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® 8th/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

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PROCESSOR</th>
<th>CHIPSET</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) processor series*</td>
<td>Intel® H310 Express Chipset</td>
</tr>
<tr>
<td></td>
<td>Intel® Pentium®/Intel Celeron® processor series</td>
<td>(For details on supported processors please refer to Kontron FTP Server)</td>
</tr>
<tr>
<td>CHIPSET/MEMORY</td>
<td></td>
<td>Memory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2x SO DIMM Socket (1.2 V), max. 32 Gbyte, Dual Channel, DDR4 – 2666 (CL19)/DDR4 – 2400 (CL17) SDRAM, unbuffered, non-ECC</td>
</tr>
<tr>
<td>VIDEO</td>
<td>GRAPHICS</td>
<td>Audio CODEC</td>
</tr>
<tr>
<td></td>
<td>Intel® HD Graphics (depends on installed processor), DX12</td>
<td>Realtek ALC255</td>
</tr>
<tr>
<td></td>
<td>1x DisplayPort V1.2</td>
<td>S-1-channel, High Definition Audio Codec, 2W@4Ohm stereo speaker support</td>
</tr>
<tr>
<td></td>
<td>1x HDMI V1.4, Dual-Channel 24bit LVDS</td>
<td>Line-In / Line-Out</td>
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<td></td>
<td></td>
<td>Front panel audio (by header)</td>
</tr>
<tr>
<td>AUDIO</td>
<td>AUDIO INTERFACE</td>
<td>NETWORK CONNECTION</td>
</tr>
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<td></td>
<td></td>
<td>ETHERNET</td>
</tr>
<tr>
<td></td>
<td>Realtek ALC255</td>
<td>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</td>
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<td>S-1-channel, High Definition Audio Codec, 2W@4Ohm stereo speaker support</td>
<td>LINE-IN / LINE-OUT</td>
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<tr>
<td></td>
<td>Line-In / Line-Out</td>
<td>Front panel audio (by header)</td>
</tr>
<tr>
<td>PERIPHERAL CONNECTION</td>
<td>USB</td>
<td>SERIAL PORT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OTHER I/Os</td>
</tr>
<tr>
<td></td>
<td>2x USB 2.0 + 3x USB 2.0 (by header)</td>
<td>1x RS232 (by header)</td>
</tr>
<tr>
<td></td>
<td>2x USB 3.1 Gen1 + 2x USB 3.1 Gen1 (by header)</td>
<td>1x 8-bit GPIO (by header) + PS/2 Keyboard</td>
</tr>
<tr>
<td>STORAGE &amp; EXPANSION</td>
<td>SATA</td>
<td>STORAGE &amp; EXPANSION</td>
</tr>
<tr>
<td></td>
<td>1x M.2 2230-Key E (WLAN/Bluetooth)</td>
<td>1x M.2 2280-Key M (PCle Storage)</td>
</tr>
<tr>
<td></td>
<td>1x M.2 2280-Key M (PCle Storage)</td>
<td>2x SATA-600</td>
</tr>
<tr>
<td>POWER</td>
<td>INPUT VOLTAGE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External DC-in: 19-24 V</td>
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<tr>
<td></td>
<td>Internal DC-in: 12 V/19-24 V</td>
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</tbody>
</table>

*Appropriate BIOS version supporting CoffeeLake-Refresh processors required
**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 SS, 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
BIOS POST-/BIOS BOOT-/OS-HW Watchdog
Integrated
Intel Integrated TPM V2.0 (Infineon TPM module optional)

**WATCHDOG**
Real Time Clock

**TPM**

**SYSTEM CONTROL & MONITORING**

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

**SECURITY**

**1x** 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 (TCG compliant, socket prepared)

**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
Safety Testreport acc. EN 62368-1

**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: cTUVus acc. IEC62368-1
FCC-B verified

**SILENT FAN**

**SYSTEM GUARD**

**RECOVERY BIOS**

**DESK UPDATE**

**MULTI BOOT**

**HDD PASSWORD**

**ALWAYS ON**

**NEVER OFF**

**CSA / UL COMPLIANCE**

**FCC COMPLIANCE**

**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)

**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!
TECHNICAL INFORMATION

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 / cTDP
- 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)**
- 10 °C – 50 °C

INTERNAL CONNECTORS
- SO DIMM Sockets (DDR4-2666)
- 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) / ALIX1 (PWM) / ALIX2
- 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

CONNECTOR / SOCKET DIAGRAM
## ORDERING INFORMATION

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
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<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, 24/7 continuous operation @ 50 °C</td>
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### ACCESSORIES

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<tr>
<th>ACCESSORY</th>
<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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