

# Fanless Edge Systems

Compact, Silent, and High Reliability for Demanding Environments



## Robust Systems for Remote Environments

Supermicro's fanless systems are designed to meet the requirements of demanding edge deployments, including industrial, outdoor, medical, or transportation environments. By using passive cooling methods instead of moving fans and air vents, fanless systems are protected from dust, grease, and other particles that could damage or disrupt the system. The absence of mechanically moving parts also means the systems are less vulnerable to vibrations and produce significantly less noise. Combined with an operating temperature ranging from -30°C to up to +60°C, Supermicro fanless systems can be deployed in a broad range of remote environments.

## Low Power, High Efficiency

Fanless systems come in a variety of form factors and configurations, optimized to deliver the necessary level of performance for any edge application with the desire for a minimal power envelope. Supermicro fanless systems are available with Intel Atom, Intel Celeron, Intel Core, or Intel Xeon D chips, ensuring you can select the right set of features required for your specific use case.

## Power-efficient Performance in a Ruggedized Form Factor

- Fanless design offers resistance to external factors such as dust, dirt, grease, and vibrations
- Featuring Intel® Atom®, Celeron®, Core™, or Xeon® D CPU options to match power and workload requirements
- NVIDIA Jetson Orin™ NX platform with integrated AI acceleration capabilities
- An extensive range of options for AI accelerators, I/O modules, and expansion cards
- Increased durability and lifecycle
- Expanded operating temperature ranging from -30°C to +60°C

## Versatility at the Edge

Fanless systems are often deployed as an integrated or embedded element of a bigger solution. Offering a varied range of I/O options and expansion cards, Supermicro's fanless systems can be deployed in virtually any edge use case. I/O options include HDMI, Display Port, or VGA for display, COM ports, USB ports, and more. Connectivity options ranging from 2 to 10 high speed LAN ports to WiFi and 5G make these platform an ideal edge gateway. Additionally, an array of M.2 slots enables the installation of extra functional modules, storage, or networking capabilities, offering the flexibility to optimize each system for your specific workload.

## Edge AI Inferencing

Edge deployments play a vital role in distributed AI applications. The ability to process input from cameras or sensors directly at the edge offers several advantages, including faster response times, improved security, and higher uptime. Supermicro's delivers a fanless system based on the NVIDIA Jetson Orin™ NX platform for integrated AI acceleration. Other fanless models are capable of leveraging specialized M.2 AI accelerator modules to deploy and independently run pre-trained models close to where data is generated.



Fanless Edge Systems	SYS-E50-14AM	SYS-E101-14AM	ARS-E103-JONX-H2
Processor Support	Intel® Atom®N97 processor, up to 4C/4T	Intel® Atom® x7000RE processor, up to 8C/8T	NVIDIA® Jetson Orin™ NX with 8-core Arm® Cortex™-A78AE processor, 1024 NVIDIA® CUDA® Cores and 32 Tensor Cores onboard
Memory Slots & Capacity	1 SO-DIMM slot; Up to 16GB non-ECC DDR5-4800MT/s	1 SO-DIMM slot; Up to 16GB non-ECC DDR5-4800MT/s	16GB ECC LPDDR5X
Compliance Features	RoHS Compliant	RoHS Compliant	RoHS Compliant
I/O Ports	2 RJ45 2.5 GbE LAN ports 2 USB 3.2 Gen2 Typ-A ports (rear) 1 HDMI 1.4 port (rear)	2 RJ45 2.5 GbE LAN ports (Intel I226) 2 USB 2.0 Type-A ports 4 USB 3.2 Gen2 Type-A ports 2 HDMI 1.4 ports 4 COM ports	4 RJ45 1 GbE ports (optional PoE) 1 RJ45 10 GbE port 1 USB 3.2 Gen2 Type-C port 3 USB 3.2 Gen2 Type-A ports 1 HDMI 2.0 port 2 COM RS-232/422/485 ports 1 CANBus port 1 4 DI / 4 DO (terminal block) port Optional 5G/Wi-Fi 6 support
Motherboard	A4SAP-H	A4SAN	AOM-JSOR-001
Form Factor	Fanless Embedded 44x148x118 mm (1.73x5.82x4.64")	DIN Rail Mounted Fanless Embedded 115x195x126 mm (5.12x7.68x4.96")	DIN Rail Mounted Fanless Embedded 80x185x140 mm (3.15x7.28x5.5")
Expansion Slots	1 M.2 E-Key (PCIe 3.0 x1) 2230	1 M.2 E-Key (PCIe x1, USB 2.0) 2230	1 M.2 B-key (USB 3.0) 3052/3042 1 M.2 E-Key (PCIe x1, USB 2.0) 2230
Drive Bays	1 M.2 B-Key (PCIe 3.0 x1 SATA) 2242/3042	1 M.2 B-Key (PCIe 3.0 x1 SATA) 2242/2280 1 M.2 M-Key (PCIe 3.0 x1 NVMe) 2242/2280	1 M.2 M-key (PCIe 4.0 x4 NVMe) 2280
Cooling	Fanless Cooling	Fanless Cooling	Fanless Cooling
Operating Temperature	-20°C~50°C (-4°F~122°F)	-20°C~60°C (-4°F~140°F)	-25°C~60°C (-40°F~140°F)
Power	12V DC power input 40W lockable power adapter	9~36V DC power input 60W lockable power adapter (optional)	9~36V DC Power Input Optional AC Power supply

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Fanless Edge Systems	SYS-E100-14AM	SYS-E100-12T	SYS-E100-13AD
Processor Support	Intel® Atom® x7000RE or N97 processor, up to 8C/8T	11th Generation Intel® Core™ i3, i5, i7, or Celeron processor, up to 4C/8T	12th Generation Intel® Core™ i3, i5, i7 or Celeron processor, up to 10C/20T
Memory Slots & Capacity	1 SO-DIMM slot; Up to 16GB non-ECC DDR5-4800MT/s	2 SO-DIMM slots; Up to 64GB non-ECC DDR4-3200MT/s	2 SO-DIMM slots; Up to 64GB non-ECC DDR5-4800MT/s
Compliance Features	RoHS Compliant	RoHS Compliant	RoHS Compliant
I/O Ports	2 GbE LAN ports (Intel i226-IT) 3 USB3.2 ports 2 USB2.0 ports 1 HDMI 2.0 port 1 HDMI 1.4b port 4 COM port HD Audio MIC in / LINE out (Optional) TPM onboard	2 GbE LAN ports (Intel i225-IT) 3 USB3.2 ports 1 USB-C port 4 USB2.0 ports 1 HDMI 2.0 port 1 HDMI 1.4b port 4 COM port 1 GPIO 8-bit configurable HD Audio MIC in / LINE out (Optional) TPM onboard	2 GbE LAN ports (Intel i225-IT) 2 USB3.2 ports 2 USB-C port (Alt mode mini DP) 4 USB2.0 ports 1 HDMI 2.0 port 1 HDMI 1.4b port 4 COM port 1 GPIO 8-bit configurable HD Audio MIC in / LINE out (Optional) TPM onboard
Motherboard	A4SAN	X12STN	X13SAN
Form Factor	Fanless Embedded 44x195x150 mm (1.73x7.68x5.94")	Fanless Embedded 44x195x150 mm (1.73x7.68x5.94")	Fanless Embedded 44x195x150 mm (1.73x7.68x5.94")
Expansion Slots	1.M.2 E-Key (PCIe 3.0 slot) 2230	1.M.2 E-Key (PCIe 3.0 slot) 2230	1.M.2 E-Key (PCIe 3.0 slot) 2230
Drive Bays	1 M.2 B-Key (PCIe 3.0 x1 SATA) 2242/2280 1 M.2 M-Key (PCIe 3.0 x1 NVMe) 2242/2280/3052	1 M.2 B-Key (SATA) 2242/3042/2280 1 M.2 M-Key (PCIe 4.0 x4 NVMe) 2242/2280	1 M.2 B-Key (SATA; USB 3.0) 2242/2280 1 M.2 M-Key (PCIe 4.0 x4 NVMe) 2242/2280
Cooling	Fanless Cooling	Fanless Cooling	Fanless Cooling
Operating Temperature	0°C-50°C (32°F-122°F) 0°C-60°C with added fin bottom cover	-30°C~50°C (-22°F~122°F)	0°C~50°C (32°F~122°F)
Power	9~36V DC power input 84W lockable power adapter(optional)	12V ~ 24V DC power input 84W lockable power adapter	12V ~ 24V DC power input 84W lockable power adapter

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Fanless Edge Systems	SYS-E302-12A	SYS-E302-13AD	SYS-E302-12D
Processor Support	Intel® Atom® processor C5315 or C5325, up to 8C/8T	12 <sup>th</sup> Generation Intel® Core™ i3, i5, i7 or Celeron processor, up to 14C/28T	Intel® Xeon® D processor D1718T or D1736NT, up to 8C/16T
Memory Slots & Capacity	2 DIMM Slots; Up to 128GB 2400MT/s ECC DDR4 RDIMM	1 SO-DIMM slot; Up to 32GB non-ECC DDR5-4800MT/s	4 DIMM slots; Up to 256GB ECC DDR4-2933MT/s
Compliance Features	RoHS Compliant	RoHS Compliant	RoHS Compliant
I/O Ports	1 RJ45 1 GbE Dedicated IPMI LAN port 2 SFP+ 10 GbE LAN ports 4 RJ45 1 GbE LAN ports 2 USB 3.0 ports 1 VGA port	3 USB 3.2 Gen2 slots 1 USB 2.0 slot 2 2.5 GbE LAN ports 1 HDMI 2.0b ports 1 DisplayPort 1.4 2 USB Type-C Ports	1 RJ45 1 GbE Dedicated IPMI LAN port 2 SFP28 25 GbE LAN ports 4 RJ45 1 GbE LAN ports 2 USB 3.0 ports 1 VGA port
Motherboard	A3SPI	X13SAV-PS	X12SDV
Form Factor	Fanless Embedded 76x295x206 mm (3x11.6x8.1")	Fanless Embedded 76x295x206 mm (3x11.6x8.1")	Fanless Embedded 76x295x206 mm (3x11.6x8.1")
Expansion Slots	1 M.2 B-Key (NVMe/SATA) 3052	-	1 M.2 E-Key (PCIe 3.0 x1 NVMe) 2230 1 M.2 B-Key (PCIe 3.0 x2 NVMe/SATA slot) 2280/3042/3052
Drive Bays	1 internal 2.5" SATA drive bay 1. M.2 M-Key (PCIe 3.0 x4 NVMe slot) 2280	1 internal 2.5" SATA drive bay 1. M.2 M-Key (PCIe 3.0 x4 NVMe slot) 2280	1 internal 2.5" NVMe/SATA drive bay 1. M.2 M-Key (PCIe 3.0 x4 NVMe/SATA slot) 2280
Cooling	Fanless Cooling	Fanless Cooling	Fanless Cooling
Operating Temperature	0°C~45°C (32°F~113°F)	0°C~40°C (32°F~104°F)	0°C~35°C (32°F~95°F)
Power	12V DC power Input 150W power supply	12V DC power Input 150W power supply	12V DC power Input 180W power supply

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