D3713-V/R mITX
Industrial Series

AMD Embedded V1000/R1000 Series SoC Platform for AMD FP5 SoC Processor

- AMD Radeon™ Vega Graphics (within SoC)
- Up to 4x DisplayPort V1.4
- Dual Channel LVDS (24 Bit) and eDP V1.3 (4 k) onboard
- Designed for Fanless Operation
- M.2 Key-B & M.2 Key M & Mini-PCI Express® supported
The industrial motherboard D3713-V/R mITX supports the AMD Ryzen™ Embedded V1000 and R1000 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 industrial PCs.

### PRODUCT HIGHLIGHTS

- **AMD Radeon™ Vega Graphics (within SoC)**
- **Up to 4x DisplayPort V1.4**
- **Dual Channel LVDS (24Bit) and eDP V1.3 (4k) onboard**
- **PCI Express® x4 (Gen3)**
- **8 Bit GPIO & HD Audio onboard**
- **USB 2.0 and USB 3.1 (Gen1/Gen2) onboard**
- **2x SATA III: USB Stick Socket**
- **Onboard support for 1x M.2 SSD (Key-M: 2230/2242/2280)**
- **Onboard support for 1x M.2 (Key-B: 2242/2252/2260/2280)**
- **Onboard support for 1x Mini-PCIe (halfsize/fullsize)**
- **Dual GbE LAN onboard incl. Teaming Support**
- **AMID integrated TPM V2.0 onboard & socket for optional TPM Module**

### TECHNICAL INFORMATION

#### SYSTEM

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<td>V2: AMD Embedded V1605B SoC</td>
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<td>V4: AMD Embedded V1807B SoC</td>
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<td>R1: AMD Embedded R1025G SoC</td>
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<td>R2: AMD Embedded R1305G SoC</td>
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<td>R4: AMD Embedded R1606G SoC</td>
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#### MEMORY

| VIDEO |
|GRAPHICS |
| AMD Radeon™ Vega Graphics |
| Up to 4x DPP V1.4 incl. DP++ support* |
| 1x embedded DP (eDP V1.3; supporting 4K resolutions) |
| 1x Dual-Channel 24bit LVDS |

#### AUDIO

| AUDIO CODEC |
| Realtek ALC256 |

#### ETHERNET

| NETWORK CONNECTION |
| Intel® i210 & 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 |

#### USB

| PERIPHERAL CONNECTION |
| 2x USB 2.0 (by header), 2x USB 3.1 Gen1, 2x USB 3.1 Gen1 (by header), 2x USB 3.1 Gen2, 1x USB 2.0 stick socket |

#### SERIAL PORT

| STORAGE & EXPANSION |
| 2x Serial ATA III 600 Interface (up to 6GBit/s), NCC, AHCI, 1x M.2 PCIe x4 (Key-M: 2230/2242/2280), 1x Mini PCIe (Gen3, halfsize/fullsize) |
| 1x PCIe x4 Gen3, 1x M.2 PCIe x2/USB 2.0/SATA (Key B: 2242/3052/2260/2280) |

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*) DPP4: DP++ supported for D3713-Vx2/Rx2 versions
***) D3713-R1: One memory socket only (single channel)
TECHNICAL INFORMATION

POWER

CONNECTOR
External/Internal DC-In (DC Jack/4-Pin Mini-Fit)

INPUT VOLTAGE
DC Input 8 V – 32 V/36 V (max. 10 A, max. 130 W)

DC-IN (wide range)

FIRMWARE

BIOS
AMI Apio 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, Support for M.2 SSD (AHCI / NVME), Watchdog Support
No legacy OS support, no MBR installation (UEFI only)
Integrated

WATCHDOG
No level HW support, no MBR installation (UEFI only)

REAL TIME CLOCK
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, Support for M.2 SSD (AHCI / NVME), Watchdog Support
No legacy OS support, no MBR installation (UEFI only)
Integrated

TPM
Integrated

AMD integrated TPM V2.0

SYSTEM CONTROL

FP HEADER
1x Header for Reset button, HDD LED, Power button, Power LED

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, socket for optional TPM upgrade module

Cooling

COOLING FAN
2x PWM fan (CPU/System)

SOFTWARE

OS SUPPORT
MS Windows 10
Linux-64
No legacy OS support, no MBR installation (UEFI only)

MECHANICAL

DIMENSIONS (L x W)
Mini-ITX: 6.7” x 6.7” (170 x 170 mm)

EMC & SAFETY
CE Class-B, FCC-B verified
cTUVus acc. IEC62368-1

*) 8 V - 36 V for D3713-Vx2/Rx2 versions

MOTHERBOARD VERSIONS

PROCESSOR (APU) *)

GRAPHICS
Radeon™ VEGA

MAX. MEMORY SPEED

- V4

V1807B
Quad-Core
3.35/3.8 GHz (**)
Supported TDP Limits: 54 W/45 W/35 W

GPU @ 1.3 GHz
11x CU (***)
up to 4 displays
(eDP, LVDS, DPP1, DPP2, DPP3, DPP4)

DDR4=3200 Two sockets
(ECC supported)

- V2

V1605B
Quad-Core
2.0/3.3 GHz (**)
Supported TDP Limits: 25 W/**/15 W/12 W

GPU @ 1.1 GHz
8x CU (***)
up to 4 displays
(eDP, LVDS, DPP1, DPP2, DPP3, DPP4)

DDR4=2400 Two sockets
(ECC supported)

- V1

V1202B
Dual-Core
2.3/3.2 GHz (**)
Supported TDP Limits: 25 W/**/15 W/12 W

GPU @ 1.0 GHz
3x CU (***)
up to 4 displays
(eDP, LVDS, DPP1, DPP2, DPP3, DPP4)

DDR4=2400 Two sockets
(ECC supported)

- R4

R1606G
Dual-Core
2.6/3.5 GHz (**)
Supported TDP Limits: 25 W/**/15 W/12 W

GPU @ 1.2 GHz
3x CU (***)
up to 3 displays
(eDP, LVDS, DPP1, DPP2, DPP4)

DDR4=2400 Two sockets
(ECC supported)

- R2

R1305G
Dual-Core
1.6/2.8 GHz (**)
Supported TDP Limits: 10 W/**/8 W

GPU @ 1.0 GHz
3x CU (***)
up to 3 displays
(eDP, LVDS, DPP1, DPP2, DPP4)

DDR4=2400 Two sockets
(ECC supported)

- R1

R1102G
Dual-Core
1.2/2.6 GHz (**)
Supported TDP Limit: 6 W

GPU @ 1.0 GHz
3x CU (***)
up to 2 displays
(eDP, LVDS, DPP1, DPP2)

DDR4=2400 One socket
(ECC supported)

*) APU = Accelerated Processing Unit
**) CPU Base Frequency / Boost Frequency
***) Default TDP
****) CU = Compute Units

POWER SUPPLY REQUIREMENTS

SOURCE
DC-IN (wide range)

VOLTAGE RANGE
8 V – 32 V/36 V (***)

MIN. PS LOAD
0 A

MAX. VOLTAGE TOLERANCE
± 5 %

TYP. MOTHERBOARD INPUT POWER
<10 W/40 W

MAX. MOTHERBOARD INPUT POWER
130 W

*) 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, PCIe/Mini-PCIe devices, USB Devices, LVDS / eDP devices, SATA devices
***) 8 V – 36 V for D3713-Vx2/Rx2 versions

See TechNotes document for detailed power requirements.
**FEATURES**

- **Chipset / SoC (APU)**
  - 1st DPP / 2nd DPP / 3rd DPP / 4th DPP* / LVDS / eDP / HDMI
  - Buzzer / int. Speaker Support (stereo)** / 5.1 Multichannel Audio
  - LAN Gbit / 100 Mbit / 10 Mbit / WoL / PXE / M.2 2230 WLAN-BT***
  - 2nd LAN Gbit / 100 Mbit / 10 Mbit / WoL / PXE
  - LAN Teaming / LAN DASH Support
  - SATA / SATA RAID / M.2 (SATa) / M.2 (PCIe/NVMe)
  - Mini-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

- **AMD Ryzen™ Embedded**
  - 12 - 54W TDP
  - 6-Layer PCB

- **SPECIAL FEATURES**
  - COM interface support for RS-232 / RS-485 / RS-422
  - Silent Fan / System Guard
  - HDD Password / EraseDisk / TPM V2.0 onboard / optional TPM module
  - BIOS POST / BIOS Boot / OS- HW Watchdog
  - Operating Mode 24-7 / 8-5 (hrs per day - days per week)
  - Motherboard operating temperature range (chassis inside)****

- **INTERNAL CONNECTORS**
  - SO DIMM Sockets (DDR4 3200/2400)
  - SATA-III / M.2 Key-M SSD / M.2 Key-B / M.2 2230 WLAN-BT / Mini-PCIe
  - Front Panel Audio (9-Pin, HD Audio) / SP-DIF Out (Digital Audio)
  - USB 2.0 pin header (provides 2 USB channel) / USB Stick socket*****
  - USB 3.1 Gen1 pin header (provides 2 USB channels)******
  - Serial COM3 header******* / Serial COM4 header*******
  - Parallel Port header
  - LVDS / LVDS Backlight / Embedded DisplayPort @ 4 lanes
  - FAN PSU / CPU (PWM) / ALX1 (PWM)
  - Intrusion (Case Open) / GPIO (8 Bit) / SMBus (Case Temp.)
  - Stereo Speaker header / Digital Mic header
  - Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin header)
  - SATA Drive Power Connector (5 V/12 V) / DC-In Connector 8-36 V (4 pin)
  - 2 x DDR4 SO DIMM

- **EXTERNAL CONNECTORS**
  - DisplayPort V1.4* / HDMI / DVI / VGA
  - Audio Mic. In / Line in / Line out (or driver configuration)
  - LAN (RJ-45) / PS/2 Keyboard / Mouse
  - USB 2.0 / USB 3.1 Gen1 / USB 3.1 Gen2
  - DC-In connector (external input) B-36 V @ 10 A max; Lockable

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*) V-series only; D3713-R2/R4 supports up to 3x DPP; D3713-R1 supports up to 2x DPP

**) Stereo speaker support; 2 W @4Ω

***) M.2 WLAN possible via Mini-PCIe to M.2 converter module D3436-S

****) Forced cooling required for high operating temperature range. See TechNotes document for details

***** USB 2.0 connector includes separate USB2.0 signal pins (2 channels)

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

******* COM3 / COM4; RS-232 @ reduced feature set / pin count; see TechNotes document for details

******** RS-232: Thereof one port (COM2) supporting RS-232/RS-422/RS-485

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**CONNECTOR / SOCKET DIAGRAM**

![Connector Diagram](image-url)
### ORDERING INFORMATION

<table>
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<th>PART NO.</th>
<th>DESCRIPTION</th>
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<td>F5120-V176</td>
<td>AMD Embedded V1202B SoC</td>
</tr>
<tr>
<td>D3713-V2 mITX</td>
<td>F5120-V177</td>
<td>AMD Embedded V1605B SoC</td>
</tr>
<tr>
<td>D3713-V4 mITX</td>
<td>F5120-V178</td>
<td>AMD Embedded V1807B SoC</td>
</tr>
<tr>
<td>D3713-R1 mITX</td>
<td>F5120-V170</td>
<td>AMD Embedded R1102G SoC</td>
</tr>
<tr>
<td>D3713-R2 mITX</td>
<td>F5120-V179</td>
<td>AMD Embedded R1305G SoC</td>
</tr>
<tr>
<td>D3713-R4 mITX</td>
<td>F5120-V180</td>
<td>AMD Embedded R1606G SoC</td>
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<tr>
<th>ACCESSORIES</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
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<tr>
<td>SLIM ACTIVE HEATSINK + BACKPLATE</td>
<td>F5000-C021</td>
<td>max. 35 W TDP</td>
</tr>
<tr>
<td>ACTIVE HEATSINK + BACKPLATE</td>
<td>F5000-C020</td>
<td>max. 54 W TDP</td>
</tr>
<tr>
<td>FANLESS HEATSINK + BACKPLATE</td>
<td>F5000-C019</td>
<td>max. 15 W TDP</td>
</tr>
<tr>
<td>USB-C REAR EXTENSION CABLE</td>
<td>tbd.</td>
<td>USB 3.1 Gen1 (fits to IO-shield)</td>
</tr>
<tr>
<td>RISERCARD</td>
<td>F5000-R006</td>
<td>1x PCIe X4</td>
</tr>
<tr>
<td>SERIAL PORT CABLE</td>
<td>F5000-K010</td>
<td>400 mm, full-size slot bracket</td>
</tr>
<tr>
<td>MINI PCIE TO M.2 ADAPTER</td>
<td>F5000-M003</td>
<td>Adapter for Mini PCIe to M.2 Wi-Fi modules</td>
</tr>
<tr>
<td>AC-ADAPTER 19V/65W</td>
<td>F5000-P006</td>
<td>For applications up to 35 W TDP (SoC)</td>
</tr>
<tr>
<td>AC-ADAPTER 20V/120W</td>
<td>F5000-P007</td>
<td>lockable connector</td>
</tr>
<tr>
<td>INTERNAL PSU KIT</td>
<td>F5000-P004</td>
<td>12 V/65 W, designed for SMARTCASE™ chassis</td>
</tr>
<tr>
<td>DRIVE POWER CABLE</td>
<td>F5000-K001</td>
<td>400 mm, power connector for 1x SATA and 1x slimline DVD</td>
</tr>
<tr>
<td>TPM MODULE</td>
<td>F5000-R012</td>
<td>Infineon SLB9670, TPM V2.0 (TCG compliant)</td>
</tr>
<tr>
<td>WLAN MODULE</td>
<td>F5000-W003</td>
<td>Intel® AC9260 WLAN/Bluetooth module (w/o antennas)</td>
</tr>
<tr>
<td>SMARTCASE S711</td>
<td>F5000-J008</td>
<td>Chassis kit solution for D3713</td>
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**GLOBAL HEADQUARTERS**

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