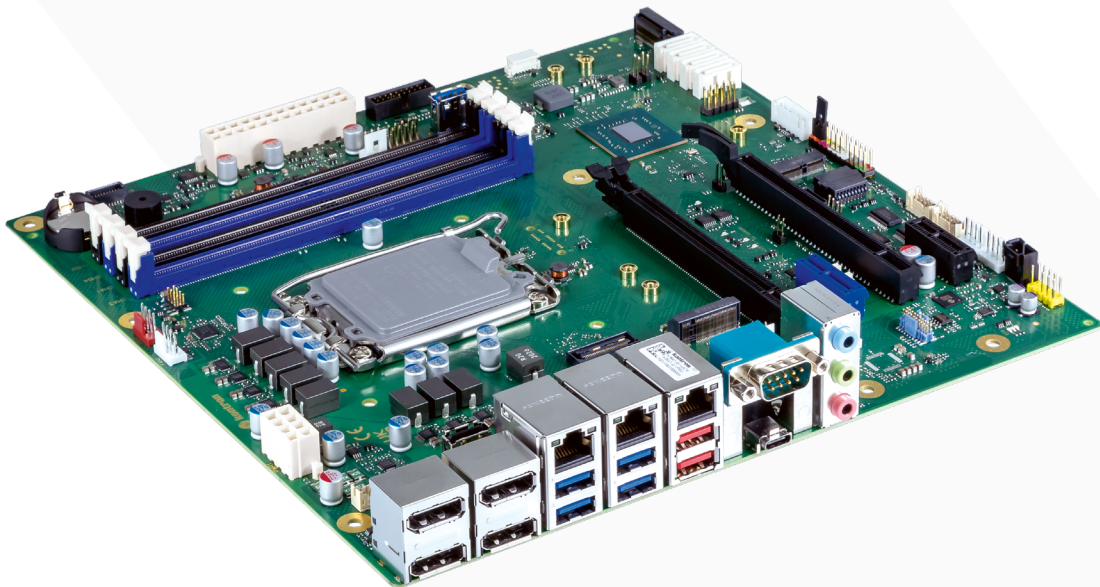


K3841-Q μ ATX

Industrial Series



Intel® Q670E Chipset and Intel® 12th & 13th Gen Core™ i3/i5/i7/i9 Processors

- ▶ Latest DDR5 memory technology for best-in-class system performance
- ▶ Intel® UHD Graphics 7xx driven by X^e Architecture
- ▶ Tripple LAN 1GbE/2.5GbE incl. Teaming and TSN support
- ▶ Dual M.2 Key-M SSD & single M.2 Key-E WLAN sockets onboard
- ▶ Powerful USB 3.2 Gen 2/Type-C, 4x COM, GPIO

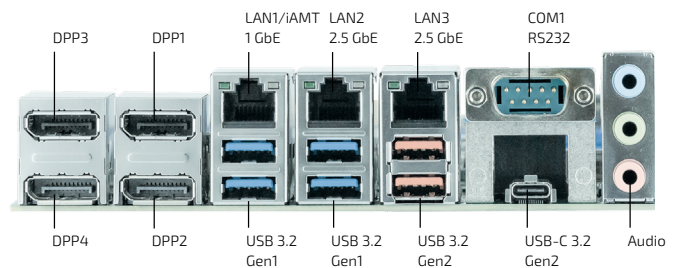
K3841-Q μATX Industrial Series

The Industrial Motherboard K3841-Q μATX is equipped with the highly performant Intel® Q670E Chipset. It also offers a multitude of supporting processors such as the Intel® Core™ i9/i7/i5/i3 (12th/13th Gen) and the Intel® Pentium®/Intel® Celeron® processor series. Designed and approved for 24/7 continuous operation and

an enhanced temperature range up to 60 °C the K3841-Q μATX provides high functionality and fits perfect with special requirements of certain markets. It offers iAMT-based Out-of-Band Management features. Besides, K3841-Q provides TSN and Real-time support (TCC) for specific industrial applications.

- Intel® 12th/13th Gen Core™ Processor Series
- DDR5-4800 UDIMM, max. 128 GByte
- cTDP – Easy & flexible reduction of CPU TDP
- Supporting Intel® iAMT features and Intel® Time Coordinated Computing (TCC)
- PCI Express® x16 (Gen5 @ CPU prepared, Gen4 @ PCH)
- 1x Intel® GbE LAN, 2x 2.5GbE incl. Teaming and TSN
- Intel® UHD Graphics 7xx driven by Xe Architecture; 4x DisplayPort V1.4a up to 8K
- Intel® High Definition 5.1 Audio; Intel® integrated TPM V2.0
- 8 Bit GPIO; 4 x COM ports
- 3x USB 3.2 Gen 2, 6x USB 3.2 Gen1, 2x USB 2.0, 1x USB 3.2 Gen2 stick socket, 1x USB 2.0 stick socket
- 4x SATA 6G incl. RAID support

- 2x M.2 2230/2242/2280 (Key-M, PCIe/NVME SSD modules), incl. NVME RAID support
- M.2 2230 (Key-E, WLAN/Bluetooth modules, incl. CNVi support)
- BIOS-POST/-Boot & OS – HW Watchdog onboard



Technical Information

| | | |
|------------------------------|---|---|
| SYSTEM | PROCESSOR CHIPSET MEMORY | Intel® Core™ i9/i7/i5/i3 (12th/13th Gen) processor series**** Intel® Pentium®/Intel® Celeron® processor series Socket LGA1700, max. 125 W TDP (For details on supported processors please refer to Kontron FTP Server) Intel® Q670E Chipset 4 DIMM Sockets DDR5-4800, max. 128 GByte, Dual Channel unbuffered, non-ECC Effective memory speed of DDR5-4800 modules according Intel® specification: 1x DIMM per channel = max. DDR5-4400*** 2x DIMM per channel (single rank) = max. DDR5-4000 2x DIMM per channel (dual rank) = max. DDR5-3600 |
| VIDEO | GRAPHICS | Intel® UHD Graphics 7xx (depends on installed processor), 4x DPP V1.4a up to 8K |
| AUDIO | AUDIO CODEC AUDIO INTERFACE | Tempo Semiconductor 92HD91B 5.1- channel*, High Definition Audio Codec |
| NETWORK CONNECTION | ETHERNET 1 ETHERNET 2/ETHERNET 3 | Intel® i219LM with 10/100/1000 MBit/s, iAMT features, Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support Intel® i225LM with 10/100/1000/2500 MBit/s, TSN Support, Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support |
| PERIPHERAL CONNECTION | USB SERIAL PORT OTHER I/OS | 2x USB 3.2 Gen 2 (rear I/O, Type-A), 1x USB 3.2 Gen 2 (rear I/O, Type-C with locking option), 4x USB 3.2 Gen1 (rear I/O, Type-A), 2x USB 3.2 Gen1 (by header), 2x USB 2.0 (by header), 1x USB 3.2 Gen2 (internal Type-A stick socket), 1x USB 2.0 (internal Type-A stick socket) 1x RS232 (rear I/O), 3x RS232 (by header)** 1x 8-Bit GPIO |

*) 5.1 surround sound is possible via digital output ports like S/PDIF or DisplayPort

***) Internal ports (COM3/COM4): Reduced feature set without DCD/DTR/DSR/RI (flow control). Fully featured COM port available from HW Rev. K3841-Q13

****) Modules DDR5-5600 can be installed, but the max. effective speed is limited to DDR5-4400 (Intel design limitation for 12th Gen/13th Gen processors @ 4 DIMM sockets)

*****) BIOS Revision 2.x.x must be installed before using a 13th gen processor.

| | | |
|--------------------------------|--|---|
| STORAGE & EXPANSION | SATA M.2 PCIe/NVME M.2 WIRELESS PCIe/PCI SLOTS GPIO | 4x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, RAID 0/1/5/10 2x M.2 2230/2242/2280 (Key-M, PCIe/NVME SSD modules), incl. NVME RAID support 1x M.2 2230 ((Key-E, WLAN/Bluetooth modules, incl. CNVi support) PCIe x16: 1x 16 lanes, Gen5**/1x 4 lanes, Gen4 PCIe x1: 1x Gen3, "open slot"/1x Gen4, "closed slot" 8 Bit GPIO (Input/Output); WLAN LED support*, WLAN enable/disable support 3.3 V/5 V/12 V supply voltage output; SMBus controller PCA9554A |
| POWER | CONNECTOR INPUT VOLTAGE | ATX (Multirail) plus 8-pin socket (12 V for CPU) |
| FIRMWARE | BIOS | 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, BIOS Support for S.M.A.R.T., Advanced Power Management, ACPI S3/S4, Wake on time from S5. No legacy OS support, no MBR installation (UEFI only) BIOS POST-/BIOS BOOT-/OS-HW Watchdog* Integrated TPM V2.0 (Intel® integrated); socket for optional TPM module |
| SYSTEM CONTROL | WATCHDOG REAL TIME CLOCK TPM FP HEADER SECURITY | 1x Header for Reset button, HDD LED & External Speaker, Power button, Power LED Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial/USB- Port Access Protection, Write Protection for Flash BIOS, EraseDisk (BIOS Feature), Trusted Platform Module (TPM) |
| SOFTWARE | OS SUPPORT | MS Windows 10, MS Windows 11, MS Windows 10 IOTG, Linux-64 No legacy OS support, no MBR installation (UEFI only) |
| MECHANICAL | DIMENSIONS (L x W) | µATX: 9.6" x 9.6" (243.8 x 243.8 mm) |
| ENVIRONMENTAL | OPERATION TEMPERATURE | 0 °C - 60 °C |
| CERTIFICATION | EMC & SAFETY | cTÜVus acc. IEC62368-1, CE Class B incl. Industrial Immunity, UKCA, FCC-B verified |

*) Available from HW Rev. K3841-Q13

**) PCIe x16 (PEG) slot: Gen5 support prepared, but not validated

Power Supply Requirements

| SOURCE | VOLTAGE | MIN. PS LOAD | MAX. VOLTAGE TOLERANCE | MOTHERBOARD CAPACITIVE LOAD | MOTHERBOARD MAX. CURRENT (continuous)* |
|-------------------|----------|--------------|------------------------|-----------------------------|--|
| Main Power Supply | + 12 V | 0 A | ± 5 % | 2.500 µF | 15 A |
| | - 12 V | n.a. | n.a. | - | - |
| | + 5 V | 0 A | ± 5 % | 1.900 µF | 6.0 A |
| | + 3.3 V | 0 A | ± 5 % | 1.100 µF | 0.5 A |
| Aux | + 5 Vaux | 0 A | ± 5 % | 1.900 µF | 2.5 A |

*) Max. motherboard input current incl. processor and DRAM memory. Additional power for drives, USB devices, PCIe cards etc. is not included! Note: BIOS provides option to reduce CPU TDP/Turbo power in order to use PSU with limited loadability.

Processor 125 W TDP: Max. Cont. Current < 15 A; max. Surge Current = 30 A (full Turbo Mode)

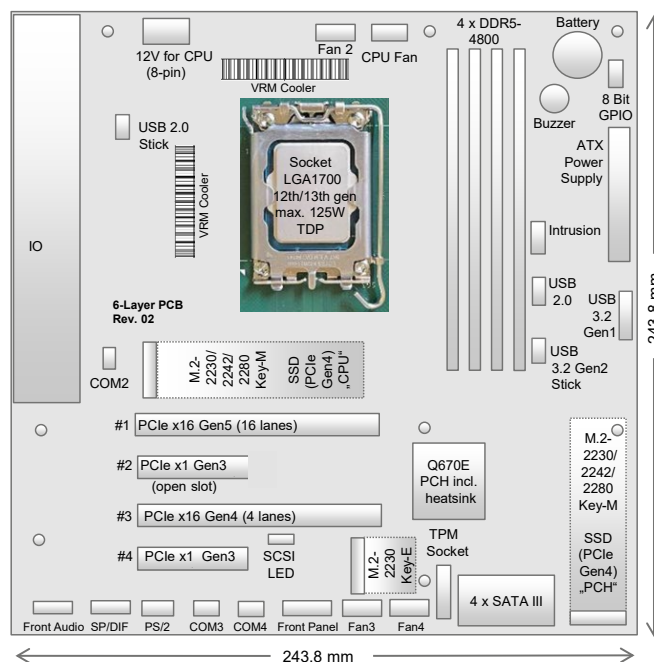
Processor 65 W TDP: Max. Cont. Current < 8 A; max. Surge Current = 26 A (full Turbo Mode)

Processor 35 W TDP: Max. Cont. Current < 5 A; max. Surge Current = 13 A (full Turbo Mode)

| | | |
|----------------------------|--|--|
| FEATURES | Board Size / Chipset VGA* / DVI / DPP / LVDS / eDP Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio Buzzer / int. Speaker Support (mono) GbE LAN / 2.5GbE LAN / Dual 2.5GbE LAN WoL / LAN Boot / Teaming / TSN Intel® Standard Manageability / iAMT / vPro SATA / SATA RAID / M.2 SSD (NVME) / NVME RAID USB 2.0 / USB 3.2 Gen1 / USB 3.2 Gen2 / USB 3.2 Type-C FAN controlled & monitored / CPU / AUX1 / AUX2 / AUX3 TEMP monitored CPU / Onboard Sensors / External Sensor | μ ATX / Q670E - / - / + / - / - - / + / + + / + + / + / + + / + / + / + + / + / - + / + / + / + + / + / + / + + / + / + / + + / + / + / + + / + / - |
| SPECIAL FEATURES | Silent Fan / System Guard / cTDP Recovery BIOS / Flash Update / Multi Boot HDD Password / EraseDisk / TPM V2.0 BIOS POST Watchdog / BIOS Boot Watchdog / OS HW Watchdog***** Logo Boot Option High Efficiency Core Voltage Regulator Design Operating Mode 24-7 / 8-5 (hrs per day - days per week) Motherboard operating temperature range (chassis inside)** | + / + / + + / + / + + / + / + + / + / + + + + / - 0 °C – 60 °C |
| INTERNAL CONNECTORS | DIMM Sockets (DDR5-4800) / ECC-Support PCI Express® x16: 16lanes-Gen5 / PCI Express® x16: 4lanes-Gen4 PCI Express® x1: Gen3-"open" / PCI Express® x1: Gen4-"closed" PCI Slots (32 Bit, 33 MHz, Rev. 2.3) / Mini-PCIe SATA-600 / M.2 Key-M (NVME SSD) / M.2 Key-B M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth) S/PDIF (digital Audio) OUT / IN Front Panel Audio (9-Pin, HD Audio) USB 2.0 / USB 3.2 (Gen1) / USB 2.0 Stick / USB 3.2 (Gen2) Stick**** Fan CPU / AUX1 / AUX2 / AUX3 Intrusion (Case Open) / GPIO (8Bit) / SM-Bus (Case Temp.) Serial Port Header (COM, RS-232) / Parallel Port Header / PS2 Header ** Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin compatible) Multirail PSU (24 pin + 8 pin) / Single 12 V PSU | 4 / - 1 / 1 1 / 1 - / - 4 / 2 / - 1 1 / - 1 1 / 1 / 1 / 1 1 / 1 / 1 / 1 1 / 1 / - 3 / - / 1 1 + / - |
| EXTERNAL CONNECTORS | VGA Sub D* / DVI-I / DVI-D / DisplayPort V1.4a Audio Mic. In / Line in / Line out (or driver configuration) LAN (RJ-45) PS/2 Mouse / Keyboard** USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2) Serial (COM1, RS-232) Parallel (EPP/ECP) | - / - / - / 4 1 / 1 / 1 3 - / - - / 4 / 3 1 - |

*) VGA possible via DP-VGA-converter (dongle)
 **) Internal PS/2 header available
 ***) Forced cooling required, see technical documentation for details
 ****) Each internal USB connector (pin header) provides two USB ports (except for USB stick socket)
 *****) Available from HW Rev. K3841-Q13

Connector/Socket Diagram



Ordering Information

| ARTICLE | PART NO. | DESCRIPTION |
|--------------|------------|---|
| K3841-Q µATX | F5110-V193 | Intel® 12th/13th Gen Core™ Processor Series, Intel® Q670E Chipset |

Accessories

| | | |
|-------------------|-------------------|-------------------------------|
| SERIAL PORT CABLE | S26361-F5000-K010 | 400 mm, fullsize slot bracket |
| M.2 CARRIER BOARD | S26361-F5000-M001 | D3352-A1 |

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