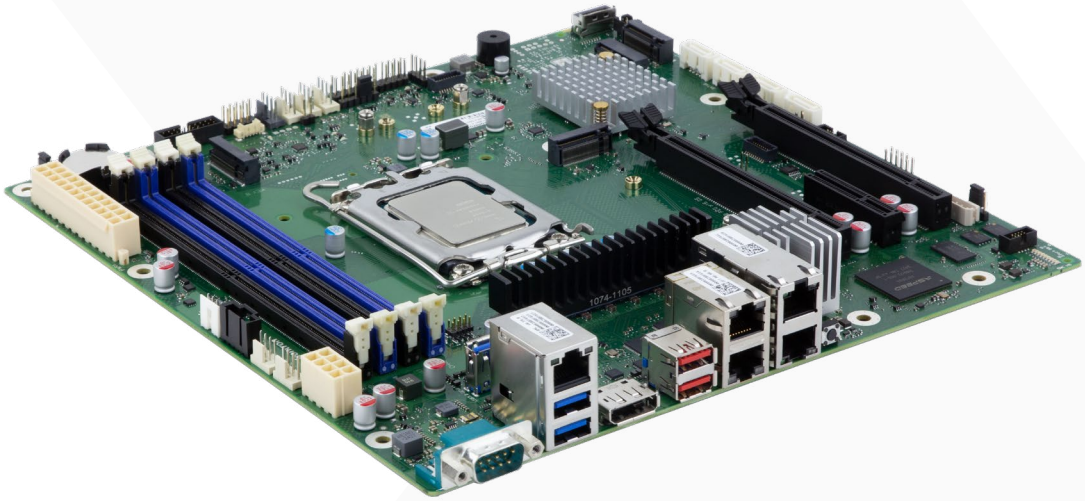
# K3881-C µATX
## Industrial Server



Features MTBF of 32.5 Years at 113F or Longer at Room Temp.

## Intel® C266 Chipset and
## Intel® XEON® 6300 series Processors
## Intel® XEON® E-2400 series Processors
## Pentium® Gold G7400T / G7400 Processors

- Latest DDR5 memory technology for best-in-class system performance
- ECC support
- Display Port ASPEED AST2600
- Remote Management
- 10GbE Dual Lan
- Prepared for 5G

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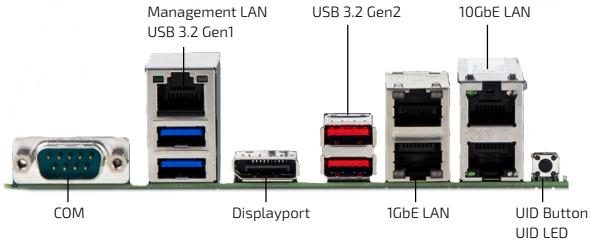
# Product Highlights

## K3881-C1 µATX Industrial Server

The K3881-C µATX is the first industrial Server Motherboard designed and made in Germany by Kontron. A custom BMC was developed for the motherboard, enabling remote management while ensuring the highest level of security. It provides an enterprise-grade solution for small businesses and entry-level cloud services which require server solutions with professional-grade reliability, expandability, and enhanced security capabilities. The K3881-C is full-featured with 10 GbE high speed ethernet, 3x PCI Express, 4x M.2, NVMe, ECC-Support, 5G Kontron Wireless solutions support and many more features for server usages. With an availability of 5+ years and 24/7 continuous operation, a reliable and stable solution is guaranteed.

- Intel® XEON® 6300 series Processors
- Intel® XEON® E-2400 series Processors
- DDR5-5600 UDIMM, max 128 Gbyte, ECC
- ASPEED AST2600 Video Graphic Adapter
- 1x Displayport 1.1a
- PCI Express® Gen5 x 16 (PEG)
- PCI Express® Gen4 x 4 (mechanical x16)
- PCI Express® Gen4 x 1 (open slot)
- 8 Bit GPIO
- 2x USB 3.2 Gen1, 2x USB 3.2 Gen2
- Internal USB3.2 Gen 1 header (2ports)
- Internal USB3.2 Gen 1 Stick socket
- 2x Intel® i210 1GbE
- 1x Intel® E610 10GbE Dual Port
- 4x SATA 6G
- 1x MCIO PCIex4 or 4x SATA 6G
- TPM Module Header
- 2x M.2 Key-M ,PCIe x4 Gen4/NVMe SSD modules
- 1x M.2 Key-B, PCIe x1 Gen4 / USB 3.2 Gen 1 (5G ready)
- 1x M.2 2230 (Key-E, WLAN/Bluetooth modules, PCIe)
- 1x RS-232 support onboard
- HW Watchdog onboard (BMC)
- ATX Multirail




# Technical Information

| | | |
|---|---|---|
| SYSTEM | PROCESSOR | Intel® XEON® 6300 series Processors<br>Intel® XEON® E-2400 series Processors<br>Pentium® Gold G7400T / G7400 processors<br>Socket LGA1700, max 95W TDP |
| | CHIPSET | Intel® C266 Chipset |
| | MEMORY | DDR5 4800/5600 ECC SDRAM*<br>4 DIMM Sockets UDIMM DDR5-4800/5600*, max. 128 GByte<br>Dual Channel unbuffered, ECC<br>Effective memory speed of DDR5 modules according Intel® specification:<br>1x DIMM per channel = max. DDR5-4400*<br>2x DIMM per channel (single rank) = max. DDR5-4000<br>2x DIMM per channel (dual rank) = max. DDR5-3600 |
| VIDEO | GRAPHICS | ASPEED AST2600 Video Graphic Adapter<br>1x Displayport 1.1a |
| NETWORK CONNECTION | ETHERNET1 | Intel® I210AT with 10/100/1000 MBit/s, shared LAN port with BMC<br>Wake-on-LAN (WoL) by interesting Packets, Link Status Change and<br>Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support |
| | ETHERNET2 | Intel® I210AT with 10/100/1000 MBit/s,<br>Wake-on-LAN (WoL) by interesting Packets, Link Status Change and<br>Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support |
| | ETHERNET3/4 | Intel® E610-XAT2 dual 10GbE, shared LAN port with BMC,<br>PXE Support, BIOS MAC Address Display, Teaming Support |
| | MANAGEMENT LAN | Realtek RLT8211F for System Management (BMC LAN) |
| PERIPHERAL CONNECTION | USB | 2x USB 3.2 Gen1, 2x USB 3.2 Gen2<br>Internal USB3.2 Gen 1 header (2ports)<br>Internal USB3.2 Gen 1 Stick socket |
| | SERIAL PORT | 1x RS232 (rear I/O, DB9 connector) |
| | OTHER I/OS | 8 Bit GPIO (Input/Output); 3.3 V/5 V/12 V supply voltage output;<br>SMBus controller PCA9554A |
| | PMBUS | 1x PMBus Connector |
| | SGPIO | 1x SGPIO |
| | SIM CARD | 1x nano SIM Card |

# Technical Information



| | | |
|---|---|---|
| STORAGE & EXPANSION | SATA<br>SATA / PCIE<br>PCIE/M.2 SLOTS | 4x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, VROC<br>4x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, VROC or 1x 4x PCIe Gen 4<br>1x M.2 2230/2280/22110 (Key-M ,PCIe x4 Gen4/NVMe SSD modules)<br>1x M.2 2280/22110 (Key-M ,PCIe x4 Gen4/NVMe SSD modules)<br>1x M.2 3052/2260/2280 (Key-B, PCIe x1 Gen4 USB 3.2 Gen1)<br>1x M.2 2230 (Key-E, WLAN/Bluetooth modules, PCIe)<br>1x PCIe x16 Gen5 PEG, bifurcation support<br>1x PCIe x1 Gen 4 (open slot)<br>1x PCIe x4 Gen 4 (mechanical x16) |
| POWER | CONNECTOR | ATX (Multirail) plus 8-pin socket (12V for CPU) |
| FIRMWARE | BIOS<br><br><br><br>WATCHDOG<br>REAL TIME CLOCK<br>TPM | AMI Aptio 5.x (UEFI) BIOS modified and adapted by Kontron; Recovery BIOS, SM-BIOS (DMI), BIOS and CPU Microcode Update, Quick Boot, Logo Boot, Quiet Boot, Plug & Play, Automatic DRAM and PCIe Configuration,<br>BIOS Support for S.M.A.R.T.,<br>No legacy OS support, no MBR installation (UEFI only)<br>BMC Hardware Watchdog<br>Integrated<br>TPM Module Header for Infinion TPM |
| SYSTEM CONTROL | FP HEADER<br><br>SECURITY | 1x Header for Reset button, HDD LED, Power button, Power LED, Unit ID switch and LED, Fault LED, LAN activity<br>Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial-/ USB-Port Access Protection, Write Protection for Flash BIOS, EraseDisk (BIOS Feature), |
| SYSTEM Management | | ASPEED AST2600, Kontron Open BMC, Redfish and IPMI support |
| COOLING | FAN | 6x PWM fan (CPU/System) |
| SOFTWARE | OS SUPPORT | Windows Server 2022, Windows Server 2025, Linux-64<br>No legacy OS support, no MBR installation (UEFI only) |
| MECHANICAL | DIMENSION (L x W) | µATX: 9.6" x 9.6" (243.8 x 243.8 mm) |
| ENVIRONMENTAL | OPERATION TEMPERATURE | -40 °C (see Note*) to 60 °C Note*: What "Operates at -40C" means |
| CERTIFICATION | EMC + SAFETY | cTÜVus acc. IEC62368-1, CE Class A incl. Industrial Immunity, UKCA, FCC Class A verified |

*) DDR5-4800/5600 memory modules are supported, but the maximum effective speed is limited to DDR5-4400 (Intel design limitation for systems with 4 DIMM sockets).

# Power Supply Requirements

| SOURCE | VOLTAGE | MIN. PS LOAD | MAX. VOLTAGE TOLERANCE | MOTHERBOARD CAPACITIVE LOAD | MOTHERBOARD MAX. CURRENT (continous)* |
|---|---|---|---|---|---|
| Main Power Supply | +12V | 0 A | ± 5 % | 2500µF | 16A |
| | -12V | n.a. | n.a | - | - |
| | +5V | 0 A | ± 5 % | 1900µF | 6A |
| | 3.3.V | 0 A | ± 5 % | 1000µF | 0.5A |

See TechNotes document for detailed power requirements

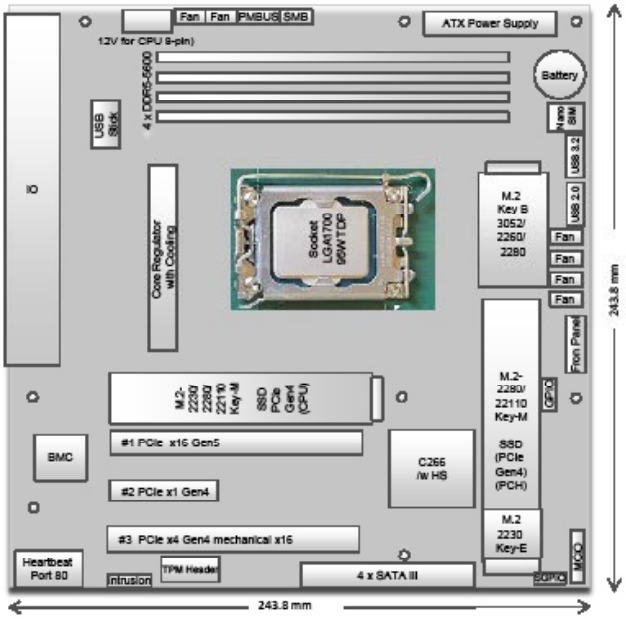
# Technical Details



| | | |
|---|---|---|
| FEATURES | Chipset | Intel® C266 |
| | DP / HDMI / LVDS / eDP | + / - / - / - |
| | Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio | - / - / - |
| | Buzzer / int. Speaker Support (stereo) | + / - |
| | GbE LAN / Dual GbE LAN / 2.5GbE LAN / 10GbE LAN | - / + / - / + |
| | Out of Band Remote Management | + |
| | WoL*/ PXE / LAN Teaming / TSN | + / + / + / - |
| | SATA / SATA RAID / M.2 (SATA) / M.2 (PCIe/NVME) | + / + / - / + |
| | USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2) / USB 3.2 (Gen2) Type-C | + / + / + / - |
| | FAN monitored & controlled CPU Thermal Zone / Board Thermal Zone | + / + |
| | TEMP monitored CPU / onboard sensors / external sensor | + / + / - |
| SPECIAL FEATURES | Silent Fan / System Guard | + / - |
| | Recovery BIOS / Flash Update / Multi Boot | + / + / + |
| | HDD Password / EraseDisk / TPM V2.0 onboard / optional TPM module | + / + / - / + |
| | BIOS POST- / BIOS Boot- / OS- HW Watchdog | + / + / + |
| | Operating Mode 24-7 / 8-5 (hrs per day - days per week) | + / - |
| | BMC Heartbeat / Port 80 / Fault LED | + / + / + |
| | Motherboard operating temperature range (chassis inside) ** | 0 °C ... +60 °C |
| INTERNAL CONNECTORS | DIMM Sockets DDR5 / ECC Support | 4 / + |
| | PCI Express® x16: 16lanes-Gen5 / PCI Express® x16: 4lanes-Gen4 | 1 / 1 |
| | PCI Express® x1: Gen4-"open" | 1 |
| | SATA-III / M.2 Key-M SSD / M.2 Key-B | upto 8 / 2 / 1 |
| | MCIO 4x (SATA orPCIe Gen4) | 1 |
| | SGPIO / SCSI Drive Activity Connector | 1 / 1 |
| | M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth) | 1 |
| | Front Panel Audio (9-Pin, HD Audio) / S-PDIF Out (Digital Audio) | - / - |
| | USB 2.0 pin header (2 port) / USB 2.0 single port header / USB Stick socket | 1 / - / 1 |
| | USB 3.2 Gen1 pin header (2 ports) / USB 3.2 Gen2 Type A header | 1 / - |
| | Serial COM header / CCTalk header[7] / Parallel Port header | - / - / - |
| | LVDS / LVDS Backlight / Embedded DisplayPort @ 4 lanes | - / - / - |
| | FAN PWM | 6 |
| | Intrusion (Case Open) / GPIO (8 Bit) / SMBus | 1 / 1 / 1 |
| | PMBus *** | 1 |
| | Stereo Speaker header / Digital Mic header | - / - |
| | Front Panel / Server extension header | 1 / 1 |
| | nano SIM Card | 1 |
| | SATA Drive Power Connector (5 V/12 V) / DC-In Connector 8-34 V (4 pin) | - / - |
| EXTERNAL CONNECTORS | DisplayPort V1.1a / HDMI / DVI / VGA | 1 / - / - / - |
| | Audio Mic. In / Line in / Line out (or driver configuration) | - / - / - |
| | LAN (RJ-45 / BMC LAN) | 4 / 1 |
| | USB 2.0 / USB 3.2 Gen1 / USB 3.2 Gen2 | 0 / 2 / 2 |
| | Multirail PSU (24 pin + 8 pin) / Single 12 V PSU | 1 / - |
| | Serial COM interface | 1 |

*) WoL on 1GbE ports.
**) Forced cooling required for high operating temperature range. See TechNotes document for details.
***) See Technotes for supported PSU Models.

# Connector/Socket Diagram



# Ordering Information



| ARTICLE | PART NO. | DESCRIPTION |
|---|---|---|
| K3881-C1 µATX | F5110-V261 | K3881-C1 Industrial Motherboard Intel® C266 Chipset |
| K3882-C1 µATX | F5110-V262 | K3882-C1 Industrial Motherboard Intel® C262 Chipset |

## Accessories

| | | |
|---|---|---|
| TPM-MODULE | S26361-F5000-R012 | Infineon SLB9670, TPM V2.0 (TCG compliant) |
| SLIM HEATSINK LGA1700 65W | F5000-C030 | Box contains 40x cooler plus 40x backplate |

## Your Contact

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