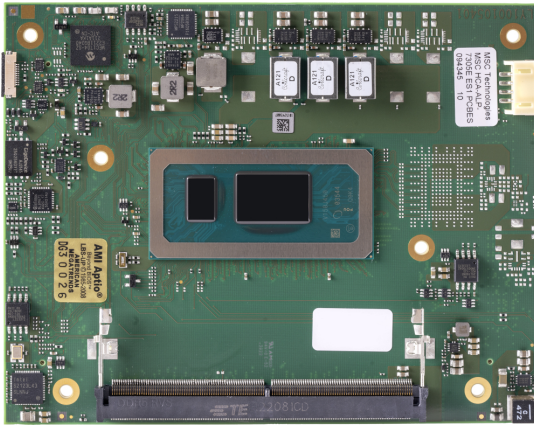


## MSC HCA-RLP

### Intel® Core™ 13th Generation



120 x 95



tdb



-40 +85



IoT Solutions  
Alliance

COM+HPC™

## Description

The MSC HCA-RLP COM-HPC Client module features the 13th Gen Intel® Core™ processor, giving application designers a great variety of choices of power efficient and performant compute solutions. Offering a great scalability of performance, the module is ideal for compute intense applications in automation, instrumentation, high-end medical equipment, transportation, and video surveillance. The Intel® performance hybrid architecture combines Performance-cores and Efficient-cores with the Intel® Thread Director providing intelligent workload optimization. The architecture scales up to fourteen cores and twenty threads at 45/35W thermal design power (TDP). The board is ideal for applications requiring support for extended temperature range and 24/7 continuous operation.

For highest data throughput the module enables fast DDR5-4800 memory technology with up to sixty-four GB SO-DIMM based memory. Module I/O comprises up to eight PCIe Gen 3 lanes, up to eight PCIe Gen 4 lanes and an optional eight lane PEG port capable of PCIe Gen 4. The two Ethernet interfaces provide up to 2.5GbE bandwidth each based on the Intel i226 network controller. Further high-speed I/O can utilize USB ports featuring USB4 and USB 3.2.

System investments are well protected through long-term availability of the module, designed, and manufactured by Avnet Embedded. In addition, the COM-HPC standard enables performance scaling and migrating applications to future technology upgrades when they become available.

## Highlights

- COM-HPC Client module, Size A
- 13th Gen Intel® Core™ processors
- Scalable CPU performance
- Up to fourteen cores, twenty threads
- Industrial grading options (Intel® TCC, TSN, IB ECC, ext. Temp., 24/7)
- Up to 64GB DDR5-4800 SDRAM, dual channel
- Intel® Iris® Xe architecture Graphics, up to 96 EUs
- Three DisplayPort/HDMI interfaces
- Embedded DisplayPort interface
- Up to four independent displays
- PCI Express® Gen 3, up to 8 lanes, PCI Express® Gen 4, up to 2x4
- PEG 1x8, PCIe Gen 4/5 (optional)
- Two USB4, two USB 3.2 Gen2, eight USB 2.0 ports
- Two UARTs
- Optional on-board NVMe SSD, up to 1TB
- Optional two SATA 6Gb/s mass storage interfaces
- Two 1 / 2.5 Gb Ethernet ports (Intel® i226)
- Trusted Platform Module TPM 2.0
- Long-term product availability

## Technical Data - MSC HCA-RLP

<b>Technology</b>	x86
<b>Formfactor</b>	COM-HPC Size A
<b>CPU</b>	<p>13th Gen Intel® Core™ processors</p> <p>H-series</p> <p>Intel® Core™ i7-13800HE 6P+8E/20T, 2.5GHz, 96 EUs, 24MB L3, 45/35W cTDP  Intel® Core™ i7-13800HRE 6P+8E/20T, 2.5GHz, 96 EUs, 24MB L3, 45/35W cTDP, TCC/TSN, IBECC, ET  Intel® Core™ i5-13600HE 4P+8E/16T, 2.7GHz, 80 EUs, 18MB L3, 45/35W cTDP  Intel® Core™ i5-13600HRE 4P+8E/16T, 2.7GHz, 80 EUs, 18MB L3, 45/35W cTDP, TCC/TSN, IBECC, ET  Intel® Core™ i3-13300HE 4P+4E/12T, 2.1GHz, 48 EUs, 12MB L3, 45/35W cTDP  Intel® Core™ i3-13300HRE 4P+4E/12T, 2.1GHz, 48 EUs, 12MB L3, 45/35W cTDP, TCC/TSN, IBECC, ET</p> <p>P-series</p> <p>Intel® Core™ i7-1370PE 6P+8E/20T, 1.9GHz, 96 EUs, 24MB L3, 28/20W cTDP  Intel® Core™ i7-1370PRE 6P+8E/20T, 1.9GHz, 96 EUs, 24MB L3, 28/20W cTDP, TCC/TSN, IBECC, ET  Intel® Core™ i5-1350PE 4P+8E/16T, 1.8GHz, 80 EUs, 12MB L3, 28/20W cTDP  Intel® Core™ i5-1350PRE 4P+8E/16T, 1.8GHz, 80 EUs, 12MB L3, 28/20W cTDP, TCC/TSN, IBECC, ET  Intel® Core™ i5-1340PE 4P+8E/16T, 1.8GHz, 80 EUs, 12MB L3, 28/20W cTDP  Intel® Core™ i3-1320PE 4P+4E/12T, 1.7GHz, 48 EUs, 12MB L3, 28/20W cTDP  Intel® Core™ i3-1320PRE 4P+4E/12T, 1.7GHz, 48 EUs, 12MB L3, 28/20W cTDP, TCC/TSN, IBECC, ET, TCC/TSN, IBECC, ET</p> <p>U-series</p> <p>Intel® Core™ i7-1365UE 2P+8E/12T, 1.7GHz, 96 EUs, 12MB L3, 15/12W cTDP  Intel® Core™ i7-1365URE 2P+8E/12T, 1.7GHz, 96 EUs, 12MB L3, 15/12W cTDP, TCC/TSN, IBECC, ET  Intel® Core™ i5-1345UE 2P+8E/12T, 1.4GHz, 80 EUs, 12MB L3, 15/12W cTDP  Intel® Core™ i5-1345URE 2P+8E/12T, 1.4GHz, 80 EUs, 12MB L3, 15/12W cTDP, TCC/TSN, IBECC, ET  Intel® Core™ i5-1335UE 2P+8E/12T, 1.3GHz, 80 EUs, 12MB L3, 15/12W cTDP  Intel® Core™ i3-1315UE 2P+4E/8T, 1.2GHz, 64 EUs, 10MB L3, 15/12W cTDP  Intel® Core™ i3-1315URE 2P+4E/8T, 1.2GHz, 64 EUs, 10MB L3, 15/12W cTDP, TCC/TSN, IBECC, ET  Intel® Processor U300E 1P+4E/6T, 1.1GHz, 48 EUs, 8MB L3, 15/12W cTDP</p> <p>Note: P core base frequency at nominal TDP shown, other clock frequencies supported</p>
<b>Chipset</b>	Integrated into SoC
<b>RAM</b>	2x 262-pin SO-DIMM socket for up to 2x 32GB DDR5 SDRAM (DDR5-4800); dual channel operation; minimum capacity 1x 8GB single channel operation
<b>Storage Interfaces</b>	2x SATA channels (up to 6Gb/s), optional optional on-board NVMe, 64GB to 1TB
<b>USB</b>	2x USB4 on COM-HPC USB[0:1]_SSTX/RX 2x USB 3.2 (Gen 1 & 2) on COM-HPC USB[2:3]_SSTX/RX 8x USB 2.0 on COM-HPC USB[0:7]

<b>Serial Interfaces</b>	2x high-speed serial ports
<b>Bus Interfaces</b>	PCI Express® Graphics (PEG) 1x8, PCIe Gen 4/5 on COM-HPC PCIe[16:23] <sup>1</sup> PCI Express® Gen 4, up to 2x4 on COM-HPC PCIe[8:15] PCI Express® Gen 3, up to 8 lanes, flexible bifurcation options on COM-HPC PCIe[0:7] <sup>1</sup> Available on H-series processors
<b>Display Controller</b>	Intel® Iris® Xe architecture Graphics, up to 96 execution units (EU) H.264/AVC, H.265/HEVC, AV1, MJPEG encode/decode/transcode
<b>Display Interfaces</b>	Four independent display streams 3x Digital Display Interface (DP 1.4a, HDMI 2.0b) 1x Embedded DisplayPort 1.4b
<b>Network Interface</b>	Two 10/100/1000Base-TX, 2.5G <sup>2</sup> based on Intel i226, TSN support <sup>2</sup> Available bandwidths depending on carrier design I-Temp variants: Intel® i226-IT C-Temp variants: Intel® i226-LM
<b>Audio Interface</b>	High Definition Audio
<b>Security Device</b>	TPM 2.0
<b>Miscellaneous</b>	Watchdog Timer: Initiates system reset, programmable  Fan Supply: 4-pin header for CPU fan, PWM speed controlled and PWM speed control for system fan supported  RTC battery: external  System Monitoring: voltage, temperature, CPU fan, system fan
<b>Feature Highlights</b>	COM-HPC Client, Size A

<b>Firmware</b>	<p>UEFI Firmware: AMI Aptio® V</p> <p>Security: TPM 2.0 support, TCG compliant</p> <p>Power Management: ACPI Active fan control</p> <p>USB: USB legacy support (keyboard, mouse, storage)</p> <p>Monitoring: System Monitoring Health Monitoring</p> <p>MSC Adv. Boot Device Selection: Boot device priority setting based on physical interfaces</p>
<b>OS Support</b>	<p>Windows 10 IoT Enterprise 2021 LTSC BSP for Linux (Yocto)</p>
<b>Power Requirement</b>	<p>Voltage: +8V to +20V, +5V Stby optional, +3V RTC voltage</p> <p>Power Consumption: tbd W to tbd W (typ.)</p>
<b>Environment</b>	<p>Ambient Temperature: 0° ... 60°C (operating) -25° ... 85°C (storage) Extended temp. variants: -40 ... +85°C (operating)</p> <p>Humidity: 5 ... 95% (operating, non-condensing), 5 ... 95% (storage, non-condensing)</p>
<b>Dimensions</b>	120 x 95
<b>Certificates</b>	UL / CE

## Order Reference - MSC HCA-RLP

Order Number	Description	Reference	Cat*
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i7-13800HE 14C/20T, vPro, 2.1GHz, 45/35W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PEG x8 Gen 4, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-13800HE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i5-13600HE 12C/16T, vPro, 2.1GHz, 45/35W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PEG x8 Gen 4, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-13600HE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i3-13300HE 8C/12T, 2.1GHz, 45/35W cTDP; Graphics: Intel® UHD Graphics 48 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PEG x8 Gen 4, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-13300HE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i7-1370PE 14C/20T, vPro, 1.9GHz, 28/20W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-1370PE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i5-1350PE 12C/16T, vPro, 1.8GHz, 28/20W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-1350PE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i3-1320PE 8C/12T, 1.7GHz, 28/20W cTDP; Graphics: Intel® UHD Graphics 48 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-1320PE-NN0131C PCBFTX	OR

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

## Order Reference - MSC HCA-RLP

Order Number	Description	Reference	Cat*
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i7-1365UE 10C/12T, vPro, 1.7GHz, 15/12W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-1365UE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i5-1345UE 10C/12T, vPro, 1.4GHz, 15/12W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-1345UE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i3-1315UE 6C/8T, 1.2GHz, 15/12W cTDP; Graphics: Intel® UHD Graphics 64 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-1315UE-NN0131C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel Processor U300E 5C/6T, 1.1GHz, 15/12W cTDP; Graphics: Intel® UHD Graphics 48 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-LM Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, 2x SATA, PCIe Gen 4 2x4, PCIe Gen 3 6x; 2x socket for DDR5; 0...+60°C.	MSC HCA-RLP-U300E-NN0121C PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i7-13800HRE 14C/20T, vPro, 1.8GHz, 45/35W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 1TB NVMe; 2x USB4, 2x USB3, 8x USB2, PEG x8 Gen 4, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-13800HRE-NA0131I PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i5-13600HRE 12C/16T, vPro, 1.9GHz, 45/35W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PEG x8 Gen 4, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-13600HRE-NN0131I PCBFTX	OR

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## Order Reference - MSC HCA-RLP

Order Number	Description	Reference	Cat*
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i3-13300HRE 8C/12T, 2.1GHz, 45/35W cTDP; Graphics: Intel® UHD Graphics 48 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PEG x8 Gen 4, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-13300HRE-NN0131I PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i7-1370PRE 14C/20T, vPro, 1.9GHz, 28/20W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-1370PRE-NN0131I PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i5-1350PRE 12C/16T, vPro, 1.8GHz, 28/20W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-1350PRE-NN0131I PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i3-1320PRE 8C/12T, 1.7GHz, 28/20W cTDP; Graphics: Intel® UHD Graphics 48 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-1320PRE-NN0131I PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i7-1365URE 10C/12T, vPro, 1.7GHz, 15/12W cTDP; Graphics: Intel® Iris® Xe 96 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-1365URE-NN0131I PCBFTX	OR
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i5-1345URE 10C/12T, vPro, 1.4GHz, 15/12W cTDP; Graphics: Intel® Iris® Xe 80 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-1345URE-NN0131I PCBFTX	OR

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

## Order Reference - MSC HCA-RLP

Order Number	Description	Reference	Cat*
tbd	COM-HPC Client Size A module (120mm x 95mm); CPU: Intel i3-1315URE 6C/8T, 2.5GHz, 15/12W cTDP; Graphics: Intel® UHD Graphics 64 EUs; 3x DP/HDMI; 1x eDP; HD Audio; Ethernet: 2x Intel i226-IT Gbit, TSN; TPM 2.0; 2x USB4, 2x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x; 2x socket for DDR5, in-band ECC; -40...+85°C, recommended for 24/7 operation.	MSC HCA-RLP-1315URE-NN0131I PCBFTX	OR

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## Accessories

Order Number	Description	Reference
<b>Cooling Options</b>		
79809	Fan kit for Heatsink MSC HCA-ALP/RLP-0x HSI-xxx, MSC C6B-ALP/RLP-0x HSI-xxx, MSC C6B-TLH-0x HSI-xxx, MSC C6C-ALP/RLP-0x HSI-xxx, MSC C6C-TLU-0x HSI-xxx, MSC C6C-WLU-0x HSI-xxx, MSC C6C-ALN-0x HSI-xxx, MSC C6C-EL-0x HSI-xxx, MSC C6C-RYZ-0x HSI-xxx, PWM fan 80x80x15mm.	MSC C6C-FANKIT-01-HSF-001
94875	Passive heatsink for HCA-ALP/RLP consisting of a single-piece aluminum profile with fins, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-ALP-01 HSI-001
94876	Passive heatsink / heat pipe for HCA-ALP/RLP consisting of a single-piece aluminum profile with fins and embedded heatpipe, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-ALP-01 HSI-HP-001
94877	Heatspreader for HCA-ALP/RLP. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-ALP-01 HSP-001
94878	Heatspreader / heat pipe for HCA-ALP/RLP. Single-piece aluminum profile with embedded heat pipe, standoffs without thread (2.7mm inner diameter), screws and thermopad for the thermal contact to CPU, chipset, NVMe.	MSC HCA-ALP-01 HSP-HP-001
94879	Heatspreader for HCA-ALP/RLP. Single-piece aluminum profile, standoffs with M2.5 thread, screws and thermopads for the thermal contact to CPU, chipset, NVMe.	MSC HCA-ALP-02 HSP-001
<b>Memory Options</b>		
97208	16GB DDR5-4800 SO-DIMM	MOD SODIMM DDR5 16GB PC5-38400 CL22 1B
97209	32GB DDR5-4800 SO-DIMM	MOD SODIMM DDR5 32GB PC5-38400 CL22 2B
97207	8GB DDR5-4800 SO-DIMM	MOD SODIMM DDR5 8GB PC5-38400 CL22 1B

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