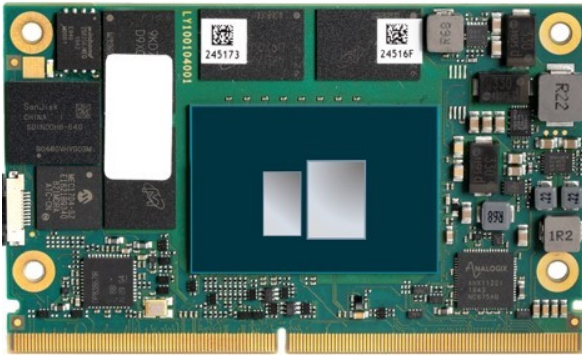


## MSC SM2S-ALN

Intel Atom<sup>®</sup> processors x7000E  
 Intel<sup>®</sup> Core<sup>™</sup>i3 processor  
 Intel<sup>®</sup> Processors N Series



82 x 50 mm

8 / 17 W

0 +60 °C



## Description

The new MSC SM2S-ALN module features the Intel Atom<sup>®</sup> processors x7000E Series, Intel<sup>®</sup> Core<sup>™</sup>i3 processor and Intel<sup>®</sup> Processors N Series (codenamed “Alderlake N”). The CPU architecture is based on the same Efficient-cores and Intel<sup>®</sup> UHD graphics driven by Xe architecture as the 12th Gen Intel<sup>®</sup> Core<sup>™</sup> processors, thus easing up application migration across Intel<sup>®</sup> CPU performance and power ranges. With support for up to eight processor cores, the module fits to a wide range of applications including point-of-sales terminals, digital signage controllers, HMI solutions and medical equipment.

The new MSC SM2S-ALN offers triple independent display support with a maximum of 4k resolution, fast LPDDR5 memory with up to 16GB and optional IB ECC capabilities, eMMC 5.1, USB 3.1 and PCIe Gen3 on a power saving and cost-efficient SMARC 2.1.1 module.

Different SOCs with dual-, quad- and eight-core processors are supported by this design. In addition to an extensive set of interfaces and features, the MSC SM2S-ALN offers 2 Gigabit Ethernet based on Intel<sup>®</sup> i226 and supports up to 2.5GbE bandwidth.

For evaluation and design-in of the MSC SM2S-ALN module, Avnet Embedded provides a suitable SMARC 2.1.1 development platform. A complete, ready-to-run Starterkit is also available.

## Highlights

- Up to eight processing cores
- Power efficient processors, TDP 6 to 15W
- Integrated Intel UHD Gen.12 graphics, max. 32 executing units
- Up to 16GB LPDDR5 SDRAM IB ECC (only Atom SKU’s)
- Up to 256GB eMMC 5.1 Flash (optional)
- SATA-III interface (6Gbps)
- 2x DP++
- LVDS / Embedded DisplayPort and MIPI-DSI
- Triple Independent Display support
- 2x MIPI-CSI Camera Interface
- Up to 4x PCI Express x1/x2/x4 Gen. 3
- 2x USB 3.1 Host interfaces
- 6x USB 2.0 Host interfaces
- 2x Gigabit Ethernet (Intel<sup>®</sup> i226)
- 1x SGMII Interface on PCIE-D (opt. only Atom SKU’s)
- UART, SPI, I2C, SMBus
- HD/I2S Audio
- Trusted Platform Module
- SMARC 2.1.1 compliant
- UEFI Firmware

## Technical Data - MSC SM2S-ALN

<b>Technology</b>	x86
<b>Formfactor</b>	SMARC™ 2.1.1 Short Size
<b>CPU</b>	<p>Intel® Core™ i3-N305, eight-core, 1.0GHz/1.8GHz, 32EU, 9/15W, PUC            Intel Atom® x7425E, four-core, 1.5GHz, 24EU, TCC, 12W, EUC            Intel Atom® x7213E, two-core, 1.7GHz, 16EU, TCC, 10W, EUC            Intel Atom® x7211E, two-core, 1.0GHz, 16EU, TCC, 6W, EUC            Intel® Processor N200, quad-core, 1.0GHz, 32EU, 6W, PUC            Intel® Processor N97, quad-core, 2.0GHz, 24EU, 12W, PUC            Intel® Processor N50, dual-core, 1.0GHz, 16EU, 6W, PUC</p> <p>EUC - Intel Embedded Use Conditions            PUC - Intel PC Client Use Conditions</p>
<b>Chipset</b>	Integrated in SOC
<b>RAM</b>	Up to 16GB LPDDR5 SDRAM, up to 4800MT/s, IB ECC (only Atom SKU's), soldered
<b>Flash</b>	Up to 256GB eMMC V5.1 Flash, soldered (optional)
<b>Storage Interfaces</b>	1x SATA-III 6Gbps
<b>USB</b>	<p>2x USB 3.1 Host interfaces            6x USB 2.0 Host interfaces</p>
<b>Serial Interfaces</b>	4x UART (two with handshake)
<b>Bus Interfaces</b>	<p>Up to 4x PCI-Express x1 Gen. 3 lanes            1x I2C Bus            1x SPI Bus (Boot)            1x SPI Bus (general purpose)/ eSPI (optional)            1x SMBus</p>
<b>Display Controller</b>	<p>Integrated Intel UHD Graphics (Gen12)            Up to 32 execution units (EU)</p>
<b>Display Interfaces</b>	<p>Three independent displays supported            2x DP++            Dual-Channel LVDS 24/18 bit up to 1920 x 1200 @ 60Hz or            Embedded DisplayPort 1.4b up to 4096 x 2304 @ 60Hz and            MIPI-DSI x4 Interface up to 1920 x 1080 @ 60Hz (optional)</p>
<b>Network Interface</b>	<p>2x 10/100/1000Base-T, up to 2.5G based on Intel i226            1x SGMII Interface on PCIE-D (opt. only Atom SKU's)</p>
<b>Audio Interface</b>	<p>High Definition Audio and I2S Audio            or 2x I2S Audio</p>
<b>Security Device</b>	Infineon Trusted Platform Module 2.0

<b>Miscellaneous</b>	MIPI CSI-2 camera interface (CSI0, 2 lane) MIPI CSI-2 camera interface (CSI1, 4 lane) 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>	SMARC™ 2.1.1 compliant
<b>Firmware</b>	AMI Aptio UEFI
<b>OS Support</b>	Windows 10 IoT Enterprise 2021 LTSC Yocto Project (LTS kernel 2021)
<b>Power Requirement</b>	+5V +/-5% +5V Standby
<b>Environment</b>	Temperature Range: Commercial: 0° ... 60°C (operating) -20° ... 85°C (storage)  Humidity: 5 ... 95% (operating, non-condensing) 5 ... 95% (storage, non-condensing)
<b>Dimensions</b>	82 x 50 mm
<b>Certificates</b>	UL / CE
<b>Cooling</b>	Heatspreader Heatsink
<b>Carrier</b>	MSC SM2-MB-EP1

## Order Reference - MSC SM2S-ALN

Order Number	Description	Reference	Cat
tbd	SMARC 2.1.1 module with Intel® Core™ i3-N305, Eight-Core (1.0GHz/1.8GHz), 9/15W, 16GB LPDDR5 (4800 MT/s), 32EU, 32GB eMMC, 2x GbE LAN, 2x USB 3.1, 6x USB 2.0, TPM 2.0, LVDS, PUC (PC Client use conditions), commercial temperature 0°C...+60°C	MSC SM2S-ALN-i3N305-1 ES1 PCBES	OR
tbd	SMARC 2.1.1 module with Intel® Processor N97, Quad-Core (2.0 GHz), 12W, 8GB LPDDR5 (4800 MT/s), 24EU, 32GB eMMC, 2x GbE LAN, 2x USB 3.1, 6x USB 2.0, TPM 2.0, LVDS, PUC (PC Client use conditions), commercial temperature 0°C...+60°C	MSC SM2S-ALN-N97-1 ES1 PCBES	OR
tbd	SMARC 2.1.1 module with Intel® Processor N50, Dual-Core (1.0 GHz), 12W, 8GB LPDDR5 (4800 MT/s), 16EU, 16GB eMMC, 2x GbE LAN, 2x USB 3.1, 6x USB 2.0, TPM 2.0, eDP, SGMII, PUC (PC Client use conditions), commercial temperature 0°C...+60°C	MSC SM2S-ALN-N50-2 ES1 PCBES	OR
tbd	SMARC 2.1.1 module with Intel Atom® x7425E, Quad-Core (1.5 GHz), 12W, 16GB LPDDR5 (4800 MT/s), 24EU, TCC, 32GB eMMC, 2x GbE LAN, 2x USB 3.1, 6x USB 2.0, TPM 2.0, LVDS, EUC (Embedded use conditions), commercial temperature 0°C...+60°C	MSC SM2S-ALN-x7425E-1 ES1 PCBES	OR
tbd	SMARC 2.1.1 module with Intel Atom® x7213E, Dual-Core (1.7 GHz), 10W, 4GB LPDDR5 (4800 MT/s), 16EU, TCC, 16GB eMMC, 2x GbE LAN, 2x USB 3.1, 6x USB 2.0, TPM 2.0, LVDS, EUC (Embedded use conditions), commercial temperature 0°C...+60°C	MSC SM2S-ALN-x7211E-1 ES1 PCBES	OR

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