

Data Sheet

FUJITSU Mainboard D3543-S Mini-ITX

Industrial Series

Intel® embedded Gemini Lake SoC (System on Chip, 10W TDP) for DDR4 2400 SDRAM Memory
Enhanced operating temperature range from 0°C to 60°C



Processors (SoC):

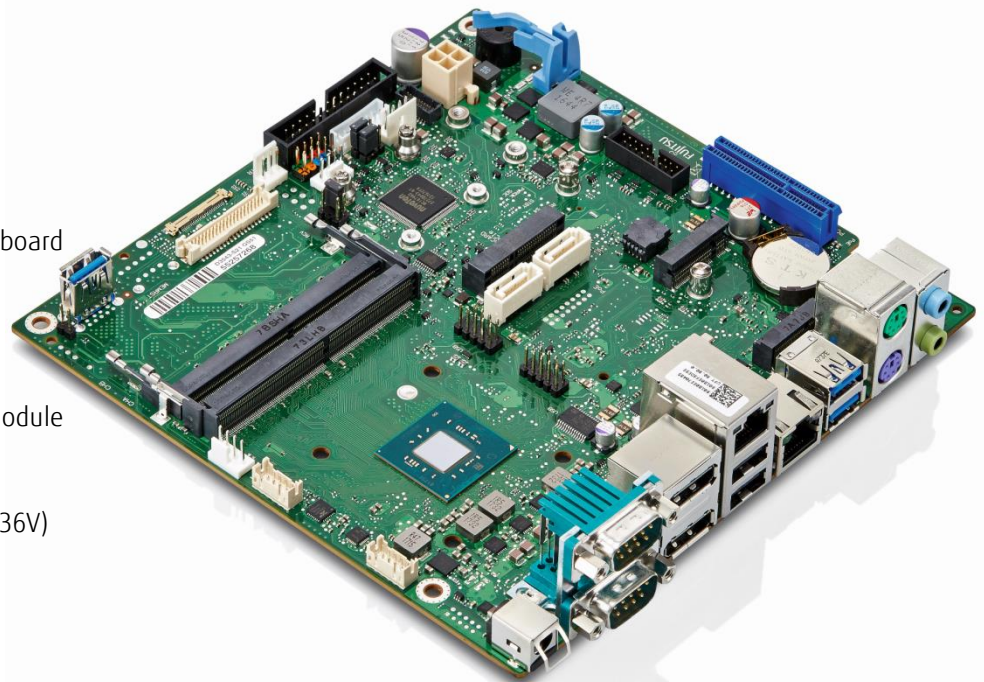
- Intel® Celeron® Processor J4005 (DC @2.0GHz / 2.7GHz), integrated Intel® UHD Graphics 600 (12EUs @700MHz)
 - Intel® Celeron® Processor J4105 (QC @1.5GHz / 2.5GHz), integrated Intel® UHD Graphics 600 (12EUs @750MHz)
 - Intel® Pentium® Silver Processor J5005 (QC @1.5GHz / 2.8GHz), integrated Intel® UHD Graphics 605 (18EUs @800MHz)
- 10W TDP

Memory:

2 x DDR4 2400 SDRAM (SO-DIMM)

Product Features:

- Intel® UHD Graphics 600/605 (within SoC)
- 2x DisplayPort V1.2a
- Dual Channel LVDS (24Bit) and eDP V1.4 onboard
- 8 Bit GPIO & HD Audio onboard
- USB 2.0 and USB 3.1 (gen1) onboard
- 2x SATA III
- Onboard support for M.2 SSD (SATA/PCIe)
- Onboard support for M.2 WLAN/Bluetooth module
- Dual GbE LAN onboard
- Intel® integrated TPM V2.0 onboard
- WideRange internal/external DC Input (8V - 36V)
- HW Watchdog onboard
- RS-232/485/422 support onboard



(upon request)



Features and benefits

Board Size Mini-ITX: 6.7" x 6.7" (170 x 170 mm)

Mainboard Versions

	Processor (SoC)	Graphics	Memory	Graphics
D3543-S1	Intel® Celeron® J4005 (Dual Core) 2.0GHz / 2.7GHz ¹⁾	Intel® UHD 600 12EUs; max. 8GB 250MHz / 700MHz ²⁾	DDR4 / 2400 two sockets max. 24GB	2 x DP V1.2 max. 4096 x 2160 @60Hz
D3543-S2	Intel® Celeron® J4105 (Quad Core) 1.5GHz / 2.5GHz ¹⁾	Intel® UHD 600 12EUs; max. 8GB 250MHz / 750MHz ²⁾		1 x eDP V1.4 2 lanes max. 1920 x 1200
D3543-S3	Intel® Pentium® Silver J5005 (Quad Core) 1.5GHz / 2.8GHz ¹⁾	Intel® UHD 605 18EUs; max. 8GB 250MHz / 800MHz ²⁾		1 x LVDS 24Bit Dual Channel max. 1920 x 1200 max. 3 x independent display

1) CPU Base Frequency / Burst Frequency 2) Graphics Base Frequency / max. Dynamic Frequency

Memory 2 x SO DIMM Socket (1.2V), max. 24GB, DDR4 - 2400 (CL17) / 2133 (CL15) SDRAM, unbuffered, non-ECC

Power Specification External DC Input 8V-36V (5A max. / 100W max.)
Internal DC Input 8V-36V (8A max. / 100W max.)
Onboard SoC and system voltage regulators (high efficiency)

Power Supply Requirements

Source	Voltage Range	Min. PSU Load	Max. Voltage Tolerance	typ. Mainboard Input Power ¹⁾	max. Mainboard Input Power ²⁾
DC-IN (wide range)	8-36V	0A	± 5 %	5W - 15W	100W

- 1) Mainboard incl. Memory and M.2 SATA SSD (MS Windows 10 Idle Mode / Full Load)
- 2) Mainboard incl. Memory, M.2 SATA SSD, any USB Devices, any LVDS / eDP devices, any SATA devices
See TechNotes document for detailed power requirements

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 Configuration, BIOS Support for S.M.A.R.T., Advanced Power Management, ACPI S3/S4, Wake on time from S5. Boot support for M.2 SSD (AHCI / NVME)
BIOS integrated HW Diagnostic Tool, Watchdog Support
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- / USB- Port Access Protection, Boot Sector Virus Warning, Write Protection for Flash BIOS, EraseDisk (BIOS Feature), Intel integrated TPM V2.0

Special Features	<p>Silent Fan</p> <p>System Guard</p> <p>Silent Drives</p> <p>Recovery BIOS</p> <p>Desk Update</p> <p>Multi Boot</p> <p>HDD Password</p> <p>Always On</p> <p>Never Off</p> <p>CSA / UL Compliance</p> <p>FCC Compliance</p>	<p>Independent temperature related processor fan and system fan supervision</p> <p>View Silent Fan features</p> <p>Noise reduction for optical and hard disk drives</p> <p>Restores a corrupted BIOS</p> <p>Simple driver update with Driver & Utilities DVD</p> <p>Comfortable boot from any boot device</p> <p>Access protection for disk drives</p> <p>Reliable power-on whenever voltage is connected</p> <p>Option to prevent the system from being shut down</p> <p>Upon request: cTÜVus acc. IEC62368-1</p> <p>FCC-B verified</p>	
Operating Systems	<p>OS</p> <p>MS Windows 10-64 RS1¹ / RS2¹</p> <p>MS Windows 10-64 RS3</p> <p>MS Windows 10-64 RS4 / RS5</p> <p>Linux-64</p> <p>Important Note: Legacy OS / MBR installation (DOS, MS Windows 7, ...) is not supported due to Intel restrictions</p>	<p>"Runnable"</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>	<p>"Tested/Released by Fujitsu"</p> <p>--</p> <p>X</p> <p>--</p> <p>basic functional test</p>
Designed for 24 / 7 use	<p>Longlife components for 24 / 7 use (0°C – 60°C) in industrial applications</p> <p>Revision control & Extended Lifecycle (min. 5 years + 1 year eXtended LifeCycle option)</p>		
Graphics	<p>Integrated Intel® UHD Graphics 600/605</p> <p>2 x DisplayPort V1.2a / 1 x embedded DisplayPort (eDP) 1.4 / 1 x Dual-Channel 24bit LVDS</p> <p>Supports up to 3 x independent display</p> <p>Following max. display combinations are supported:</p> <ul style="list-style-type: none"> 1 x DisplayPort (external) + 1 x LVDS (internal) + 1 x embedded DisplayPort (internal) 2 x DisplayPort (DP, external) + 1 x embedded DisplayPort (eDP, internal) <p>Note: Simultaneous use of LVDS and DP2 (upper port) is not possible</p>		
Audio	<p>Realtek ALC671 5.1-channel, High Definition Audio Codec</p>		
LAN	<p>1 x Intel i210 with 10/100/1000MBit/s, Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE and iSCSI supported, BIOS MAC Address Display</p> <p>1 x Realtek RTL8111G 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</p>		
Drives / Modules	<p>2 x Serial ATA (SATA) III 600 Interface (up to 6GBit/s), NCQ, AHCI;</p> <p>1 x M.2 Key B socket (2242 / 2260 / 2280) for following applications:</p> <ul style="list-style-type: none"> • SATA based M.2 SSD modules • PCIe based M.2 SSD modules (one PCI lane) • Specific M.2 PCIe-based extension modules like LAN, SATA, COM, etc. <p>Boot support: AHCI / NVME</p> <p><u>Notes:</u> M.2 (SATA mode only) is shared with SATA port 1</p> <p>Simultaneous use of M.2 2280 modules and M.2 2230 (WLAN/Bluetooth) possible!</p>		
WLAN / Bluetooth	<p>1 x M.2 Key E socket (WLAN / Bluetooth), mechanical support for 2230</p> <p>Supports M.2 modules with PCIe x1 (Gen2) and / or USB 2.0 interface</p> <p><u>Note:</u> Simultaneous use of M.2 2280 modules and M.2 2230 (WLAN/Bluetooth) possible!</p>		

¹ Long-term driver update support for RS1 (LTSB) and RS2 is not guaranteed by Intel

LVDS	LVDS Controller Realtek RTD2136R (DisplayPort to LVDS converter)	
Mini-PCIe	1 x mini PCIe socket (PCIe / USB), mechanical support for full and half size mini PCIe cards Supports modules with mini PCIe x1 (Gen2) and USB 2.0 interface	
Features D3543-S (Mini-ITX)	Chipset	Intel Gemini Lake SoC
	DP V1.2a / 2 nd DP V1.2a / LVDS / eDP V1.4 / HDMI / DVI / VGA	✓ / ✓ / ✓ / ✓ / ✓ / - / - / - / -
	Buzzer / int. Speaker Support (mono) ² / 5.1 Multichannel Audio	✓ / ✓ / ✓
	LAN Gbit / 100 Mbit / 10 Mbit / WoL / PXE / M.2 2230 WLAN-BT	✓ / ✓ / ✓ / ✓ / ✓ / ✓ / ✓ / ✓
	iAMT-vPro / Intel Standard Manageability / DASH V1.1	- / - / -
	SATA / M.2 (SATA) / M.2 PCIe (1 lane) / eSATA-Support / RAID / mSATA	✓ / ✓ / ✓ / ✓ / ✓ / - / - / -
	Mini-PCIe / USB 2.0 / USB 3.1 (gen1) / FireWire™	✓ / ✓ / ✓ / ✓ / -
	FAN monitored & controlled PSU / CPU / AUX1 / AUX2	- / ✓ / ✓ / ✓ / -
	TEMP monitored CPU / onboard sensors / external sensor	✓ / ✓ / ✓ / -
Special Features D3543-S	COM interface support for RS-232 / RS-485 / RS-422	✓
	Silent Fan / System Guard / Silent Drives	✓ / ✓ / ✓ / ✓
	Recovery BIOS / Desk Update / Multi Boot	✓ / ✓ / ✓ / ✓
	HDD Password / EraseDisk ³ / TPM V1.2 / TPM V2.0	✓ / ✓ / ✓ / - / ✓
	Logo Boot Option / Intel On Screen Branding	✓ / ✓
	BIOS POST- / BIOS Boot- / OS- HW Watchdog	✓ / ✓ / ✓ / ✓
	Operating Mode 24-7 / 8-5 (hrs per day - days per week)	✓ / -
	Mainboard operating temperature range (chassis inside) ⁴	0°C – 60°C
Internal Connectors D3543-S	SO DIMM Sockets (DDR4 2400)	2
	SATA-600 / M.2 SSD ⁵ / M.2 WLAN-BT / mSATA / Mini-PCIe	2 / 1 / 1 / 1 / - / 1
	Front Panel Audio (9-Pin, HD Audio) / SP-DIF Out (Digital Audio)	1 / 1
	USB 2.0 pin header (provides 2 USB channel) / USB Stick socket	2 / 1
	USB 3.1 Gen1 pin header (provides 2 USB channels) ⁶	1
	Serial COM3 header ⁷ / Serial COM4 header ⁷ / Parallel Port header	1 / 1 / 1
	LVDS / LVDS Backlight / Embedded DisplayPort	1 / 1 / 1
	FAN PSU / CPU (PWM) / AUX1 (PWM)	- / 1 / 1
	Intrusion (Case Open) / GPIO (8Bit) / SMBus (Case Temp.)	1 / 1 / -
	Mono Speaker header / Internal Stereo Speaker header / DMIC header	1 / - / -
	Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin header)	1
	SATA Drive Power Connector (5V/12V) / DC-In Connector 8-36V (4 pin)	1 / 1
External Connectors D3543-S	DisplayPort V1.2a / HDMI / DVI / VGA	2 / - / - / -
	Audio Mic. In / Line in / Line out (or driver configuration)	- / 1 / 1
	LAN (RJ-45) / PS/2 Keyboard / Mouse	2 / 2
	USB 2.0 / USB 3.1 Gen1	2 / 2
	DC-In connector (external input) 8-36V @ 5A max.	1
	Serial COM interface	2

² Mono speaker support; max. 2.2W @4Ω / 1.3W @8Ω

³ BIOS feature; License included

⁴ Forced cooling required for high operating temperature range. See upcoming TechNotes document for details

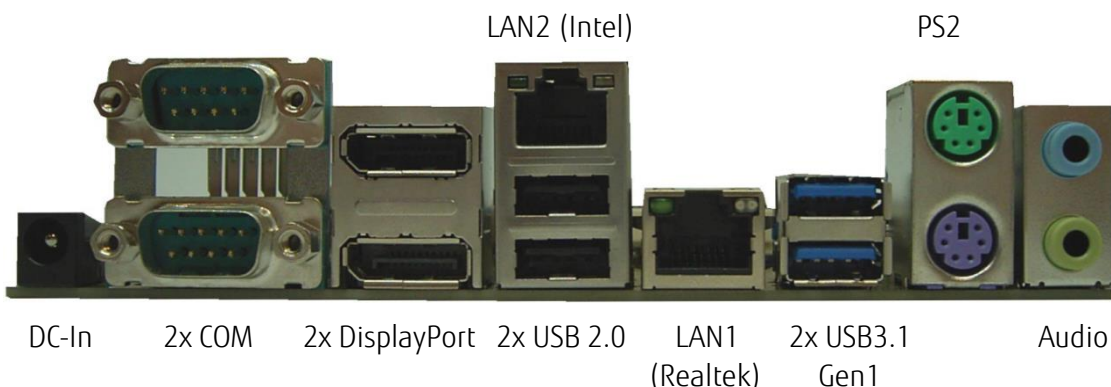
⁵ SATA-based M.2 SSD is shared with SATA port 1; simultaneous use of M.2 2280 module and M.2 2230 module (WLAN/Bluetooth) possible

⁶ USB3 connector includes separate USB2.0 signal pins (2 channels)

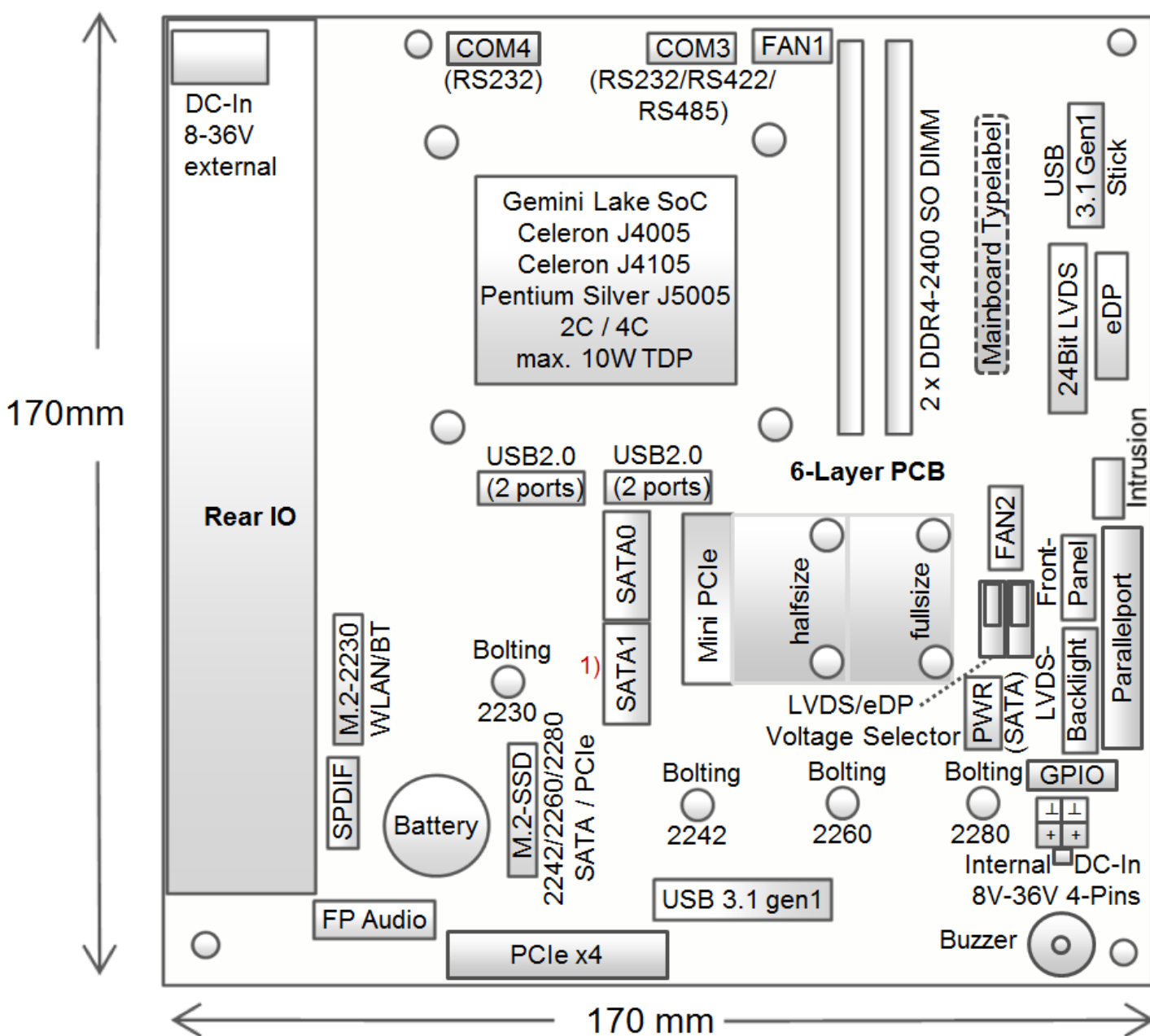
⁷ COM3 / COM4: RS-232 @ reduced feature set; pin header 2mm pitch; COM3 provides additional support for RS-422 / RS-485; specific device driver for both COM3 / COM4 supported from BIOS R1.6.0
See TechNotes document for details

External Connectors

Rear I/O:



Connector / Socket Diagram



1) SATA Port1 shared with M.2 SATA-SSD

Accessories

	(Ordercode)	
Mini-ITX Chassis Kit for D3543-S	F5000-J5	
Internal AC Adapter 12V/65W for chassis kit	F5000-P4	
AC Adapter 19V/40W	F5000-P5 (E622)	
AC Adapter 19V/65W	F5000-P3 (E623)	
Active Heatsink + Backplate	F5000-C9	
Fanless Heatsink + Backplate	F5000-C10	
USB-C Rear Extension Cable (USB 3.1/gen1)	F5000-K8	
Risercard 1x PCIe X4	F5000-R6 (D3318)	
Serial Port Cable (400mm, fullsize slot bracket)	F5000-K10	

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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

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Contact

Fujitsu Technology Solutions GmbH
OEM Mainboard Sales

Email: oem-sales@ts.fujitsu.com

Website: <http://ts.fujitsu.com>
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