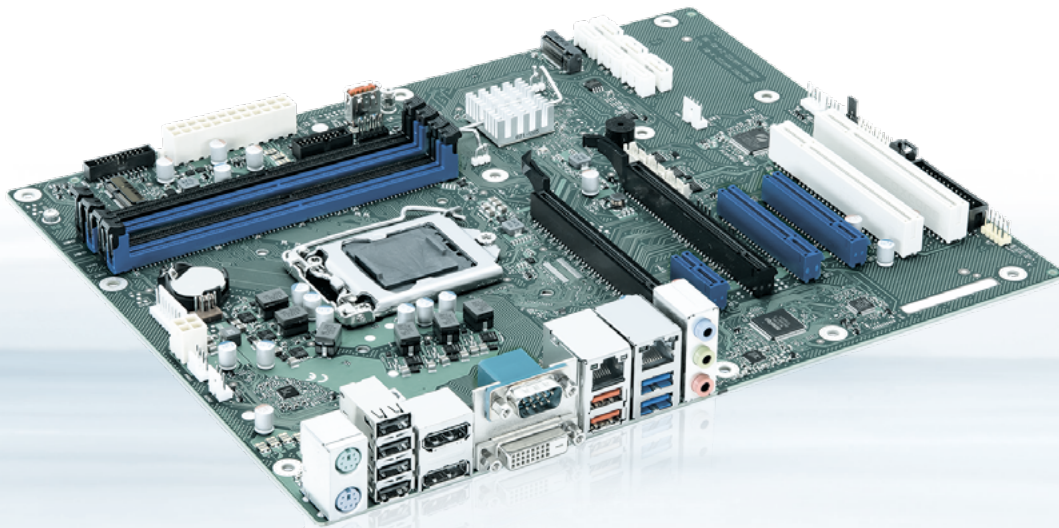


# D3646-S ATX

## Industrial 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
- ▶ Dual LAN, 4x COM, GPIO & 2x PCI
- ▶ M.2 SSD & M.2 WLAN Slots onboard
- ▶ HW Watchdog
- ▶ Powerful USB 3.1 Gen2

POSSIBILITIES START HERE

# D3646-S ATX

## Industrial Series

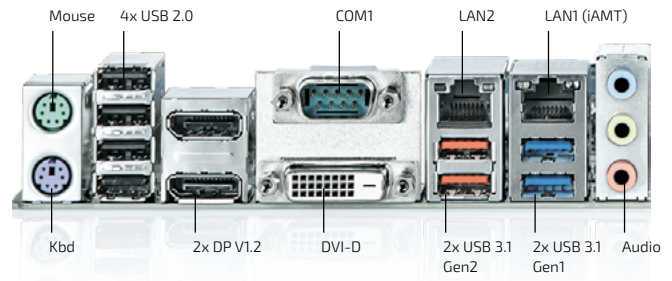
Besides assured extended availability for a minimum of five years, the Motherboard D3646-S ATX of the Industrial Series provides support for highly performant Intel® Xeon® E-21xx/E-22xx processors, Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) processors and Intel®

Pentium®/Intel® Celeron® processors. It also offers latest Intel® AMT 12.0 and vPro manageability. It is particularly suitable for applications like workstations and entry-level servers, various medical applications and applications with high-performance needs.

### ▶ 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) & 2x PCI (32 Bit/33 MHz Rev. 2.3)
- ▶ 2x Intel® GbE LAN (incl. Teaming)
- ▶ Intel® UHD Graphics (DX12); 1x DVI-D, 2x DP V1.2
- ▶ Intel® High Definition 5.1 Audio; Infineon TPM V2.0
- ▶ 8 Bit GPIO; 4x COM ports, HW watchdog
- ▶ 6x USB 2.0, 4x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1x USB 3.1 Gen2 stick socket
- ▶ 6x SATA 6G incl. RAID support, parallel port (internal pin header)

- ▶ 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 Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) processor series Intel® Pentium®/Intel® Celeron® processor series Socket LGA1151, max. 95 W TDP (For details on supported processors please refer to Kontron FTP Server)
	<b>CHIPSET</b>	Intel® C246 Express Chipset
	<b>MEMORY</b>	4 DIMM Sockets DDR4-2666 (1.2 V), max. 64 GByte, Dual Channel DDR4 -2666 (CL19)/-2400 (CL17)/-2133 (CL15) SDRAM, unbuffered, ECC/non-ECC Note: 128 GByte memory configuration (4x 32 GByte modules) not supported Effective memory speed depends on installed processor
<b>VIDEO</b>	<b>GRAPHICS</b>	Intel® UHD Graphics (depends on installed processor), DX12 2x DisplayPort V1.2 & 1x DVI-D VGA output possible via optional VGA extension module D3653
<b>AUDIO</b>	<b>AUDIO CODEC</b>	Realtek ALC671
	<b>AUDIO INTERFACE</b>	5.1- channel, High Definition Audio Codec
<b>NETWORK CONNECTION</b>	<b>ETHERNET</b>	Intel i219LM & i210AT with 10/100/1000 MBit/s, AMT 12.0/vPro Support Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support
<b>PERIPHERAL CONNECTION</b>	<b>USB</b>	6x USB 2.0, 4x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1x USB 3.1 Gen2 stick socket
	<b>SERIAL PORT</b>	1x RS232 + 3x by header
	<b>OTHER I/Os</b>	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>STORAGE &amp; EXPANSION</b>	<b>SATA</b>	6x Serial ATA III 600 Interface (up to 6 GBit/s), NCQ, AHCI, RAID 0/1/5/10, 1x M.2 PCIe (2280), 1x M.2 Key-E (2230)
	<b>PCIe/PCI SLOTS</b>	PCIe x16: 1x 16 Lanes, Gen3/1x 4 Lanes, Gen3 PCIe x8: 2x 1 Lane, "open", Gen3 PCIe x1: 1x "open", Gen3 PCI: 2x
<b>POWER</b>	<b>CONNECTOR</b>	ATX Power Supply (24+4 Pin)
<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 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) Recovery BIOS, System and BIOS Password integrated TPM V2.0 (Infineon SLB9670; TCG compliant)
	<b>WATCHDOG</b>	
	<b>REAL TIME CLOCK</b>	
	<b>TPM</b>	

## TECHNICAL INFORMATION

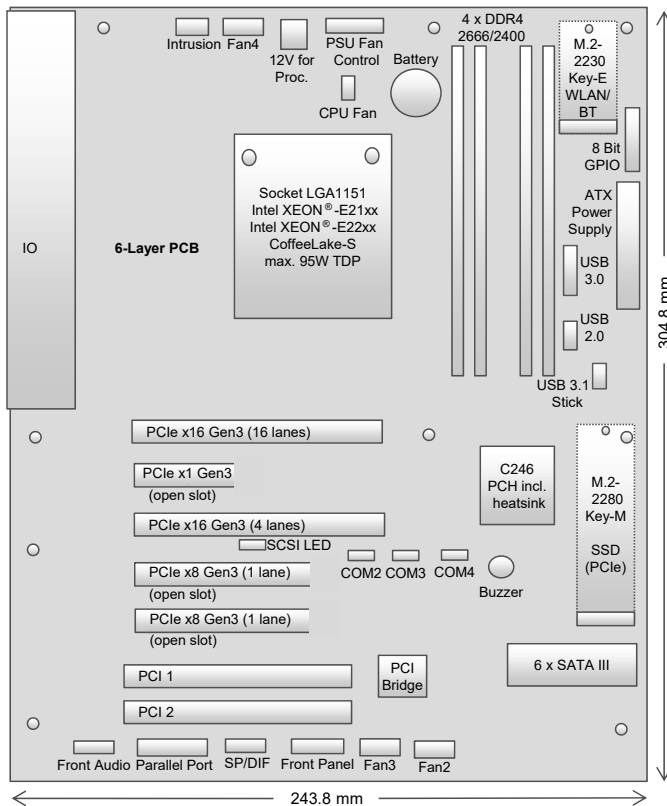
<b>SYSTEM CONTROL</b>	<b>FP HEADER</b>	1x Header for Reset button, HDD LED & External Speaker, Power button, Power LED Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial/USB- Port Access Protection, Write Protection for Flash BIOS, EraseDisk Infineon Trusted Platform Module (TPM)
	<b>SECURITY</b>	
<b>SOFTWARE</b>	<b>OS SUPPORT</b>	MS Windows 10 Linux-64
<b>MECHANICAL</b>	<b>DIMENSIONS (L x W)</b>	ATX: 9.6" x 12" (243.8 x 304.8 mm)
<b>ENVIRONMENTAL</b>	<b>OPERATION TEMPERATURE</b>	0 °C - 60 °C
<b>CERTIFICATION</b>	<b>EMC &amp; SAFETY</b>	cTÜVus acc. IEC62368-1 CE Class B Industrial Immunity, 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 (< 100 sec) / 18 A (< 10 ms)  
 Processor 65 W TDP: Max. Cont. Current = 7 A; max. Surge Current = 14 A (< 100 sec) / 18 A (< 10 ms)  
 Processor 35 W TDP: Max. Cont. Current = 4 A; max. Surge Current = 10 A (< 100 sec) / 14 A (< 10 ms)

## CONNECTOR / SOCKET DIAGRAM



## ▶ TECHNICAL INFORMATION

<b>FEATURES</b>	Board Size / Chipset VGA* / DVI-I / DVI-D / DP V1.2 / 2nd DP V1.2 / LVDS Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio Buzzer / int. Speaker Support (mono) Dual LAN Gbit / 100 Mbit / 10 Mbit / WoL / LAN Boot / Teaming AMT 12.0 vPro / Intel Standard Manageability / DASH V1.1 SATA / SATA RAID / eSATA Support / mSATA / M.2 SSD (PCIe) USB 2.0 / USB 3.1 Gen1 / USB 3.1 Gen2 FAN controlled & monitored PSU** / CPU / AUX1 / AUX2 / AUX3 TEMP monitored CPU / Onboard Sensors / External Sensor	ATX / iC246 - / - / + / + / + / - - / + / + + / + + / + / + / + / + / + + / + / - + / + / + / - / + + / + / + + / + / + / + / + + / + / -
<b>SPECIAL FEATURES</b>	Silent Fan / System Guard / cTDP Recovery BIOS / Desk 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
<b>INTERNAL CONNECTORS</b>	DIMM Sockets (DDR4 2666MHz) PCI Express® x16: 16lanes-gen3 / PCI Express® x16: 4lanes-gen3 PCI Express® x1: gen3-"open" / PCI Express® x8: gen3-1 lane-"open" PCI Slots (32 Bit, 33 MHz, Rev. 2.3) / Mini-PCIe SATA-600 / mSATA / M.2 SSD 2280 (Key-M, PCIe/NVME) 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 3.1 (Gen1) / USB 3.1 (Gen2) / USB 3.1 (Gen2) Stick**** FAN PSU / CPU / AUX1 / AUX2 / Aux3 Intrusion (Case Open) / GPIO (8Bit) / SM-Bus (Case Temp.) Serial (COM, RS-232) / Parallel Port Pin Header***** Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin compatible) ATX Power Supply (24 pin + 4 pin) / Single 12 V Power Supply	4 1 / 1 1 / 2 2 / - 6 / - / 1 1 1 / - 1 1 / 1 / - / 1 1 / 1 / 1 / 1 / 1 1 / 1 / - 3 / 1 1 + / -
<b>EXTERNAL CONNECTORS</b>	VGA Sub D <sup>2</sup> / DVI-I / DVI-D / DisplayPort V1.2 Audio Mic. In / Line in / Line out (or driver configuration) LAN (RJ-45) PS/2 Mouse / Keyboard USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2) Serial (COM1, RS-232) Parallel (EPP/ECP)***	- / - / 1 / 2 1 / 1 / 1 2 1 / 1 4 / 2 / 2 1 -

\*) VGA possible via optional converter board D3653 or DP-VGA-converter (dongle)

\*\*\*) Not supported by standard Power Supplies

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

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

\*\*\*\*\*) External parallel port possible via optional connector cable

## ▶ ORDERING INFORMATION

ARTICLE	PART NO.	DESCRIPTION
D3646-S ATX	F5110-V164	Intel® 8th/9th Gen Core™ Processor Series, Intel® C246 Chipset
<b>ACCESSORIES</b>		
VGA EXTENSION CARD	F5000-R009	D3653-A
SERIAL PORT CABLE	F5000-K010	400 mm, fullsize slot bracket
M.2 CARRIER BOARD	F5000-M001	D3352-A1

## ▶ GLOBAL HEADQUARTERS

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