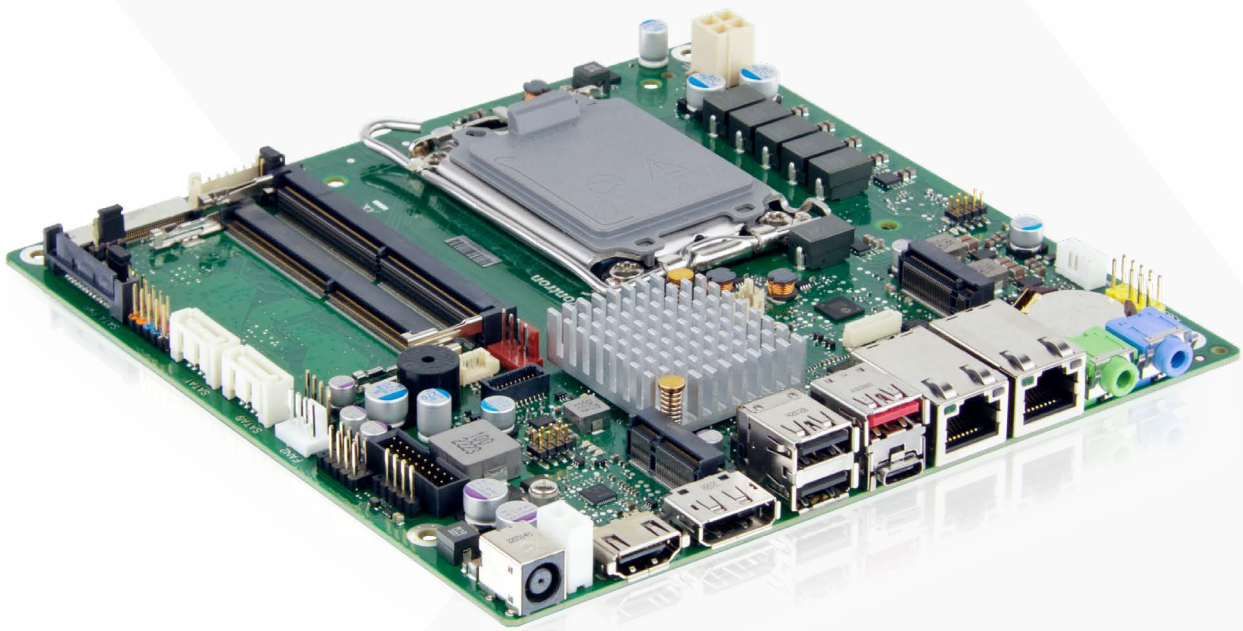


# K3831-H Thin mITX Industrial Series



## Intel® H610 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-, HDMI-, and LVDS- support
- ▶ Dual LAN 1GbE incl. Teaming
- ▶ M.2 Key-M Gen4 & Key-E; Powerful USB 3.2 Gen2
- ▶ 8-Bit GPIO

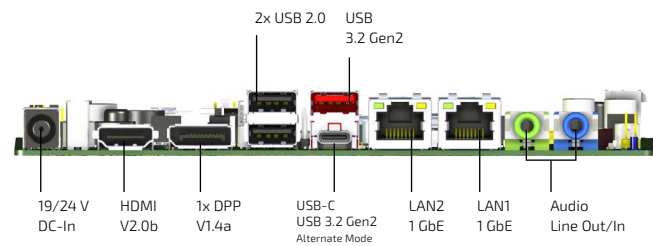
## K3831-H Thin mITX Industrial Series

The Industrial Motherboard K3831-H Thin mITX provides highest performance and functionality for demanding requirements on a small and ultra thin form factor. It supports the Intel® Core™ i9/i7/i5/i3 processor (12th/13th/14th Gen) as well as the Intel®

Pentium®/Intel® Celeron® processor series. Despite the limited space on this motherboard, the K3831-H is equipped with connectors for HDMI V2.0b, Display Port V1.4a, Dual Channel LVDS, Dual GbE LAN and 9x USB (2.0, 3.2 Gen1 and 3.2 Gen2).

- ▶ Intel® Core™ processors (12th/13th/14th Gen)
- ▶ DDR5-5600 SODIMM, max. 64 GByte
- ▶ cTDP – Easy & flexible reduction of CPU TDP
- ▶ Intel® UHD Graphics 7xx driven by Xe Architecture
- ▶ HDMI 2.0b, DP V1.4a and USB Type-C Alt mode (DPoC) Dual Channel LVDS support
- ▶ 8 Bit GPIO & multichannel Audio onboard
- ▶ USB 2.0, USB 3.2 Gen1 and USB 3.2 Gen2 onboard
- ▶ Onboard support for M.2 SSD (PCIe x4 Gen 4 based M.2 2242)
- ▶ Onboard support for M.2 WLAN/Bluetooth (M.2 2230)
- ▶ 1x Intel® GbE LAN, 1x Realtek GbE LAN
- ▶ Intel integrated TPM V2.0 onboard

- ▶ Dual-Range DC Power Supply 12 V/19-24 V
- ▶ HW Watchdog onboard
- ▶ Motherboard operating temperature range (chassis inside) 0 °C - 60 °C



## Technical Information

<b>SYSTEM</b>	<b>PROCESSOR</b>	Intel® Core™ processors (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)
	<b>CHIPSET MEMORY</b>	Intel® H610 Express Chipset 2 SO DIMM Sockets DDR5-5600, max. 64 GByte, Dual Channel unbuffered non-ECC. Effective memory speed depends on installed processor*
<b>VIDEO</b>	<b>GRAPHICS</b>	Intel® UHD Graphics 7xx (depends on installed processor), 1x Display Port V1.4a and 1x USB Alternate mode (DPoC) via Type-C 1x HDMI V2.0b Dual-Channel (24bit) LVDS
<b>AUDIO</b>	<b>AUDIO CODEC AUDIO INTERFACE</b>	Realtek ALC256 High Definition Audio Codec, 2W@40hm stereo speaker support Line-In / Line-Out Front panel audio (by header)
<b>NETWORK CONNECTION</b>	<b>ETHERNET 1</b>	Intel® i219LM with 10/100/1000 MBit/s, Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support
	<b>ETHERNET 2</b>	Realtek RTL8111H with 10/100/1000 MBit/s, Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE support, BIOS MAC Address Display
<b>PERIPHERAL CONNECTION</b>	<b>USB</b>	2x USB 2.0 (rear I/O, Type-A) + 3x USB 2.0 (by header) 1x USB 3.2 Gen 2 (rear I/O, Type-A), 1x USB 3.2 Gen 2 (rear I/O, Type-C) 2x USB 3.2 Gen 1 (by header)
	<b>SERIAL PORT OTHER I/Os</b>	1x RS232 (by header) 1x 8-bit GPIO (by header)
<b>STORAGE &amp; EXPANSION</b>	<b>SATA M.2 PCIe/NVME M.2 WIRELESS GPIO</b>	2x SATA-600 1x M.2 2242 (Key-M, Gen 4, PCIe/NVME SSD modules) 1x M.2 2230 (Key-E, WLAN/Bluetooth modules, incl. CNVi support) 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
<b>POWER</b>	<b>INPUT VOLTAGE</b>	External DC-in: 19-24 V Internal DC-in: 12 V/19-24 V

\*) Support for DDR5-5600 with BIOS ≥ R2.13.0. Requires at least appropriate Intel® Core™ processor (13th/14th gen)

<b>FIRMWARE</b>	<b>BIOS</b>	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 Configuration, BIOS Support for S.M.A.R.T., Advanced Power Management, ACPI S3/S4, Wake on time from S5. <b>No legacy OS support, no MBR installation (UEFI only)</b> BIOS POST-/BIOS BOOT-/OS-HW Watchdog Integrated Intel® Integrated TPM V2.0 (Infineon TPM module optional)
<b>SYSTEM CONTROL &amp; MONITORING</b>	<b>WATCHDOG</b> <b>REAL TIME CLOCK</b> <b>TPM</b> <b>FP HEADER</b> <b>SECURITY</b>	1x Front Panel header (Power Button, Reset Button, Power LED, HDD LED, Monitor Backlight Switch) Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial-/ USB- Port Access Protection, Write Protection for Flash BIOS, EraseDisk (BIOS Feature), Intel integrated TPM V2.0, optional Infineon TPM module (TCG compliant, socket prepared)
<b>COOLING</b>	<b>FAN</b>	1x CPU-Fan (4Pin-Header, PWM) 1x System-Fan (4Pin-Header, PWM)
<b>SOFTWARE</b>	<b>OS SUPPORT</b>	MS Windows 10, MS Windows 11, MS Windows 10 IoT, Linux-64 No legacy OS support, no MBR installation (UEFI only)
<b>MECHANICAL</b>	<b>DIMENSIONS (L x W)</b>	Thin mITX: 6.7" x 6.7" (170 x 170 mm)
<b>ENVIRONMENTAL</b>	<b>OPERATING TEMPERATURE</b>	0 °C - 60 °C
<b>CERTIFICATION</b>	<b>EMC &amp; SAFETY</b>	CE TÜVus acc. IEC62368-1, CE Class B incl. Industrial Immunity, UKCA, FCC-B verified
<b>SPECIAL FEATURES</b>	<b>CTDP</b> <b>SILENT FAN</b> <b>SYSTEM GUARD</b> <b>RECOVERY BIOS</b> <b>MULTI BOOT</b> <b>HDD PASSWORD</b> <b>ALWAYS ON</b> <b>NEVER OFF</b>	Easy and flexible reduction of CPU TDP (BIOS Setup) down to 10W TDP Independent temperature related processor fan and system fan supervision View Silent Fan features Restores a corrupted BIOS Comfortable boot from any boot device Access protection for disk drives Reliable power-on whenever voltage is connected Option to prevent the system from being shut down

## Power Supply Requirements

SOURCE	VOLTAGE	MIN. PS LOAD	MAX. VOLTAGE TOLERANCE	MOTHERBOARD CAPACITIVE LOAD	MOTHERBOARD MAX. CURRENT/ LOAD
External connector	19-24 V	0 A	+ 10%/- 15%	200 µF	max. 10 A max. 120 W *
Internal (2 pin) connector	19-24 V	0 A	+ 10%/- 15%	200 µF	max. 8 A max. 120 W *
Internal (4 pin) connector	+ 12 V	0 A	± 5 %	1.500 µF	max. 12 A max. 120W/145W **

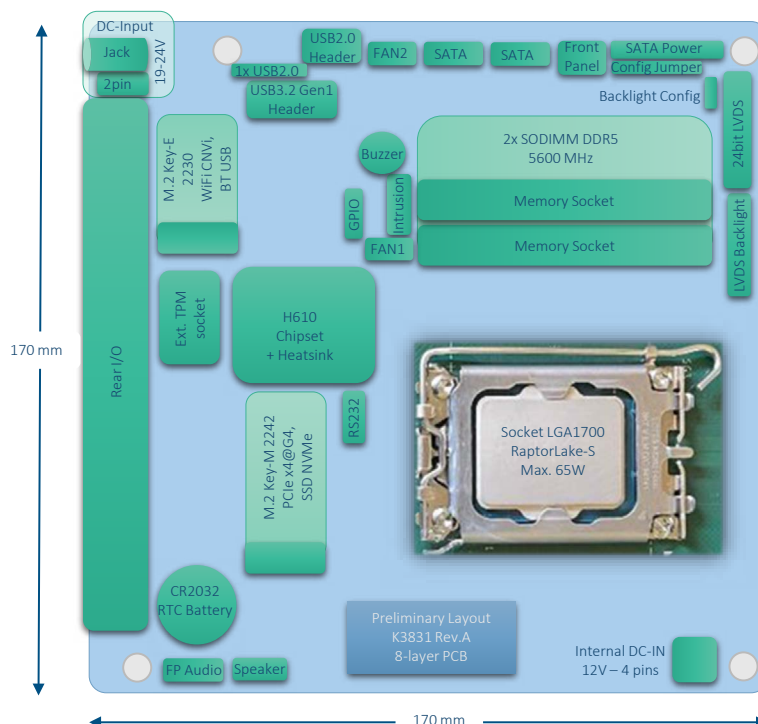
For onboard components (worst case incl. processor, memory and any attached internal and external devices like M.2 devices, SATA devices, LVDS panels, USB devices).

\*) LVDS backlight (19/24V) not included in 120W limit. See TechNotes document for further details.  
Possible surge current (CPU Turbo mode) must be considered for system design!  
Note: BIOS Setup provides option to reduce CPU TDP/Turbo power in order to use a PSU with limited loadability.  
\*\*) Max. 145W @12V supported from HW revision K3831-H13

<b>FEATURES</b>	Chipset Board Size DVI / DPP / 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 / M.2 2230 WLAN-BT WoL / PXE / LAN Teaming / TSN Intel® Standard Manageability / iAMT / vPro SATA / SATA RAID / M.2 (SATA) / M.2 (PCIe/NVMe) USB 2.0 / USB 3.2 gen1 / USB 3.2 gen2 / USB 3.2 Type-C FAN monitored & controlled / CPU / AUX1 / AUX2 TEMP monitored CPU / onboard sensors / external sensor	iH610 Thin Mini-ITX - / + / + / + / - + / + / + / + + / + / - / + + / + / + / - - / - / - / - + / - / - / + + / + / + / + + / + / + / - + / + / -
<b>SPECIAL FEATURES</b>	Silent Fan / System Guard / cTDP Recovery BIOS / Flash Update / Multi Boot HDD Password / EraseDisk / TPM V2.0 BIOS POST- / BIOS Boot- / OS- HW Watchdog Logo Boot Option High Efficiency Core Voltage Regulator Design Operating Mode 24-7 / 8-5 (hrs per day - days per week) Mainboard operating temperature range (chassis inside)*	+ / + / + + / + / + + / + / + + / + / + + + + / - 0 °C – 60 °C
<b>INTERNAL CONNECTORS</b>	SO DIMM Sockets (DDR5-5600) SATA-600 / mSATA / M.2 SSD 2242 (Key-M, PCIe/NVMe) M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth) Frontpanel Audio (9-Pin, HD Audio) USB 2.0 channels / USB 3.2 (Gen1) / USB 3.2 (Gen2) / USB Stick Serial (COM1, RS232) / Parallel Port Connector LVDS / LVDS Backlight / Embedded DisplayPort FAN CPU (PWM) / AUX1 (PWM) / AUX2 Intrusion (Case Open) / GPIO (8Bit) / SMBus (Case Temp.) Internal Stereo Speakers header / DMIC header (digital microphone) Front Panel (Intel 10 pin header: Power Switch, Reset Switch, LEDs, Monitor Backlight Switch) Onboard SATA Drive Power Connector (3.3V/5V/12V) Onboard (internal) DC-In Connector 12 V (4 pin) / 19-24 V (2 pin)	2 2 / - / 1 1 1 3 / 2 / - / - 1 / - 1 / 1 / - 1 / 1 / 0 1 / 1 / - 1 / 1 1 1 1 / 1
<b>EXTERNAL CONNECTORS</b>	DVI-I / DVI-D / DisplayPort V1.4a / DPP via USB-C ** / HDMI 2.0b 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) / USB 3.2 (Gen2, Type-C) DC-In connector (external input) 19-24V.	- / - / 1 / 1 / 1 - / 1 / 1 2 - / - 2 / 0 / 1 / 1 1

\*) Forced cooling required, see technical documentation for details  
 \*\*) USB-C 3.2 Gen2 Alternate Mode

## Connector/Socket Diagram



# Ordering Information

ARTICLE	PART NO.	DESCRIPTION
K3831-H Thin mITX	F5120-V219	Intel® Core™ processors (12th/13th/14th Gen), Intel® H610 Chipset

## Accessories

COM1 EXTENSION CABLE	S26361-F5000-K007	120 mm, w/o slot bracket
COM1 EXTENSION CABLE	S26361-F5000-K010	400 mm, fullsize slot bracket
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
SLIM HEATSINK LGA1700 65W	F5000-C030	Box contains 40x cooler plus 40x backplate

## Global Headquarters

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