FUJITSU

Data Sheet
FUJITSU Mainboard D3644-B µATX
Extended Lifecycle Series

Powered by the Intel® C246 Express Chipset supporting DDR4-2666 SDRAM Memory and Intel® XEON® / Intel® 8th generation CoreTM i7 / i5 / i3 Processors.

Designed and approved for 24/7 continuous operation @ 50℃
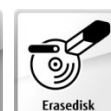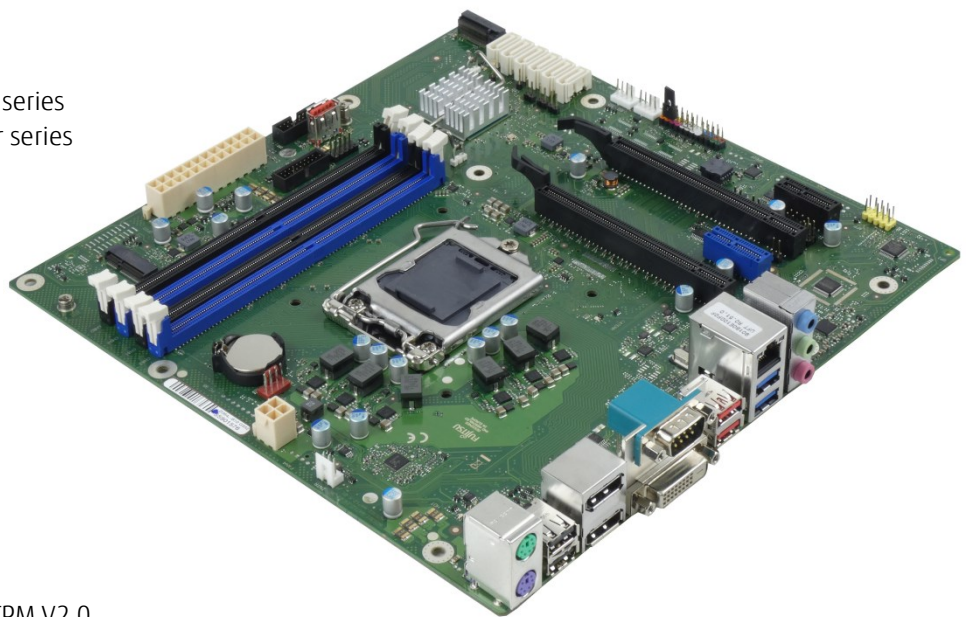
Chipset:
Intel® C246 Express Chipset

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

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

Product Features:
Supporting Intel AMT 12.0 / vPro
PCI Express x16 (Gen.3)
Intel® GbE LAN
Intel® UHD Graphics (DX12)
1x DVI-D, 2x DP V1.2
Intel® High Definition 5.1 Audio; Infineon TPM V2.0
1 x COM port
4x USB 2.0, 6x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1 x USB 3.1 Gen2 stick socket
6x SATA 6G/s incl. RAID support
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	µATX: 9.6" x 9.6" (243.8 x 243.8 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 (8th 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)
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[2] (BIOS Feature); TPM V2.0 (Infineon; TCG compliant).

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1 ECC support for XEON processors only

2 License required!

Special Features	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
	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	X	X
	MS Windows 10 RS4	X	X
	Linux-64	X	tbd

Important Note:

Legacy OS / MBR installation (DOS, MS Windows 7, …) is not supported due to Intel restrictions

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 with 10/100/1000 MBit/s
	Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE Support, BIOS MAC Address Display

SATA Ports	6 x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, RAID 0/1/5/10

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

Legacy Ports	1 x external RS-232 port
	1 x PS/2 (mouse)
	1 x PS/2 (keyboard)

Designed for 24/7 use	Longlife components for 24 / 7 continuous operation @ 50°C
	Revision control & Extended Lifecycle (up to 3 years)

Features D3644-B	Chipset / Board Size	iC246 / µATX
	VGA[3] / DVI-I / DVI-D / DP V1.2 / 2nd DP V1.2 / LVDS	- / - / ✓ / ✓ / ✓ / -
	Stereo Audio / 5.1 Multichannel Audio/ Front Panel Audio	- / ✓ / ✓
	Buzzer / internal Speaker Support (mono)	- / ✓
	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[4] / CPU / AUX1 / AUX2 / Aux3	- / ✓ / ✓ / ✓ / -
	TEMP monitored CPU / onboard sensors / external sensor	✓ / ✓ / -
Special Features D3644-B	Silent Fan / System Guard	✓ / ✓
	Recovery BIOS / Desk Update / Multi Boot	✓ / ✓ / ✓
	HDD Password / EraseDisk[5] / 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]	10°C – 50°C
Internal Connectors D3644-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 slot") / PCI Express x1 (Gen3, "closed slot")	1 / 1
	PCI Slots (32Bit, 33 MHz, Rev. 2.3) / Mini-PCIe	- / -
	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	- / -
	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 / 2 / - / 1
	FAN PSU / CPU / AUX1 / AUX2 / Aux3	- / 1 / 1 / 1 / -
	Intrusion (Case Open) / GPIO (8Bit) / SM-Bus (Case Temp.)	1 / - / -
	Serial (COM, RS-232) / Parallel Port Pin Header	- / -
	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 D3644-B	VGA Sub D[2] / 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)	1
	PS/2 Mouse / Keyboard	1 / 1
	USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2)	2 / 2 / 2
	Serial (COM1, RS-232)	1
	Parallel (EPP/ECP)	-

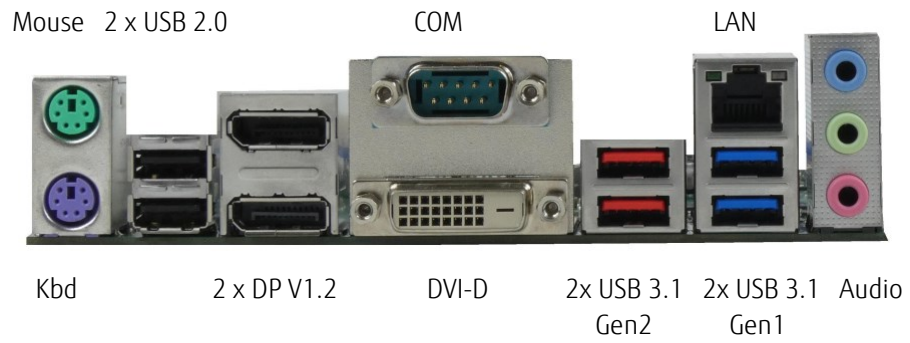3 VGA possible via optional converter board D3653 or DP-VGA-converter (dongle)

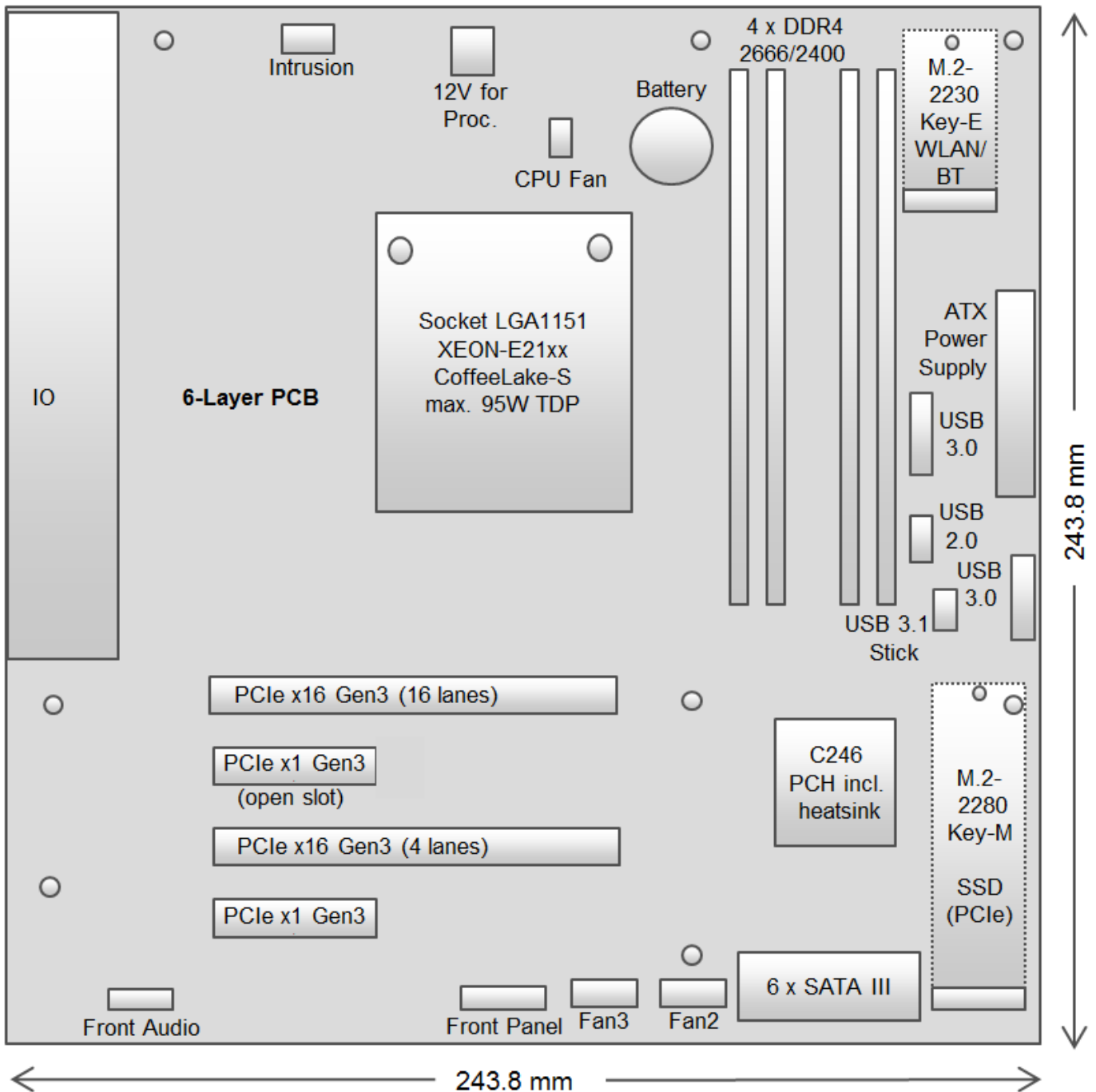4 Not supported by standard Power Supplies

5 License required

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)

External Connectors

Mouse 2 x USB 2.0   COM   LAN

Kbd   2 x DP V1.2   DVI-D   2x USB 3.1   2x USB 3.1   Audio
                                              Gen2   Gen1

Connector / Socket Diagramm

Intrusion

12V for
Proc.

CPU Fan

Battery

4 x DDR4
2666/2400

M.2-
2230
Key-E
WLAN/
BT

IO

6-Layer PCB

Socket LGA1151
XEON-E21xx
CoffeeLake-S
max. 95W TDP

ATX
Power
Supply

USB
3.0

USB
2.0

USB
3.0

USB 3.1
Stick

243.8 mm

PCIe x16 Gen3 (16 lanes)

PCIe x1 Gen3
(open slot)

PCIe x16 Gen3 (4 lanes)

PCIe x1 Gen3

C246
PCH incl.
heatsink

M.2-
2280
Key-M

SSD
(PCIe)

Front Audio

Front Panel   Fan3   Fan2

6 x SATA III

243.8 mm

Accessories

	OEM Order Code	
Fujitsu VGA Converter Board D3653	S26361-F5000-Rx	
M.2 Carrier Board D3352-A1	S26361-F5000-M1	
Displayport to DVI Converter Cable (400mm)	S26361-F5000-A3	

Further industrial products offered by Fujitsu

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