

Flexible embedded platform for developing Qseven systems

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This article describes a compact MSC Q7-MB-EP1 embedded platform for power-saving Qseven modules, enabling simple integration of different displays and offering a wide range of industrial interfaces. The baseboard can not only be used for fast development of embedded systems, but also for small and medium production runs.



Figure 1. Complete Qseven system construction with display

■ Today, developers of powerful embedded systems are confronted with a number of questions. How can I minimize the development time for my complex solution? How can the complete system be built up as quickly and simply as possible? Can subsequent changes and potential enhancements be carried out without any problems? How can I connect a display to the embedded system without any great effort?

In order to address these issues, the embedded systems developer looks for finished devices and modules, because completely new electronic designs, from start to finish, from housing layout to display integration, are extremely time-consuming. Building block systems that support a customer-specific solution based on a prefabricated computer-on-module are offered by several embedded computing manufacturers. MSC now provides a very compact MSC Q7-MB-EP1 embedded platform for power-saving Qseven modules, which enables the simple integration of different displays and offers a wide range of industrial interfaces. In addition to fast development of innovative embedded systems, the cost-effective baseboard can also be used for small and medium production runs. The compact 3.5 inch platform format underlines the small dimensions of 70mm x 70mm of the standardized Q7-US15W-FD Qseven modules that are mounted

via a proven MXM connector on the baseboard. MSC currently provides three versions of its Qseven module with integrated Intel Atom processor. These differ in processor performance and the number of SATA and PCI Express x1 interfaces. The modules are particularly suitable for mobile, battery-operated and fan-less applications. Despite its compact design, the baseboard offers a selection of important interfaces defined in the Qseven specification. All relevant connections for automation applications are on the front side extending outward. In addition to two USB 2.0 ports, these include HD audio and a serial interface via a D-sub connector as well as a fast Gigabit LAN port. The internal interfaces are designed such that they are individually usable without extensive cable adaptations. Industrial displays are connected using the J1L130 connector via the LVDS interface. A standardization of cables for all embedded platforms from MSC is thus possible. A large selection of corresponding display solutions from different manufacturers is offered by MSC in its distribution portfolio. The same also applies to the connection of a touchscreen, because, due to the three market standards, three different connection possibilities are implemented on the baseboard. The embedded platform is also available with touchscreen for a 7-inch display and an external full HD monitor. Thanks to the flexible circuit board with connectors no special adaptation

is necessary. The current MSC Q7-MB-EP1 platform can be extended via the Mini PCI Express socket, for which there are already a large number of interface cards such as UMTS and LAN modules, additional flash memory capacities and solid state disks, with no great effort required. The baseboard is also universally configurable via the two internal USB ports for the connection of further interface converters as well as via the integrated socket for MMC/SD cards. The 4-pin power supply connector on the baseboard is designed for a wide range power supply that provides the embedded platform with a voltage in the range from 10 to 28 VDC and enables both battery operation and stationary operation in an industrial environment.

The MSC Q7-US15W-FD Qseven modules with integrated NAND memory enable a simple adaptation of the embedded solution to the system environment. Thus, the system can not only be booted via a hard disk, but alternatively via the on-board flash. The boot speed and memory capacity are sufficient for the requirements of many embedded applications. Since the external hard disk is not required when booting from the flash disk, the system is considerably more compact and less expensive. Furthermore, the mechanical stability is increased. The flash disk, which is designed for industrial use, has a capacity of 4 GBytes

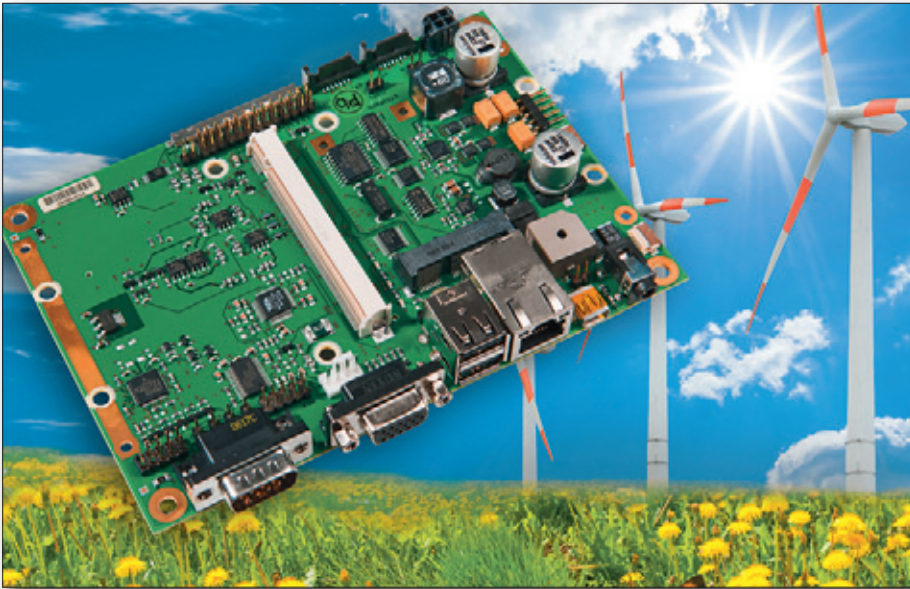


Figure 2. The MSC Q7-MB-EP1 embedded platform enables fast development of powerful embedded systems based on a power-saving Qseven module.

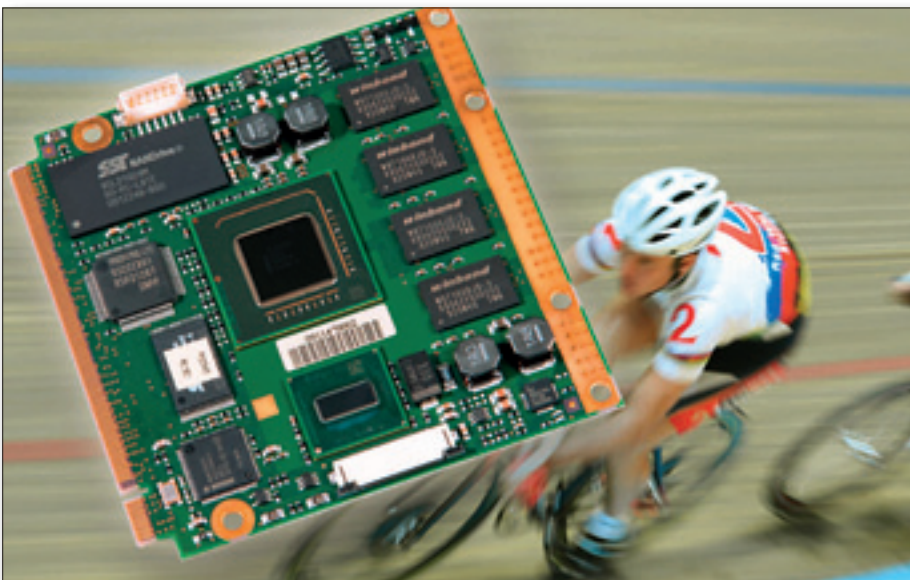


Figure 3. The MSC Q7-US15W-FD Qseven module in the form factor of 70mm x 70mm is now also available with integrated flash disk.

and is designed for 10 million write cycles. Customers can load Windows XP (embedded), Windows 7 Embedded Standard and Linux operating systems in the memory. The NAND memory can also alternatively be integrated on the baseboard. The module is available in two performance classes: with the power-saving Intel Atom processors Z530 (1.6 GHz), or with the Z510, which is clocked at 1.1 GHz. The Z530 version supports hyper-threading and Intel virtualization technology. Also located on the module are the Intel US15W SCH chipset with integrated Intel graphics media accelerator 500 and a DDR2 SDRAM with a memory capacity of up to 1 GByte. As with all of MSC's new embedded modules, the Qseven series also integrates innovative hardware and

BIOS-based security functions in compliance with the requirements of the Trusted Computing Group (TCG). In addition, the modules integrate the Trusted Platform Module (TPM) from Infineon and furthermore, the SecureCore BIOS from Phoenix Technologies. In addition to the Qseven baseboard, MSC also provides a wide range of TFT displays in different sizes. Thanks to the prefabricated cables, the monitors can be easily connected. Inverters and touchscreens in various versions are also available. The MSC Q7-MB-EP2, a further embedded platform for Qseven modules is specifically designed for POI/POS and digital signage applications. The target platform has a digital visual interface (DVI) for connection of large-area screens and has two Gigabit LAN interfaces. ■