

# Data Sheet **-preliminary -** FUJITSU Mainboard D3646-S ATX Industrial Series



Powered by the Intel® C246 Express Chipset supporting DDR4-2666 SDRAM Memory and Intel® XEON® / Intel® 8<sup>th</sup> generation Core™ i7 / i5 / i3 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:

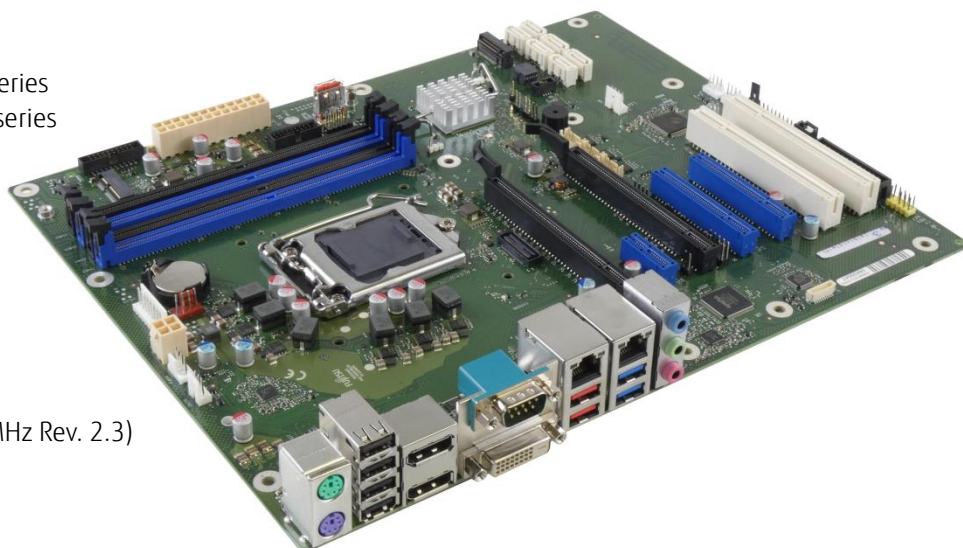
Intel® XEON® E-21xx processor series  
Intel® Core™ i7 / i5 / i3 (8<sup>th</sup> gen.) processor series  
Intel® Pentium® / Intel® Celeron® processor series  
Socket LGA1151 – up to 95W TDP

### Memory:

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

### Product Features:

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

<b>Board Size</b>	ATX: 9.6" x 12" (243.8 x 304.8 mm)
<b>Chipset</b>	Intel® C246 Express Chipset
<b>Memory</b>	4 DIMM Sockets DDR4-2666 (1.2V), max. 64GB, Dual Channel DDR4 -2666 (CL19) / -2400 (CL17) / -2133 (CL15) SDRAM, unbuffered, ECC <sup>1</sup> / non-ECC Effective memory speed depends on installed processor
<b>Processor</b>	Intel® XEON® E-21xx processor series Intel® Core™ i7 / i5 / i3 (8 <sup>th</sup> generation) processor series Intel® Pentium® / Intel® Celeron® processor series Socket LGA1151, max. 95W TDP (For details on supported processors please refer to OEM FTP Server)
<b>Power Specification</b>	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
<b>Power Supply Requirements</b>	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 <sup>1)</sup>
	- 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)

<b>BIOS</b>	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. <b>No legacy OS support, no MBR installation</b> (UEFI only due to Intel restrictions)
-------------	---

<b>Security Features</b>	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).
--------------------------	--

<sup>1</sup> ECC support for XEON processors only

<b>Special Features</b>	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 (planned)	
FCC compliance	FCC-B verified (planned)		
<b>Operating Systems</b>	<b>OS</b>	<b>"Runnable"</b>	<b>"Tested/Released by Fujitsu"</b>
	MS Windows 10 RS3	X	X
	MS Windows 10 RS4	X	X
	Linux-64	X	tbd
<b>Important Note:</b> <b>Legacy OS / MBR installation (DOS, MS Windows 7, ...) is not supported due to Intel restrictions</b>			
<b>Designed for Industrial Applications</b>	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) <sup>2</sup>		
<b>Graphics</b>	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		
<b>Audio</b>	Realtek ALC671, 5.1- channel, High Definition Audio Codec		
<b>TPM</b>	TPM V2.0 (Infineon SLB9670; TCG compliant)		
<b>LAN</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>SATA Ports</b>	6 x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, RAID 0/1/5/10		
<b>PCI / PCI Bridge</b>	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)		
<b>M.2 Sockets</b>	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		
<b>GPIO Port</b>	8 Bit GPIO (Input/Output); WLAN LED support, WLAN enable/disable support		
	3.3V / 5V / 12V supply voltage output		
	SMBus controller PCA9554A		
<b>Legacy Ports</b>	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)		

<sup>2</sup> Forced cooling required, see technical documentation for detailed requirements

<b>Features</b> <b>D3646-S</b>	Chipset / Board Size	iC246 / ATX
	VGA <sup>3</sup> / DVI-I / DVI-D / DP V1.2 / 2 <sup>nd</sup> 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 <sup>4</sup> / CPU / AUX1 / AUX2 / Aux3	✓ / ✓ / ✓ / ✓ / ✓ / ✓
	TEMP monitored CPU / onboard sensors / external sensor	✓ / ✓ / ✓ / -
<b>Special Features</b> <b>D3646-S</b>	Silent Fan / System Guard	✓ / ✓
	Recovery BIOS / Desk Update / Multi Boot	✓ / ✓ / ✓
	HDD Password / EraseDisk <sup>5</sup> / 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) <sup>6</sup>	0°C – 60°C
<b>Internal Connectors</b> <b>D3646-S</b>	DIMM Sockets (DDR4-2666)	4
	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 <sup>7</sup>	1 / 1 / - / 1
	FAN PSU / CPU / AUX1 / AUX2 / Aux3	1 / 1 / 1 / 1 / 1
	Intrusion (Case Open) / GPIO <sup>8</sup> (8Bit) / SM-Bus (Case Temp.)	1 / 1 / -
	Serial (COM, RS-232) / Parallel Port Pin Header <sup>8</sup>	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	✓ / -
<b>External Connectors</b> <b>D3646-S</b>	VGA Sub D <sup>2</sup> / DVI-I / DVI-D / DisplayPort V1.2	- / - / 1 / 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) <sup>6</sup>	-

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

4 Not supported by standard Power Supplies

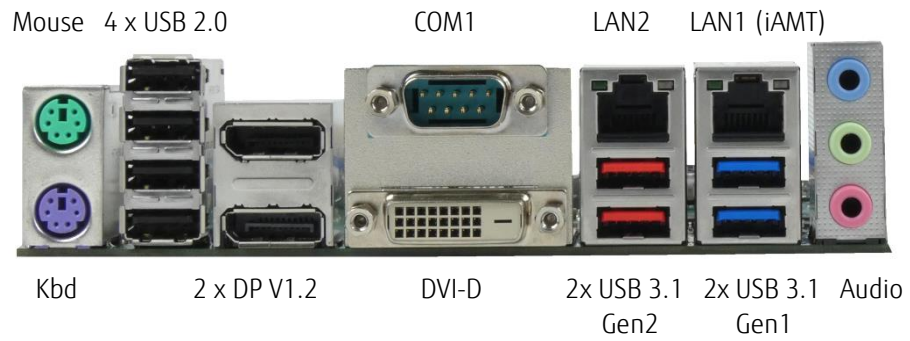
5 License included

6 Forced cooling required, see technical documentation for details

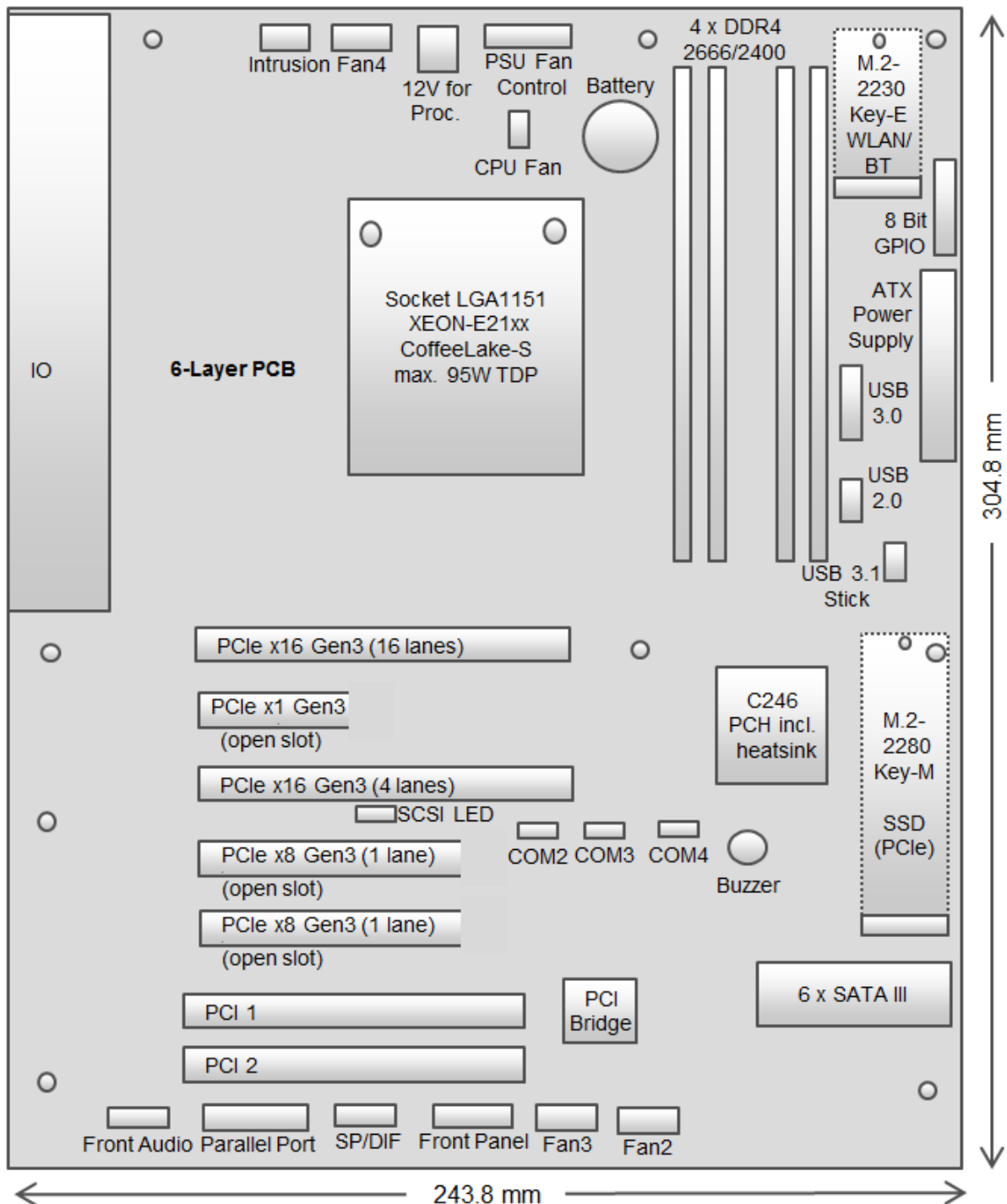
7 Each internal USB connector (pin header) provides two USB ports (except for USB stick socket)

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 (fullsize slot bracket)	S26361-F5000-K10
M.2 Carrier Board D3352-A1	S26361-F5000-M1
Diplyport to DVI Converter Cable (400mm)	S26361-F5000-A3



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](http://emea.fujitsu.com/components)  
Address: Diamantlaan 25  
2132 WV Hoofddorp  
Netherlands

# More information

## Fujitsu products, solutions & services

### Products

[www.fujitsu.com/global/products/](http://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/](http://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/](http://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/](http://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](mailto:oem-sales@ts.fujitsu.com)

Website: <http://ts.fujitsu.com>  
2018-07-03

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](http://ts.fujitsu.com/terms_of_use.html)