the RFID compatible digital signage system enables customers to discover additional information such as stock availability, additional promotions, or help shoppers find what they are looking for instantly. Intel's Core™ i5 series processors are ideal for this level of intelligent digital signage systems.

Intelligent Multi-Processor Digital Signage

are extremely intelligent displays that incorporate multiple media types, transparent LCD panel or video analytics tools, and interaction with the customer through multi-touch or motion sensing gesturing to deliver customized and interactive advertising content to the target audiences in real time while keeping customers entertained. Some applications might even require multi-monitors support with add-on cards on a single computing system. These high end digital signage systems not only offer extensive spanning possibilities to the ad agency but also the ability to gather and real time business intelligence like never before. In order to achieve the real time video capturing interactivities, high performance computing capability is required. Intel's 2nd generation Core™ i7 series platforms are ideal for this level of digital signage systems.

Market Segments

The digital signage applications have gained great popularity in recent years and the demand keeps increasing along with the expanded capabilities of the signage systems. Additional factors key to the segment growth include - (1) LCD, plasma and touch panel price have decreased significantly yet provide combined with better display quality which makes the digital signage system more effective yet affordable; (2) the improvements in high speed internet, WiFi, cellular, and cloud-based technologies enables the digital signage systems to optimize interaction by providing customized messages to target audiences increasing the ROI.



Digital signage systems can be found in many different market segments including:

- **Entertainment:** casino, movie theaters, theme parks, gyms, auditoriums
- **Education:** library, museum, schools
- **Retail and banking:** shopping centers, department stores, supermarket, banks, gas stations, fast food chains, restaurants, hotels, beauty salons, food courts
- **Hospitality:** hotels and resorts, convention centers, intelligent in-room appliances
- **Industrial:** factory shop-floor, automation, training, break rooms
- **Healthcare:** hospital waiting rooms, doctor offices, health food stores
- **Transportation:** Airport, subways, train stations, bus-stops, taxis, parking lots, cruise ships
- **Corporate Communication**

Digital signage system applications include:

- Slot Machines and Lottery Terminals
- ATM/Banking Kiosk
- Cash Register POS
- Airport Self-Check-in/out Kiosk
- Flight Information Display System
- Digital Menu Boards
- Store Front Window Display
- Outdoor Digital Billboard
- Vending Machines
- Shopping Center Digital Directory
- Hotel/Restaurant Information System
- Auditorium/Stage Display
- Gas Pump Digital Signage System
- Supermarket Shelf/Shopping Cart LCD
- Multimedia Preview Kiosk
- In-store Digital Signage System
- Retail Store ePoster Signage
- Video Wall and Entertainment Advertising

MX67QM mini-ITX for Mainstream and Intelligent Digital signage System Hardware

System:

Mainstream and intelligent digital signage systems normally used to deliver rich 2D, 3D, HD video, HD audio contents and rich user interactivities such as multi-user, multi-touch and real-time motion sensing and demographic capturing/analyzing technologies. To handle such complicated applications simultaneously the system will require multi-core processing performance and faster data communication capabilities between the processor, memory and storage. The MX67QM supports 2nd generation Intel® Core™ i3/i5/i7 processors and DDR3 memory modules.



Figure Above: MX67QM mini-ITX motherboard is a two chip platform supporting 2nd generation Intel® Core™ i7/i5/i3 processors

Multi-Monitors:

Mainstream and intelligent digital signage systems may require more than two displays. Most of the

higher end industrial motherboards can support at least two onboard videos through the HDMI, DVI, VGA and LVDS connectors. The MX67QM mini-ITX motherboard supports the dual independent display feature. Moreover, the MX67QM motherboard is able to support onboard graphics and PCIe graphics simultaneously allowing two additional independent video outputs to be supported through the PCIe x16 expansion slot for a total of four simultaneous independent displays.



Figure Above: Live Demo Unit presented at the gaming conference in Las Vegas, 2011. BI355-67QM Industrial Computer (MX67QM mini-ITX motherboard inside) with Intel® Core i7 processor supports four monitors playing different HD content.

Rich I/O Interfaces:

Besides multi-monitor support, many mainstream and intelligent digital signage systems require rich I/O interfaces in order to support devices such as touch interface, card reader, RFID scanner, web cam, motion sensors, keyboard, mouse, pole display, light set or receipt printers. These types of devices are

usually accessed through USB or COM/Serial ports. The MX67QM mini-ITX motherboard provides eight USB ports and five COM ports to fulfill these I/O requirements.

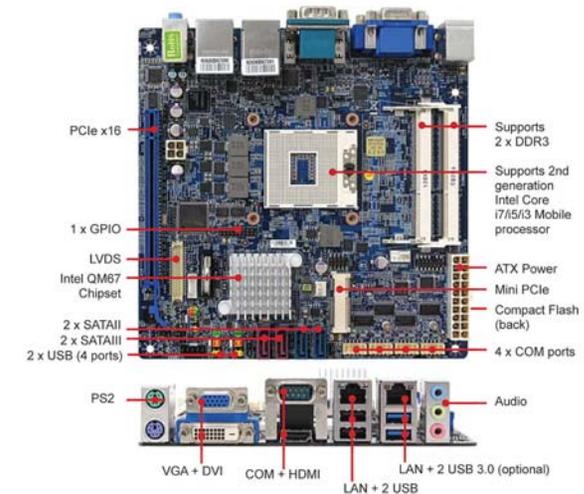


Figure Above: MX67QM mini-ITX motherboard provides rich IO interfaces and expansion slots.

Fast Ethernet Communication and WiFi Capability:

Mainstream and intelligent digital signage systems require fast network access in order to process the data promptly. The MX67QM mini-ITX motherboard supports dual Gigabit Ethernet communications through dual Intel® LAN controllers. Wi-Fi capability can be supported via onboard Mini PCIe slot.

Intel® Advanced Technology

The build-in Intel® advanced technologies help to optimize the performance for digital signage systems. The MX67QM motherboard provides Intel® Active Management Technology 7.0 which enables remote

management and system maintenance even when the system is turned off. This feature will help reduce system down time and the onsite maintenance cost.

The Intel® Turbo Boost Technology help to run multiple applications faster and while the intelligent power technology reduces idle power consumption.

Security

Mainstream and intelligent digital signage systems with rich user interaction may involve receiving sensitive data from customers or system administrators. The built-in Intel® Trusted Execution Technology and TPM1.2 play important roles for hardware based data protection and security assurance to against software based attacks.

Long-life Support with Intel® Intelligent System Alliance

BCM is an Associate member of the Intel® Intelligent System Alliance. This membership not only allows us obtaining early access product information for ODM/OEM development but also ensures at least 7 years product longevity for embedded customers.

In conclusion, BCM's MX67QM mini-ITX motherboard is the ideal platform for intelligent digital signage systems. . BCM also welcomes custom motherboard design based on the Intel® QM67 platform. Please contact us at BCMSales@bcmcom.com with your inquiries.

Safety and Environmental Regulations

BCM is committed to protect and enhance the global environment. To meet the expectations of our customers, employees, and the community in which our products are manufactured, marketed and used, all BCM motherboards are made with lead-free materials since July 1st, 2006. The MX67QM are no exceptions to this commitment and are regulated as RoHS Compliant motherboards.

In addition to the RoHS Compliant, the MX67QM motherboard has passed FCC and CE emission testing and is available in a full UL certified barebones system providing a ready-for-market building block for fast adoption and cost effective deployment by industry VARs for use in applications mentioned in this paper.

Embedded Lifecycle Support through Intel® Intelligent System Alliance

BCM is an Associate member of the Intel® Intelligent System Alliance, a community of embedded developers and solution providers. Through this membership, Intel® provides its members with long life product support for its processors, chipsets and technologies to ensure at least 7 year lifecycles.

Intel's long life product support enables industrial motherboard manufactures like BCM to design and manufacturing long life embedded boards using these high-quality, modular, standards-based building components. Thus the benefits are extended to our ODM/OEM customers by helping them to design more efficiently knowing they can count on the industrial motherboard they have selected, like the MX67QM, to be available for many years reducing frequent and costly redesigns and qualifications.

About the Intel® Intelligent System Alliance

The Intel® Intelligent System Alliance is one of the world's most recognized embedded technology platform providers. This community offers customers a trusted supply line of Intel® based products and technologies. The alliance members are committed to providing ideal solutions and total lifecycle support to help customers develop quick time-to-market and faster time-to-profit embedded products.

About BCM

BCM is a leading supplier of the long life industrial motherboards & systems serving our customers with turn-key stable computing platforms since 1990. We specialize in designing and manufacturing custom motherboards for industrial markets including gaming, retail, security and surveillance, industrial controls and automation, and medical equipment. In addition to customized ODM products, we also carry a broad line of off-the-shelf standard products in popular industrial motherboard form factors including Nano ITX, Mini ITX, mATX and ATX.

BCM is an Associate member of the Intel® Intelligent System Alliance. We specializes in supporting our custom motherboard design services through our strong engineering and project management teams located in Southern California complimenting our core development teams located in Taipei, Taiwan. Additionally, we are well staffed in North America to provide local warranty

service, logistics, and technical support for prompt problem solving assistance. Our products have guaranteed extended lifecycles and are designed for 24/7/365 operation. For more information please visit BCM's website at www.bcmcom.com. Additional information about Intel® embedded products, please visit www.intel.com/embedded/index.htm

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