K3841-Q μATX
Industrial Series

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

- Latest DDR5 memory technology for best-in-class system performance
- Intel® UHD Graphics 7xx driven by Xe 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

POSSIBILITIES START HERE
The Industrial Motherboard K3841-Q µATX is equipped with the high-performant Intel® Q670E Chipset. It also offers a multitude of supporting processors such as the Intel® Core™ i9/i7/i5/i3 (12th 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 Realtime support (TCC) for specific industrial applications.

### TECHNICAL INFORMATION

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PROCESSOR</th>
<th>Intel® Core™ (9/11/13/15) (12th 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 4x 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</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIPSET</td>
<td>MEMORY</td>
<td></td>
</tr>
<tr>
<td>VIDEO</td>
<td>GRAPHICS</td>
<td>Intel® UHD Graphics 7xx (depends on installed processor), 4x DisplayPort V1.4a</td>
</tr>
<tr>
<td>AUDIO</td>
<td>AUDIO CODEC</td>
<td>Tempo Semiconductor 92HD91B 5.1-channel™, High Definition Audio Codec</td>
</tr>
<tr>
<td>NETWORK CONNECTION</td>
<td>ETHERNET 1</td>
<td>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, Teamiing 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, Teamiing Support</td>
</tr>
<tr>
<td>PERIPHERAL CONNECTION</td>
<td>USB</td>
<td>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), 2x USB 3.2 Gen1 (rear I/O, Type-A), 2x USB 3.2 Gen1 (by header), 1x USB 2.0 (by header), 1x USB 3.2 Gen2 (internal Type-A stick socket), 1x USB 2.0 (internal Type-A stick socket)</td>
</tr>
<tr>
<td>STORAGE &amp; EXPANSION</td>
<td>SATA M.2 PCIe/NVME</td>
<td>4x Serial ATA III 600 Interface (up to 6Gb/s), NCQ, AHCI, RAID 0/1/5/10 2x M.2 2230/2242/2280 (Key-M, PCIe/NVME SSD modules), incl. NVME RAID support</td>
</tr>
<tr>
<td></td>
<td>M.2 WIRELESS PCIe/PCI SLOTS</td>
<td>1x M.2 2230 (Key-E, WLAN/Bluetooth modules, incl. CNVi support) PCIe x16: 1x 16 lanes, Gen5x4 lanes, Gen4 PCIe x1: 1x Gen3, “open slot”, 1x Gen3, “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</td>
</tr>
<tr>
<td>POWER</td>
<td>GPIO</td>
<td></td>
</tr>
<tr>
<td>CONNECTOR INPUT VOLTAGE</td>
<td>ATX (Multirail) plus 8-pin socket (12 V for CPU)</td>
<td></td>
</tr>
</tbody>
</table>

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* 5.1 support via SPDIF output
** Requires HW Rev. ≥ 02xx
TECHNICAL INFORMATION

BIOS
AMI Aoptio 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. HW Watchdog support*

WATCHDOG
REAL TIME CLOCK TPM
TLP V2.0 (Intel® integrated); socket for optional TPM module

SYSTEM CONTROL
FP HEADER
TPM
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, MS Windows Server Linux-64
No legacy OS support, no MBR installation (UEFI only)

MECHANICAL
ENVIRONMENTAL
CERTIFICATION
DIMENSIONS (L x W) µATX: 9.6” x 9.6” (243.8 x 243.8 mm)
OPERATION TEMPERATURE 0 °C – 60 °C
cTUVus acc. IEC62368-1, CE Class B incl. Industrial Immunity, UKCA, FCC-B verified

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 | 26 A
| - 12 V | 0 A | ± 10 % | - | 0.3 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 = 26 A; max. Surge Current = 39 A (< 10ms)
Processor 65 W TDP: Max. Cont. Current = 23 A; max. Surge Current = 34 A (< 10ms)
Processor 35 W TDP: Max. Cont. Current = 11 A; max. Surge Current = 19 A (< 10ms)

CONNECTOR / SOCKET DIAGRAM

12V for CPU (8-pin)
CPU Fan
Fan 2
VRM Cooler
USB 2.0 Stick
PS/2
COM2
COM1
COM4
Front Panel
Fan3
Fan4
ATX Power Supply
Battery
12V for CPU
(8-pin)
USB 3.2 Gen1
USB 3.2 Gen2 Stick
USB 2.0
ATX Power Supply
Buzzer
Q670E
PCH incl.
heatsink
TPM Socket
M.2 2230/2242/2280
Key-M
SSD (PCIe Gen3)
QPI
4 x SATA III
4 x DDR5-4800
8 Bit
gPIO
Fan 2
CPU Fan
VRM Cooler
IO
6-Layer PCB Rev. 02
COM2
COM1
COM4
COM3
Front Panel
Fan3
Fan4

12V for CPU
(8-pin)
USB 2.0 Stick
PS/2
COM2
COM1
COM4
Front Panel
Fan3
Fan4
ATX Power Supply
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4 x DDR5-4800
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CPU Fan
VRM Cooler
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6-Layer PCB Rev. 02
COM2
COM1
COM4
COM3
Front Panel
Fan3
Fan4

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**TECHNICAL INFORMATION**

### FEATURES

<table>
<thead>
<tr>
<th>Board Size / Chipset</th>
<th>µATX / Q670E</th>
</tr>
</thead>
<tbody>
<tr>
<td>VGA* / DVI / DPP / LVDS / eDP</td>
<td>- / + / + / -</td>
</tr>
<tr>
<td>Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio</td>
<td>+ / + / +</td>
</tr>
<tr>
<td>Buzzer / int. Speaker Support (mono)</td>
<td>+ / + / +</td>
</tr>
<tr>
<td>GbE LAN / 2.5GigE LAN / Dual 2.5GigE LAN</td>
<td>+ / + / +</td>
</tr>
<tr>
<td>Wol. / LAN Boot / Teaming / TSN</td>
<td>+ / + / + / +</td>
</tr>
<tr>
<td>Intel® Standard Manageability / IAMT / vPro</td>
<td>+ / +</td>
</tr>
<tr>
<td>SATA / SATA RAID / M.2 SSD (NVME) / NVME RAID</td>
<td>+ / + / +</td>
</tr>
<tr>
<td>USB 2.0 / USB 3.2 Gen1 / USB 3.2 Gen2 / USB 3.2 Type-C</td>
<td>+ / + / + / +</td>
</tr>
<tr>
<td>FAN controlled &amp; monitored / CPU / AUX1 / AUX2 / AUX3</td>
<td>+ / + / + / +</td>
</tr>
<tr>
<td>TEMP monitored CPU / Onboard Sensors / External Sensor</td>
<td>+ / + / -</td>
</tr>
</tbody>
</table>

### 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

| DIIMM Sockets (DDRR5~4800) / ECC-Support | 4 / - |
| PCI Express® x16: 16lanes-Gen5 / PCI Express® x16: 4lanes-Gen4 | 1 / 1 |
| PCI Express® x1: Gen3-“open” / PCI Express® x1: Gen4-“closed” | 1 / 1 |
| PCI Slots (32 Bit, 33 MHz, Rev. 2.3) / Mini-PCIe | - / - |
| SATA-600 / M.2 Key-M (NVME SSD) / M.2 Key-B | 4 / 2 / - |
| M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth) | 1 |
| S/PIDF (digital Audio) OUT / IN | 1 / - |
| Front Panel Audio (9-Pin, HD Audio) | 1 |
| USB 2.0 / USB 3.2 (Gen1) / USB 2.0 Stick / USB 3.2 (Gen2) Stick**** | 1 / 1 / 1 |
| Fan CPU / AUX1 / AUX2 / AUX3 | 1 / 1 / 1 |
| Intrusion (Case Open) / GPIO (8Bit) / SM-Bus (Case Temp.) | 1 / - / - |
| Serial Port Header (COM, RS-232) / Parallel Port Header / PS2 Header ** | 3 / - / 1 |
| Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin compatible) | 1 |
| Multirail PSU (24 pin + 6 pin) / Single 12 V PSU | + / - |

### EXTERNAL CONNECTORS

| VGA Sub D* / DVI-I / DVI-D / DisplayPort V1.4a | - / - / - / 4 |
| Audio Mic. In / Line in / Line out (or driver configuration) | 1 / 1 / 1 |
| LAN (RJ-45) | 3 |
| PS/2 Mouse / Keyboard** | - / - |
| USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2) | - / 4 / 3 |
| Serial (COM1, RS-232) | 1 |
| Parallel (EPP/ECP) | - |

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**ORDERING INFORMATION**

### ARTICLE

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3841-Q</td>
<td>µATX</td>
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<tr>
<td>E0110-V193</td>
<td>Intel® 12th Gen Core™ Processor Series, Intel® Q670E Chipset</td>
</tr>
</tbody>
</table>

### ACCESSORIES

<table>
<thead>
<tr>
<th>SERIAL PORT CABLE</th>
<th>F5000-K010</th>
<th>400 mm, fullsize slot bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.2 CARRIER BOARD</td>
<td>F5000-M001</td>
<td>D3532-A1</td>
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</tbody>
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**GLOBAL HEADQUARTERS**

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