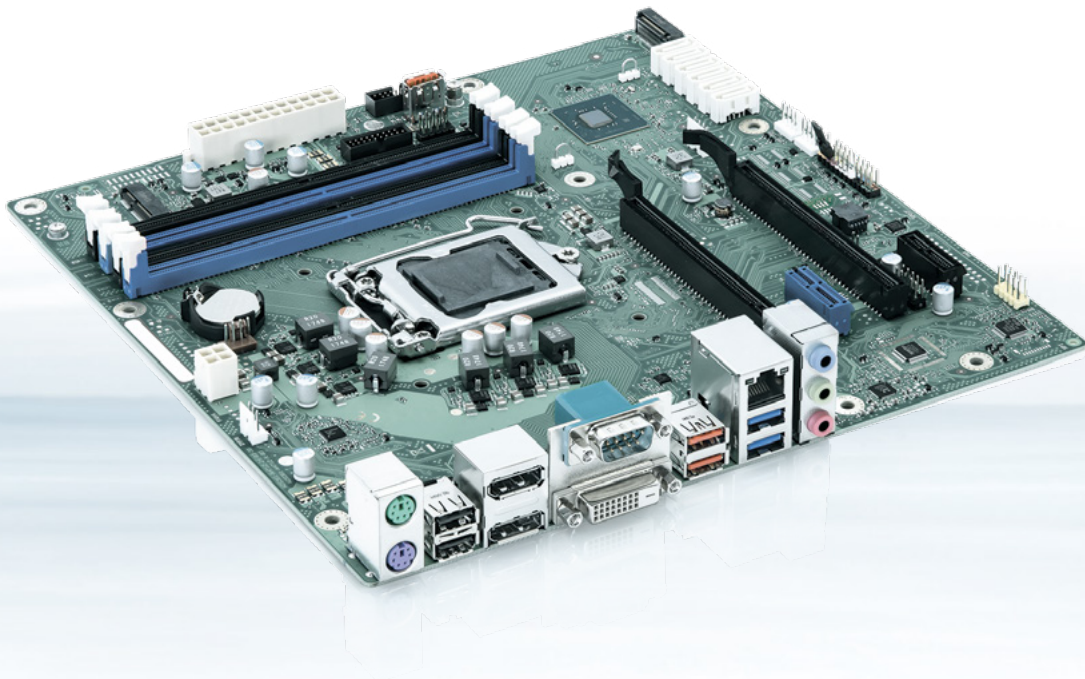


# D3644-B $\mu$ ATX

## Extended Lifecycle Series

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Intel® C246 Express Chipset and  
Intel® Xeon®/Intel® 8th/9th Gen Core™ i3/i5/i7/i9 Processors

- ▶ cTDP – Easy & flexible reduction of CPU TDP
- ▶ Supporting Intel® AMT 12.0/vPro
- ▶ 6x SATA/RAID
- ▶ M.2 SSD & M.2 WLAN Slots onboard
- ▶ Powerful USB 3.1 Gen2

POSSIBILITIES START HERE



## D3644-B µATX

### Extended Lifecycle Series

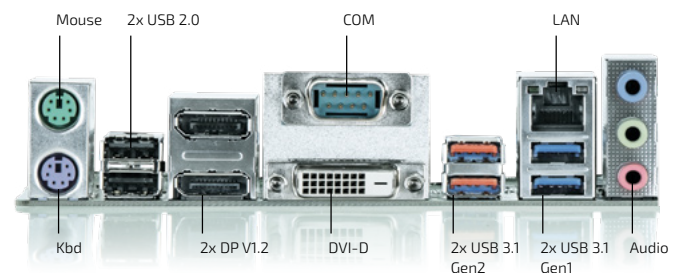
The Motherboard D3644-B µATX of the Extended Lifecycle Series is the best solution for demanding requirements. It supports the Intel® Xeon® E-21xx/E-22xx processor series, the Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) and the Intel® Pentium®/Intel® Celeron®

processor series. The D3644-B µATX is "designed by Fujitsu" and therefore made in Germany. Furthermore, it provides highest performance and functionality while keeping energy consumption at an extraordinary low level.

#### PRODUCT HIGHLIGHTS

- ▶ Intel® 8th/9th Gen Core™ & Intel® Xeon® Processor Series
- ▶ DDR4-2666 SDRAM, max. 64 GByte
- ▶ cTDP – Easy & flexible reduction of CPU TDP
- ▶ Supporting Intel® AMT 12.0/vPro
- ▶ PCI Express® x16 (Gen.3)
- ▶ Intel® GbE LAN
- ▶ Intel® UHD Graphics (DX12); 1x DVI-D, 2x DP V1.2
- ▶ Intel® High Definition 5.1 Audio; Infineon TPM V2.0
- ▶ 1x COM port
- ▶ 4x USB 2.0, 6x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1x USB 3.1 Gen2 stick socket
- ▶ 6x SATA 6G/s incl. RAID support
- ▶ M.2 2280 (PCIe-based SSD modules)

- ▶ M.2 2230 (WLAN/Bluetooth modules)
- ▶ BIOS-POST/-Boot & OS – HW Watchdog onboard



#### TECHNICAL INFORMATION

|                                |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SYSTEM</b>                  | <b>PROCESSOR</b>                            | Intel® Xeon® E-21xx/E-22xx processor series<br>Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) processor series**<br>Intel® Pentium®/Intel® Celeron® processor series<br>Socket LGA1151, max. 95 W TDP<br>(For details on supported processors please refer to Kontron FTP Server)                                                                                                                                                                                                  |
|                                | <b>CHIPSET<br/>MEMORY</b>                   | Intel® C246 Express Chipset<br>4 DIMM Sockets DDR4-2666 (1.2V), max. 64 GByte, Dual Channel<br>DDR4 -2666 (CL19)/-2400 (CL17)/-2133 (CL15) SDRAM, unbuffered, ECC*/non-ECC<br>Effective memory speed depends on installed processor                                                                                                                                                                                                                                        |
| <b>VIDEO</b>                   | <b>GRAPHICS</b>                             | Intel® UHD Graphics (depends on installed processor), DX12<br>2x DP V1.2<br>1x DVI-D<br>VGA output possible via optional VGA extension card D3653-A                                                                                                                                                                                                                                                                                                                        |
| <b>AUDIO</b>                   | <b>AUDIO CODEC<br/>AUDIO INTERFACE</b>      | Realtek ALC671<br>5.1- channel, High Definition Audio Codec                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>NETWORK CONNECTION</b>      | <b>ETHERNET</b>                             | Intel® i219LM with 10/100/1000 MBit/s<br>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<br/>SERIAL PORT</b>                  | 4x USB 2.0, 6x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1x USB 3.1 Gen2 stick socket<br>1x RS232 (by header)                                                                                                                                                                                                                                                                                                                                                                         |
| <b>STORAGE &amp; EXPANSION</b> | <b>SATA</b>                                 | 6x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, RAID 0/1/5/10,                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                | <b>PCIe/PCI SLOTS</b>                       | 1x M.2 PCIe (2280), 1x M.2 Key-E (2230)<br>PCIe x16: 1x 16 lanes, Gen3/1x 4 lanes, Gen3<br>PCIe x1: 1x Gen3, "open"/1x 1 lane, Gen3, "closed"                                                                                                                                                                                                                                                                                                                              |
| <b>POWER</b>                   | <b>CONNECTOR<br/>INPUT VOLTAGE</b>          | ATX- 24 Pin or ATX- 20 Pin + 4 Pin (12 V) Power Connector required<br>12 V and 3.3 V Supply Voltage on PCIe Slots<br>3.3 V Auxiliary Supply Voltage on PCIe Slots (Wake-Up Function)                                                                                                                                                                                                                                                                                       |
| <b>FIRMWARE</b>                | <b>BIOS</b>                                 | AMI Aptio 5.x (UEFI) BIOS<br>modified and adapted by Fujitsu Technology Solutions; 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 & BIOS integrated HW Diagnostic Tool. No legacy OS support, no MBR installation (UEFI only due to Intel restrictions) |
|                                | <b>WATCHDOG<br/>REAL TIME CLOCK<br/>TPM</b> | Recovery BIOS, System and BIOS Password, Boot Sequence Control<br>Integrated<br>TPM V2.0 (Infineon SLB9670; TCG compliant)                                                                                                                                                                                                                                                                                                                                                 |

## TECHNICAL INFORMATION

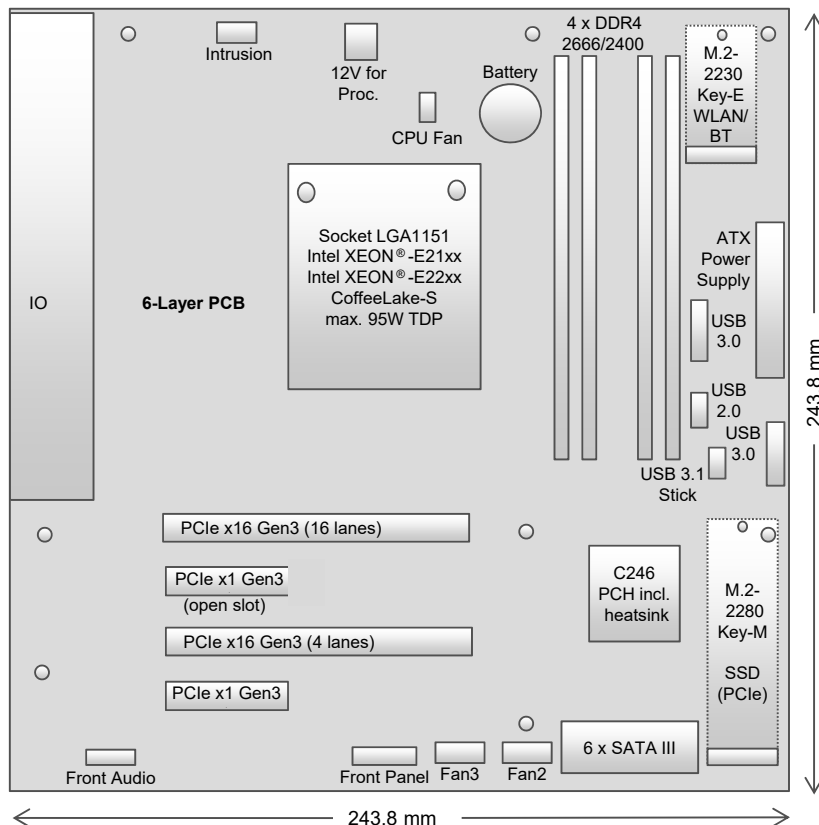
|                |                       |                                                                                                                                                                                                                                                                                                                           |
|----------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYSTEM CONTROL | FP HEADER             | 1x Header for Reset button, HDD LED & External Speaker                                                                                                                                                                                                                                                                    |
|                | SECURITY              | 1x Header for Power button, Power LED<br>Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial/USB- Port Access Protection, Boot Sector Virus Warning, Write Protection for Flash BIOS, EraseDisk (optional BIOS Feature), Infineon Trusted Platform Module (TPM) V2.0 (Infineon SLB9670i TCG compliant) |
| SOFTWARE       | OS SUPPORT            | MS Windows 10<br>Linux-64                                                                                                                                                                                                                                                                                                 |
| MECHANICAL     | DIMENSIONS (L x W)    | µATX: 9.6" x 9.6" (243.8 x 243.8 mm)                                                                                                                                                                                                                                                                                      |
| ENVIRONMENTAL  | OPERATION TEMPERATURE | 10 °C - 50 °C                                                                                                                                                                                                                                                                                                             |
| CERTIFICATION  | EMC & SAFETY          | cTÜVus acc. IEC62368-1, CE Class B, 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   | 0.05 A       | ± 5 %                  | 5.000 µF                    | 10 A / 18 A*                          |
|                   | - 12 V   | 0 A          | ± 10 %                 | 470 µF                      | 0.3 A                                 |
|                   | + 5 V    | 0.2 A        | ± 5 %                  | 3.000 µF                    | 6.0 A                                 |
|                   | + 3.3 V  | 0 A          | ± 5 %                  | 3.000 µF                    | 0.5 A                                 |
| Aux               | + 5 Vaux | 0 A          | + 5 % / - 3 %          | 3.000 µF                    | 2.5 A                                 |

\*) Processor 95 W TDP: Max. Cont. Current = 10 A; max. Surge Current = 16 A (< 100sec) / 18 A (< 10ms)  
 Processor 65 W TDP: Max. Cont. Current = 7 A; max. Surge Current = 14 A (< 100sec) / 18 A (< 10ms)  
 Processor 35 W TDP: Max. Cont. Current = 4 A; max. Surge Current = 10 A (< 100sec) / 14 A (< 10ms)

## CONNECTOR / SOCKET DIAGRAM



## ► TECHNICAL INFORMATION

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                              |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FEATURES</b>            | Board Size / Chipset<br>VGA* / DVI-I / DVI-D / DP V1.2 / 2nd DP V1.2 / LVDS<br>Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio<br>Buzzer / int. Speaker Support (mono)<br>LAN Gbit / 100 Mbit / 10 Mbit / WoL / LAN Boot / Teaming<br>AMT 12.0 vPro / Intel Standard Manageability / DASH V1.1<br>SATA / SATA RAID / eSATA Support / mSATA / M.2 SSD (PCIe)<br>USB 2.0 / USB 3.1 Gen1 / USB 3.1 Gen2<br>FAN controlled & monitored PSU** / CPU / AUX1 / AUX2 / AUX3<br>TEMP monitored CPU / Onboard Sensors / External Sensor                                                                                                                                                                                                                                                 | µATX / iC246<br>- / - / + / + / + / -<br>- / + / +<br>+ / + / + / + / + / -<br>+ / + / +<br>+ / + / + / - / +<br>+ / + / +<br>- / + / + / + / -<br>+ / + / - |
| <b>SPECIAL FEATURES</b>    | Silent Fan / System Guard / cTDP<br>Recovery BIOS / Desk Update / Multi Boot<br>HDD Password / EraseDisk*** / TPM V2.0<br>BIOS POST Watchdog / BIOS Boot Watchdog / OS HW Watchdog<br>Logo Boot Option<br>High Efficiency Core Voltage Regulator Design<br>Operating Mode 24-7 / 8-5 (hrs per day - days per week)<br>Motherboard operating temperature range (chassis inside)****                                                                                                                                                                                                                                                                                                                                                                                                      | + / + / +<br>+ / + / +<br>+ / + / +<br>+ / + / +<br>+<br>+<br>+ / -<br>10 °C – 50 °C                                                                         |
| <b>INTERNAL CONNECTORS</b> | DIMM Sockets (DDR4 2666MHz)<br>PCI Express® x16: 16lanes-gen3 / PCI Express® x16: 4lanes-gen3<br>PCI Express® x1: gen3-"open" / PCI Express® x1: gen3-1 lane-"closed"<br>PCI Slots (32 Bit, 33 MHz, Rev. 2.3) / Mini-PCIe<br>SATA-600 / mSATA / M.2 SSD 2280 (Key-M, PCIe/NVME)<br>M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth)<br>S/PDIF (digital Audio) OUT / IN<br>Front Panel Audio (9-Pin, HD Audio)<br>USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2) / USB 3.1 (Gen2) Stick*****<br>FAN PSU / CPU / AUX1 / AUX2 / Aux3<br>Intrusion (Case Open) / GPIO (8Bit) / SM-Bus (Case Temp.)<br>Serial (COM, RS-232) / Parallel Port Pin Header<br>Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin compatible)<br>ATX Power Supply (24 pin + 4 pin) / 12 V-only Power Supply | 4<br>1 / 1<br>1 / 1<br>- / -<br>6 / - / 1<br>1<br>- / -<br>1<br>1 / 2 / - / 1<br>- / 1 / 1 / 1 / -<br>1 / - / -<br>- / -<br>1<br>+ / -                       |
| <b>EXTERNAL CONNECTORS</b> | VGA Sub D* / DVI-I / DVI-D / DP V1.2<br>Audio Mic. In / Line in / Line out (or driver configuration)<br>LAN (RJ-45)<br>PS/2 Mouse / Keyboard<br>USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2)<br>Serial (COM1, RS-232)<br>Parallel (EPP/ECP)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | - / - / 1 / 2<br>1 / 1 / 1<br>1<br>1 / 1<br>2 / 2 / 2<br>1<br>-                                                                                              |

\*) VGA possible via optional Extension Card D3653-A or DP-VGA-converter (dongle)

\*\*) Not supported by standard Power Supplies

\*\*\*) Planned for factory shipments from 05/2019

\*\*\*\*) Forced cooling required, see technical documentation for details

\*\*\*\*\*) Each internal USB connector (pin header) provides two USB ports (except for USB stick socket)

## ► ORDERING INFORMATION

| ARTICLE            | PART NO.   | DESCRIPTION                                                                   |
|--------------------|------------|-------------------------------------------------------------------------------|
| D3644-B µATX       | F5110-V162 | Intel® 8th/9th Gen Core™ & Intel® Xeon® processor series, Intel® C246 Chipset |
| <b>ACCESSORIES</b> |            |                                                                               |
| VGA EXTENSION CARD | F5000-R9   | D3653-A                                                                       |
| M.2 CARRIER BOARD  | F5000-M1   | D3352-A1                                                                      |

## ► Global Headquarters

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