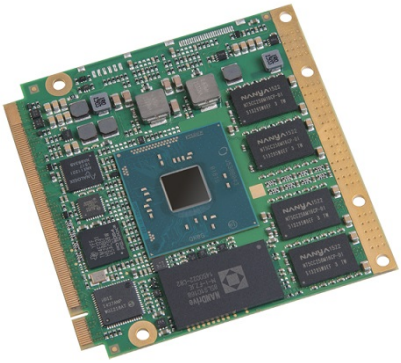
Qseven

AVNET EMBEDDED

MSC Q7-BW

Intel® Atom™ / Pentium® / Celeron® SOC N3000



70 x 70 mm	
6 / 9 W	
0	+60

IoT Solutions Alliance

Description

The MSC Q7-BW module is based on Intel‘s multi-core system-on-chip (SOC) Atom generation ("Braswell") that integrates next generation Intel processor core, graphics, memory, and I/O interfaces into one solution. Based on 14nm processor technology this multi-core processor provides outstanding computing and graphics performance and is more power efficient compared to its predecessors.

The new MSC Q7-BW brings triple independent display support, DirectX 11.1, fast DDR3L-1600 memory and USB 3.0 on a compact, power saving and cost-efficient Qseven Rev. 2.0 compliant module.

Different SOCs with dual- and quad-core processors are supported by this design. Next to an extensive set of interfaces and features, the MSC Q7-BW optionally offers hardware based security compliant to the requirements of TCG (Trusted Computing Group).

For evaluation and design-in of the MSC Q7-BW module, Avnet Embedded provides suitable Qseven Rev. 2.0 platform boards. A complete, ready-to-run Starterkit is also available.

Highlights

- Intel Pentium N3710 quad-core 1.6/2.56GHz, 6W
- Intel Celeron N3160 quad-core 1.6/2.24GHz, 6W
- Intel Celeron N3060 dual-core 1.6/2.48GHz, 6W
- Intel Celeron N3010 dual-core 1.04/2.24GHz, 4W
- Intel Atom x5-E8000 quad-core 1.04/2.0GHz, 5W
- Integrated Intel Gen. 8 HD Graphics
- Up to 8GB DDR3L SDRAM, dual-channel
- Up to 64GB eMMC Flash (optional)
- Up to 64GB SATA NAND Drive (optional)
- Up to 2x SATA-III interfaces (6Gbps)
- DisplayPort/HDMI/DVI interface
- LVDS/Embedded DisplayPort interface
- Triple Independent Display support
- DirectX 11.1, OpenGL 4.2, OpenCL 1.2
- Up to 3x PCI Express x1 Gen. 2
- Up to 2x USB 3.0 Host interfaces
- Up to 8x USB 2.0 Host interfaces
- 1x USB Host/Device support*
- Gigabit Ethernet
- UART, LPC, I2C, SMBus
- HD Audio, SD Card interface
- Trusted Platform Module (optional)
- Qseven Rev. 2.0 compliant
- UEFI Firmware

Technical Data - MSC Q7-BW

Technology	x86
Formfactor	Qseven
CPU	Intel Pentium N3710 quad-core 1.6/2.56GHz, 2MB cache, 16 EU GFX, 6W Intel Celeron N3160 quad-core 1.6/2.24GHz, 2MB cache, 12 EU GFX, 6W Intel Celeron N3060 dual-core 1.6/2.48GHz, 2MB cache, 12 EU GFX, 6W Intel Celeron N3010 dual-core 1.04/2.24GHz, 2MB cache, 12 EU GFX, 4W Intel Atom x5-E8000 quad-core 1.04/2.0GHz, 2MB cache, 12 EU GFX, 5W Intel® Technologies: Enhanced Intel SpeedStep® Technology Intel® Virtualization Technology (VT-x) Intel® AES New Instructions, Secure Key
Chipset	Integrated in SOC
RAM	Up to 8GB 1600 MT/s DDR3L SDRAM, dual-channel, soldered
Flash	Up to 64GB eMMC Flash, soldered (optional) Up to 64GB SATA NAND Drive, soldered (optional)
Storage Interfaces	2x SATA-III 6Gbps (one port used for optional SATA NAND Drive) 1x SD 3.01
USB	4x USB 2.0 + 2x USB 3.0, one port supports USB 2.0/3.0 Host/Device* or 5x USB 2.0 + 1x USB 3.0, one port supports USB 2.0 Host/Device* or 6x USB 2.0 + 1x USB 3.0, one port supports USB 2.0 Host/Device* or 8x USB 2.0, one port supports USB 2.0 Host/Device* *USB Device only supported by Android
Serial Interfaces	1x UART (no handshake)
Bus Interfaces	Up to 3x PCI-Express x1 Gen. 2 lanes 1x LPC Bus 1x I2C Bus 1x SPI Bus* 1x SMBus *User/SIO SPI not supported; only external BIOS Flash
Display Controller	Integrated Intel HD graphics Gen. 8 Up to 16 execution units (EU) 3D Acceleration: DirectX 11.1, OpenGL 4.2, OpenCL 1.2 Video Decode: MPEG2, H.264 (L5.1), VC-1, WMV9, VP8, JPEG/MJPEG
Display Interfaces	Three independent displays supported 1x DisplayPort++ (DisplayPort 1.1a / HDMI 1.4b up to 3840 x 2160 @ 30Hz or 2560 x 1600 @ 60Hz) Dual-Channel LVDS 24/18 bit up to 1920 x 1200 @ 60Hz or 2x Embedded DisplayPort 1.4 up to 2560 x 1440 @ 60Hz (optional)

Network Interface	10/100/1000Base-T (Intel i210)
Audio Interface	High Definition Audio
Security Device	Infineon Trusted Platform Module 1.2 (optional)
Miscellaneous	Watchdog Timer: Initiates system reset, (programmable, 1s … 255h) Fan Supply: PWM Speed Control for system fan on carrier board Real-Time Clock: Integrated in SOC, external battery System Monitoring: Voltage, Temperature, CPU Fan, System Fan
Feature Highlights	Qseven Rev.2.0 compliant
Firmware	AMI Aptio UEFI
OS Support	Windows 7 / 8 / 10 BSP for Linux on request EAPI (HW Programming Interface)
Power Requirement	+5V +/-5% +5V Standby
Environment	Temperature Range: 0° … 60°C (operating commercial) -20° … 85°C (storage) Humidity: 5 … 95% (operating, non-condensing) 5 … 95% (storage, non-condensing)
Dimensions	70 x 70 mm
Certificates	UL / CE
Cooling	Heatspreader Heatsink
Carrier	MSC Q7-MB-EP5 MSC Q7-MB-EP6

Order Reference - MSC Q7-BW

Order Number	Description	Reference	Cat
69817	Qseven Rev.2.0 module with Intel Pentium N3710 processor (1.6/2.56GHz), Quad-Core, 6W, 4GB 1600MT/s DDR3L, 16GB eMMC Flash, 2x SATA-III, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, TPM, DP, LVDS Graphics	MSC Q7-BW-N3710-24N0211C PCBFTX	PV
69819	Qseven Rev.2.0 module with Intel Pentium N3710 processor (1.6/2.56GHz), Quad-Core, 6W, 4GB 1600MT/s DDR3L, 32GB eMMC Flash, 32GB SATA SSD, 1x SATA-III, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, TPM, DP, LVDS Graphics	MSC Q7-BW-N3710-2550211C PCBFTX	PV
69815	Qseven Rev.2.0 module with Intel Celeron N3160 processor (1.6/2.24GHz), Quad-Core, 6W, 4GB 1600MT/s DDR3L, 16GB eMMC Flash, 2x SATA-III, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, TPM, DP, LVDS Graphics	MSC Q7-BW-N3160-24N0211C PCBFTX	PV
72002	Qseven Rev.2.0 module with Intel Celeron N3160 processor (1.6/2.24GHz), Quad-Core, 6W, 8GB 1600MT/s DDR3L, 16GB eMMC Flash, 2x SATA-III, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, TPM, DP, LVDS Graphics	MSC Q7-BW-N3160-34N0211C PCBFTX	PV
69813	Qseven Rev.2.0 module with Intel Celeron N3060 processor (1.6/2.48GHz), Dual-Core, 6W, 2GB 1600MT/s DDR3L, 8GB eMMC Flash, 2x SATA-III, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, TPM, DP, LVDS Graphics	MSC Q7-BW-N3060-13N0211C PCBFTX	PV
69811	Qseven Rev.2.0 module with Intel Celeron N3010 processor (1.04/2.24GHz), Dual-Core, 4W, 2GB 1600MT/s DDR3L, 8GB eMMC Flash, 2x SATA-III, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, TPM, DP, LVDS Graphics	MSC Q7-BW-N3010-13N0211C PCBFTX	PV
69821	Qseven Rev.2.0 module with Intel Atom x5-E8000 processor (1.04/2.00GHz), Quad-Core, 5W, 2GB 1600MT/s DDR3L, 8GB eMMC Flash, 2x SATA-III, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, TPM, DP, LVDS Graphics	MSC Q7-BW-E8000-13N0211C PCBFTX	PV
69823	Qseven Rev.2.0 module with Intel Atom x5-E8000 processor (1.04/2.00GHz), Quad-Core, 5W, 2GB 1600MT/s DDR3L, 8GB eMMC Flash, 2x SATA-III, GbE LAN, USB 3.0 Host, 5x USB 2.0 Host, DP, LVDS Graphics	MSC Q7-BW-E8000-13N0220C PCBFTX	PV
71374	Qseven Rev.2.0 module with Intel Atom x5-E8000 processor (1.04/2.00GHz), Quad-Core, 5W, 2GB 1600MT/s DDR3L, 32GB eMMC Flash, 2x SATA-III, 3x PCIE x1, GbE LAN, 8x USB 2.0 Host, HSUART, HDA, DP, LVDS Graphics	MSC Q7-BW-E8000-15N0200C PCBFTX	PV

Accessories

Order Number	Description	Reference
	Carrier Options	
67690	Qseven Rev. 2.0 compatible embedded platform (148 x 102mm), 10-28V input voltage, 1x RS232 on DB9 connector, 1x RS485 on pin header, 1x RS232 no handshake on pin header, dual RJ45 LAN connector with LED, 1x SATA, 1x mSATA slot, SD card holder, 1x USB 3.0 connector, 2x USB 2.0 connector, 1x USB 2.0 on pin row, 1x microUSB 2.0 OTG, CAN, I2C, LPC/ GPIO on pin header, I2C/SMBus, SPI, DisplayPort connector, LVDS/eDP on JILI30 connector, regulated backlight supply, mini PCI Express slot, HD Audio, CMOS battery. Commercial temperature range 0..+70°C	MSC Q7-MB-EP6-601 PCBFTX
	Cooling Options	
1114190	Passive Heatsink for Q7-BT, consisting of a single-piece aluminum profile with fins, through-hole distance bolts and through-holes in the heatrail part, with thermo pad for the thermal contact to the CPU. M3 mounting holes for an optional fan. Heatsink is also suitable for Q7-BW (all modules) and Q7-AL (only modules with Celeron/Pentium processor)	MSC Q7-BT-01 HSI-001
1114178	Heatspreader for Q7-BT with through-hole distance bolts, only offers a 70x65mm aluminium plane to mount a heatsink or thermally connect to a cooler. Heatspreader is also suitable for Q7-BW (all modules) and Q7-AL (only modules with Celeron/Pentium processor)	MSC Q7-BT-01 HSP-001
1137658	Passive Heatsink for Q7-BT, consisting of a single-piece aluminum profile with fins, threaded distance bolts and threaded holes in the heatrail part, and thermo pad for the thermal contact to the CPU. M3 mounting holes for an optional fan. Heatsink is also suitable for Q7-BW (all modules) and Q7-AL (only modules with Celeron/Pentium processor)	MSC Q7-BT-02 HSI-001
1129447	Heatspreader for Q7-BT with through-hole distance bolts and threaded holes in the heatrail part, offers a 70x65mm aluminium plane to mount a heatsink or thermally connect to a cooler. Heatspreader is also suitable for Q7-BW (all modules) and Q7-AL (only modules with Celeron/Pentium processor)	MSC Q7-BT-02 HSP-001
1137181	Heatspreader for Q7-BT with threaded distance bolts and through-holes in the heatrail part, offers a 70x65mm aluminium plane to mount a heatsink or thermally connect to a cooler. Heatspreader is also suitable for Q7-BW (all modules) and Q7-AL (only modules with Celeron/Pentium processor)	MSC Q7-BT-04 HSP-001
82584	Heatspreader for Q7-BT/BW with through-hole distance bolts and 4 through-holes in the heatrail part, all holes for countersunk screws, offers a 70x65mm aluminium plane to mount a heatsink or thermally connect to a cooler. Heatspreader is also suitable for Q7-AL (only modules with Celeron/ Pentium processor).	MSC Q7-BT-07 HSP-001
1053769	Heat rail for Q7 baseboards. Recommended for conductive heat transfer from the Q7 module to the Q7 baseboard. Already assembled on all MSC baseboards.	MSC Q7-XXX-01 HTR-001
	Starter Kits	

Accessories

Order Number	Description	Reference
46995	Starterkit for MSC Q7-BT/BW modules. Includes MSC Q7-MB-EP6 Baseboard, Power Supply, Cable Kit and Heatsink. Please order the Q7-BT/BW module of your choice separately.	MSC Q7-SK-BT-EP6-KIT001

Avnet Embedded
MSC Technologies GmbH
Industriestr. 16
76297 Stutensee

AvnetEmbedded@avnet.com
avnet.com/embedded

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