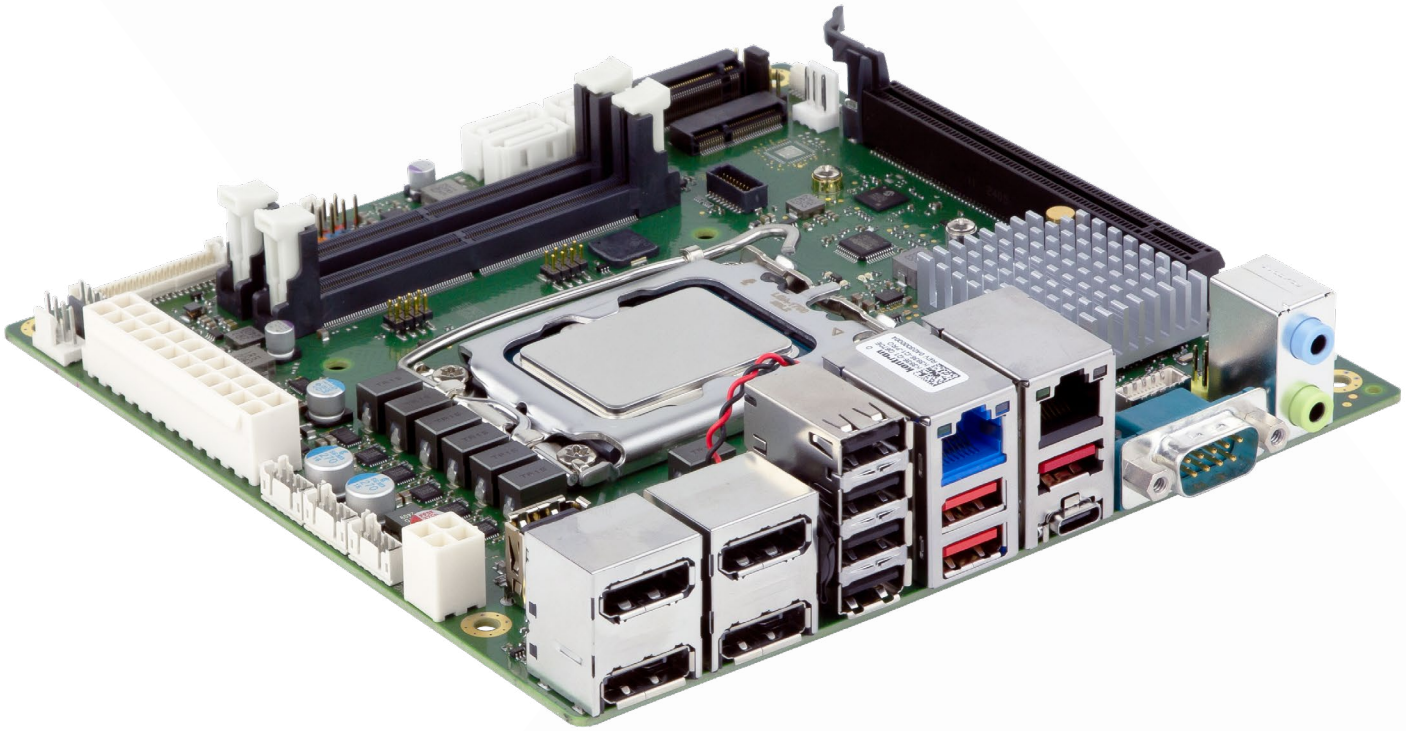
K3836-Q/R mITX
Industrial Series



Intel® Q670/R680E Chipset and Intel® Core™ Processors (12th, 13th, 14th gen)

- Latest DDR5 memory technology for best-in-class system performance
- Intel® UHD Graphics 7xx driven by Xe Architecture; DPP-, eDP-, and LVDS- support
- Dual LAN 1GbE/2.5GbE incl. Teaming and TSN support
- M.2 Key-M & Key-E; Powerful USB 3.2 Gen2
- Combined ATX Standard PSU or Single 12V Supply

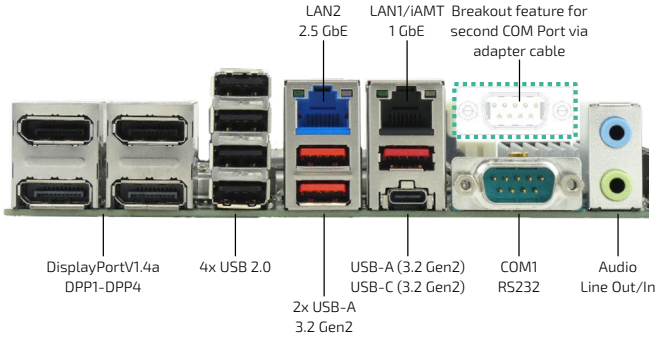
kontron
The Power of IoT

Product Highlights

K3836-Q/R mITX Industrial Series

The K3836 mITX motherboard is the successor to the prosperous D3633-S. It combines the proven functionality of its popular forerunner with the latest Intel® Core™ processor generation and latest standards. Developed and produced in Germany, this motherboard offers two configuration options: The K3836-R is equipped with the high-performance Intel® R680E chipset with ECC support for mission-critical applications. The K3836-Q has the equally powerful Q670 chipset onboard. Unleash unparalleled connectivity with the K3836, featuring 2x Intel® LAN (1x 2.5 GbE), PCIe x16 Gen5, multiple USB ports, M.2 or Display Ports supporting graphics up to 8K resolutions and much more. It is particularly reliable thanks to 24/7 continuous operation at temperatures up to 60° C. Therefore, it can be used for various applications in the fields of industry, medicine, infotainment and more.

- Intel® Core™ processor series (12th, 13th, 14th gen)
- DDR5-4800/5600 SODIMM, max. 96 GByte
- ECC Support with R680E chipset
- cTDP – Easy & flexible reduction of CPU TDP
- Supporting Intel® iAMT features and Intel® Time Coordinated Computing (TCC)
- PCI Express® x16 (Gen5 prepared)
- 1x Intel® GbE LAN, 1x 2.5GbE incl. Teaming and TSN
- Intel® UHD Graphics 7xx driven by Xe Architecture;
- 4x DisplayPort V1.4a up to 8K; 1x eDP V1.4b @4K; 1x Dual Channel LVDS
- HD Audio onboard
- Intel® integrated TPM V2.0
- 8 Bit GPIO; 4x COM port
- 6x USB 3.2 Gen 2, 7x USB 2.0
- 1x M.2 2242/2280 (Key-M, PCIe/NVME SSD modules)
- M.2 2230 (Key-E, WLAN/Bluetooth modules)
- 4x SATA 6G incl. RAID support
- BIOS-POST/-Boot & OS – HW Watchdog onboard



Technical Information

SYSTEM	PROCESSOR	Intel® Core™ processor series i9/i7/i5/i3 (12th, 13th, 14th gen) Intel® Pentium®/Intel® Celeron® processor series Socket LGA1700, max. 65 W TDP (For details on supported processors please refer to Kontron FTP Server)
	CHIPSET	K3836-Q: Intel® Q670 K3836-R: Intel® R680E
	MEMORY	2 SODIMM Sockets DDR5-4800/5600[1], max. 96 GByte, Dual Channel unbuffered
	MEMORY ECC SUPPORT	ECC supported by K3836-R with R680E only
VIDEO	GRAPHICS	Intel® UHD Graphics 7xx (depends on installed processor), 4x DisplayPort V1.4a up to 8K; 1x Embedded DP (eDP V1.4b up to 4K resolution) 1x Dual Channel LVDS (24 bit) Following max. display combinations are supported[2]: 4x DPP, 3x DPP + eDP, 3x DPP + LVDS
AUDIO	AUDIO CODEC AUDIO INTERFACE	Realtek ALC256 High Definition Stereo Audio Codec[3]
NETWORK CONNECTION	ETHERNET 1	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
	ETHERNET 2	Intel® i226LM 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	Rear I/O: 3x USB 3.2 Gen2 (Type-A), 1x USB 3.2 Gen 2 (Type-C), 4x USB 2.0 (Type-A) Internal: 2x USB 3.2 Gen2 (Key-B header), 2x USB 2.0 (by header), 1x USB 2.0 Stick socket
	SERIAL PORT	1x RS232/422/485, 3x RS232 (1x rear I/O, 3x by headers)[4]
	OTHER I/Os	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
STORAGE & EXPANSION	SATA	4x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, RAID 0/1/5/10
	M.2 PCIe/NVME	1x M.2 2242/2280 (Key-M, PCIe/NVME SSD modules)
	M.2 WIRELESS	1x M.2 2230 (Key-E, WLAN/Bluetooth modules, PCIe + USB)
	PCIe/PCI SLOTS	PCIe x16: 1x 16 lanes, Gen5[5], Support for lane split (x16 or x8+x8)

1) Support for DDR5-5600 requires Intel® Core™ i7 or i9 processor (13th gen) and single rank SO-DIMM modules
2) Simultaneous use of LVDS and eDP is not supported.
3) 5.1 surround sound is supported via DisplayPort or S/PDIF
4) COM1 (Rear I/O), COM3 and COM4 (by header): Full RS232 feature support
COM2 (by header): RS232/RS422/RS485 feature support
5) PCIe x16 slot: Gen5 ready

Technical Information

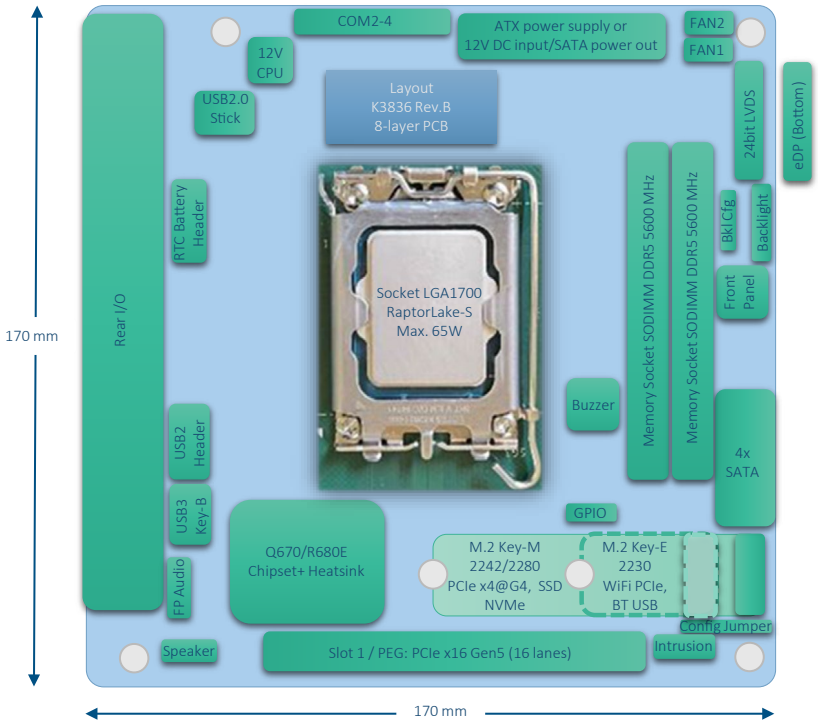
POWER	INPUT VOLTAGE CONNECTOR	Dual supply option: Single 12 V PSU ("DC In") or Standard ATX Multirail PSU 24-pin ATX socket plus 4-pin socket for CPU
FIRMWARE	BIOS	AMI Aptio 5.x (UEFI) BIOS modified and adapted by Kontron; Recovery BIOS, SM-BIOS (DMI), BIOS and CPU Microcode Update, Quick Boot, Logo Boot, Quiet Boot, Plug & Play, Automatic DRAM and PCIe Configuration, BIOS Support for S.M.A.R.T., Advanced Power Management, ACPI S3/S4, Modern Standby S0ix, Wake on time from S5. No legacy OS support, no MBR installation (UEFI only)
	WATCHDOG REAL TIME CLOCK TPM	BIOS POST-/BIOS BOOT-/OS-HW Watchdog Integrated TPM V2.0 (Intel® integrated)
SYSTEM CONTROL	FP HEADER SECURITY	1x Intel compliant header for Power and Reset button, Power LED and HDD 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® 10 IoT (LTSC), MS Windows® 11, MS Windows® 11 IoT (LTSC), Linux 64 No legacy OS support, no MBR installation (UEFI only)
MECHANICAL	DIMENSIONS (L x W)	Mini-ITX: 6.7" x 6.7" (170 x 170 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

Power Supply Requirements

SOURCE	VOLTAGE	MIN. PS LOAD	MAX. VOLTAGE TOLERANCE	MOTHERBOARD CAPACITIVE LOAD	MOTHERBOARD MAX. CURRENT (continous)*
Main Power Supply	+ 12 V	0.05 A	± 5 %	1.900 µF	10 A
(Multirail PSU)	- 12 V	n.a.	n.a.	-	Not used
	+ 5 V	0.2 A	± 5 %	1800 µF	4.5 A
	+ 3.3 V	0 A	± 5 %	500 µF	0.5 A
	+ 5 Vaux	0 A	± 5 %	1800 µF	2.5 A
Single 12V DC	+ 12 V	0 A	± 5 %	1.900 µF	13 A

*) Max. motherboard input current incl. processor and DRAM memory. Additional power for drives, USB devices, PCIe cards, eDP etc. is not included!
Note: BIOS provides option to reduce CPU TDP/Turbo power in order to use PSU with limited loadabilty.
Processor 65 W TDP: Max. Cont. Current < 13 A; max. Surge Current = 19 A (full Turbo Mode)
Processor 35 W TDP: Max. Cont. Current < 8 A; max. Surge Current = 13 A (full Turbo Mode)

Connector/Socket Diagram



Technical Details

FEATURES	Board Size / Chipset	Mini-ITX / Q670 or R680E
	VGA / DVI / DPP / LVDS / eDP	- / - / + / + / +
	Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio	+ / - / +
	Buzzer / int Speaker Support Mono / Stereo	+ / - / +
	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	+ / + / -
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)[1]	0 °C – 60 °C
INTERNAL CONNECTORS	SODIMM Sockets (DDR5-4800/5600) / ECC-Support	2 / (+)[2]
	PCI Express® x16: 16 lanes - Gen5 / Support for lane split (x16 or x8+x8)	1 / +
	SATA-600 / M.2 Key-M (NVME SSD) / M.2 Key-B	4 / 1 / -
	M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth)	1
	S/PDIF (digital Audio) OUT / IN	1 / -
	Front Panel Audio (9-Pin, HD Audio)	1
	USB 2.0 / USB 3.2 (Gen2) / USB 2.0 Stick / USB 3.2 (Gen2) Stick[3]	2 / 2 / 1 / 0
	Fan CPU / AUX1 / AUX2 / AUX3	1 / 1 / - / -
	Intrusion (Case Open) / GPIO (8 Bit) / SM-Bus (Case Temp.)	1 / 1 / 1
	Serial Port Header[4] / Parallel Port Header / PS2 Header	3 / - / -
	Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin compatible)	1
	SATA Drive Power Connector	Via ATX connector (Single 12V mode)
	Multirail PSU (24 pin + 4 pin) / Single 12V PSU / ATX12VO	+ / + / -
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
	LAN (RJ-45)	2
	PS/2 Mouse / Keyboard	- / -
	USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2)	4 / 0 / 4
	Serial (COM1, RS-232)	1
	Parallel (EPP/ECP)	-

[1]) Forced cooling required, see technical documentation for details
[2]) ECC support only with R680E chipset on K3836-R
[3]) Each internal USB connector (pin header) provides two USB ports (except for USB stick socket)
[4]) COM2 with RS232/RS422/RS485 support, COM3+COM4 with RS232 support

Ordering Information

ARTICLE	PART NO.	DESCRIPTION
K3836-Q mITX	F5120-V197	Intel® Core™ processor series (12th, 13th, 14th gen), Intel® Q670 Chipset
K3836-R mITX	F5120-V198	Intel® Core™ processor series (12th, 13th, 14th gen), Intel® R680E Chipset

Accessories

RISERCARD	S26361- F5000-R006	1x PCIe x4 (D3318-A)
INTERNAL SERIAL CABLE	S26361- F5000-K010	400 mm; fullsize slot bracket
SLIM HEATSINK LGA1700 65W	F5000-C030	Box contains 40x cooler plus 40x backplate
M.2 KEY-E/A SATA ADDON	F5000-M004	AddOn for M.2 Key-E/A slot to provide two SATA 6G ports, Kit contains 40 x adapter K1201-A
INTERNAL USB KEY-B TO IDC20 HEADER CABLE	F5000-K020	Adapter cable for USB Key-B header to provide standard IDC20 USB3 frontpanel header.

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