

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:

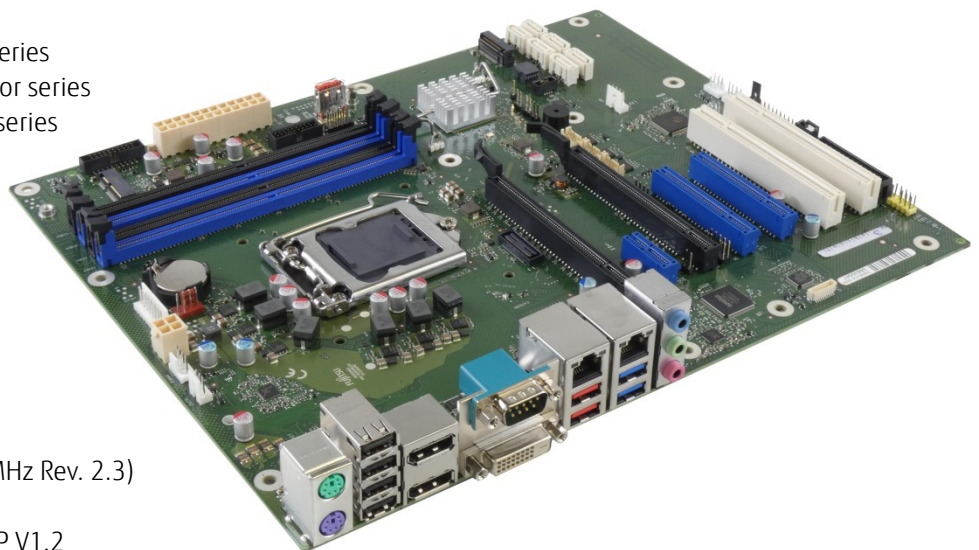
Intel® XEON® E-21xx processor series
 Intel® Core™ i7 / i5 / i3 (8th gen.) processor series
 Intel® Core™ i9 / i7 / i5 / i3 (9th gen.) processor series
 Intel® Pentium® / Intel® Celeron® processor series
 Socket LGA1151 – up to 95W TDP

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



Features and benefits

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)
-------------	---

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

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)

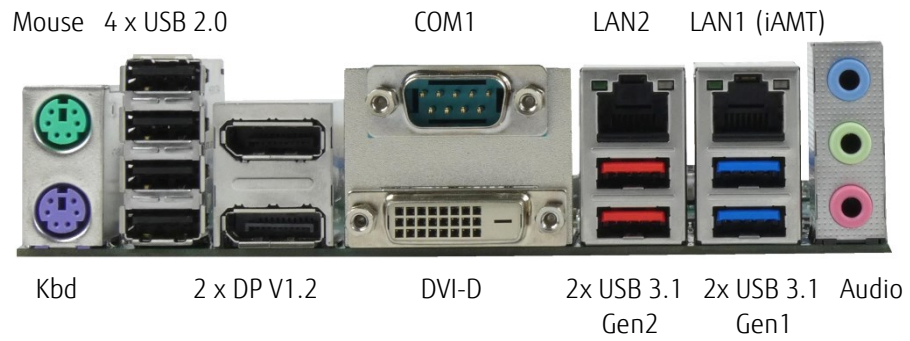
⁵ Not supported by standard Power Supplies

⁶ Forced cooling required, see technical documentation for details

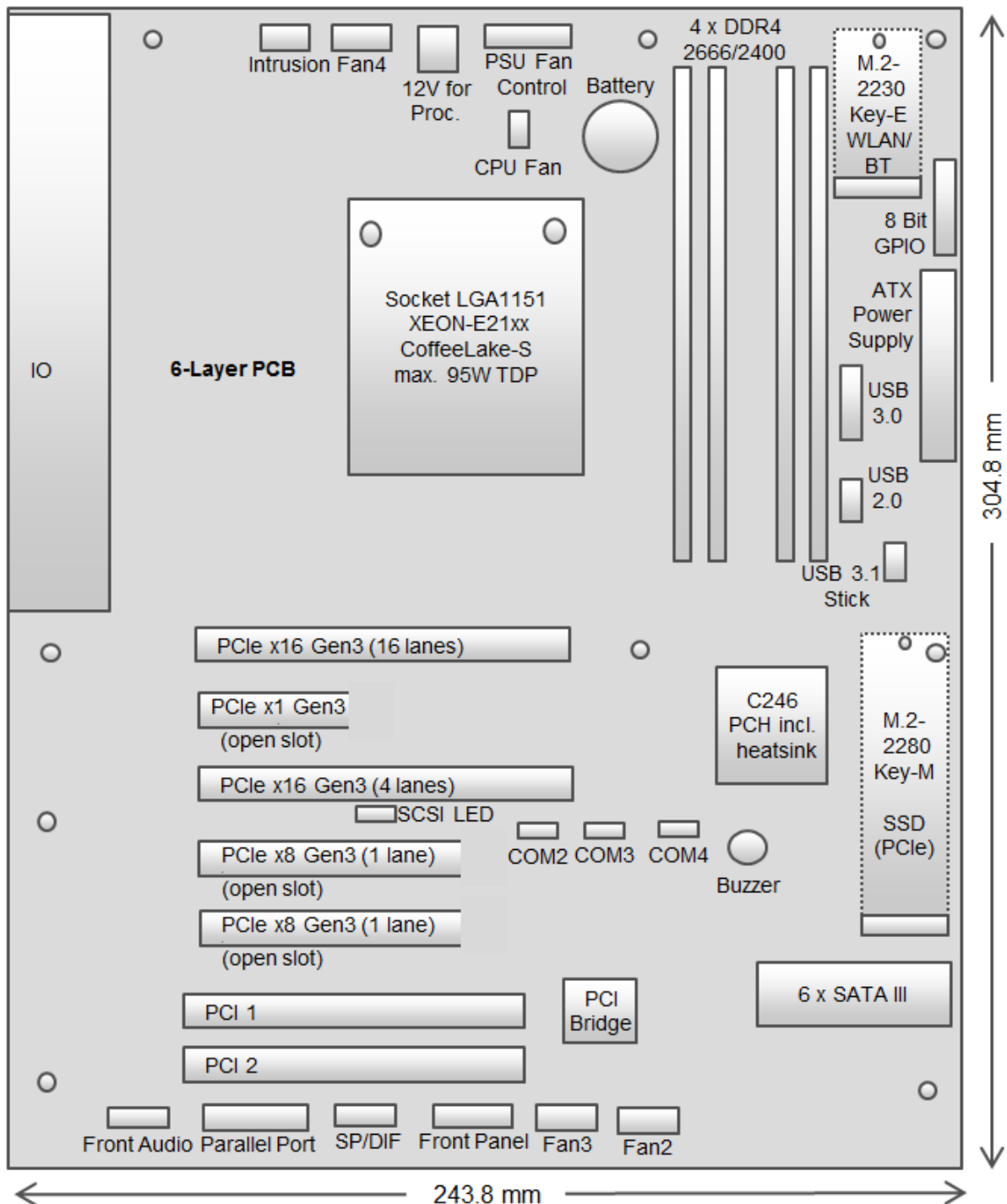
⁷ Each internal USB connector (pin header) provides two USB ports (except for USB stick socket)

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	

Further industrial products offered by Fujitsu

- Connectors
- KVM Switches
- Relays
- Touch Panels
- Thermal Printers
- Wireless Modules



24 Volt Kiosk Printers



Multi-Input Touch Panels

Contact:

Fujitsu Components Europe, B.V.
Tel.: +31 (0)23 556 0910
Fax: +31 (0)23 556 0950
Website: emea.fujitsu.com/components
Address: Diamantlaan 25
2132 WV Hoofddorp
Netherlands

More information

Fujitsu products, solutions & services

Products

www.fujitsu.com/global/products/

In addition to the Fujitsu mainboards, Fujitsu offers a full portfolio of other computing products.

Computing products

- Storage systems: ETERNUS
- Server: PRIMERGY, PRIMEQUEST, Fujitsu SPARC M10, BS2000/OSD Mainframe
- Client Computing Devices: LIFEBOOK, STYLISTIC, ESPRIMO, FUTRO, CELSIUS
- Peripherals: Fujitsu Displays, Accessories
- Software
- Network

Product Support Services with different service levels agreements are recommended to safeguard each product and ensure smooth IT operation.

Solutions

<http://www.fujitsu.com/global/solutions>

The Fujitsu solutions combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships. Fujitsu's Solutions include parts of one or more activity groups (e.g., planning, implementation, support, management, and training services) and are designed to solve a specific business need.

Infrastructure Solutions are customer offerings created by bringing Fujitsu's best products, services and technologies together with those from partners to deliver benefit to our customers' businesses.

Industry Solutions are tailored to meet the needs of specific verticals.

Business and Technology Solutions provide a variety of technologies developed to tackle specific business issues such as security and sustainability, across many verticals.

Services

www.fujitsu.com/global/services/

Several customizable Fujitsu Service offerings ensure that IT makes a real difference and delivers true business value. We do this by leveraging our extensive experience in managing large, complex, transformational IT programs to help clients in planning, delivering and operating IT services in a challenging and changing business environment.

Application Services support the development, integration, testing, deployment and on-going management of both custom developed and packaged applications. The services focus on delivering business and productivity improvements for organizations.

Business Services respond to the challenge of planning, delivering and operating IT in a complex and changing IT environment.

Managed Infrastructure Services enable customers to deliver the optimal IT environment to meet their needs – achieving high levels of IT service quality and performance for data center and end user environments.

Fujitsu green policy innovation

www.fujitsu.com/global/about/environment/
Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment. Using our global know-how, we aim to resolve issues of environmental energy efficiency through IT. Please find further information at:



More information

Learn more about Fujitsu, please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.
www.fujitsu.com/fts/mainboards/

Copyright

© 2015 Fujitsu Technology Solutions GmbH
Fujitsu and the Fujitsu logo are trademarks or registered trademarks of Fujitsu Limited in Japan and other countries.

Intel Chipset C236, Xeon C3 and Intel Core i7 / i5 / i3 are trademarks or registered trademarks of Intel Corporation in America and other countries. Other company, product and service names may be trademarks or registered trademarks of their respective owners. All rights reserved, including intellectual property rights. Changes to technical data reserved. Delivery subject to availability. Any liability that the data and illustrations are complete, actual or correct is excluded.

Disclaimer

Technical data subject to modification and delivery subject to availability. Any liability that the data and illustrations are complete, actual or correct is excluded. Designations may be trademarks and/or copyrights of the respective manufacturer, the use of which by third parties for their own purposes may infringe the rights of such owner.

Contact

Fujitsu Technology Solutions GmbH
OEM Mainboard Sales
Email: oem-sales@ts.fujitsu.com

Website: <http://ts.fujitsu.com>
2019-04-02

Copyright © Fujitsu Technology Solutions

All rights reserved, including intellectual property rights. Changes to technical data reserved. Delivery subject to availability. Any liability that the data and illustrations are complete, actual or correct is excluded. Designations may be trademarks and/or copyrights of the respective manufacturer, the use of which by third parties for their own purposes may infringe the rights of such owner.

For further information see http://ts.fujitsu.com/terms_of_use.html