AMD Embedded R2000 Series SoC
Platform for AMD FP5 SoC Processor

- AMD Radeon™ Vega Graphics (within SoC)
- Up to 3x DisplayPort V1.4 plus HDMI V2.0b
- Dual Channel LVDS (24 Bit) and eDP V1.3 (4 k) onboard
- Designed for Fanless Operation
- MS Windows 11 Support
Product Highlights

D3724-R mSTX Industrial Series

The industrial motherboard D3724-R mSTX supports the AMD Ryzen™ Embedded R2000 series processors with integrated AMD Radeon™ Vega Graphics and can be used in applications with high graphical requirements like casino gaming, medical displays, thin clients and ultra small industrial PCs.

- AMD Radeon™ Vega Graphics (within SoC)
- Up to 3x DisplayPort V1.4 plus HDMI V2.0b
- Dual Channel LVDS (24Bit) and eDP V1.3 (4k) onboard
- 8 Bit GPIO & HD Audio onboard
- USB 2.0 and USB 3.2 (Gen1/Gen2) onboard
- 1x SATA III onboard
- Onboard support for 1x M.2 SSD (Key-M: 2230/2242/2280)
- Onboard support for 1x M.2 WLAN/Bluetooth (Key-E: 2230)
- Dual GbE LAN onboard incl. Teaming Support
- AMD integrated TPM V2.0 onboard
- Auto Dual Range internal/external DC Input (12 V or 19-28 V)
- HW Watchdog onboard
- RS-232/485/422 support onboard

It is equipped with up to three DisplayPorts, one HDMI Port, one embedded DisplayPort and one Dual-Channel LVDS (24bit) and powers up to four independent displays in 4K resolution. Depending on the requirements for (graphical) performance, there are 3 motherboard versions available.

Technical Information

<table>
<thead>
<tr>
<th>SYSTEM PROCESSOR</th>
<th>AMD Ryzen™ Embedded R2000 Series D3724-R3: AMD Embedded R2514 D3724-R2: AMD Embedded R2314 D3724-R1: AMD Embedded R2312 DDR4 2400/2666 SDRAM, Dual Channel 2x SO DIMM sockets, up to 32 GByte memory, ECC/non-ECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEMORY VIDEO GRAPHICS</td>
<td>AMR Radeon™ Vega Graphics Up to 3x DPP V1.4 incl. DP++ support 1x HDMI V2.0b 1x embedded LED (eDP V1.3; supporting 4K resolutions; shared with DPP1) 1x Dual-Channel 24bit LVDS (shared with DPP3) Following max. display combinations are supported: D3724-R2/-R3: 1x DPP + HDMI + LVDS + eDP; 1x DPP + HDMI + LVDS; 2x DPP + HDMI + eDP; 3x DPP + HDMI D3724-R1: HDMI + LVDS + eDP; 1x DPP + HDMI + LVDS; 3x DPP + HDMI + eDP; 2x DPP + HDMI</td>
</tr>
<tr>
<td>AUDIO AUDIO CODEC AUDIO INTERFACE</td>
<td>Realtek ALC256 High Definition Stereo Audio Codec front stereo microphone (2.5 mm jack) front headphones/headset (2.5 mm jack, CITA standard)</td>
</tr>
<tr>
<td>NETWORK CONNECTION ETHERNET</td>
<td>Intel® i210 &amp; Realtek RTL8111H 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, Teaming Support</td>
</tr>
<tr>
<td>PERIPHERAL CONNECTION USB</td>
<td>2x USB 2.0 (by header), 2x USB 3.2 Gen1 (rear), 2x USB 3.2 Gen2 (rear), 1x USB 3.2 Gen1 (front), 1x USB 3.2 Gen1 (Type C, front) 1x RS232 (by header); 1x RS232/422/485 (by header) GPIO (by header)</td>
</tr>
<tr>
<td>STORAGE &amp; EXPANSION SATA PCIe/PCI SLOTS</td>
<td>1x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, 1x M.2 PCIe x4 (Key-M: 2230/2242/2280) 1x M.2 WLAN/Bluetooth (Key-E: 2230, supports PCIe x1/Gen3 + USB 2.0)</td>
</tr>
</tbody>
</table>
Technical Information  D3724-R mSTX

**Power Supply Requirements**

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>VOLTAGE RANGE</th>
<th>MIN. PS LOAD</th>
<th>MAX. VOLTAGE TOLERANCE</th>
<th>TYP. MOTHERBOARD INPUT POWER*</th>
<th>MAX. MOTHERBOARD INPUT POWER**</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC-IN (auto dual range)</td>
<td>12 V/19-28 V</td>
<td>0 A</td>
<td>12 V: +/- 10 %; 19-28 V: +/- 15 %</td>
<td>&lt;10 W / &lt;40 W</td>
<td>100 W (external or internal DC-In)</td>
</tr>
</tbody>
</table>

* Motherboard incl. Memory and M.2 NVMe SSD (approximations for MS Windows 10 Idle Mode / Full Processor Load @ 25 W TDP)
** Motherboard incl. Memory, M.2 USB Devices, LVDS / eDP devices, SATA devices
See TechNotes document for detailed power requirements

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**Motherboard Versions**

<table>
<thead>
<tr>
<th>D3724</th>
<th>PROCESSOR (APU) *)</th>
<th>GRAPHICS RADEON™ VEGA</th>
<th>MAX. MEMORY SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>-R3</td>
<td>R2514 Quad-Core 2.1/3.7 GHz</td>
<td>GPU @ 1.2 GHz up to 4 displays (eDP, LVDS, HDMI, DPP1, DPP2, DPP3)</td>
<td>DDR4-2666 Two sockets (ECC supported)</td>
</tr>
<tr>
<td></td>
<td>Supported TDP Limits: 25 W <em>/</em>/15 W/12 W</td>
<td></td>
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</tr>
<tr>
<td>-R2</td>
<td>R2344 Quad-Core 2.1/3.5 GHz</td>
<td>GPU @ 1.2 GHz up to 4 displays (eDP, LVDS, HDMI, DPP1, DPP2, DPP3)</td>
<td>DDR4-2666 Two sockets (ECC supported)</td>
</tr>
<tr>
<td></td>
<td>Supported TDP Limits: 25 W <em>/</em>/15 W/12 W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-R1</td>
<td>R2312 Dual-Core 2.7/3.5 GHz</td>
<td>GPU @ 1.2 GHz up to 3 displays (eDP, LVDS, HDMI, DPP1, DPP3)</td>
<td>DDR4-2400 Two sockets (ECC supported)</td>
</tr>
<tr>
<td></td>
<td>Supported TDP Limits: 25 W <em>/</em>/15 W/12 W</td>
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</tr>
</tbody>
</table>

*) APU = Accelerated Processing Unit
**) CPU Base Frequency / Boost Frequency
*/*/Default TDP (Note D3724-R supports up to max. 25 W TDP)
****) CU = Compute Units

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**Technical Specifications**

- **Power Connector**: External/Internal DC-In (DC Jack/4-Pin Micro-Fit)
- **Input Voltage**: DC Input 12 V or 19-28 V, max. 5 A/65 W (external DC-In), max. 10 A/100 W (internal DC-In)
- **Firmware**: AMI Aptio 5.x (UEFI) BIOS, modified and adapted by Kontron; Recovery BIOS, SM-BIOS (DMI), BIOS 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 (NVME), Watchdog Support
- **No legacy OS support, no MBR installation (UEFI only)**
- **3 level HW Watchdog (BIOS POST/BIOS Boot/OS)**
- **System Control**: FP Header
- **Security**: Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial-/USB-Port Access Protection, Write Protection for Flash BIOS, EraseDisk (BIOS Feature), AMD integrated TPM V2.0
- **Cooling**: Fan Support
- **Software**: OS Support
- **Mechanical**: Dimensions (L x W)
- **Certification**: EMC & Safety

www.kontron.com
# Technical Details

## D3724-R mSTX

### Connector/Socket Diagram

![Diagram](image)

### FEATURES
- **Chipset / SoC (APU)**
- DPP / HDMI / LVDS / eDP
- Buzzer / int. Speaker Support (stereo)* / S.1 Multichannel Audio
- GbE LAN / Dual GbE LAN / 2.5GbE LAN / M.2 2230 WLAN-BT
- WOL / PXE / LAN Teaming / TSN
- SATA / SATA RAID / M.2 (SATa) / M.2 (PCIe/NVMe)
- Mini-PCIe / USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2)
- FAN monitored & controlled CPU / AUX1 / AUX2
- TEMP monitored & onboard sensors / external sensor

### SPECIAL FEATURES
- COM interface support for RS-232 / RS-485 / RS-422
- Silent Fan / System Guard
- Recovery BIOS / Multi Boot
- HDD Password / EraseDisk / TPM V2.0 onboard / optional TPM module
- BIOS POST / BIOS Boot - DS - HW Watchdog
- Operating Mode 24-7 / B-5 (hrs per day - days per week)
- Motherboard operating temperature range (chassis inside)**

### INTERNAL CONNECTORS
- SO-DIMM Sockets (DDR4 2400)
- SATA-III / M.2 Key-M SSD / M.2 Key-B / M.2 2230 WLAN-BT / Mini-PCIe
- USB 2.0 pin header (provides 2 USB channel) / USB Stick socket
- USB 3.2 Gen1 pin header (provides 2 USB channels)
- Serial COM1 header / serial COM2 header
- LVDS / LVDS Backlight / Embedded DisplayPort @ 4 lanes
- CPU (PWM) / AUX1 (PWM)
- Intrusion (Case Open) / GPOO (B Bit) / SMBus (Case Temp.)
- Stereo Speaker header / Digital Mic header
- Front Panel (Power Switch, LEDs, Intel 10 pin header, 2 mm pitch) ***
- SATA Drive Power Connector (5 V/12 V) / DC-In Connector 12 V/19-28 V (4 pin)

### EXTERNAL CONNECTORS
- DisplayPort V1.4 / HDMI / DVI / VGA
- Audio Stereo Mic In / Headphones (Headset) [Front Connectors]
- LAN (RJ-45) / PS/2
- USB 2.0 / USB 3.2 Gen1 / USB 3.2 Gen2
- USB 3.1 Gen1 Type-A / USB 3.1 Gen1-Type C [Front Connectors]
- DC-In connector (external input) 12 V/19-28 V @ 5 A max.

### Specifications
- **Chipset / SoC (APU)**
- **Buzzer / int. Speaker Support (stereo)* / S.1 Multichannel Audio
- **GbE LAN / Dual GbE LAN / 2.5GbE LAN / M.2 2230 WLAN-BT**
- **WOL / PXE / LAN Teaming / TSN**
- **SATA / SATA RAID / M.2 (SATa) / M.2 (PCIe/NVMe)**
- **Mini-PCIe / USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2)**
- **FAN monitored & controlled CPU / AUX1 / AUX2**
- **TEMP monitored & onboard sensors / external sensor**

### AMD Ryzen™ Embedded
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### Special Features
- COM interface support for RS-232 / RS-485 / RS-422
- Silent Fan / System Guard
- Recovery BIOS / Multi Boot
- HDD Password / EraseDisk / TPM V2.0 onboard / optional TPM module
- BIOS POST / BIOS Boot - DS - HW Watchdog
- Operating Mode 24-7 / B-5 (hrs per day - days per week)
- Motherboard operating temperature range (chassis inside)**

### Internal Connectors
- SO-DIMM Sockets (DDR4 2400)
- SATA-III / M.2 Key-M SSD / M.2 Key-B / M.2 2230 WLAN-BT / Mini-PCIe
- USB 2.0 pin header (provides 2 USB channel) / USB Stick socket
- USB 3.2 Gen1 pin header (provides 2 USB channels)
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- Stereo Speaker header / Digital Mic header
- Front Panel (Power Switch, LEDs, Intel 10 pin header, 2 mm pitch) ***
- SATA Drive Power Connector (5 V/12 V) / DC-In Connector 12 V/19-28 V (4 pin)

### External Connectors
- DisplayPort V1.4 / HDMI / DVI / VGA
- Audio Stereo Mic In / Headphones (Headset) [Front Connectors]
- LAN (RJ-45) / PS/2
- USB 2.0 / USB 3.2 Gen1 / USB 3.2 Gen2
- USB 3.1 Gen1 Type-A / USB 3.1 Gen1-Type C [Front Connectors]
- DC-In connector (external input) 12 V/19-28 V @ 5 A max.

### Notes
- (*) Stereo speaker support; 2 W @4Ω
- **) Forced cooling required for high operating temperature range.
- (***) Reset switch not supported!
- See TechNotes document for details.
# Ordering Information

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>D3724-R3 mSTX</td>
<td>F5120-V205</td>
<td>AMD Embedded R2514 SoC</td>
</tr>
<tr>
<td>D3724-R2 mSTX</td>
<td>F5120-V204</td>
<td>AMD Embedded R2314 SoC</td>
</tr>
<tr>
<td>D3724-R1 mSTX</td>
<td>F5120-V203</td>
<td>AMD Embedded R2312 SoC</td>
</tr>
</tbody>
</table>

## Accessories

| SLIM ACTIVE HEATSINK + BACKPLATE | S26361-F5000-C021 | max. 35 W TDP                                   |
| FANLESS HEATSINK + BACKPLATE     | F5000-C022        | max. 10 W TDP, designed for SMARTCASE™ S511     |
| EXTRA LOW ACTIVE HEATSINK + BACKPLATE | F5000-C023 | max. 25 W TDP, designed for SMARTCASE™ S511     |
| SMARTCASE™ S511*                 | F5000-J011        | Chassis kit for D3714-Rx/-Vx and D3724-Rx, active or passive cooling |
| SERIAL PORT CABLE                | S26361-F5000-K010 | 400 mm, fullsize slot bracket                   |
| SERIAL PORT CABLE                | S26361-F5000-K007 | Short cable (120 mm), w/o slot bracket         |
| AC-ADAPTER 19V/65W              | S26361-F5000-P006 | For applications up to 25 W TDP (SoC)          |
| DRIVE POWER CABLE               | S26361-F5000-K001 | 400 mm, power connector for 1x SATA and 1x slimline DVD   |
| WLAN ANTENNA KIT                | S26361-F5000-W005 | WLAN antenna kit; left (grey)/right (black) antennas incl. cable for SMARTCASE™ S500/S511/S520. M.2 WLAN module not included! |
| VESA MOUNT KIT                  | S26361-F5000-X002 | Suitable for SMARTCASE™ S500/S511/S520         |
| WALL MOUNT BRACKETS             | S26361-F5000-X001 | Suitable for SMARTCASE™ S500/S511/S520, 2x Brackets per chassis incl. screws |
| DC-IN CONNECTOR LOCK            | S26361-F5000-X003 | Suitable for SMARTCASE™ S500/S511/S520, fits to AC-Adapter F5000-P006 |

* *) See SMARTCASE S511 datasheet regarding detailed requirements/limitations when using D3724-Rx motherboard series.