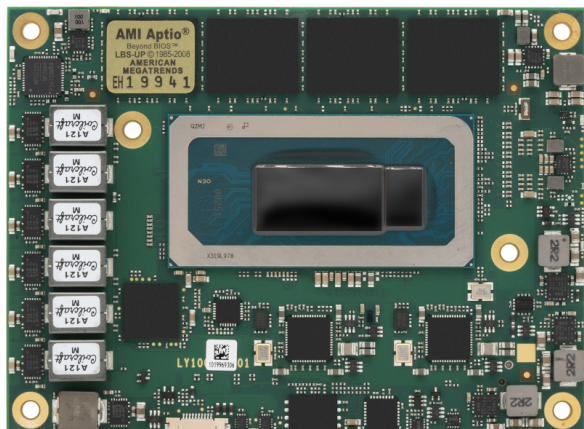


## TRIA HMM-RLP

Intel® Core™ 13th Generation



95 x 70

tbd

-40 - +85°C



COM+HPC®

## Highlights

- COM-HPC Mini module
- 13th Gen Intel® Core™ processors
- Scalable CPU performance, up to fourteen cores, twenty threads
- Industrial grading options (Intel® TCC, TSN, IBEC, ext. Temp., 24/7)
- LPDDR5-6400 main memory, memory-down, up to 64GB, In-band ECC option
- Intel® Iris® Xe architecture Graphics, up to 96 EUs
- Up to four independent displays, embedded DisplayPort interface
- Supports COM-HPC Mini Config 1, 2, 3 (optional)
- Up to two DisplayPort/HDMI interface (DDI)
- Up to two USB4 port, up to four USB 3.2 Gen2x1, eight USB 2.0 ports
- PCI Express® Gen 3, up to 8 lanes with flexible bifurcation options, PCI Express® Gen 4, up to 2x4
- Dual MIPI-CSI
- Optional on-board NVMe SSD, 128GB, 256GB, optional two SATA 6Gb/s mass storage interfaces
- Two 2.5 Gb Ethernet ports (Intel® i226)
- Two UARTs

## Technical Data

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technology             | x86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Formfactor / Interface | COM-HPC Mini                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| CPU                    | 13th Gen Intel® Core™ processors<br>H-series<br>Intel® Core™ i7-13800HE 6P+8E/20T, 2.5GHz, 96 EUs, 24MB L3, 45/35W cTDP<br>Intel® Core™ i7-13800HRE 6P+8E/20T, 2.5GHz, 96 EUs, 24MB L3, 45/35W cTDP, TCC/TSN, IBECC, ET<br>Intel® Core™ i5-13600HE 4P+8E/16T, 2.7GHz, 80 EUs, 18MB L3, 45/35W cTDP<br>Intel® Core™ i5-13600HRE 4P+8E/16T, 2.7GHz, 80 EUs, 18MB L3, 45/35W cTDP, TCC/TSN, IBECC, ET<br>Intel® Core™ i3-13300HE 4P+4E/12T, 2.1GHz, 48 EUs, 12MB L3, 45/35W cTDP<br>Intel® Core™ i3-13300HRE 4P+4E/12T, 2.1GHz, 48 EUs, 12MB L3, 45/35W cTDP, TCC/TSN, IBECC, ET<br><br>P-series<br>Intel® Core™ i7-1370PE 6P+8E/20T, 1.9GHz, 96 EUs, 24MB L3, 28/20W cTDP<br>Intel® Core™ i7-1370PRE 6P+8E/20T, 1.9GHz, 96 EUs, 24MB L3, 28/20W cTDP, TCC/TSN, IBECC, ET<br>Intel® Core™ i5-1350PE 4P+8E/16T, 1.8GHz, 80 EUs, 12MB L3, 28/20W cTDP<br>Intel® Core™ i5-1350PRE 4P+8E/16T, 1.8GHz, 80 EUs, 12MB L3, 28/20W cTDP, TCC/TSN, IBECC, ET<br>Intel® Core™ i5-1340PE 4P+8E/16T, 1.8GHz, 80 EUs, 12MB L3, 28/20W cTDP<br>Intel® Core™ i3-1320PE 4P+4E/12T, 1.7GHz, 48 EUs, 12MB L3, 28/20W cTDP<br>Intel® Core™ i3-1320PRE 4P+4E/12T, 1.7GHz, 48 EUs, 12MB L3, 28/20W cTDP, TCC/TSN, IBECC, ET, TCC/TSN, IBECC, ET<br><br>U-series<br>Intel® Core™ i7-1365UE 2P+8E/12T, 1.7GHz, 96 EUs, 12MB L3, 15/12W cTDP<br>Intel® Core™ i7-1365URE 2P+8E/12T, 1.7GHz, 96 EUs, 12MB L3, 15/12W cTDP, TCC/TSN, IBECC, ET<br>Intel® Core™ i5-1345UE 2P+8E/12T, 1.4GHz, 80 EUs, 12MB L3, 15/12W cTDP<br>Intel® Core™ i5-1345URE 2P+8E/12T, 1.4GHz, 80 EUs, 12MB L3, 15/12W cTDP, TCC/TSN, IBECC, ET<br>Intel® Core™ i5-1335UE 2P+8E/12T, 1.3GHz, 80 EUs, 12MB L3, 15/12W cTDP<br>Intel® Core™ i3-1315UE 2P+4E/8T, 1.2GHz, 64 EUs, 10MB L3, 15/12W cTDP<br>Intel® Core™ i3-1315URE 2P+4E/8T, 1.2GHz, 64 EUs, 10MB L3, 15/12W cTDP, TCC/TSN, IBECC, ET<br>Intel® Processor U300E 1P+4E/6T, 1.1GHz, 48 EUs, 8MB L3, 15/12W cTDP<br><br>Note: P core base frequency at nominal TDP shown, other clock frequencies supported |
| Chipset                | Integrated into SoC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| RAM                    | LPDDR5 memory, up to 6400 MT/s (variant dependent); memory-down<br>Capacity options: 4GB, 8GB, 16GB, 32GB, 64GB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Storage Interfaces     | 2x SATA channels (up to 6Gb/s), optional, mutually exclusive with COM-HPC PCIe[6,7]<br>Optional on-board NVMe, 128GB, 256GB, mutually exclusive with COM-HPC PCIe[12:15]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| USB                    | Up to two USB4 on COM-HPC SS Lane 2, 3 (mutually exclusive with DD1) and Lane 4, 5 (mutually exclusive with USB3 #2, #3)<br>Two USB 3.2 Gen 2x1 on COM-HPC SS Lane 6, 7 (USB3 #0, #1)<br>Up to two USB 3.2 Gen 2x1 on COM-HPC SS Lane 4, 5 (mutually exclusive with USB4 #1)<br>8x USB 2.0 on COM-HPC USB[0:7]<br>Note: supported interfaces depending on COM-HPC carrier design. Config 3 on request                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Serial Interfaces      | 2x high-speed serial ports                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Bus Interfaces         | PCI Express® Gen 4, up to 2x4 on COM-HPC PCIe[8:15], PCIe[12:15] mutually exclusive with on-board NVMe<br>PCI Express® Gen 3, up to 8 lanes, flexible bifurcation options on COM-HPC PCIe[0:7], PCIe[6,7] mutually exclusive with COM-HPC SATA[0,1]<br>Note: For different bifurcation options, dedicated BIOS images required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Display Controller     | Intel® Iris® Xe architecture Graphics, up to 96 execution units (EU)<br>H.264/AVC, H.265/HEVC, AV1, MJPEG encode/decode/transcode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Display Interfaces     | Up to four independent display streams<br>Supports COM-HPC Mini Config 1, 2. Config 3 on request<br>Up to two DisplayPort/HDMI interface (DDI), DP 1.4a, HDMI 2.1<br>Up to two USB4/USB-C ports (DP tunneling, DP Alt Mode)<br>1x Embedded DisplayPort 1.4b<br><br>Config 1    2x DDI        -        4x USB3<br>Config 2    1x DDI        1x USB4    4x USB3<br>Config 3    1x DDI        2x USB4    2x USB3<br><br>Note: supported interfaces depending on COM-HPC carrier design.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                          |                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Interface</b> | Two 10/100/1000Base-TX, 2.5Gb <sup>1</sup> based on Intel i226, TSN support<br><sup>1</sup> Available bandwidths depending on carrier design<br>I-Temp variants: Intel® i226-IT<br>C-Temp variants: Intel® i226-LM                                                                                                                                  |
| <b>Audio Interface</b>   | High Definition Audio (HDA)<br>Optional SoundWire (COM-HPC SNDW[2:3] mutually exclusive with HDA)                                                                                                                                                                                                                                                   |
| <b>Security Device</b>   | TPM 2.0                                                                                                                                                                                                                                                                                                                                             |
| <b>Miscellaneous</b>     | 2x MIPI CSI camera interface on FFC connectors<br>Watchdog Timer:<br>Initiates system reset, programmable<br>Fan Supply:<br>4-pin header for CPU fan, PWM speed controlled<br>and PWM speed control for system fan supported<br>RTC battery:<br>external<br>System Monitoring:<br>voltage, temperature, CPU fan, system fan<br>User space in EEPROM |
| <b>Firmware</b>          | UEFI Firmware:<br>AMI Aptio® V<br>Security:<br>TPM 2.0 support, TCG compliant<br>Power Management:<br>ACPI<br>Active fan control<br>USB:<br>USB legacy support (keyboard, mouse, storage)<br>Monitoring:<br>System Monitoring<br>Health Monitoring<br>Tria Adv. Boot Device Selection:<br>Boot device priority setting based on physical interfaces |
| <b>OS Support</b>        | Windows 11 IoT Enterprise LTSC<br>BSP for Linux (Yocto)                                                                                                                                                                                                                                                                                             |
| <b>Power Requirement</b> | Voltage:<br>+8V to +20V, +3V RTC voltage<br>Power Consumption:<br>tbd W to tbd W (typ.)                                                                                                                                                                                                                                                             |
| <b>Environment</b>       | Ambient Temperature:<br>0° ... 60°C (operating)<br>-25° ... 85°C (storage)<br>Extended temp. variants: -40 ... +85°C (operating)<br>Humidity:<br>5 ... 95% (operating, non-condensing),<br>5 ... 95% (storage, non-condensing)                                                                                                                      |
| <b>Dimensions</b>        | 95mm x 70mm                                                                                                                                                                                                                                                                                                                                         |

Technical Data for TRIA HMM-RLP

## Order Reference

| Order No. | Description                                                                                                                                                                                                                                                                                                                                                            | Reference                                   |    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----|
| 120723    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel i7-13800HRE 14C/20T, vPro, 1.8GHz, 35W cTDP;<br>Graphics: Intel® Iris® Xe 96 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-IT Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>16GB LPDDR5-6400 memory;<br>-40...+85°C, recommended for 24/7 operation.   | MSC HMM-<br>RLP-13800HRE-4N03<br>1I PCBFTX  | PV |
| 120725    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel i7-1370PRE 14C/20T, vPro, 1.9GHz, 28/20W cTDP;<br>Graphics: Intel® Iris® Xe 96 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-IT Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>32GB LPDDR5-6400 memory;<br>-40...+85°C, recommended for 24/7 operation. | MSC HMM-<br>RLP-1370PRE-5N031I<br>PCBFTX    | OR |
| 122144    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel i7-1370PRE 14C/20T, vPro, 1.9GHz, 28/20W cTDP;<br>Graphics: Intel® Iris® Xe 96 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-IT Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>16GB LPDDR5-6400 memory;<br>-40...+85°C, recommended for 24/7 operation. | MSC HMM-<br>RLP-1370PRE-4N031I<br>PCBFTX    | PV |
| 120727    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel i5-1350PRE 12C/16T, vPro, 1.8GHz, 28/20W cTDP;<br>Graphics: Intel® Iris® Xe 80 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-IT Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>16GB LPDDR5-6400 memory;<br>-40...+85°C, recommended for 24/7 operation. | MSC<br>HMM-<br>RLP-1350PRE-4N031I<br>PCBFTX | OR |
| 120729    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel i3-1315URE 6C/8T, 1.2GHz, 15/12W cTDP;<br>Graphics: Intel® UHD 64 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-IT Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>8GB LPDDR5-5200 memory;<br>-40...+85°C, recommended for 24/7 operation.               | MSC HMM-<br>RLP-1315URE-3N031<br>I PCBFTX   | PV |
| 120731    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel i5-1345UE 10C/12T, vPro, 1.4GHz, 15/12W cTDP;<br>Graphics: Intel® Iris® Xe 80 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>16GB LPDDR5-6400 memory;<br>0...+60°C.                                    | MSC HMM-<br>RLP-1345UE-4N031C<br>PCBFTX     | OR |
| 120733    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel i3-1315UE 6C/8T, 1.2GHz, 15/12W cTDP;<br>Graphics: Intel® UHD 64 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>16GB LPDDR5-5200 memory;<br>0...+60°C.                                                 | MSC HMM-<br>RLP-1315UE-4N031C<br>PCBFTX     | PV |
| 120735    | COM-HPC Mini module (95mm x 70mm);<br>CPU: Intel Processor U300E 5C/6T, 1.1GHz, 15/12W cTDP;<br>Graphics: Intel® UHD 48 EUs; 2x DP/HDMI; 1x eDP;<br>Ethernet: 2x Intel i226-LM Gbit, TSN; HD audio; TPM 2.0;<br>2x SATA, 1x USB4, 4x USB3, 8x USB2, PCIe Gen 4 2x4, PCIe Gen 3 8x;<br>8GB LPDDR5-5200 memory;<br>0...+60°C.                                            | MSC HMM-RLP-<br>U300E-3N031C<br>PCBFTX      | PV |

Ordering Information for TRIA HMM-RLP \*PV = Preferred variant; OR = on Request (in OEM quantities only)

## Accessories

### Carrier Boards

| Order No. | Description                | Reference           |
|-----------|----------------------------|---------------------|
| 121630    | COM-HPC Mini Carrier Board | MSC HM-MB-EV BRDFTX |

Carrier Options for TRIA COM-HPC Mini modules

### Cooling Solutions

| Order No. | Description                           | Reference                 |
|-----------|---------------------------------------|---------------------------|
| 116871    | Fan kit for Heatsink HMM-RLP PWM fan. | MSC HMM-FANKIT-01 HSF-001 |

Fan Kit for COM-HPC Mini Heatsinks

| Order No. | Description                                                                                                                                                                                                 | Reference              |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 116849    | Passive heatsink for HMM-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 HMM-RLP-01 HSI-001 |
| 116850    | Heatspreader for HMM-RLP. Single-piece aluminum profile, standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU, chipset, NVMe.                              | MSC HMM-RLP-01 HSP-001 |
| 116851    | Heatspreader for HMM-RLP. Single-piece aluminum profile, standoffs with M2.5 thread, screws and thermopads for the thermal contact to CPU, chipset, NVMe.                                                   | MSC HMM-RLP-02 HSP-001 |

Cooling Options for TRIA HMM-RLP

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