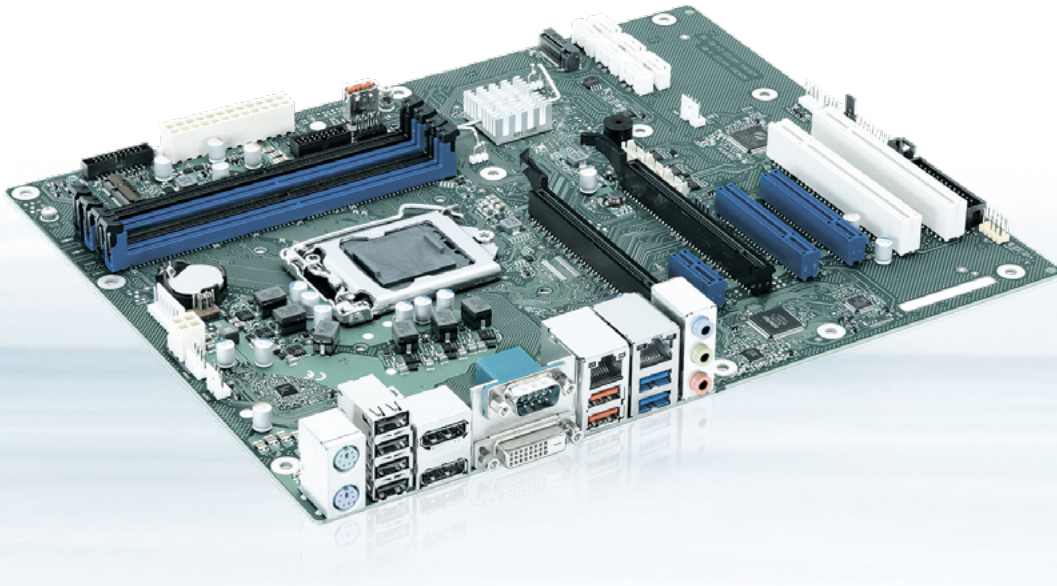


D3646-S ATX

Industrial Series



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

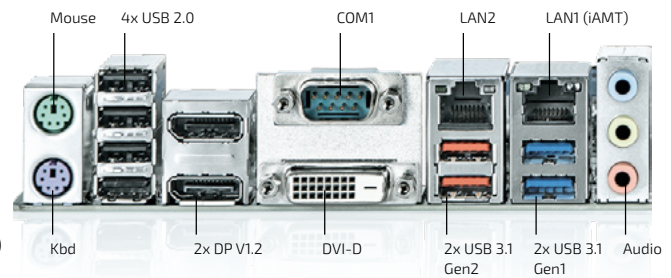
Besides assured extended availability for a minimum of five years, the Motherboard D3646-S ATX of the Industrial Series provides support for highly performant Intel® Xeon® E-21xx/E-22xx processors, Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) processors and Intel®

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/s 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

SYSTEM	PROCESSOR	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)
	CHIPSET	Intel® C246 Express Chipset
	MEMORY	4 DIMM Sockets DDR4-2666 (1.2 V), max. 64 GByte, Dual Channel DDR4 -2666 (CL19)/-2400 (CL17)/-2133 (CL15) SDRAM, unbuffered, ECC1 / non-ECC Effective memory speed depends on installed processor
VIDEO	GRAPHICS	Intel® UHD Graphics (depends on installed processor), DX12 2x DisplayPort V1.2 & 1x DVI-D VGA output possible via optional VGA extension module D3653
AUDIO	AUDIO CODEC	Realtek ALC671
	AUDIO INTERFACE	5.1- channel, High Definition Audio Codec
NETWORK CONNECTION	ETHERNET	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
PERIPHERAL CONNECTION	USB	6x USB 2.0, 4x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1x USB 3.1 Gen2 stick socket
	SERIAL PORT	1x RS232 + 3x by header
	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	6x Serial ATA III 600 Interface (up to 6 GBit/s), NCQ, AHCI, RAID 0/1/5/10,
	PCIe/PCI SLOTS	1x M.2 PCIe (2280), 1x M.2 Key-E (2230) PCIe x16: 1x 16 Lanes, Gen3/1x 4 Lanes, Gen3 PCIe x8: 2x 1 Lane, "open", Gen3 PCIe x1: 1x "open", Gen3 PCI: 2x
POWER	CONNECTOR	ATX Power Supply (24+4 Pin)
FIRMWARE	BIOS	AMI Aptio 5.x (UEFI) BIOS 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) Recovery BIOS, System and BIOS Password integrated TPM V2.0 (Infineon SLB9670; TCG compliant)
	WATCHDOG	
	REAL TIME CLOCK	
	TPM	

► TECHNICAL INFORMATION

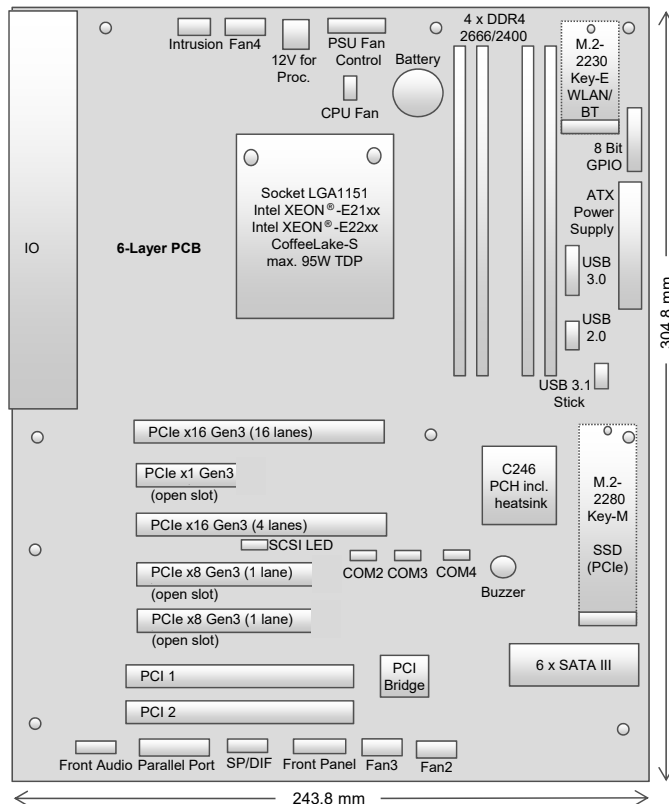
SYSTEM CONTROL	FP HEADER	1x Header for Reset button, HDD LED & External Speaker, Power button, Power LED Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial/USB- Port Access Protection, Boot Sector Virus Warning, Write Protection for Flash BIOS, EraseDisk Infineon Trusted Platform Module (TPM)
	SECURITY	
SOFTWARE	OS SUPPORT	MS Windows 10 Linux-64
MECHANICAL	DIMENSIONS (L x W)	ATX: 9.6" x 12" (243.8 x 304.8 mm)
ENVIRONMENTAL	OPERATION TEMPERATURE	10 °C - 60 °C
CERTIFICATION	EMC & SAFETY	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

FEATURES	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 - / - / + / + / + / - - / + / + + / + + / + / + / + / + / + + / + / - + / + / + / - / + + / + / + + / + / + / + / + + / + / -
SPECIAL FEATURES	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
INTERNAL CONNECTORS	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 + / -
EXTERNAL CONNECTORS	VGA Sub D ² / 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
ACCESSORIES		
VGA EXTENSION CARD	F5000-R9	D3653-A
SERIAL PORT CABLE	F5000-K10	400 mm, fullsize slot bracket
M.2 CARRIER BOARD	F5000-M1	D3352-A1

► Global Headquarters

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