

## MSC C10M-AL

Intel® Atom™ E3900 Series /  
Pentium® / Celeron® SOC



84 x 55



7 / 14W



-40 +85



IoT Solutions  
Alliance

COM  Express

## Description

The MSC C10M-AL module is based on Intel's multi-core system-on-chip (SOC) Atom generation (codenamed "Apollo Lake"). It integrates next generation Intel processor core, graphics, memory, and I/O interfaces into one solution. Manufactured in 14nm 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 C10M-AL brings dual independent display support, DirectX 12, fast DDR3L memory, two USB 3.0 and 6 USB 2.0 on a compact, power saving and cost-efficient COM Express Mini module. Different SOC's with dual- and quad-core processors are supported. Besides an extensive set of interfaces and features, the MSC C10M-AL optionally offers hardware based security compliant to the requirements of TCG (Trusted Computing Group).

Type 10 pin-out supports digital display interfaces like DisplayPort, HDMI and DVI.

The rugged design with soldered memory, optional ECC support and extended temperature range combined with a long-term availability commitment make it perfectly suited for modern IoT solutions.

## Highlights

- Intel Atom X7-E3950 quad-core 1.6/2.0GHz, 12W
- Intel Atom X5-E3940 quad-core 1.6/1.8GHz, 9.5W
- Intel Atom X5-E3930 dual-core 1.3/1.8GHz, 6.5W
- Intel Pentium N4200 quad-core 1.1/2.5GHz, 6W
- Intel Celeron N3350 dual-core 1.1/2.4GHz, 6W
- Integrated Intel Gen. 9 HD graphics
- Up to 8GB DDR3L SDRAM (ECC option)
- Two SATA 6Gb/s mass storage interfaces
- eMMC option
- DisplayPort/HDMI/DVI interface
- LVDS/Embedded DisplayPort interface
- Two independent displays supported
- DirectX 12, OpenGL 4.3, OpenCL 2.0
- Two USB 3.0/2.0 and six USB 2.0 interfaces
- Two high-speed UARTs
- Up to four PCI Express™ x1 lanes
- UEFI Firmware
- Trusted Platform Module (option)
- Extended temperature variants

## Technical Data - MSC C10M-AL

<b>Technology</b>	x86
<b>Formfactor</b>	COM Express Mini
<b>CPU</b>	Intel Atom X7-E3950 quad-core 1.6/2.0GHz, 18 EU GFX, 12W Intel Atom X5-E3940 quad-core 1.6/1.8GHz, 12 EU GFX, 9.5W Intel Atom X5-E3930 dual-core 1.3/1.8GHz, 12 EU GFX, 6.5W Intel Pentium N4200 quad-core 1.1/2.5GHz, 18 EU GFX, 6W Intel Celeron N3350 dual-core 1.1/2.4GHz, 12 EU GFX, 6W
<b>Chipset</b>	SOC
<b>RAM</b>	up to 8GB DDR3L@1.35V SDRAM soldered on board, ECC optional
<b>Flash</b>	eMMC option
<b>Storage Interfaces</b>	2x SATA 6Gb/s
<b>USB</b>	2x USB 3.0, 6 x USB 2.0, 1 x USB 2.0/3.0 client
<b>Serial Interfaces</b>	2x HS UART
<b>Bus Interfaces</b>	4x PCI Express x1 Gen 2, LPC bus (Low Pin Count bus)
<b>Display Controller</b>	Integrated Intel HD graphics Gen. 9 Up to 18 execution units (EU) DirectX 12.0, OpenGL 4.3, OpenCL 2.0 Full Profile; MPEG2, H.264 (L5.2), VC-1, WMV9, VP8, JPEG/MJPEG, H.265 (HEVC), VP9, MVC
<b>Display Interfaces</b>	Two independent displays supported: 1x Digital Display Interface (DP 1.2a (4096 x 2160 @ 60Hz), HDMI 1.4b (3840 x 2160 @ 30Hz) 1x Embedded DisplayPort 1.3 (on variants without LVDS only); 4096 x 2160 @ 60Hz, LVDS 24bit, single-channel, 1366 x 768 @ 60Hz (shared with Embedded DisplayPort)
<b>Network Interface</b>	10/100/1000Base-TX (Intel i210)
<b>Audio Interface</b>	High Definition Audio
<b>Security Device</b>	TPM 2.0 (option)
<b>Miscellaneous</b>	Watchdog Timer: Initiates system reset, programmable RTC battery: external System Monitoring: voltage, temperature, CPU fan, system fan
<b>Feature Highlights</b>	Type 10 pin-out

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<b>Firmware</b>	AMI Aptio UEFI
<b>OS Support</b>	Windows 10 (embedded) BSP for Linux on request EAPI (HW Programming Interface)
<b>Power Requirement</b>	Wide range input +5 ... +20V, 5V Stby optional, 7 W (typ.) up to 14 W (typ.)
<b>Environment</b>	Ambient Temperature; 0° ... 60°C (operating, commercial), -40° ... 85°C (operating, industrial), -40° ... 85°C (storage) Humidity: 5 ... 95% (operating, non-condensing), 5 ... 95% (storage, non-condensing)
<b>Dimensions</b>	84mm x 55mm

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## Order Reference - MSC C10M-AL

Order Number	Description	Reference	Cat
70258	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Atom X5-E3930 dual-core 1.3/1.8GHz, 2MB L2, 6.5W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and LVDS interfaces; Ethernet: Intel i210 Gbit; 4GB DDR3L SDRAM; 16GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; -40 ... +85°C	MSC C10M-AL-E3930-240201I PCBFTX	PV
70348	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Atom X5-E3930 dual-core 1.3/1.8GHz, 2MB L2, 6.5W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and eDP interfaces; Ethernet: Intel i210 Gbit; 4GB DDR3L SDRAM; 16GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; -40 ... +85°C	MSC C10M-AL-E3930-240101I PCBFTX	OR
70346	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Atom X5-E3930 dual-core 1.3/1.8GHz, 2MB L2, 6.5W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and LVDS interfaces; Ethernet: Intel i210 Gbit; 2GB DDR3L SDRAM; no eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; -40 ... +85°C	MSC C10M-AL-E3930-1N0201I PCBFTX	OR
70332	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Atom X5-E3940 quad-core 1.6/1.8GHz, 2MB L2, 9.5W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and LVDS interfaces; Ethernet: Intel i210 Gbit; 4GB DDR3L SDRAM; 16GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; -40 ... +85°C	MSC C10M-AL-E3940-240201I PCBFTX	PV
70260	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Atom X5-E3940 quad-core 1.6/1.8GHz, 2MB L2, 9.5W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and eDP interfaces; Ethernet: Intel i210 Gbit; 4GB DDR3L SDRAM; 16GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; -40 ... +85°C	MSC C10M-AL-E3940-240101I PCBFTX	PV
70334	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Atom X5-E3950 quad-core 1.6/2.0GHz, 2MB L2, 12W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and LVDS interfaces; Ethernet: Intel i210 Gbit; 8GB DDR3L ECC SDRAM; 16GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; -40 ... +85°C	MSC C10M-AL-E3950-341201I PCBFTX	PV

## Order Reference - MSC C10M-AL

Order Number	Description	Reference	Cat
70336	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Atom X5-E3950 quad-core 1.6/2.0GHz, 2MB L2, 12W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and eDP interfaces; Ethernet: Intel i210 Gbit; 8GB DDR3L ECC SDRAM; 32GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; -40 ... +85°C	MSC C10M-AL-E3950-351101I PCBFTX	OR
70338	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Celeron N3350 dual-core 1.1/2.4GHz, 2MB L2, 6W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and LVDS interfaces; Ethernet: Intel i210 Gbit; 8GB DDR3L SDRAM; 16GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; 0 ... +60°C;	MSC C10M-AL-N3350E-340201C PCBFTX	PV
70342	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Celeron N3350 dual-core 1.1/2.4GHz, 2MB L2, 6W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and eDP interfaces; Ethernet: Intel i210 Gbit; 8GB DDR3L SDRAM; 32GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; 0 ... +60°C;	MSC C10M-AL-N3350E-350101C PCBFTX	OR
70344	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Pentium N4200 quad-core 1.1/2.5GHz, 1MB L2, 6W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and LVDS interfaces; Ethernet: Intel i210 Gbit; 8GB DDR3L SDRAM; 32GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; 0 ... +60°C;	MSC C10M-AL-N4200E-350201C PCBFTX	PV
70340	COM Express Type 10 Mini module (84mm x 55mm); CPU: Intel Pentium N4200 quad-core 1.1/2.5GHz, 1MB L2, 6W TDP; Graphics: integrated Intel HD Gen 9; DP/HDMI and eDP interfaces; Ethernet: Intel i210 Gbit; 8GB DDR3L SDRAM; 16GB eMMC; HD audio; TPM; 2x SATA, 2x USB3/2, 6x USB2, 2x HS UART; 4x PCIe x1; 0 ... +60°C;	MSC C10M-AL-N4200E-340101C PCBFTX	OR

## Accessories

Order Number	Description	Reference
<b>Cooling Options</b>		
1137515	Passive Heatsink for C10M-AL (Atom versions only), consisting of a single-piece aluminum pin cooler, standoffs without thread (2.7mm inner diameter) and thermopad for the thermal contact to SOC. With threaded mounting holes for an optional fan.	MSC C10M-AL-01 HSI-001
1137516	Heatspreader for C10M-AL (Atom versions only). Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter) and thermopad for the thermal contact to SOC.	MSC C10M-AL-01 HSP-001
1137518	Passive Heatsink for C10M-AL (Pentium/Celeron versions only), consisting of a single-piece aluminum pin cooler, standoffs without thread (2.7mm inner diameter) and thermopad for the thermal contact to SOC. With threaded mounting holes for an optional fan.	MSC C10M-AL-02 HSI-001
1137517	Heatspreader for C10M-AL (Atom versions only). Single-piece aluminum profile, standoffs with M2.5 thread and thermopad for the thermal contact to SOC.	MSC C10M-AL-02 HSP-001
1137519	Heatspreader for C10M-AL (Pentium/Celeron versions only). Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter) and thermopad for the thermal contact to SOC.	MSC C10M-AL-03 HSP-001
1137520	Heatspreader for C10M-AL (Pentium/Celeron versions only). Single-piece aluminum profile, standoffs with M2.5 thread and thermopad for the thermal contact to SOC.	MSC C10M-AL-04 HSP-001
<b>Starter Kits</b>		
70810	COM Express Type 10 Starterkit for C10M-AL modules with Intel Apollo Lake processors; uses the C10-MB-EV Mini-ITX platform for Type 10 modules; includes suitable Heatsinks for C10M-AL modules, 12V Power Supply and cable kit. Please order separately the COM Express C10M-AL module of your choice.	MSC C10-SK-AL-EV-KIT001

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