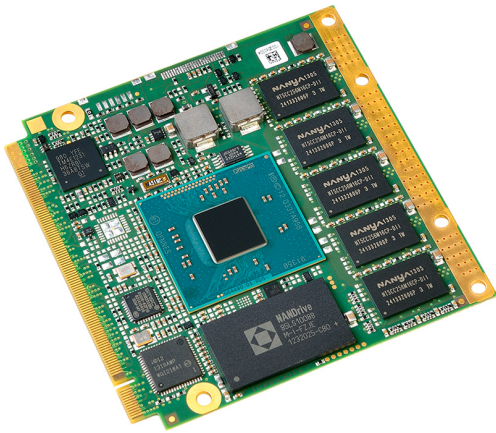


## MSC Q7-BT

### Intel® System on Chip (SOC) Atom™ E3800



70x70



4.5 to 12 W (typ.)



-40 +85



## Description

The MSC Q7-BT module is based on the Qseven Rev. 2.0 and using Intel's multi-core System-On-Chip (SOC) Atom generation that integrates next generation Intel processor core, graphics, memory, and I/O interfaces into one solution. Based on Intel's 22nm processor technology, this multi-core Atom processor provides outstanding computing and graphics power and is more power efficient compared to its predecessors.

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

Different SOCs with single-, dual- and quad-core processors are supported by this design. Next to an extensive set of interfaces and features, the MSC Q7-BT offers hardware based security compliant to the requirements of TCG (Trusted Computing Group). For evaluation and design-in of the MSC Q7-BT module, Avnet Embedded provides a number of development platforms. A complete, ready-to-run Starterkit is also available.

## Highlights

- Intel® Atom™ System-On-Chip with Quad-/Dual- /Single-Core Processor:
  - E3845 Quad-Core, 1.91 GHz, 10W TDP E3827 Dual-Core, 1.75 GHz, 8W TDP E3826 Dual-Core, 1.46 GHz, 7W TDP E3825 Dual-Core, 1.33 GHz, 6W TDP E3815 Single-Core, 1.46 GHz, 5W TDP E3805 Dual-Core, 1.33 GHz, 3W TDP
  - Up to 4GB DDR3L SDRAM (opt. ECC)
  - Up to 64GB SATA Flash Disk (optional)
  - Up to 32GB eMMC Flash (optional)
  - 2x SATA-II interfaces (1 used for opt. Flash Disk)
  - Integrated Intel Gen. 7 HD Graphics
  - HDMI up to 1920x1200
  - DisplayPort 1.1a up to 2560x1600
  - Dual-Channel LVDS 24 or 18 bit up to 1920x1200
- Dual Simultaneous Display support
- Gigabit Ethernet
- 3x PCIe x1 Gen. 2.0 ports
- USB 3.0 Host, optional USB 3.0 Device
- Up to 6x USB 2.0 Host, optional USB 2.0 Device
- UART, LPC, HD Audio, SPI, I2C, SMBus, SDIO, opt. TPM

## Technical Data - MSC Q7-BT

<b>Technology</b>	x86
<b>Formfactor</b>	Qseven
<b>CPU</b>	Intel® Atom™ E3845, E3827, E3826, E3825, E3815, E3805
<b>Chipset</b>	in SOC
<b>RAM</b>	up to 4 GB LVDDR3-1333 SDRAM, soldered optional ECC
<b>Flash</b>	optional on-board SATA Flash Disk up to 64 GB optional in-board eMMC Flash up to 32GB
<b>Storage Interfaces</b>	2x SATA 3Gb/s one optionally used for SATA Flash Disk
<b>USB</b>	1x USB 3.0 Host up to 6x USB Host optional USB 3.0 Device optional USB 2.0 Device
<b>Serial Interfaces</b>	I <sup>2</sup> C Bus SMBus SPI Bus
<b>Bus Interfaces</b>	3x PCI-Express x1 Gen. 2 LPC Bus
<b>Display Controller</b>	Integrated Intel HD Graphics Gen. 7
<b>Display Memory</b>	UMA
<b>Display Interfaces</b>	HDMI up to 1920 x 1200 @60Hz DisplayPort 1.1a up to 2560 x 1600 @60Hz LVDS 18/24 bit, dual channel, up to 1920 x 1200 @60Hz
<b>Network Interface</b>	10/100/1000Base-TX
<b>Audio Interface</b>	HD Audio (I2S optional)
<b>Security Device</b>	TPM 1.2 optional
<b>Miscellaneous</b>	Watchdog Timer: Initiates system reset, (programmable, 1s ... 255h) Fan Supply: PWM Speed Control for system fan on carrier board RTC battery: external System Monitoring: Voltage, Temperature, CPU Fan, System Fan
<b>Feature Highlights</b>	ECC controlled Memory Optional TPM for Security HDMI, DisplayPort outputs

<b>Firmware</b>	AMI Aptio UEFI
<b>OS Support</b>	Windows 7 / ES7 / 8 / 10 Linux EAPI (HW Programming Interface)
<b>Power Requirement</b>	+5V +/-5%, 5V Standby optional
<b>Environment</b>	Operating Temperature: 0° ... 60°C (operating, commercial) -40° ... 85°C (operating, industrial) -20° ... 85°C (storage, commercial) -40° ... 85°C (storage, industrial) Humidity: 5 ... 95% (operating, non-condensing), 5 ... 95% (storage, non-condensing)
<b>Dimensions</b>	70mmx70mm
<b>Certificates</b>	UL / CE
<b>Cooling</b>	Heatspreader with threaded standoffs Heatsink with threaded standoffs
<b>Carrier</b>	Qseven Rev. 2.0 Carrier board in 3.5" (ECX) form factor Carrier board for evaluation in ATX form factor

## Order Reference - MSC Q7-BT

Order Number	Description	Reference	Cat*
65993	Qseven 2.0 module with Intel Atom E3815 SC 1.46GHz, 5W TDP, 1 GB DDR3L, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, UART, std. temp.	MSC Q7-BT-15-1001 PCBFTX	PV
65995	Qseven 2.0 module with Intel Atom E3815 SC 1.46GHz, 5W TDP, 2 GB DDR3L, GbE LAN, USB 3.0 Host, USB 3.0 Device, 3x USB 2.0 Host, USB 2.0 Host/Device, UART, std. temp.	MSC Q7-BT-15-2008 PCBFTX	OR
82310	Qseven 2.0 module with Intel Atom E3815 SC 1.46GHz, 5W TDP, 2GB DDR3L, 16GB eMMC Flash, GbE LAN, USB 3.0 Host, 5x USB 2.0, USB 2.0 Host/Device, UART, TPM, ind. temp.	MSC Q7-BT-15-2402I PCBFTX	PV
48938	Qseven 2.0 module with Intel Atom E3815 SC 1.46GHz, 5W TDP, 2 GB DDR3L, 4 GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, UART, ind. temp.	MSC Q7-BT-15-2201I PCBFTX	PV
48924	Qseven 2.0 module with Intel Atom E3825 DC 1.33GHz, 6 W TDP, 2 GB DDR3L, 4 GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, UART, ind. temp.	MSC Q7-BT-25-2201I PCBFTX	PV
48925	Qseven 2.0 module with Intel Atom E3826 DC 1.46GHz, 7 W TDP, 2 GB DDR3L, 4 GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, UART, ind. temp.	MSC Q7-BT-26-2201I PCBFTX	PV
82312	Qseven 2.0 module with Intel Atom E3826 DC 1.46GHz, 7W TDP, 4GB DDR3L, 16GB eMMC Flash, GbE LAN, USB 3.0 Host, 5x USB 2.0, USB 2.0 Host/Device, UART, TPM, ind. temp.	MSC Q7-BT-26-4402I PCBFTX	PV
65495	Qseven 2.0 module with Intel Atom E3827 DC 1.75GHz, 8 W TDP, 2 GB DDR3L, 4 GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, UART, ind. temp.	MSC Q7-BT-27-2201I PCBFTX	PV
66172	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10 W TDP, 2 GB DDR3L, GbE LAN, USB 3.0 Host, 4x USB 2.0 Host, UART, ind. temp.	MSC Q7-BT-45-2006I PCBFTX	PV
48927	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10 W TDP, 2 GB DDR3L, 4 GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, UART, TPM, ind. temp.	MSC Q7-BT-45-2200I PCBFTX	PV
48991	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10 W TDP, 4 GB DDR3L, GbE LAN, USB 3.0 Host, 6x USB 2.0 Host, UART, ind. temp.	MSC Q7-BT-45-4001I PCBFTX	PV

\*COM products are divided in two categories, „PV“ (preferred variant) and „OR“ (on request).

## Order Reference - MSC Q7-BT

Order Number	Description	Reference	Cat*
82316	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10W TDP, 4GB DDR3L, 16GB eMMC Flash, GbE LAN, USB 3.0 Host, 5x USB 2.0, USB 2.0 Host/Device, UART, TPM, ind. temp.	MSC Q7-BT-45-4402I PCBFTX	PV
48929	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10W TDP, 4GB DDR3L, ECC, GbE LAN, USB 3.0 Host, USB 3.0 Device, 3x USB 2.0, USB 2.0 Host/Device, UART, ind. temp.	MSC Q7-BT-45-8005I PCBFTX	OR
67047	Qseven 2.0 module with Intel Atom E3815 SC 1.46GHz, 5W TDP, 2GB DDR3L, 4GB SATA Flash, GbE LAN, USB 3.0 Host, 5x USB 2.0, USB 2.0 Host/Device, UART, TPM, ind. temp.	MSC Q7-BT-15-20B2I PCBFTX	PV
69460	Qseven 2.0 module with Intel Atom E3805 DC 1.33GHz, 3W TDP, 2GB DDR3L, 16GB eMMC Flash, GbE LAN, USB 3.0 Host, 5x USB 2.0, USB 2.0 Host/Device, UART, TPM, ind. temp. -- Processor & Module without any Graphics!	MSC Q7-BT-05-2402I PCBFTX	PV
69353	Qseven 2.0 module with Intel Atom E3815 SC 1.46GHz, 5W TDP, 2GB DDR3L, 8GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0, UART, std. temp.	MSC Q7-BT-15-2301 PCBFTX	PV
67758	Qseven 2.0 module with Intel Atom E3826 DC 1.46GHz, 7W TDP, 2GB DDR3L, 8GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0, UART, std. temp.	MSC Q7-BT-26-2301 PCBFTX	OR
82314	Qseven 2.0 module with Intel Atom E3827 DC 1.75GHz, 8W TDP, 4GB DDR3L, 32GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0, UART, ind. temp.	MSC Q7-BT-27-4501I PCBFTX	OR
65316	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10W TDP, 4GB DDR3L, 4GB eMMC Flash, GbE LAN, USB 3.0 Host, 5x USB 2.0, USB 2.0 Host/Device, UART, TPM, embedded DisplayPort Output (eDP), no LVDS, ind. temp.	MSC Q7-BT-45-4207I PCBFTX	OR
71625	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10W TDP, 2GB DDR3L, 8GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0, UART, ind. temp.	MSC Q7-BT-45-2301I PCBFTX	OR
71623	Qseven 2.0 module with Intel Atom E3845 QC 1.91GHz, 10W TDP, 4GB DDR3L, 4GB eMMC Flash, GbE LAN, USB 3.0 Host, 6x USB 2.0, UART, ind. temp.	MSC Q7-BT-45-4201I PCBFTX	OR
73499	Qseven 2.0 module with Intel Atom E3815 SC 1.46GHz, 5W TDP, 2GB DDR3L, GbE LAN, USB 3.0 Host, 6x USB 2.0, UART, ind. temp.	MSC Q7-BT-15-2001I PCBFTX	OR

\*COM products are divided in two categories, „PV“ (preferred variant) and „OR“ (on request).

## Accessories

Order Number	Description	Reference
<b>Carrier Options</b>		
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 JIL130 connector, regulated backlight supply, mini PCI Express slot, HD Audio, CMOS battery. Commercial temperature range 0..+70°C	MSC Q7-MB-EP6-601 PCBFTX
<b>Cooling Options</b>		
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
<b>Starter Kits</b>		

## 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

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