D3674-B Thin mITX
Extended Lifecycle Series

Intel® H310 Express Chipset supporting 8th/9th Gen Core™ i3/i5/i7/i9 Processors

- cTDP – Easy & flexible reduction of CPU TDP
- Intel® HD Graphics (DX12, integrated in processor)
- HDMI V1.4, DP V1.2 and Dual Channel LVDS support
- 8 Bit GPIO
## PRODUCT HIGHLIGHTS

- Intel® B8v/9th Gen Core™ i processor series
- DDR4 2666 SDRAM memory capacity up to 32GB
- cTDP – Easy & flexible reduction of CPU TDP
- Intel® HD Graphics (DX12, integrated in processor)
- HDMI V1.4, DP V1.2 and Dual Channel LVDS support
- 8 Bit GPIO & multichannel Audio onboard
- USB 2.0 and USB 3.1 Gen1 onboard
- Onboard support for M.2 SSD (PCIe x4 based M.2 2280)
- Onboard support for M.2 WLAN/Bluetooth (M.2 2230)
- Realtek GbE LAN onboard
- Intel integrated TPM V2.0 onboard
- Dual-Range DC Power Supply 12 V/19-24 V
- HW Watchdog onboard
- Motherboard operating temperature range (chassis inside) 10 °C - 50 °C

## TECHNICAL INFORMATION

### SYSTEM

| PROCESSOR | Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) processor series
| CHIPSET | Intel® H310 Express Chipset
| MEMORY | 2x SO DIMM Socket (1.2 V), max. 32 GByte, Dual Channel, DDR4 - 2666 (CL19)/DDR4 – 2400 (CL17) SDRAM, unbuffered, non-ECC
| VIDEO | Intel® HD Graphics (depends on installed processor), DX12 1x DisplayPort V1.2 1x HDMI V1.4, Dual-Channel 24bit LVDS Max. 2 independent displays
| AUDIO | Realtek ALC255 5.1-channel, High Definition Audio Codec, 2W@4Ohm stereo speaker support Line-In / Line-Out Front panel audio (by header)
| NETWORK CONNECTION | Realtek RTL8111E 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

### PERIPHERAL CONNECTION

| USB | 2x USB 2.0 + 3x USB 2.0 (by header) 2x USB 3.1 Gen1 + 2x USB 3.1 Gen1 (by header)
| SERIAL PORT | 1x RS232 (by header) 1x 8-bit GPIO (by header) + PS/2 Keyboard
| STORAGE & EXPANSION | 1x M.2 2230-Key E (WLAN/Bluetooth) 1x M.2 2280-Key M (PCle Storage) 2x SATA-600

*Appropriate BIOS version supporting CoffeeLake-Refresh processors required
## TECHNICAL INFORMATION

### FIRMWARE

**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 (PCIe x4-based M.2, NVMe) BIOS integrated HW Diagnostic Tool. Watchdog Support No legacy OS support, no MBR installation

**WATCHDOG**
BIOS POST-/BIOS Boot-/OS-HW Watchdog

**REAL TIME CLOCK**
Integrated

**TPM**
Intel Integrated TPM V2.0 (Infineon TPM module optional)

### SYSTEM CONTROL & MONITORING

**FP HEADER**
1x Front Panel header (Power Button, Reset Button, Power LED, HDD LED)

**SECURITY**
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, optional Infineon TPM module (TGC compliant, socket prepared)

### COOLING

**FAN**
1x CPU-Fan (4Pin-Header, PWM)
1x System-Fan (4Pin-Header, PWM)

### SOFTWARE

**OS SUPPORT**
MS Windows 10
Linux-64

### MECHANICAL

**DIMENSIONS (L x W)**
Thin mITX: 6.7” x 6.7” (170 x 170 mm)

### CERTIFICATION

**EMC & SAFETY**
CE Class B, FCC-B verified

**SPECIAL FEATURES**
CTDP
Easy and flexible reduction of CPU TDP (BIOS Setup) down to 10W TDP
Independent temperature related processor fan and system fan supervision
View Silent Fan features
Restores a corrupted BIOS
Simple driver update with Driver & Utilities DVD
Comfortable boot from any boot device
Access protection for disk drives
Reliable power-on whenever voltage is connected
Option to prevent the system from being shut down
Upon request: cTÜVus acc. IEC62368-1
FCC-B verified

### POWER SUPPLY REQUIREMENTS

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>VOLTAGE</th>
<th>MIN. PS LOAD</th>
<th>MAX. VOLTAGE TOLERANCE</th>
<th>MOTHERBOARD CAPACITIVE LOAD</th>
<th>MOTHERBOARD MAX. CURRENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>External connector</td>
<td>19-24 V</td>
<td>0 A</td>
<td>+10%/-15%</td>
<td>200 µF</td>
<td>max. 10 A, max. 130 W**</td>
</tr>
<tr>
<td>Internal (2 pin) connector</td>
<td>19-24 V</td>
<td>0 A</td>
<td>+10%/-15%</td>
<td>200 µF</td>
<td>max. 8 A, max. 130 W**</td>
</tr>
<tr>
<td>Internal (4 pin) connector</td>
<td>+ 12 V</td>
<td>0 A</td>
<td>±5 %</td>
<td>1.500 µF</td>
<td>max. 12 A, max. 144 W</td>
</tr>
</tbody>
</table>

For onboard components (worst case incl. processor, memory and any attached internal and external devices like M.2 devices, SATA devices, LVDS panels, USB devices)

**Notes:**
- LVDS backlight (19/24V) not included in 130W limit. See TechNotes document for further details.
- Possible surge current (CPU Turbo mode) must be considered for system design!
**FEATURES**

- Chipset: IH310
- Board Size: Thin Mini-ITX
- DP v1.2 / 2nd DP v1.2 / LVDS / HDMI 1.4 / eDP
- Buzzer / int. Speaker Support (stereo) / 5.1 Multichannel Audio
- LAN Gbit / 100 Mbit / 10 Mbit / WoL / LAN Boot
- iAMT 12.0 vPro / Intel Standard Manageability / DASH V1.1
- SATA / RAID / eSATA-Support / mSATA / M.2 SSD (PCIe)
- USB 2.0 / USB 3.1 gen1 / USB 3.1 gen2
- FAN monitored & controlled PSU / CPU / AUX1 / AUX2
- TEMP monitored CPU / onboard sensors / external sensor

**SPECIAL FEATURES**

- Silent Fan / System Guard / c TDP
- Recovery BIOS / Desk Update / Multi Boot
- HDD Password / EraseDisk* / TPM V2.0
- Logo Boot Option
- High Efficiency Core Voltage Regulator Design
- 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)**

**INTERNAL CONNECTORS**

- SATA-600 / mSATA / M.2 SSD 2280 (Key-M, PCIe/NVME)
- M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth)
- Frontpanel Audio (9-Pin, HD Audio)
- USB 2.0 channels / USB 3.1 Gen1 channels / USB 3.1 Gen2 / USB Stick
- Serial (COM1, RS232)/ Parallel Port Connector
- LVDS / LVDS Backlight / Embedded DisplayPort
- FAN PSU / CPU (PWM) / ALUX1 (PWM) / ALUX2
- Intrusion (Case Open) / GPIO (8Bit) / SMBus (Case Temp.)
- Internal Stereo Speakers header / DMIC header (digital microphone)
- Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin header)
- Onboard SATA Drive Power Connector
- Onboard (internal) DC-In Connector 12 V (4 pin) / 19-24 V (2 pin)

**EXTERNAL CONNECTORS**

- DVI-I / DVI-D / DisplayPort V1.2 / HDMI V1.4
- Audio Mic. In / Line in / Line out (or driver configuration)
- LAN (RJ-45)
- PS/2 Mouse / Keyboard
- USB 2.0 / USB 3.1 Gen1 / USB 3.1 Gen2
- DC-In connector (external input) 19-24V @ 10A max.

*) Planned for factory shipments from 06/2019
**) Forced cooling required, see technical documentation for details

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**CONNECTOR / SOCKET DIAGRAM**

![Connector Diagram](image_url)
### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3674-B Thin mITX</td>
<td>F5120-V168</td>
<td>Intel® 8th/9th Gen Core™ i3/i5/i7/i9 Processors, Intel® H310 Chipset,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24/7 continuous operation @ 50 °C</td>
</tr>
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</table>

#### ACCESSORIES

<table>
<thead>
<tr>
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<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVE HEATSINK + BACKPLATE</td>
<td>F5000-C11</td>
<td>35 W TDP</td>
</tr>
<tr>
<td>COM1 EXTENSION CABLE</td>
<td>F5000-K7</td>
<td>120 mm, w/o slot bracket</td>
</tr>
<tr>
<td>COM1 EXTENSION CABLE</td>
<td>F5000-K10</td>
<td>400 mm, fullsize slot bracket</td>
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</tbody>
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### GLOBAL HEADQUARTERS

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