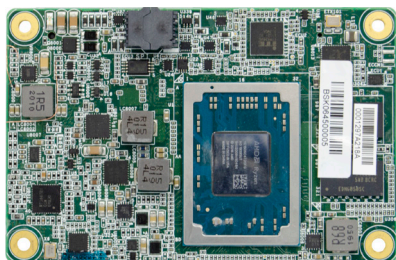




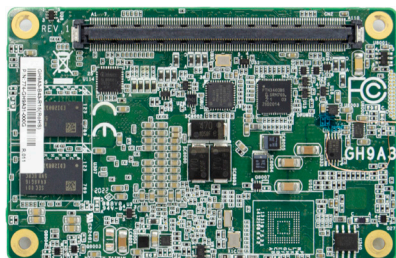
# AMD® Ryzen™ R1000 Series Processor COM Express® Mini

## GH9A3

R1000

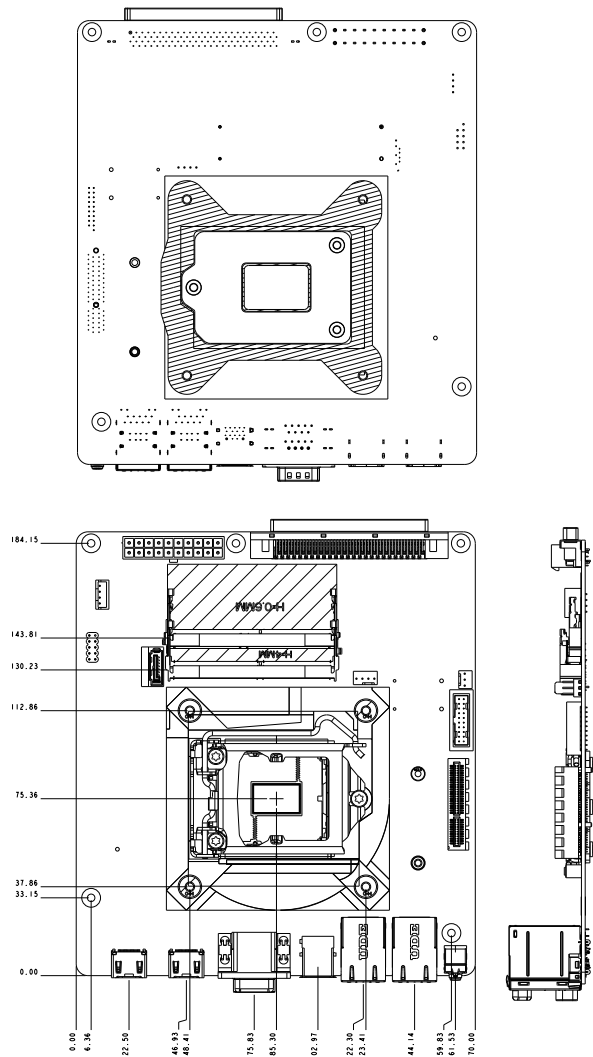


TOP



BOTTOM

### Mechanical Drawing

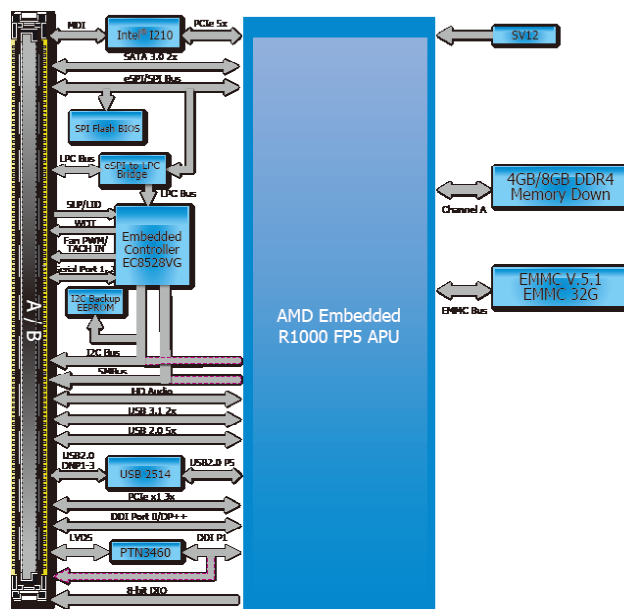


### Features

- Single Channel DDR4 2400MHz Memory Down up to 8GB
- 1 LVDS/eDP, 1 DDI (HDMI/DP)  
Supports dual displays: DDI + LVDS/eDP
- DP++ resolution supports up to 3840x2160 @ 60Hz
- Multiple expansions: 3 PCIe x1
- Rich I/O: 1 Intel GbE, 2 USB 3.1, 8 USB 2.0



### Block Diagram



## Specifications

|                               |                              |                                                                                                                                                                                                     |                                                                                                                                                                                               |
|-------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SYSTEM</b>                 | <b>Processor</b>             | AMD® Ryzen™ Embedded R1606G, Dual Core, 1MB Cache, 3 CU, 2.6GHz (3.5GHz), 12W<br>AMD® Ryzen™ Embedded R1505G, Dual Core, 1MB Cache, 3 CU, 2.4GHz (3.3GHz), 12W<br>AMD® Ryzen™ Embedded R1000 series |                                                                                                                                                                                               |
|                               | <b>Memory</b>                | 4GB/8GB Memory Down                                                                                                                                                                                 | Single Channel DDR4 2400MHz                                                                                                                                                                   |
|                               | <b>BIOS</b>                  | SPI 64Mbit (default supports fTPM2.0)                                                                                                                                                               |                                                                                                                                                                                               |
| <b>GRAPHICS</b>               | <b>Controller</b>            | Radeon™ Vega 3 Graphics                                                                                                                                                                             |                                                                                                                                                                                               |
|                               | <b>Feature</b>               | OpenGL 5.0, DirectX 12, OpenCL 2.1<br>HW Decode: AVC/H.264, MPEG2, VC1, WMV9, JPEG/MJPEG, HEVC/H.265, VP8, VP9, MVC<br>HW Encode: AVC/H.264, JPEG/MJPEG, HEVC/H.265, VP8, VP9, MVC                  |                                                                                                                                                                                               |
|                               | <b>Display</b>               | 1 x DDI (HDMI/DP++)<br>1 x LVDS/eDP                                                                                                                                                                 | LVDS: single channel 24-bit, resolution up to 1366x768 @ 60Hz<br>HDMI: resolution up to 4096x2160 @ 24Hz<br>DP++: resolution up to 3840x2160 @ 60Hz<br>eDP: resolution up to 3840x2160 @ 60Hz |
|                               | <b>Dual Display</b>          | DDI + LVDS                                                                                                                                                                                          | DDI + eDP                                                                                                                                                                                     |
| <b>EXPANSION</b>              | <b>Interface</b>             | 3 x PCIe x1 (Gen 3)<br>1 x SDIO<br>1 x LPC<br>2 x I <sup>2</sup> C<br>1 x SMBus<br>1 x SPI<br>2 x UART (TX/RX)                                                                                      |                                                                                                                                                                                               |
| <b>AUDIO</b>                  | <b>Interface</b>             | HD Audio                                                                                                                                                                                            |                                                                                                                                                                                               |
| <b>ETHERNET</b>               | <b>Controller</b>            | 1 x Intel® I210 (10/100/1000Mbps)                                                                                                                                                                   |                                                                                                                                                                                               |
| <b>I/O</b>                    | <b>USB</b>                   | 2 x USB 3.1<br>8 x USB 2.0                                                                                                                                                                          |                                                                                                                                                                                               |
|                               | <b>SATA</b>                  | 2 x SATA 3.0 (up to 6Gb/s)                                                                                                                                                                          |                                                                                                                                                                                               |
|                               | <b>GPIO</b>                  | 1 x 8-bit GPIO                                                                                                                                                                                      |                                                                                                                                                                                               |
| <b>SECURITY</b>               | <b>TPM</b>                   | BIOS default support fTPM, TPM2.0 by request.                                                                                                                                                       |                                                                                                                                                                                               |
| <b>WATCHDOG TIMER</b>         | <b>Output &amp; Interval</b> | System Reset, Programmable via Software from 1 to 255 Seconds                                                                                                                                       |                                                                                                                                                                                               |
| <b>POWER</b>                  | <b>Type</b>                  | 12V~20V, 5VSB, VCC_RTC (ATX mode)                                                                                                                                                                   | 12V~20V, VCC_RTC (AT mode)                                                                                                                                                                    |
|                               | <b>Consumption</b>           | TBD                                                                                                                                                                                                 |                                                                                                                                                                                               |
| <b>OS SUPPORT (UEFI ONLY)</b> |                              | Windows 10 IoT Enterprise 64-bit                                                                                                                                                                    | Linux                                                                                                                                                                                         |
| <b>ENVIRONMENT</b>            | <b>Temperature</b>           | Operating: 0 to 60°C<br>-40 to 85°C                                                                                                                                                                 | Storage: -40 to 85°C                                                                                                                                                                          |
|                               | <b>Humidity</b>              | Operating: 5 to 90% RH                                                                                                                                                                              | Storage: 5 to 90% RH                                                                                                                                                                          |
|                               | <b>MTBF</b>                  | TBD                                                                                                                                                                                                 |                                                                                                                                                                                               |
| <b>MECHANICAL</b>             | <b>Dimensions</b>            | COM Express® Mini                                                                                                                                                                                   | 84mm (3.30") x 55mm (2.16")                                                                                                                                                                   |
|                               | <b>Compliance</b>            | PICMG COM Express® R3.0, Type 10                                                                                                                                                                    |                                                                                                                                                                                               |

## Ordering Information

| Model Name            | P/N             | Processor | Memory    | eMMC  | DIO/SDIO | LVDS/eDP | GbE | USB 3.0 | USB 2.0 | Power  | Thermal | Temp.       |
|-----------------------|-----------------|-----------|-----------|-------|----------|----------|-----|---------|---------|--------|---------|-------------|
| <b>GH9A3-BC43-R15</b> | 770-GH9A31-000G | R1505G    | DDR4 4 GB | 32 GB | DIO      | LVDS     | 1   | 2       | 8       | ATX/AT | TBD     | 0 to 60°C   |
| <b>GH9A3-TC43-R16</b> | 770-GH9A31-100G | R1606G    | DDR4 4 GB | 32 GB | DIO      | LVDS     | 1   | 2       | 8       | ATX/AT | TBD     | -40 to 85°C |
| <b>GH9A3-TC83-R16</b> | 770-GH9A31-200G | R1606G    | DDR4 8 GB | 32 GB | SDIO     | eDP      | 1   | 2       | 8       | ATX/AT | TBD     | -40 to 85°C |

## Packing List

|                               |                 |
|-------------------------------|-----------------|
| • 1 GH9A3 board               |                 |
| • 1 Heat sink (for 0 to 60°C) | A71-008164-000G |
| • 1 Cooler (for -40 to 85°C)  | A71-108133-000G |

## Optional Items

|                              |                 |
|------------------------------|-----------------|
| • COM100-B carrier board kit | 770-COM104-000G |
|------------------------------|-----------------|