Data Sheet
FUJITSU Mainboard D3544-S Mini-STX
Industrial Series

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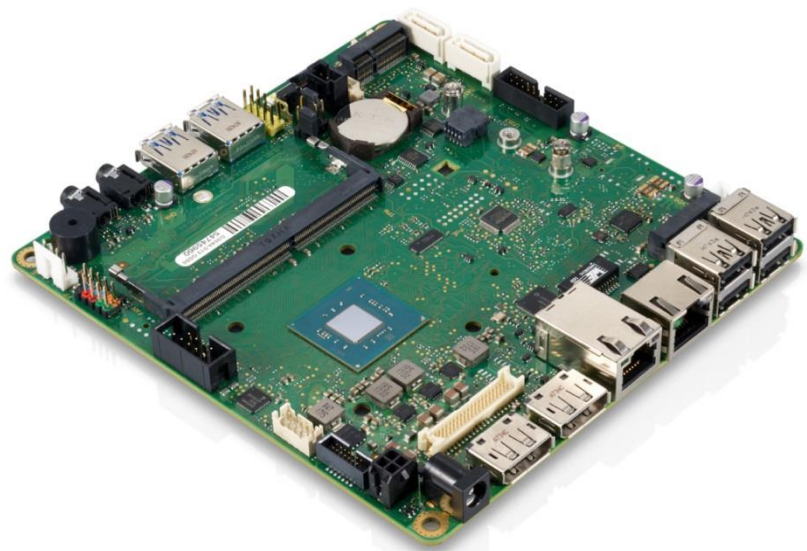Enhanced operating temperature range from 0°C to 60°C

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)
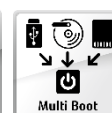10W TDP

Memory:

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 - 24V)
HW Watchdog onboard
RS-232/485/422 support onboard

(upon request)

24/7 Operation   Silent Drives   SILENT FAN   System Guard   Multi Boot   HDD Password   Recovery BIOS   Desk Update   Watch Dog   Erasedisk

Green IT

Features and benefits

Board Size	Mini-STX: 5.5" x 5.8" (140 x 148 mm)

Mainboard Versions

	Processor (SoC)	Graphics	Memory	Graphics
D3544-S1	Intel® Celeron® J4005 (Dual Core) 2.0GHz / 2.7GHz [1]	Intel® UHD 600 12EUs; max. 8GB 250MHz / 700MHz [2]	DDR4 / 2400 one socket max. 16GB	2 x DP V1.2 max. 4096 x 2160 @60Hz 1 x eDP V1.4 2 lanes max. 1920 x 1200 1 x LVDS 24Bit Dual Channel max. 1920 x 1200 max. 3 x independent display
D3544-S2	Intel® Celeron® J4105 (Quad Core) 1.5GHz / 2.5GHz [1]	Intel® UHD 600 12EUs; max. 8GB 250MHz / 750MHz [2]		
D3544-S3	Intel® Pentium® Silver J5005 (Quad Core) 1.5GHz / 2.8GHz [1]	Intel® UHD 605 18EUs; max. 8GB 250MHz / 800MHz [2]		

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

Memory	1 x SO DIMM Socket (1.2V), max. 16GB, DDR4 - 2400 (CL17) / 2133 (CL15) SDRAM, unbuffered, non-ECC
Power Specification	External DC Input 8V-24V (5A max. / 100W max.) Internal DC Input 8V-24V (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)	8-24V	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	Silent Fan	Independent temperature related processor fan supervision
	System Guard	View Silent Fan features
	Silent Drives	Noise reduction for optical and hard disk drives
	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
	Always On	Reliable power-on whenever voltage is connected
	Never Off	Option to prevent the system from being shut down
	CSA / UL Compliance	Upon request: cTÜVus acc. IEC62368-1
	FCC Compliance	FCC-B verified

Operating Systems

OS	"Runnable"	"Tested/Released by Fujitsu"
MS Windows 10-64 RS1 / RS2[1]	X	--
MS Windows 10-64 RS3	X	X
MS Windows 10-64 RS4 / RS5	X	--
Linux-64	X	basic functional test

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

Designed for 24 / 7 use	Longlife components for 24 / 7 use (0°C – 60°C) in industrial applications
	Revision control & Extended Lifecycle (min. 5 years + 1 year eXtended LifeCycle option)

Graphics	Integrated **Intel® UHD Graphics 600/605**
	2 x DisplayPort V1.2a / 1 x embedded DisplayPort (eDP) 1.4 / 1 x Dual-Channel 24bit LVDS
	Supports up to 3 x independent display
	Following max. display combinations are supported:
	2 x DisplayPort (DP, external) + 1 x LVDS (internal)
	2 x DisplayPort (DP, external) + 1 x embedded DisplayPort (eDP, internal)
	Note: Simultaneous use of LVDS and eDP is not supported

Audio	**Realtek ALC671** 5.1-channel, High Definition Audio Codec

LAN	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
	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

Drives / Modules	2 x Serial ATA (SATA) III 600 Interface (up to 6GBit/s), NCQ, AHCI;
	1 x M.2 Key B socket (2242 / 2260 / 2280) for following applications:
	• SATA based M.2 SSD modules (recommended for best M.2 SSD performance)
	• PCIe based M.2 SSD modules (one PCI lane)
	• Specific M.2 PCIe-based extension modules like LAN, SATA, COM, etc.
	Boot support: AHCI / NVME
	<u>Notes:</u> M.2 (SATA mode only) is shared with SATA port 1
	Simultaneous use of **M.2 2280** modules <u>and</u> **M.2 2230** (WLAN/Bluetooth) possible!

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

WLAN / Bluetooth	1 x M.2 Key E socket (WLAN / Bluetooth), mechanical support for 2230	
	Supports M.2 modules with PCIe x1 (Gen2) and / or USB 2.0 interface	
	Note: **Simultaneous use** of **M.2 2280** modules and **M.2 2230** (WLAN/Bluetooth) possible!	

LVDS	LVDS Controller **Realtek RTD2136R** (DisplayPort to LVDS converter)	

Features D3544-S (Mini-STX)	Chipset	Intel Gemini Lake SoC
	DP V1.2a / 2nd 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	✔ / ✔ / ✔ / ✔ / - / -
	USB 2.0 / USB 3.1 (gen1) / FireWire™	✔ / ✔ / -
	FAN monitored & controlled PSU / CPU / AUX1 / AUX2	- / ✔ / - / -
	TEMP monitored CPU / onboard sensors / external sensor	✔ / ✔ / -

Special Features D3544-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 D3544-S	SO DIMM Sockets (DDR4 2400)	1
	SATA-600 / M.2 SSD[5] / M.2 WLAN-BT / mSATA	2 / 1 / 1 / -
	Front Panel Audio (9-Pin, HD Audio) / SP-DIF Out (Digital Audio)	1 / 1
	USB 2.0 pin header (provides 1 USB channel) / USB Stick socket	1 / -
	USB 3.1/gen1 pin header (provides 2 USB channels)[6]	1
	Serial COM1 (RS-232 / -422 / -485; pin header 2mm pitch)[7]	1
	Serial COM2 (RS-232; specific connector)[8] / Parallel Port header	1 / -
	LVDS / LVDS Backlight / Embedded DisplayPort	1 / 1 / 1
	FAN PSU / CPU (PWM) / AUX1 (PWM)	- / 1 / -
	Intrusion (Case Open) / GPIO (8Bit) / SMBus (Case Temp.)	1 / 1 / -
	Mono Speaker header / Stereo Speaker header / Digital MIC header	1 / - / -
	Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin header)	1
	SATA Drive Power Connector (5V/12V) / DC-In Connector 8-324 (4 pin)	1 / 1

External Connectors D3544-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 / PS-2 Mouse	2 / - / -
	USB 2.0 / USB 3.1 gen1	4 / 2
	DC-In connector (external input) 8-24V @ 5A max.	1

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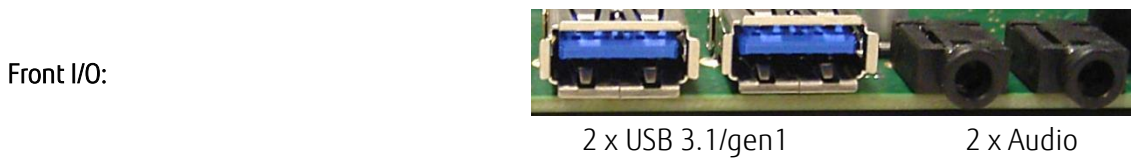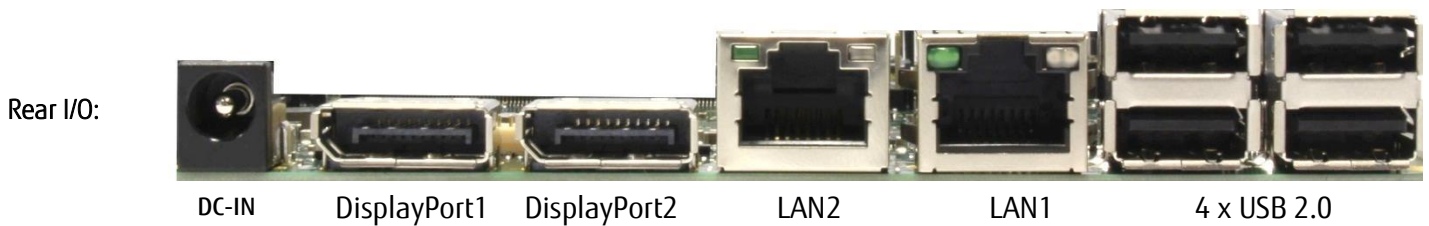
[5] SATA-based M.2 SSD is shared with SATA port 1; simultaneous use of M.2 2280 module and M.2 2230 module (WLAN/Bluetooth) possible

[6] USB3 connector includes separate USB2.0 signal pins (2 channels)
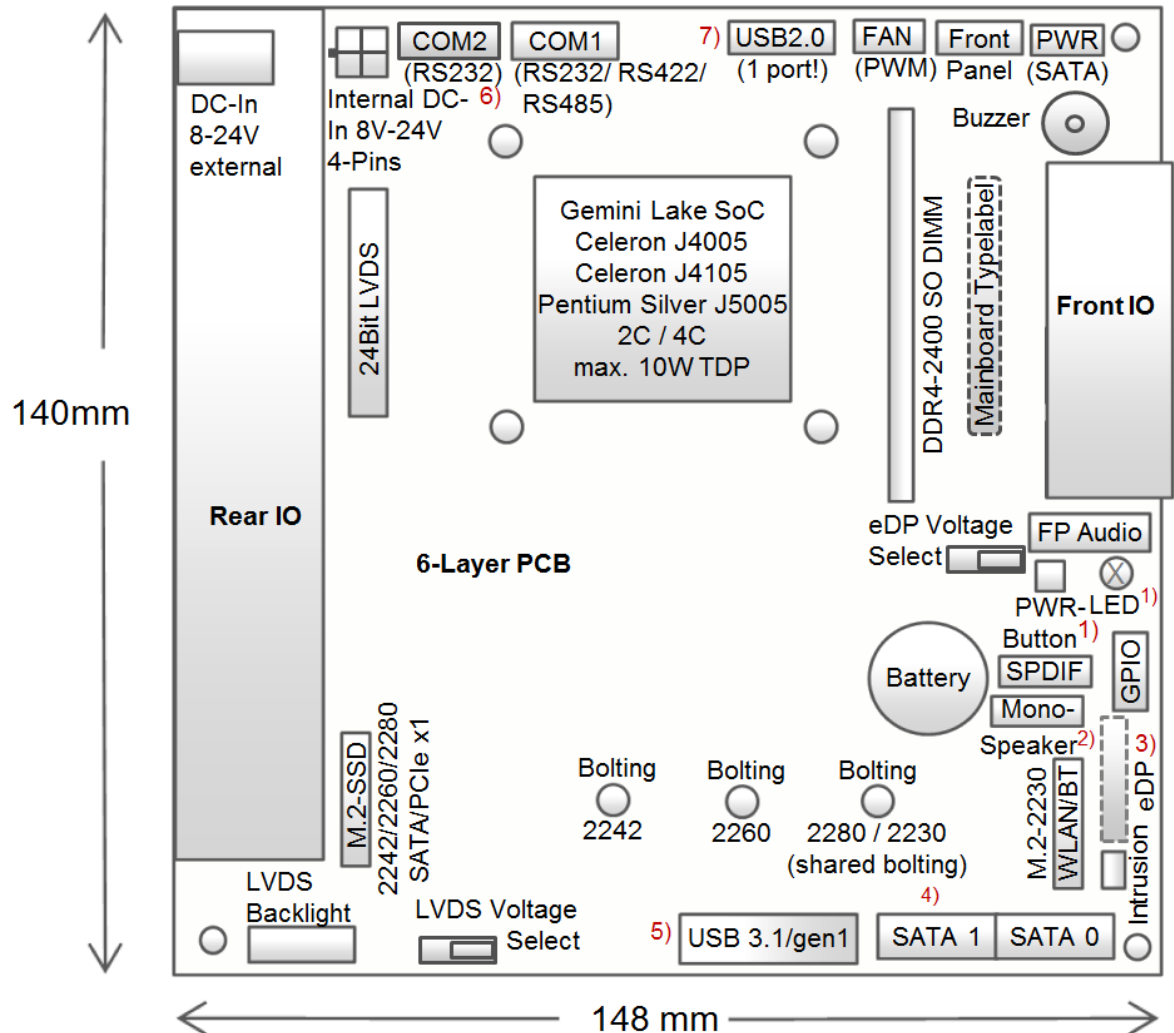
[7] RS-232 / RS-422 / RS-485; pin header 2mm pitch. See TechNotes document for details

[8] RS-232; reduced feature set; specific device driver supported from BIOS R1.6.0; specific connector cable (incl. RS-232 line driver) required. See TechNotes document for details

External Connectors

Rear I/O:

DC-IN DisplayPort1 DisplayPort2 LAN2 LAN1 4 x USB 2.0

Front I/O:

2 x USB 3.1/gen1 2 x Audio
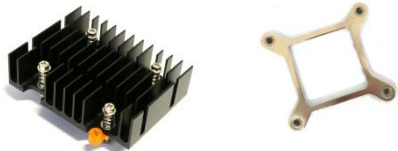
Connector / Socket Diagram

140mm

148 mm

COM2 (RS232) COM1 (RS232/ RS422/ RS485) 7) USB2.0 (1 port!) FAN (PWM) Front Panel PWR (SATA)

DC-In 8-24V external

Internal DC-In 8V-24V 4-Pins 6)

Buzzer

24Bit LVDS

Gemini Lake SoC
Celeron J4005
Celeron J4105
Pentium Silver J5005
2C / 4C
max. 10W TDP

DDR4-2400 SO DIMM

Mainboard Typelabel

Front IO

Rear IO

6-Layer PCB

eDP Voltage Select

FP Audio

PWR-LED 1)

Button 1)

SPDIF

GPIO

Mono-Speaker 2)

3)

M.2-SSD 2242/2260/2280 SATA/PCIe x1

Battery

Bolting 2242 Bolting 2260 Bolting 2280 / 2230 (shared bolting)

M.2-2230 WLAN/BT

Intrusion eDP

LVDS Backlight

LVDS Voltage Select

5) USB 3.1/gen1

4)

SATA 1 SATA 0

1) Onboard power button (push button) and power LED are designed for usage in Fujitsu STX chassis kit
2) Optional speaker kit available upon request for Fujitsu STX chassis kit
3) eDP (embedded DisplayPort) connector located at bottom side
4) SATA Port1 shared with SATA-based M.2 SSD
5) Optional USB Type-C extension cable (USB 3.1/gen1) planned for Fujitsu STX chassis kit
6) Optional COM 1 cable for Fujitsu STX chassis kit available
   COM2 port: Reduced feature set; specific device driver supported from BIOS Rev. 1.6.0.
   Requires specific cable with integrated line driver
7) Supports one USB2.0 channel only (→Bottom pin header row = 4 pins + key useable)

Accessories

	(Ordercode)
Mini-STX Chassis Kit for D3544-S	F5000-J4
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
COM1 extension cable	F5000-K7
COM2 extension cable (active version)	F5000-K11
WLAN Module Intel 9260 (M.2 2230)	F5000-W3
WLAN Module Intel 9260 (M.2 2230) incl. Dual WLAN Antenna for SMARTCASE S500	F5000-W2
Mono Speaker Kit for SMARTCASE S500	F5000-K9

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