

White Paper

RX67Q and RX67Q-LVDS industrial mATX motherboard support onboard graphic and PCIe graphic cards simultaneously up to six independent displays



RX67Q and RX67Q-LVDS mATX Motherboards Support Multi-Monitors

RX67Q and RX67Q-LVDS Micro ATX Motherboard Architecture Overview

Both RX67Q and RX67Q-LVDS are based on Intel® Sandy Bridge two-chip desktop platform, socket H2 LGA1155 equipped with Intel® Q67 Express Chipset. The boards support 2nd generation 32nm Intel® Core processor family. The only difference between the two is RX67Q-LVDS provides LVDS connector onboard enabling direct connection to LVDS devices. This document will focus on demonstrating its new feature, Multi-monitor support with Windows XP, which allows the system to operate onboard graphics and PCI/PCIe graphic cards simultaneously.

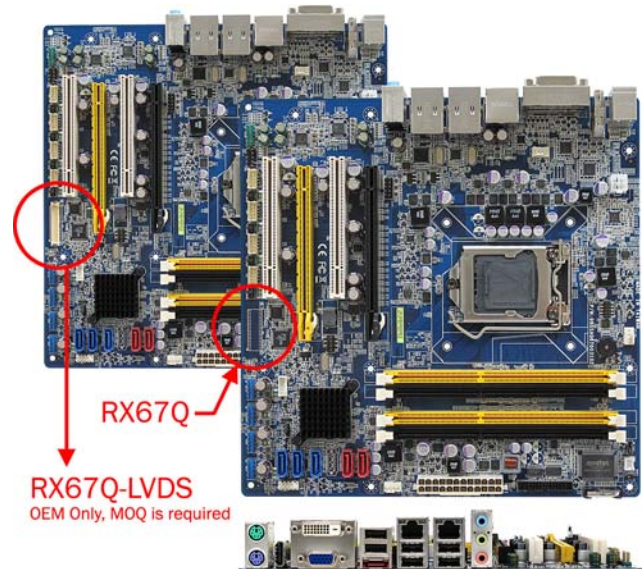
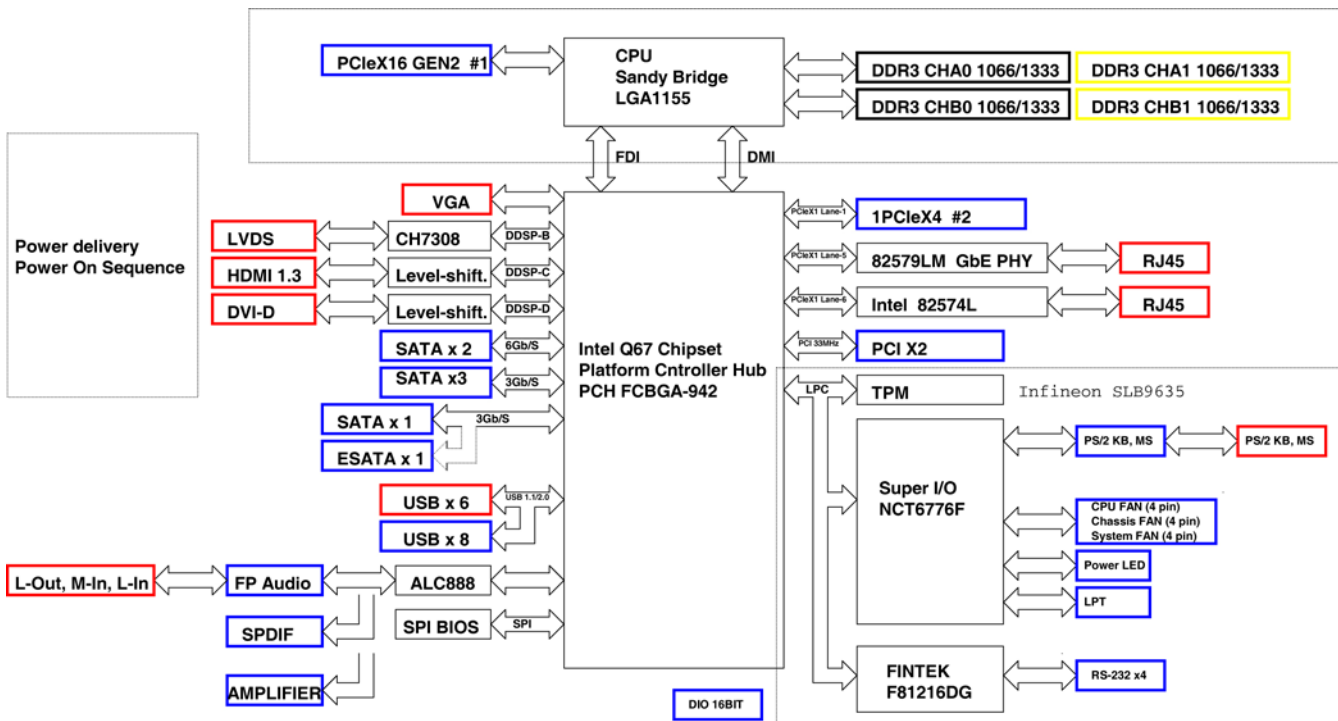


Figure 1 (Below): The RX67Q and RX67Q-LVDS Motherboard Block Diagram

Figure 2 (Right): The RX67Q and RX67Q-LVDS comparison also showing the location of the LVDS connector



Intel® introduced the feature of enabling a computing system to operate onboard graphics and PCI/PCIe graphic cards simultaneously in its first generation Intel® Core™ i7/i5/i3 processors and Intel® Q57/QM57 chipset architecture. This feature was improved with more stability and configuration settings in its 2nd generation Intel® Core™ i7/i5/i3 processors and Intel® Q67/QM67 chipset architecture, so called the Sandy Bridge platform. The most significant benefit of this improvement is to allow the motherboard to support more than two monitors which can not be done in the previous X86 platforms.

Hardware required for this demonstration

- RX67Q mATX motherboard
- Six LCD monitors
- One PCIe x16 graphic card with at least two video output interfaces (DVI/HDMI/VGA)
- One PCI x4 graphic card with at least two video output interfaces (DVI/HDMI/VGA)
- Intel® Core™ i7/i5 processor with Intel® HD graphic support
- Four 2 GB DDR3 SDRAM to support total 8 GB system memory
- ATX power supply
- Microsoft Windows XP+SP3 Operation System

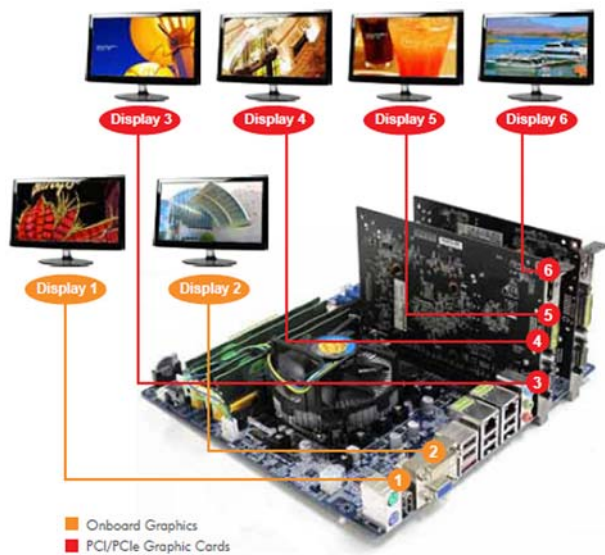


Figure 3 (Above): Hardware setting configurations

The next table provides a list of CPU models supported by the RX67Q and RX67Q-LVDS motherboards. However, in order to run six monitors at the same time, it is suggested to choose the

core™ i5 and above series (i5/i7 series) which provide HD graphic integrated in the processors. The first two displays can be supported by the onboard DVI/VGA/HDMI interfaces. Secondly, we add PCIe graphics card plugged into the onboard x16 and x4 PCIe slots, each has HDMI, DVI and VGA output interfaces to choose from. Upon completion of the hardware setting as figure 3, the motherboard is able to run up to six displays at the same time.

Please note that by default the multi-monitor feature is disabled. It can be turned on through the BIOS setting if this is required by customers.



Figure 4 (Above): Demonstration of six monitors presented by William H.

CPU Model	Cache
Core i7-2600K	8M Cache, up to 3.80 GHz
Core i7-2600S	8M Cache, up to 3.80 GHz
Core i7-2600	8M Cache, up to 3.80 GHz
Core i5-2500K	6M Cache, up to 3.70 GHz
Core i5-2500T	6M Cache, up to 3.30 GHz
Core i5-2500S	6M Cache, up to 3.70 GHz
Core i5-2500	6M Cache, up to 3.70 GHz
Core i5-2405S	6M Cache, up to 3.30 GHz
Core i5-2390T	3M Cache, up to 3.50 GHz
Core i5-2400S	6M Cache, up to 3.30 GHz
Core i5-2450P	6M Cache, up to 3.50 GHz
Core i5-2550K	6M Cache, up to 3.80 GHz
Core i3-2130	3M Cache, up to 3.40 GHz
Core i3-2105	3M Cache, up to 3.10 GHz
Core i3-2125	3M Cache, up to 3.30 GHz
Core i3-2100T	3M Cache, up to 2.5GHz
Core i3-2120T	3M Cache, up to 2.60 GHz

Core i3-2100	3M Cache, up to 3.10 GHz
Core i3-2120	3M Cache, up to 3.30 GHz
Core i3-2102	3M Cache, up to 3.10 GHz
Pentium G860	3M Cache, up to 3.00 GHz
Pentium G840	3M Cache, up to 2.80 GHz
Pentium G850	3M Cache, up to 2.90 GHz
Pentium G620T	3M Cache, up to 2.20 GHz
Pentium G630T	3M Cache, up to 2.30 GHz
Pentium G620	3M Cache, up to 2.60 GHz
Pentium G630	3M Cache, up to 2.70 GHz
Pentium G622	3M Cache, up to 2.60 GHz
Pentium G632	3M Cache, up to 2.70 GHz
Celeron G540	3M Cache, up to 2.90 GHz
Celeron G530T	3M Cache, up to 2.90 GHz
Celeron G530	2M Cache, up to 2.40 GHz
Celeron G440	1M Cache, up to 1.60 GHz
Celeron G460	1.5M Cache, up to 1.80 GHz

Table 1: The information above is collected from Intel® website (<http://ark.intel.com/products/chipsets/52770>)

The resolution of each monitor is different; however they are adjustable through the control panel. By providing enough processing power, graphic performance and memory access, the system is able to support different types of digital content without lagging including video, HD video, 3D games, images, web browsing and etc.



Figure 4 (Above): Demonstration of six monitors presented by William H. Each monitor plays different digital contents

What Types of Industrial Applications Can Be Benefited By Multi-monitors Supported By the RX67Q and RX67Q-LVDS Motherboards?



Digital Surveillance Systems

Such applications require the computing ability to handle complex algorithms, data-intensive workloads, and multi-protocol wireless networking. The essentials computing components behind these everyday machines are often built around the industrial motherboards which combine powerful central processor, with built-in smart chipsets, I/O, and expandability in allow the integration of add-on and supporting technologies specific to each industry.

Medical Applications

Magnetic Resonant Imaging CT (MRIC), Ultrasound CT and medical imaging systems

Retailing Applications

Digital Signage Systems, Point-of-Sale (cashier, register), multimedia interactive clients (ticketing system, ATM terminal, self-checkout station, coin exchange machine, lottery kiosk, tourist information kiosk, vending machines)

Gaming Applications

Slot machines, lottery terminals, bingo machines, player tracking systems

Industrial Control & Automation

Factory and building automation, robotic systems.

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 RX67Q and RX67Q-LVDS are no exceptions to this commitment and are regulated as RoHS Compliant motherboards.

In addition to the RoHS Compliant, both RX67Q and RX67Q-LVDS motherboards have passed FCC and CE emission testing to ensure their safe use in the equipment and applications mentioned in this paper.

Embedded Lifecycle Support through Intel® Embedded Alliance

BCM is an Associate member of the Intel® Embedded 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 or more years life cycles.

Intel's long life product support enables the industrial motherboard manufacturers like BCM to design and manufacturing long life embedded boards by 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 RX67Q/RX67Q-LVDS, to be available for many years reducing frequent and costly redesigns and qualifications.

About the Intel® Embedded and Communications Alliance

The Intel® Embedded and Communications Alliance is one of the world's most recognized embedded and communications provider. This community offers customers a trusted supply line of Intel® based products and technologies. The alliance members are committed to provide ideal solutions and total lifecycle support to help customers develop quick time-to-market and faster time-to-profit applications.

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® Embedded Alliance member. We specialize 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 are 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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