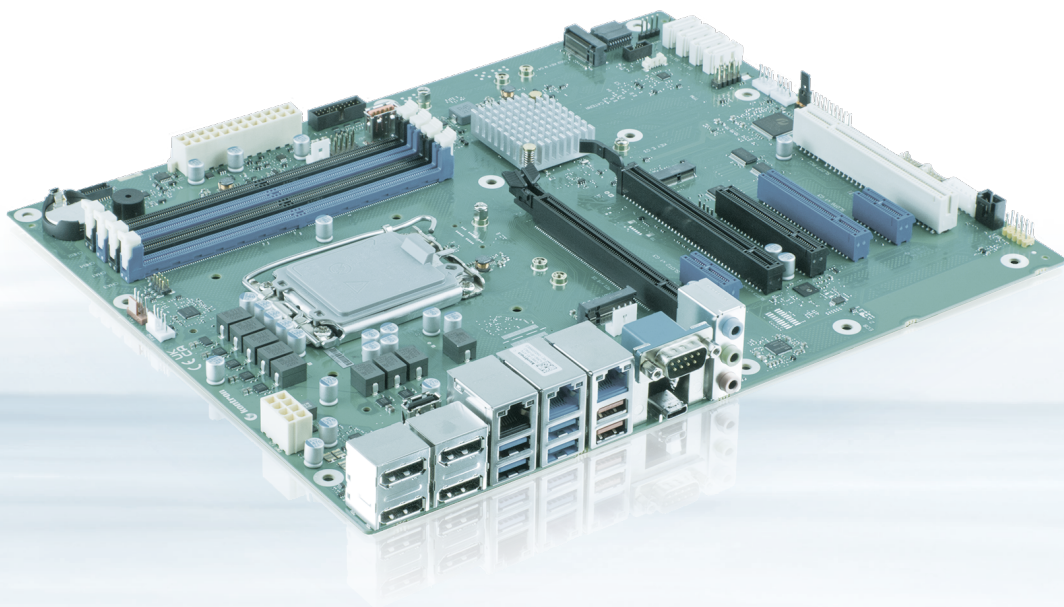


K3851-R ATX

Industrial Series



Intel® R680E 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



K3851-R ATX

Industrial Series

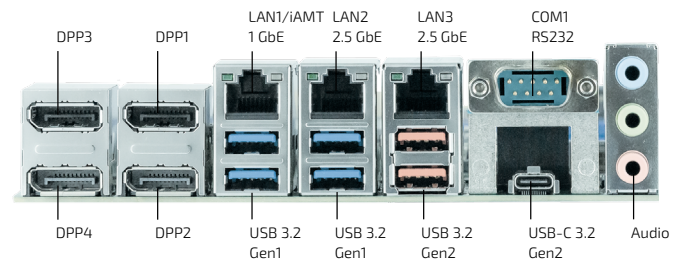
The Industrial Motherboard K3851-R ATX is equipped with the highly performant Intel® R680E Chipset. It also offers a multitude of supporting processors such as the Intel® Core™ i9/i7/i5/i3 (12th Gen) and the Intel® Pentium®/Intel® Celeron® processor series. Designed and approved for 24/7 continuous operation and

an enhanced temperature range up to 60 °C the K3851-R ATX provides high functionality and fits perfect with special requirements of certain markets. It offers iAMT-based Out-of-Band Management features. Besides, K3851-R provides TSN and Realtime support (TCC) for specific industrial applications.

PRODUCT HIGHLIGHTS

- ▶ Intel® 12th Gen Core™ Processor Series
- ▶ DDR5-4800 UDIMM, max. 128 GByte, ECC support
- ▶ cTDP – Easy & flexible reduction of CPU TDP
- ▶ Supporting Intel® iAMT features and Intel® Time Coordinated Computing (TCC)
- ▶ PCI Express® x16 (Gen5 @ CPU, 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 @4k
- ▶ 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)
- ▶ PCI Slot (32 Bit)
- ▶ BIOS-POST/-Boot & OS – HW Watchdog onboard



TECHNICAL INFORMATION

SYSTEM	PROCESSOR	Intel® Core™ i9/i7/i5/i3 (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® R680E Chipset 4 DIMM Sockets DDR5-4800, max. 128 GByte, Dual Channel unbuffered, ECC support 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
AUDIO	AUDIO CODEC AUDIO INTERFACE	Tempo Semiconductor 92HD91B 5.1- channel*, High Definition Audio Codec
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 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
	ETHERNET 2/ETHERNET 3	
PERIPHERAL CONNECTION	USB	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
	SERIAL PORT OTHER I/Os	
STORAGE & EXPANSION	SATA M.2 PCIe/NVME	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 x8: 1x 4 lanes, Gen4 ("open slot")/1x 4 lanes, Gen3 ("closed slot") PCIe x1: 2x Gen3 ("open slots") PCI: 1x 32Bit 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
	M.2 WIRELESS PCIe/PCI SLOTS	
	GPIO	
POWER	CONNECTOR INPUT VOLTAGE	ATX (Multirail) plus 8-pin socket (12 V for CPU)

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

TECHNICAL INFORMATION

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. HW Watchdog support* No legacy OS support, no MBR installation (UEFI only) Recovery BIOS, System and BIOS Password, Boot Sequence Control Integrated TPM V2.0 (Intel® integrated); socket for optional TPM module
SYSTEM CONTROL	WATCHDOG REAL TIME CLOCK TPM FP HEADER	1x Header for Reset button, HDD LED & External Speaker, Power button, Power LED
SOFTWARE	SECURITY	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)
MECHANICAL	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)
ENVIRONMENTAL	DIMENSIONS (L x W)	ATX: 9.6" x 12" (243.8 x 304.8 mm)
CERTIFICATION	OPERATION TEMPERATURE EMC & SAFETY	0 °C - 60 °C Planned: cTUVus acc. IEC62368-1, CE Class B incl. Industrial Immunity, UKCA, FCC-B verified

*) Requires HW Rev. ≥ 02xx

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

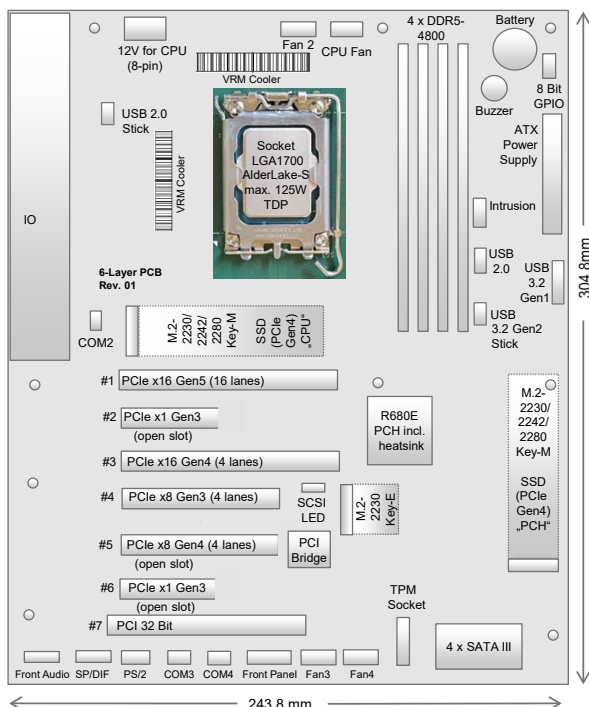
*) Max. motherboard input current incl. processor and DRAM memory. Additional power for drives, USB devices, PCIe cards etc. is not included!
Note: BIOS provides option to reduce CPU TDP/Turbo power in order to use PSU with limited loadability.

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



► TECHNICAL INFORMATION

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	ATX / R680E - / - / + / - / - - / + / + + / + + / + / + + / + / + / + + / + / + / + + / + / + / + + / + / - + / + / + / + + / + / + / + + / + / + / + + / + / -
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 PCIe x8 @4 lanes: Gen4-"open" / Gen3-"closed" PCI Express® x1: Gen3-"open" 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 2 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)

*****) Requires HW Rev. ≥ 02xx

► ORDERING INFORMATION

ARTICLE	PART NO.	DESCRIPTION
K3851-R ATX	F5110-V194	Intel® 12th Gen Core™ Processor Series, Intel® R680E Chipset
ACCESSORIES		
SERIAL PORT CABLE	F5000-K010	400 mm, fullsize slot bracket
M.2 CARRIER BOARD	F5000-M001	D3352-A1

► GLOBAL HEADQUARTERS

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