

Data Sheet

FUJITSU Mainboard D3646-S ATX

Industrial Series

Powered by the Intel® C246 Express Chipset supporting DDR4-2666 SDRAM Memory and Intel® XEON® / Intel® 8th & 9th generation Core™ i3 / i5 / i7 / i9 Processors. Designed & approved for enhanced operating temperature range from 0°C to 60°C. Designed and approved for 24/7 continuous operation



Chipset:

Intel® C246 Express Chipset

Processors:

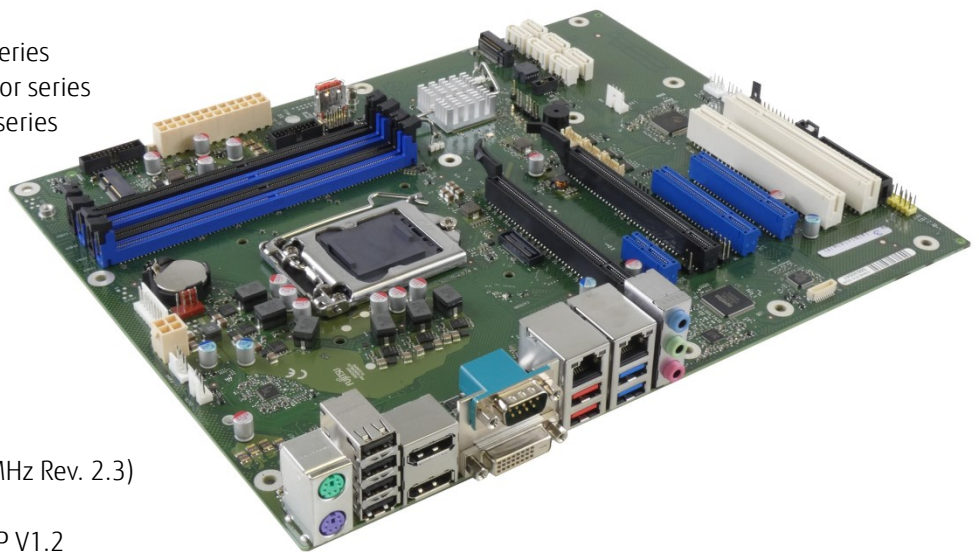
Intel® XEON® E-21xx processor series
 Intel® Core™ i7 / i5 / i3 (8th gen.) processor series
 Intel® Core™ i9 / i7 / i5 / i3 (9th gen.) processor series
 Intel® Pentium® / Intel® Celeron® processor series
 Socket LGA1151 – up to 95W TDP

Memory:

DDR4-2666, Dual Channel, ECC support
 4 DIMM sockets, up to 64GB memory

Product Features:

cTPD – Easy & flexible reduction of CPU TDP
 Supporting Intel AMT 12.0 / vPro
 PCI Express x16 (Gen.3) & 2 x PCI (32Bit/33MHz 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; 4 x COM ports, HW watchdog
 6x USB 2.0, 4x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1 x 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



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Features and benefits

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|----------------------------------|--|
| Board Size | ATX: 9.6" x 12" (243.8 x 304.8 mm) |
| Chipset | Intel® C246 Express Chipset |
| Memory | 4 DIMM Sockets DDR4-2666 (1.2V), max. 64GB, Dual Channel DDR4 -2666 (CL19) / -2400 (CL17) / -2133 (CL15) SDRAM, unbuffered, ECC ¹ / non-ECC Effective memory speed depends on installed processor |
| Processor | Intel® XEON® E-21xx processor series Intel® Core™ i7 / i5 / i3 (8 th generation) processor series Intel® Core™ i9 / i7 / i5 / i3 (9 th generation) processor series ² Intel® Pentium® / Intel® Celeron® processor series Socket LGA1151, max. 95W TDP (For details on supported processors please refer to OEM FTP Server) |
| Power Specification | ATX- 24 Pin or ATX- 20 Pin + 4 Pin (12V) Power Connector required Support for Soft-Off Power Supplies 12V and 3.3V Supply Voltage on PCIe Slots 3.3V Auxiliary Supply Voltage on PCIe Slots (Wake-Up Function) On board high-efficiency CPU Voltage Regulator, 5V / 2.5A Auxiliary Power required for USB Wake-Up from Save-to-RAM, Save-to-Disk |
| Power Supply Requirements | for mainboard only - worst case incl. processor & memory; w/o USB devices; w/o PCIe cards; w/o SATA drives; w/o M.2 devices |

| Source | Voltage | Min. PS Load | Max.Voltage Tolerance | Mainboard Capacitive Load | Max. Mainboard Current |
|-------------------|---------|--------------|-----------------------|---------------------------|------------------------|
| Main Power Supply | + 12V | 0.05A | ± 5 % | 5.000µF | 10A/18A ¹⁾ |
| | - 12V | 0A | ± 10 % | 470µF | 0.3A |
| | + 5V | 0.2A | ± 5 % | 3.000µF | 6.0A |
| | + 3.3V | 0A | ± 5 % | 3.000µF | 0.5A |
| Aux. Power | + 5Vaux | 0A | +5 % / -3% | 3.000µF | 2.5A |

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

| | |
|-------------|---|
| 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) |
|-------------|---|

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|--------------------------|--|
| Security Features | Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial-/ Parallel-/ USB- Port Access, Boot Sector Virus Warning, Write Protection for Flash BIOS, Erase Disk (BIOS Feature); TPM V2.0 (Infineon; TCG compliant). |
|--------------------------|--|

1 ECC support for Intel XEON, Celeron, Pentium, and Core i3 processors

2 Appropriate BIOS version supporting CoffeeLake-Refresh processors required

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|--|--|--|-------------------------------------|
| Special Features | cTDP | Easy & flexible reduction of CPU TDP (BIOS Setup) down to 10W TDP | |
| | Silent Fan | Independent temperature related processor fan and system fan supervision and control | |
| | System Guard | View Silent Fan features | |
| | Recovery BIOS | Restores a corrupted BIOS | |
| | Desk Update | Simple driver update with Driver & Utilities DVD | |
| | Multi Boot | Comfortable boot from any boot device | |
| | HDD Password | Access protection for disk drives / M.2 SSD modules | |
| | Always On | Reliable power-on whenever voltage is connected | |
| | Never Off | Option to prevent the system from being shut down | |
| CSA / UL compliance | cTÜVus acc. IEC62368-1 | | |
| FCC compliance | FCC-B verified (planned) | | |
| Operating Systems | OS | "Runnable" | "Tested/Released by Fujitsu" |
| | MS Windows 10 RS3/RS4/RS5 | X | X |
| | Linux-64 | X | |
| Important Note: Legacy OS / MBR installation (DOS, MS Windows 7, ...) is not supported due to Intel restrictions | | | |
| Designed for Industrial Applications | Longlife components | Designed for 24/7 use in industrial applications | |
| | Revision control | Strict control and pre-announcements | |
| | Extended lifecycle up to 6 years | Mainboard available for more than five years | |
| | Industrial grade EMI immunity | | |
| | Enhanced operating temperature range (0°C-60°C) ³ | | |
| Graphics | Intel® UHD Graphics (depends on installed processor), DX12 2 x DisplayPort V1.2 & 1 x DVI-D VGA output possible via optional VGA extension module D3653 | | |
| Audio | Realtek ALC671, 5.1- channel, High Definition Audio Codec | | |
| TPM | TPM V2.0 (Infineon SLB9670; TCG compliant) | | |
| LAN | 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 | | |
| SATA Ports | 6 x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, RAID 0/1/5/10 | | |
| PCI / PCI Bridge | Pericom PI7C9X118SL PCIe to PCI Bridge; 2 x PCI slot For 5V-only and 3.3V/5V universal PCI cards (PCI Rev. 2.3; 32Bit/33MHz) | | |
| M.2 Sockets | M.2 2280 Key-M for PCIe-based SSD NVME modules; 4 x PCIe Gen3 lanes M.2 2230 Key-E for PCIe/USB-based WLAN/Bluetooth modules; 1 x PCIe Gen3, 1 x USB2.0 | | |
| GPIO Port | 8 Bit GPIO (Input/Output); WLAN LED support, WLAN enable/disable support 3.3V / 5V / 12V supply voltage output; SMBus controller PCA9554A | | |
| Legacy Ports | 1 x internal Parallel Port (pin header) 1 x external RS-232 port 3 x internal RS-232 ports (pin header, 2mm pitch) 1 x PS/2 (mouse) / 1 x PS/2 (keyboard) | | |

³ Forced cooling required, see technical documentation for detailed requirements

| | | |
|---|---|---|
| Features D3646-S | Chipset / Board Size | iC246 / ATX |
| | VGA ⁴ / DVI-I / DVI-D / DP V1.2 / 2 nd DP V1.2 / LVDS | - / - / ✓ / ✓ / ✓ / ✓ / - |
| | Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio | - / ✓ / ✓ |
| | Buzzer / internal 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 monitored & controlled PSU ⁵ / CPU / AUX1 / AUX2 / Aux3 | ✓ / ✓ / ✓ / ✓ / ✓ / ✓ |
| | TEMP monitored CPU / onboard sensors / external sensor | ✓ / ✓ / ✓ / - |
| Special Features D3646-S | 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 / Intel On Screen Branding | ✓ / ✓ |
| | High Efficiency Core Voltage Regulator Design | ✓ |
| | Operating Mode 24-7 / 8-5 (hrs per day - days per week) | ✓ / - |
| | Mainboard operating temperature range (chassis inside) ⁶ | 0°C – 60°C |
| | Internal Connectors D3646-S | DIMM Sockets (DDR4-2666) |
| PCI Express x16 (16 Lanes, Gen3) / PCI Express x16 (4 Lanes, Gen3) | | 1 / 1 |
| PCI Express x1 (Gen3, "open") / PCI Express x8 (Gen3, 1 lane, "open") | | 1 / 2 |
| PCI Slots (32Bit, 33 MHz, Rev. 2.3) / Mini-PCIe | | 2 / - |
| SATA-600 / mSATA / M.2 SSD 2280 (Key-M, PCIe/NVME) | | 6 / - / 1 |
| M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth) | | 1 |
| S/PDIF (digital Audio) OUT / IN | | 1 / - |
| Front Panel Audio (9-Pin, HD Audio) | | 1 |
| USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2) / USB 3.1 (Gen2) Stick ⁷ | | 1 / 1 / - / 1 |
| FAN PSU / CPU / AUX1 / AUX2 / Aux3 | | 1 / 1 / 1 / 1 / 1 |
| Intrusion (Case Open) / GPIO ⁸ (8Bit) / SM-Bus (Case Temp.) | | 1 / 1 / - |
| Serial (COM, RS-232) / Parallel Port Pin Header ⁸ | | 3 / 1 |
| Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin compatible) | | 1 |
| ATX Power Supply (24 pin + 4 pin) / 12V-only Power Supply | | ✓ / - |
| External Connectors D3646-S | | VGA Sub D ² / DVI-I / DVI-D / DisplayPort V1.2 |
| | Audio Mic. In / Line in / Line out (or driver configuration) | 1 / 1 / 1 |
| | LAN (RJ-45) | 2 |
| | PS/2 Mouse / Keyboard | 1 / 1 |
| | USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2) | 4 / 2 / 2 |
| | Serial (COM1, RS-232) | 1 |
| | Parallel (EPP/ECP) ⁶ | - |

⁴ VGA possible via optional converter board D3653 or DP-VGA-converter (dongle)

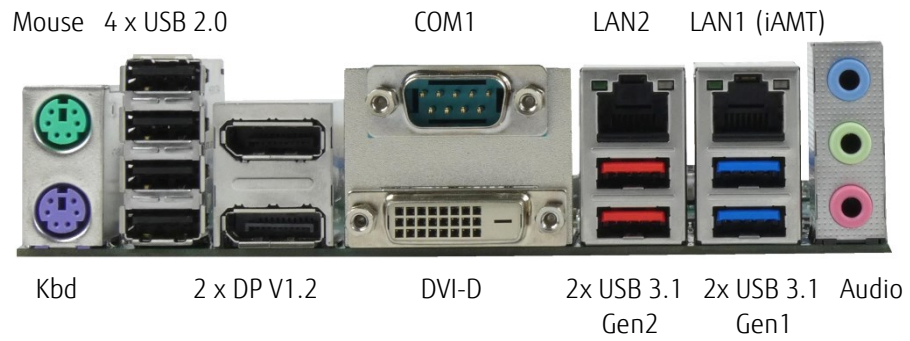
⁵ Not supported by standard Power Supplies

⁶ Forced cooling required, see technical documentation for details

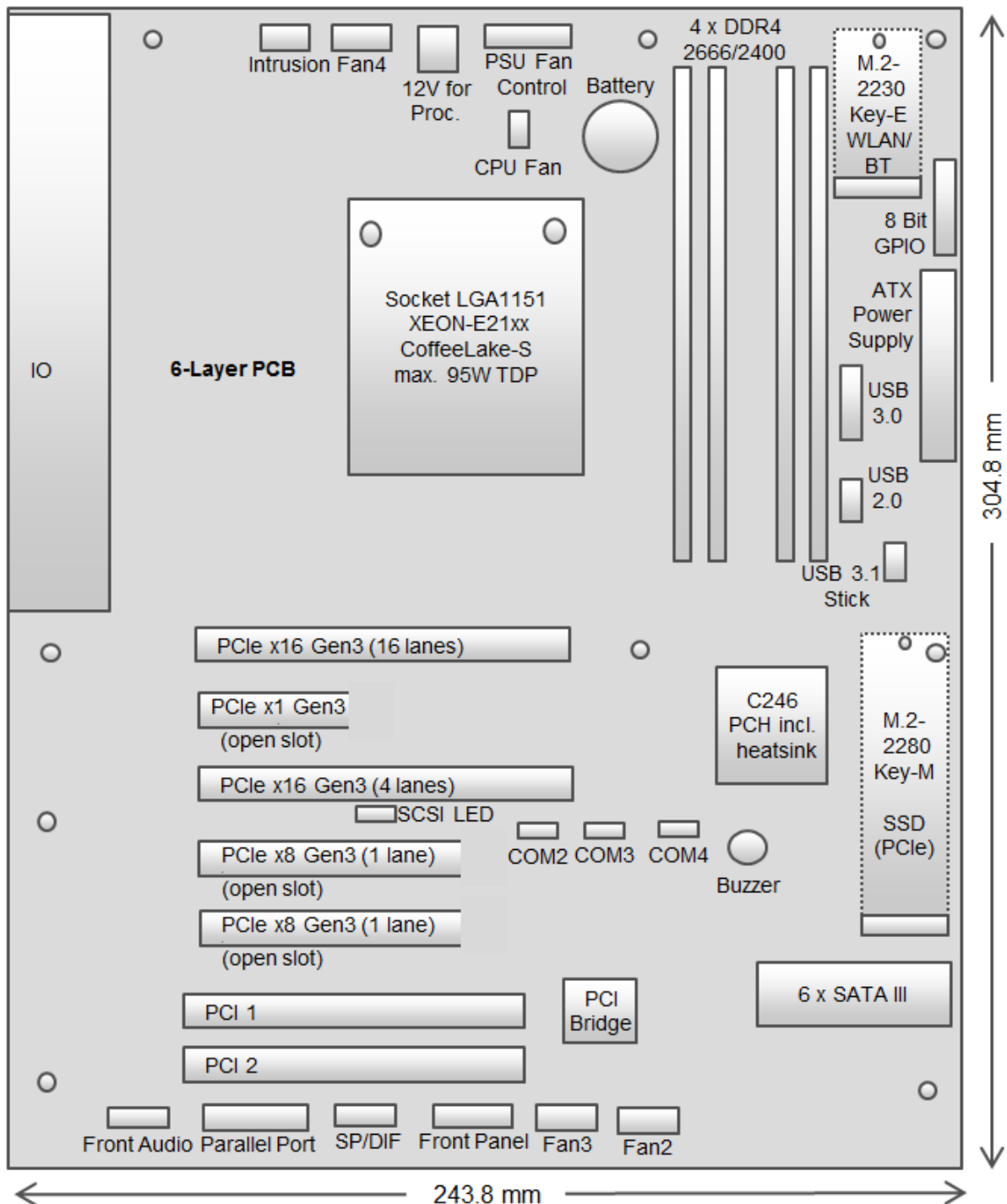
⁷ Each internal USB connector (pin header) provides two USB ports (except for USB stick socket)

⁸ External parallel port possible via optional connector cable




External Connectors



Connector / Socket Diagramm



Accessories

| | OEM Order Code | |
|---|------------------|---|
| Fujitsu VGA Converter Board D3653 | S26361-F5000-Rx |  |
| Serial Port Cable (400mm, fullsize slot bracket) | S26361-F5000-K10 |  |
| M.2 Carrier Board D3352-A1 | S26361-F5000-M1 |  |

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24 Volt Kiosk Printers



Multi-Input Touch Panels

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