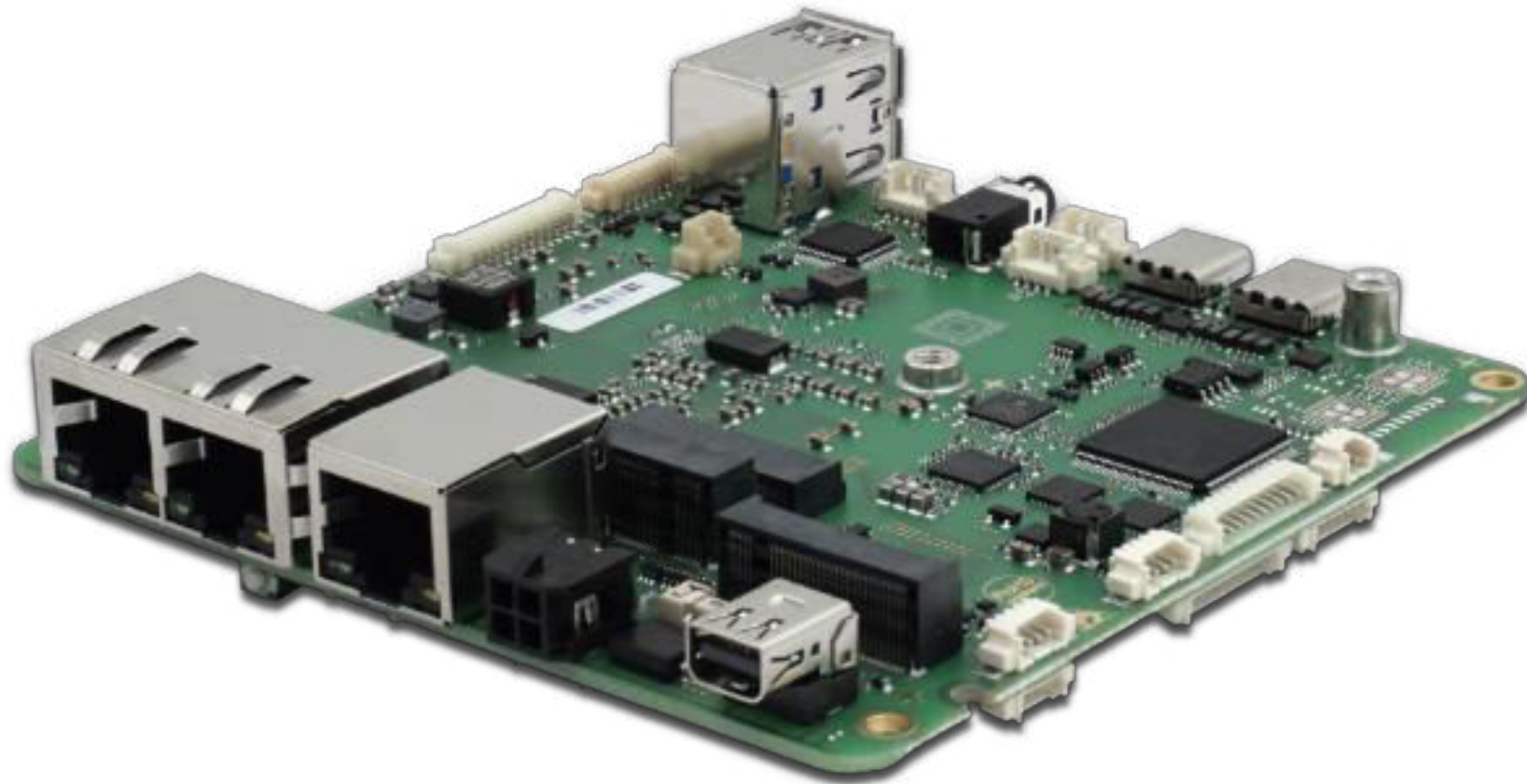


PROFIVE® NUCN – Hardware Reference Manual



Manufacturer

E.E.P.D. Electronic Equipment Produktion & Distribution GmbH
Gewerbering 3
85258 Weichs

Phone: +49 8136 2282 – 0
Web: <https://www.eepd.de>
E-Mail: sales@eepd.de

General Notes

This user manual is for your information.

The information contained herein has been checked carefully and is believed to be reliable. However, E.E.P.D. GmbH gives no guarantee or warranty concerning the accuracy of spoken information and shall not be responsible for any loss or damage of any nature resulting from the usage of or from reliance upon it.

We are thankful for all suggestions or improvements at any time.

E.E.P.D. GmbH reserves the right to make changes in the products or specifications, or both, at any time without notice.

08/2025 Version 1.0

E.E.P.D. GmbH | Gewerbering 3 | 85258 Weichs

Copyright © 2025 E.E.P.D. GmbH. All rights reserved.
08/2025 Version 1.0

Copyright Notice

Copyright© 2025 E.E.P.D. GmbH. ALL RIGHTS RESERVED!

E.E.P.D. GmbH copyrights this document. You may not reproduce, transmit, transcribe, store in a retrieval system, or translate into any language, in any form or by any means, or otherwise, any part of this publication without the express written permission of E.E.P.D. GmbH.

Trademark Acknowledgement

Intel, Core, Celeron and Atom are registered trademarks of Intel Corporation.

AMD, Ryzen and Radeon are registered trademarks of Advanced Micro Devices, Inc.

Panel Link and TMDS are registered trademarks of Silicon Image, Inc.

VESA is a registered trademark of Video Electronics Standard Association.

Windows 10/11 is a registered trademark of Microsoft Corporation.

PROFIVE® and E.E.P.D.® are registered trademarks of E.E.P.D. Electronic Equipment Produktion and Distribution GmbH.

All rights reserved. All other mentioned trademarks are registered trademarks of their owners.

Disclaimer

This document is provided for the general information of the customer. It describes the general functionality of the board and is not considered as assured characteristics. The written declarations in this specification are not constituent part of any contract.

E.E.P.D. GmbH reserves the right to modify the information contained in this manual as necessary and the customer should ensure that he has the most recent revision of this document.

E.E.P.D. GmbH makes no warranty for the use of its products and bears no responsibility for any errors, which may appear in this document. The customer should be on notice that the field of personal computers is the subject of many patents held by different parties. Customer must ensure that they take appropriate action so that their use of the products does not infringe upon any patents. It is the policy of E.E.P.D. GmbH to respect the valid patent rights of third parties and not to infringe upon or assist others to infringe upon such rights.

E.E.P.D. GmbH assumes no responsibility for circuits, descriptions and tables within this document as far as patents or other rights of third parties are concerned.

Life Support Applications

E.E.P.D. GmbH products are not intended for using as critical components in life support appliances, devices or systems in which the failing of an E.E.P.D. GmbH product could be expected to result in personal injury.

FCC and CE Disclaimer

This product cannot be used as a stand-alone product!

Therefore, it has to be integrated together with other products like power supplies, mass storage devices (i. e. hard disks), etc. to be functional.

To meet FCC and/or CE requirements every component as well as the combination of all components has to be validated against all standards required for the end product.

In order to meet FCC and/or CE requirements this product has to be integrated into a proper housing, which provides appropriate shielding and insulation.

It is on the customer's sole responsibility to assure that this end-product meets all required standards.

E.E.P.D. GmbH gives no warranty at all that their products will meet the FCC and CE standards when used in combination with other third-party products or when used in any other way than specified.

Limited Warranty

This product will be free from defects in workmanship and material under normal and proper use for the period of time defined in our General Terms of Business, effective the date of the original shipment from E.E.P.D. GmbH.

In the event of a warranty claim for defects, which appear within the warranty period, customer shall deliver the product along with proof of purchase to the original place of purchase, shipping prepaid. Repair, replacement or refund of the purchase price of the defective product will be at the sole option of the manufacturer. All transportation risks and costs in connection with warranty service are the responsibility of the customer.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TO ANY CUSTOMER, CONSUMER, END USER, PURCHASER, OR OTHERWISE. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR LOSS OF PROFITS, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY BREACH OF CONTRACT OR WARRANTY, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE.

The remedies for defects in this product are limited to those set forth above. If this limitation of remedies is held by any court to be void or unenforceable, or if no warranty is made, manufacturers liability shall in no event exceed the purchase price of the product giving rise to the claim, regardless of whether such claim is brought in breach of contract or warranty, negligence, strict liability or otherwise.

Product Returns

If you return the product to E.E.P.D. GmbH please remove all connections and peripheral equipment.

Protect the unit through a suitable packaging, preferably use the original packaging.

Packaging

The product is in a protective package to avoid damage during transport.

This protective package should be environmentally friendly recycled after use.

Disposal of Device



At the end of the lifetime please dispose and/or recycle the components of the device accordingly.

Technical Support

For technical information about hardware and software please contact:
support@eepd.de

Revision History

Date	Version	Changes	Proofed
26.08.2025	1.0	First release for HW Rev.1	

Table of Contents

General Notes 1

Revision History..... 5

Used Symbols 7

1 Product Description 8

1.1 Feature Overview 8

1.2 Environmental Specification..... 10

2 System Overview 11

3 Assembly 12

3.1 Product Views 12

3.2 Mechanical Mounting..... 13

3.3 Dimensions 14

4 Feature Details..... 15

4.1 Connection Overview 16

4.2 Mini-DP++ Connector 18

4.3 2.5 Gigabit Ethernet Ports 18

4.4 USB 3.2 Ports 19

4.5 Internal USB 2.0 Connectors 19

4.6 Power Connector..... 20

4.7 Audio Connectors..... 21

4.8 M.2 Sockets 22

4.9 eDP Connector..... 23

4.10 Feature Connector 24

4.11 Battery Connector 24

4.12 RS232/485 Connectors.....25

4.13 FAN Connectors26

4.14 Ambient Light Sensor Connector.....27

4.15 Power Button, Power and SSD Activity LEDs.....27

4.16 Reset Button Connector.....28

4.17 Power Button Connector.....28

Index of Figures.....29

Index of Tables30

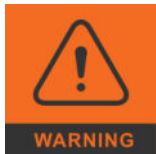
Terminology31

Classified Index.....32

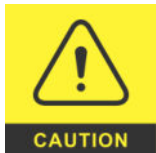
Used Symbols



The red danger sign warns you when a wrong or missing action dramatically endangers your life or health. The used components as well as the peripheral components could be destroyed.



The orange warning sign warns you when a wrong or missing action could seriously harm your health or destroy the used components.



The yellow caution sign warns you when a wrong or missing action could damage the component.



The yellow ESD sign draws your attention that static sensitive parts of the component could be destroyed. Unpack shielded components only with ESD protections like an ESD wrist strap.



The information sign gives you more information and advice for optimal use of this product. For example, it helps you to purchase necessary or optional accessories.

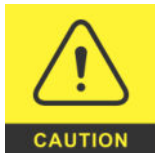
1 Product Description

In the first chapter you will get a glance of all the integrated features. For further information and a brief description of all possible changes and extensions please refer to the corresponding chapter.

1.1 Feature Overview

Power Supply

Designed for min. 8 V to max. 32 V (DC) single power supply, max. 7.5 A, automotive grade (eDP variants require min. 14 V) | KL15 (ignition), min 90 W, 8 A fused.



Current rating of the power supply has to exceed the expected current draw depending on the system configuration, CPU variant and its TDP settings, and peripheral devices used with the system. Power supplies might derate due to lower efficiency at higher operating temperature. Insufficient power supply might lead to the system instability, shutdown and data loss.

Power Connector

Four-pin power connector for external DC power, ignition and ground.

Molex 43045 Series or compatible 3.00 mm Micro MF connector with lock, max. 8.5 A.

Power Limit

Internal and external 3.3 V power max. 20 W.

Internal and external 5 V power max. 30 W.

Internal and external power is related to m.2 connectors, USB, FAN, SATA power and display.

E.E.P.D. GmbH | Gewerbering 3 | 85258 Weichs

Copyright © 2025 E.E.P.D. GmbH. All rights reserved.
08/2025 Version 1.0

Processor Support

(Note: Some processors are only available for OEM/ODM variants)

Intel® Atom® Processors x7000 series:

x7211E / 2C / 2T / 1.0 GHz - 3.2 GHz / 6 W

x7213E / 2C / 2T / 1.7 GHz - 3.2 GHz / 10 W

x7425E / 4C / 4T / 1.5 GHz - 3.4 GHz / 12 W

x7211RE / 2C / 2T / 1.0 GHz - 3.2 GHz / 6 W

x7213RE / 2C / 2T / 2.0 GHz - 3.4 GHz / 9 W

x7433RE / 4C / 4T / 1.5 GHz - 3.4 GHz / 9 W

x7835RE / 8C / 8T / 1.3 GHz - 3.6 GHz / 12 W

Intel® Processor N series:

N50 / 2C / 2T / 1.0 GHz - 3.4 GHz / 6 W

N97 / 4C / 4T / 2.0 GHz - 3.6 GHz / 12 W

N100 / 4C / 4T / 1.0 GHz - 3.4 GHz / 6 W

N200 / 4C / 4T / 1.0 GHz - 3.7 GHz / 6 W

i3-N305 / 8C / 8T / 1.0 GHz - 3.4 GHz / 12 W (9 - 15 W)

Ethernet Controller

Up to 3x Intel® i226-V/IT 2.5 Gbit/s Ethernet PCI Express® controllers with IEEE1588, Wake-on-LAN supported by ETH 3.

I226-V: 0 °C to +60 °C ambient commercial temperature board variants, TSN not supported

I226-IT: -40 °C to +85 °C ambient industrial temperature board variants, TSN-supported

Memory

Up to 16 GB LPDDR5-4800 memory down, industrial CPUs support in-band ECC.

Display

1x Mini-DP++ connector (v1.4), up to 3840 x 2160 @ 60 Hz.

2x USB-C Alt mode, up to 3840 x 2160 @ 60 Hz.

1x eDP, v1.3, up to 3840 x 2160 @ 60 Hz (OEM/ODM only).

Only three displays at the same time.

USB Support

1x Dual-USB 3.2 Gen2 (10 Gb/s, OCP = 1.5 A each), Type A at the front side.

2x USB 3.2 Gen1/Gen2 (depends on CPU; up to 10 Gb/s, OCP = 3 A each), Type C at the rear side.

2x USB 2.0 (480 Mb/s, OCP = 900 mA each) on Molex (PicoBlade) connector.

Storage Support

1x M.2 Key M, 2280, PCIe Gen3 x2 NVMe.

1x eMMC onboard module, up to 128 GB, JEDEC / MMCA version 5.1 interface with 1-I/O, 4-I/O and 8-I/O mode

Expansion Slots

1x Key E, 2230, support for PCIe Gen3 x1 / USB 2.0, e. g. for WLAN/BT.

1x Key B, 3042, support for USB 2.0 / USB 3.2, e. g. for WWAN.

Serial Ports

2x RS-232/485 (FDX|HDX) (OEM only) port on internal Molex (PicoBlade) connector.

Audio

HDA Codec with MIC IN, stereo HP OUT on 3.5 mm audio jack.

SPDIF in / SPDIF out on internal Molex (PicoBlade) connector.

Supports commercial temperature only.

Cooling

Fanless cooling / passive cooling options available

Optional CPU fan, 5V DC, max. 250 mA, not fused

Optional auxiliary fan, 5V DC, max. 250 mA, not fused

OS Support

Microsoft® Windows® 11

Microsoft® Windows® 11 IOT Enterprise LTSC

Microsoft® Windows® 10

Microsoft® Windows® 10 IoT Enterprise

Linux Ubuntu 24.04 LTS

Extended Features

Onboard μ -Controller-IC for:

Input voltage level detection

Power-up sequencing and timing

System reset management

Temperature monitoring, fan control and watchdog

Power and reset button input

C-taster support

Clamp 15 car (ignition) support

Feature connector (4x GPIO [3.3 V], 3x GPO [3.3 V/50 kHz], not fused)

Power LED onboard
Status LED onboard
LVDS panel backlight
RTC battery connector
Intel® PTT (Firmware TPM)
TPM 2.0 support (Infineon SLB 9670) – OEM only
Size approx. 102 x 102 mm
Weight approx. 110 g + options

1.2 Environmental Specification

Max. Operating Temperature

0 °C to +60 °C ambient commercial grade

-40 °C to +85 °C ambient industrial grade (industrial versions only)

Adequate cooling provided, depending on variant and cooling system

CPU throttling may occur at higher ambient temperatures.

Max. Storage Temperature

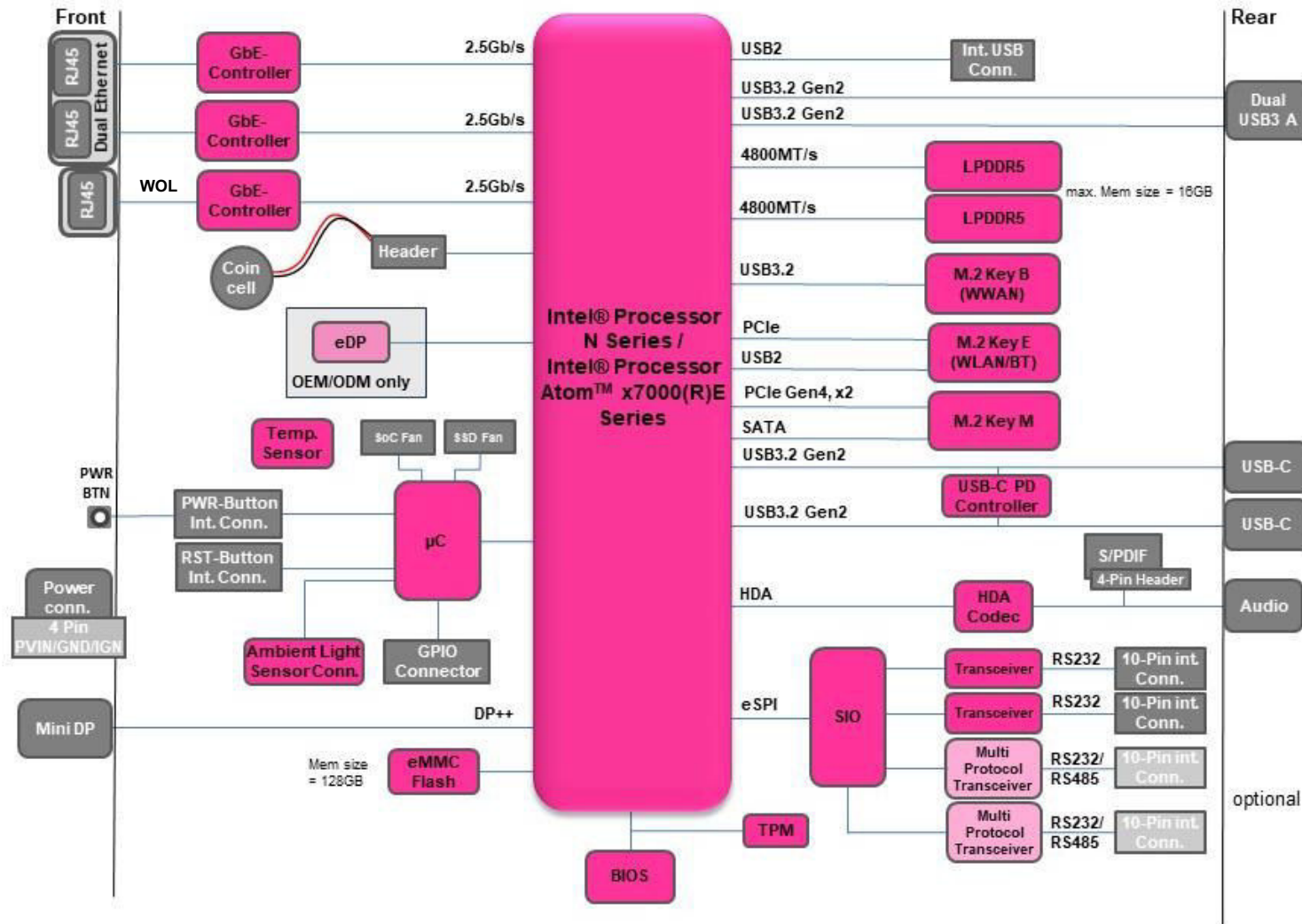
-40 °C to +85 °C, non-condensing

Max. rel. Humidity for all versions

95 % @ 40 °C non-condensing while stored, 89% while working

2 System Overview

This chapter describes the main hardware components of the NUCNX board.



3 Assembly

The board must be mounted in a stable case. The mechanical mounting points according to chapter 3.2 must be used.

The available sockets and connector for system build-up are specified in chapter 4.

E.E.P.D. recommends M3 Torx screws with a screw locking coating and a **maximum tightening torque of 0.5 Nm** (Metric strength class 5.6 or better).

3.1 Product Views

Top View

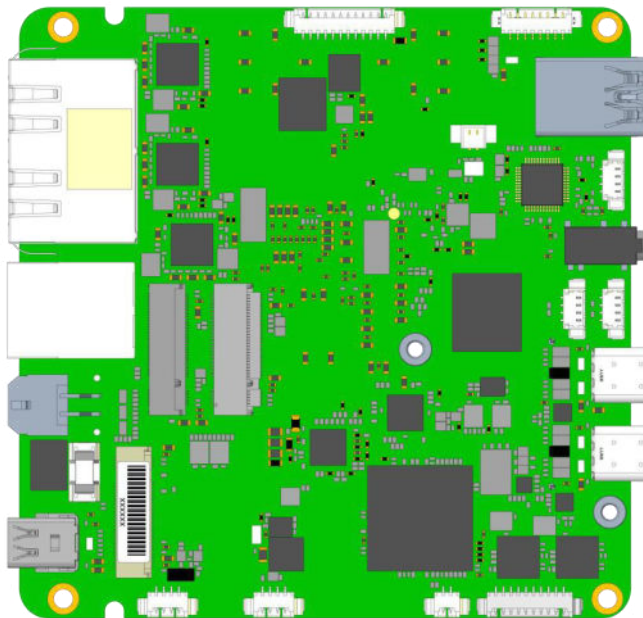


Fig. 2: Top View

Bottom View

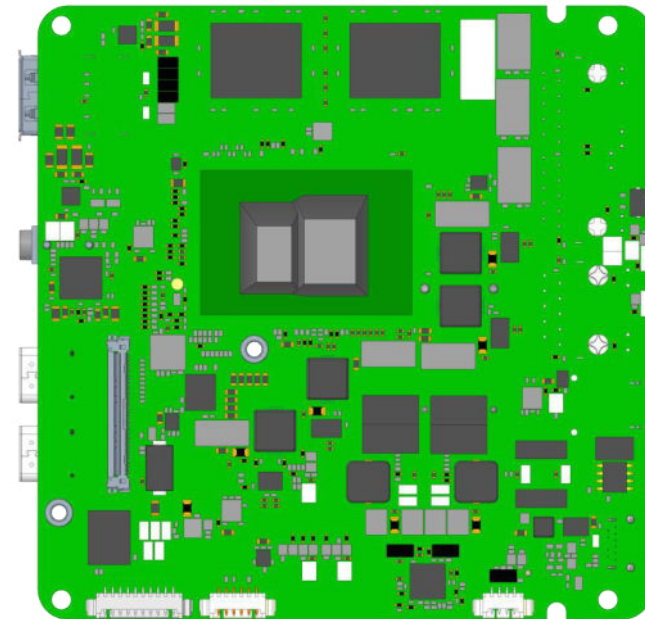


Fig. 3: Bottom View

Front View



Fig. 4: Front View

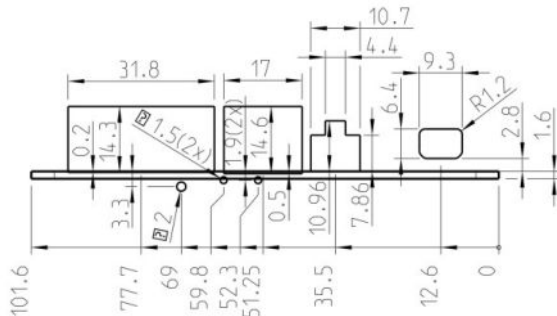


Fig. 5: Recommended cutouts front panel, approx. values [mm]

Rear View

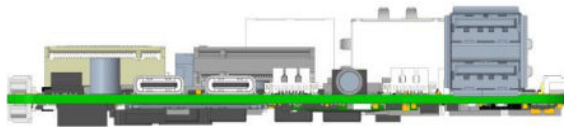


Fig. 6: Rear View

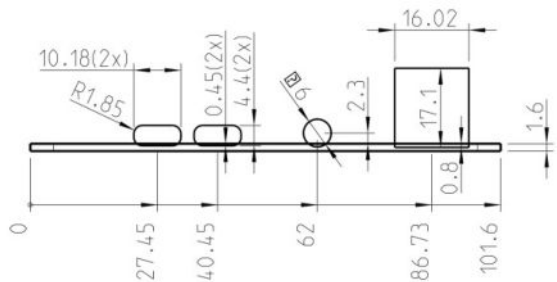


Fig. 7: Recommended cutouts rear panel, approx. values [mm]

E.E.P.D. GmbH | Gewerbering 3 | 85258 Weichs

Copyright © 2025 E.E.P.D. GmbH. All rights reserved.
08/2025 Version 1.0

3.2 Mechanical Mounting

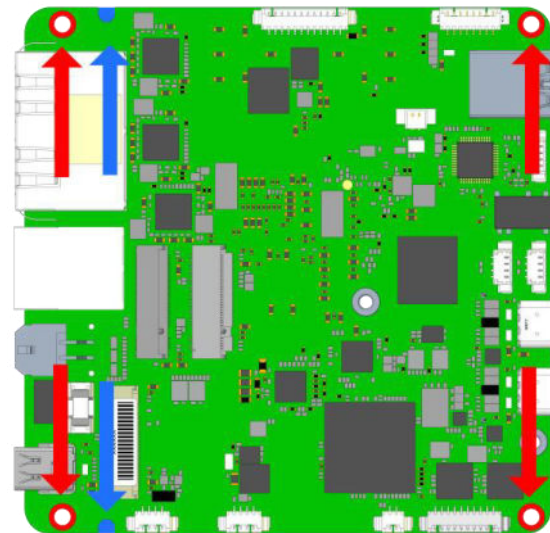
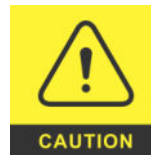


Fig. 8: Mechanical Mounting



Please use the 4 mounting points (red outline) to fasten the base board. In order to prevent short circuit use distance bolts with a minimum length of 15.24 mm (0.6 inches).



The blue marked areas can be used for additional mounting in order to improve the mechanical concept or housing situation.

3.3 Dimensions

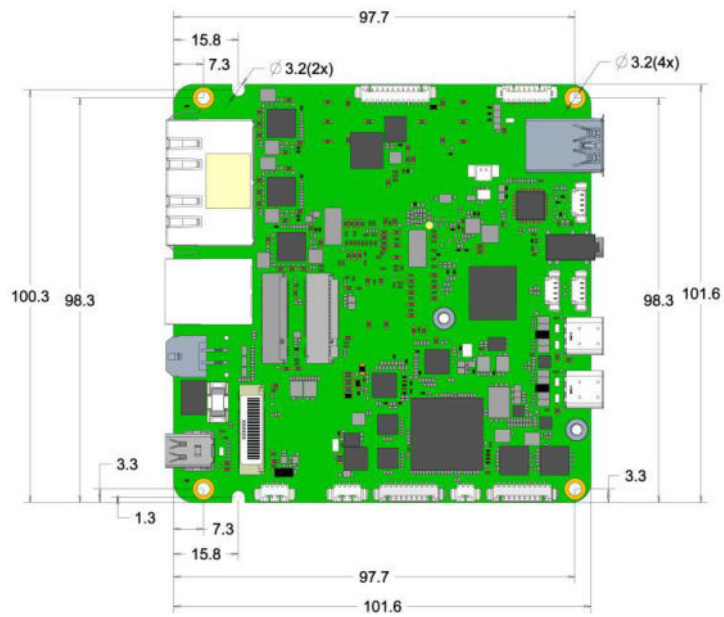


Fig. 9: Dimensions of the Board, approx. values [mm]

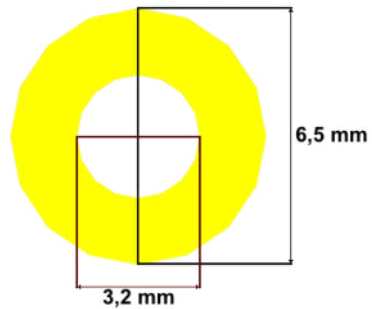


Fig. 10: Dimensions of the mounting points, approx. values [mm]

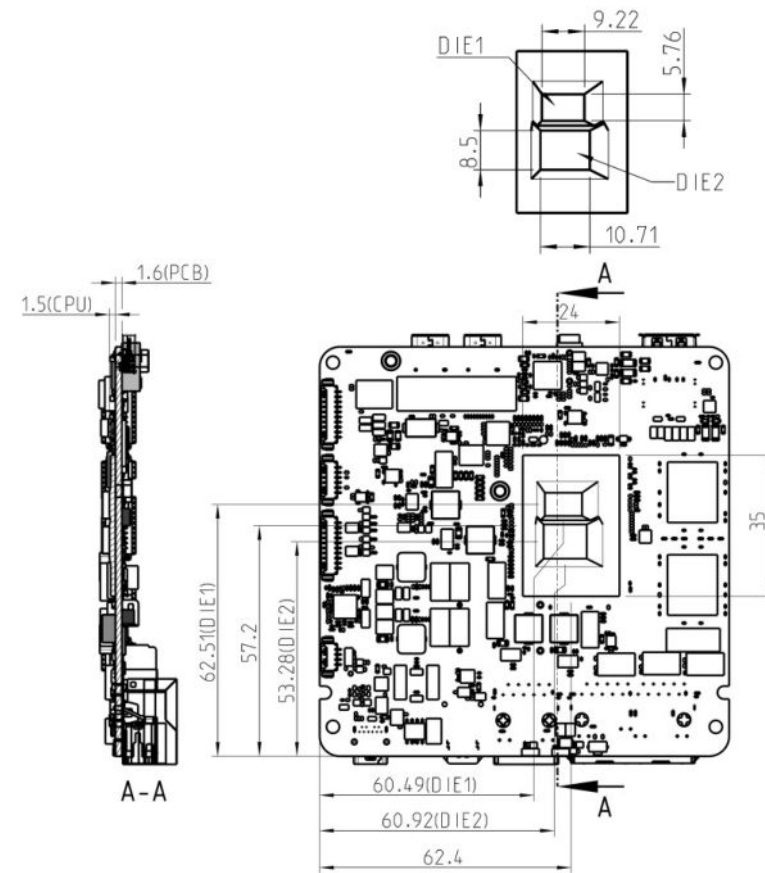


Fig. 11: Dimensions of the CPU, approx. values [mm]

4 Feature Details

The following schedule contains all the necessary information to connect the board to your peripheral equipment.

On the left side of the page, you will see the position on the board (red mark) and on the right side a magnified image of the explained item.

The explanation provides general information, electrical specifications and a pin assignment table.

All voltages are DC:	
VCC	5 V +/- 5%
P3V3	3.3 V +/- 5%
P12V_DISPLAY	12 V +/- 5%
PVIN (min. – max.)	8 – 32 V
VDD_LCD	3.3 V/5 V +/- 5%
VDD_BKL	12 V +/- 5%
VDD_FAN	5 V +/- 5%

4.1 Connection Overview

Top Side

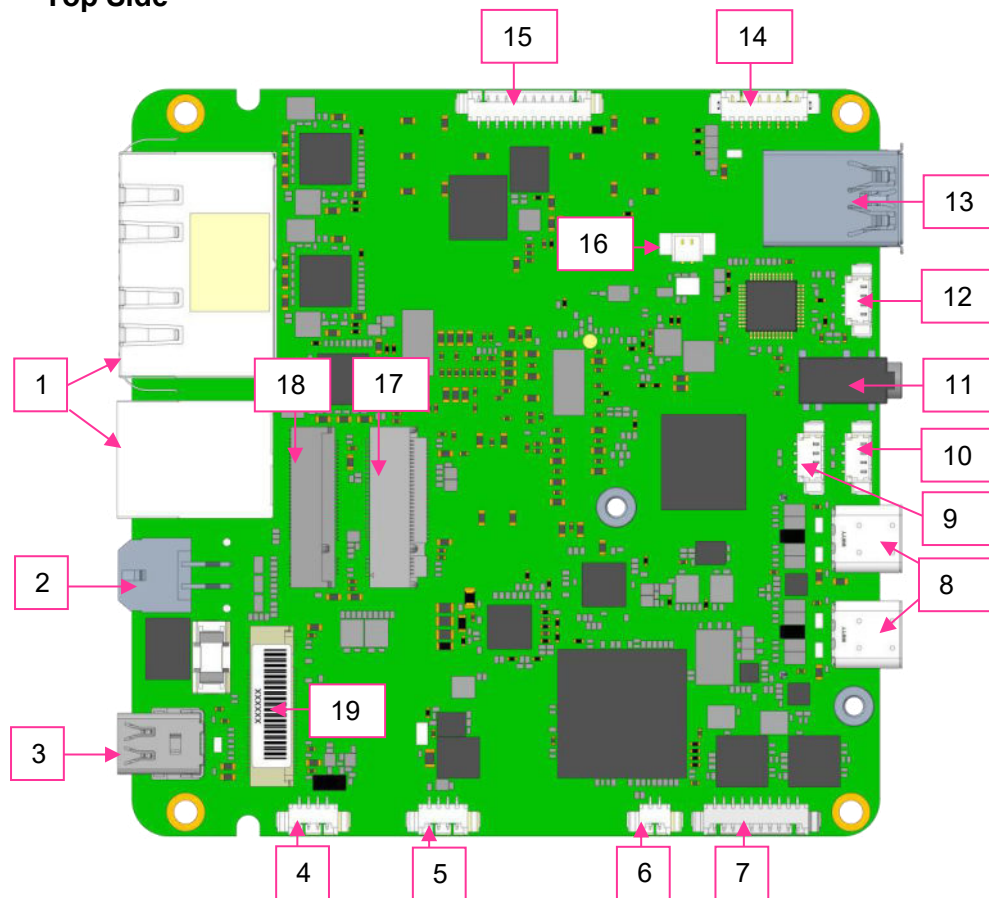
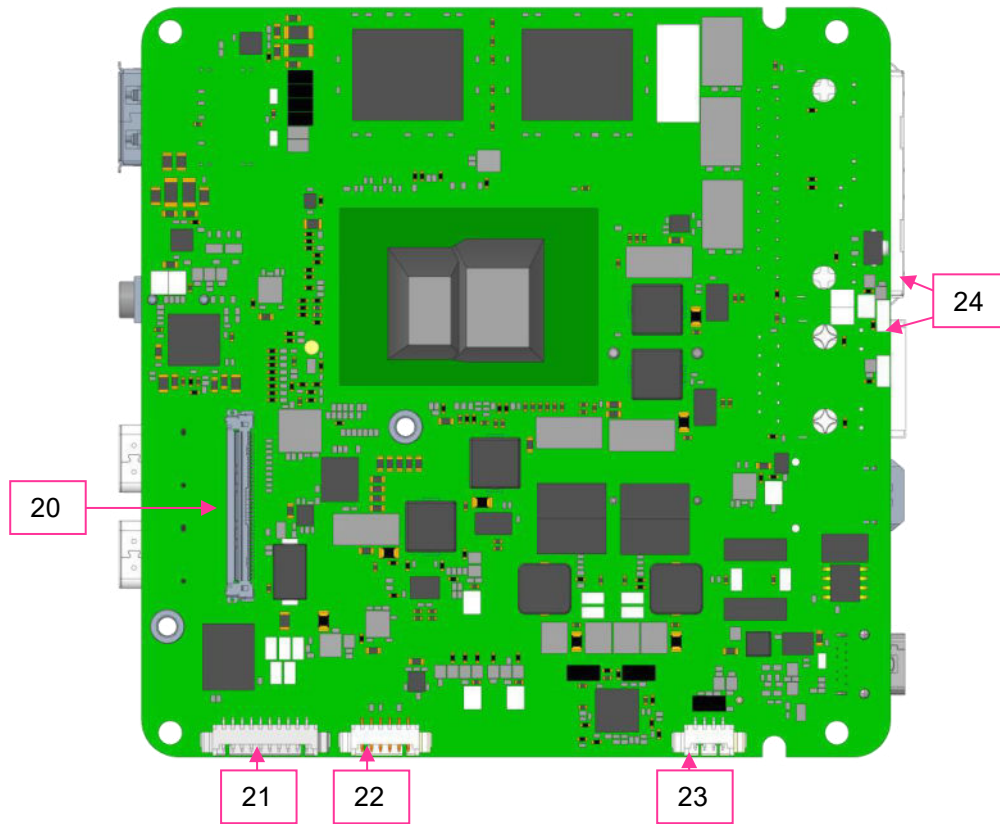


Fig. 12: Connection Overview Top Side

- 1 – 2.5 Gigabit Ethernet ports, see chapter 4.3
- 2 – Power connector, see chapter 4.6
- 3 – Mini Display port, see chapter 4.2
- 4 – Auxiliary fan connector, see chapter 4.13
- 5 – Power button connector, see chapter 4.17
- 6 – Reset button connector, see chapter 4.16
- 7 – RS232/485 connectors, see chapter 4.12
- 8 – USB-C ports, see chapter 4.4
- 9 – Ambient light sensor, see chapter 4.14
- 10 – reserved for internal use only
- 11 – Audio jack, see chapter 4.7
- 12 – S/PDIF, see chapter 4.7
- 13 – Dual USB-A port, see chapter 4.4
- 14 – internal USB 2.0 connectors, see chapter 4.5
- 15 – Feature connector, see chapter 4.10
- 16 – Battery connector, see chapter 4.11
- 17 – M.2 Key E socket, see chapter 4.8
- 18 – M.2 Key B socket, see chapter 4.8
- 19 – M.2 Key M socket, see chapter 4.8

Bottom Side



- 20 – eDP connector, see chapter 4.9
- 21 – RS22/485 connector, see chapter 4.12
- 22 – reserved for internal use only
- 23 – CPU fan connector, see chapter 4.13
- 24 – Power button, Power and SATA/SSD Activity LEDs, see chapter 4.15

Fig. 13: Connection Overview Bottom Side

4.2 Mini-DP++ Connector

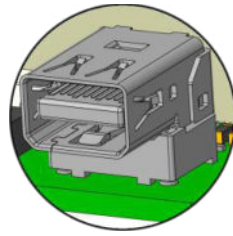
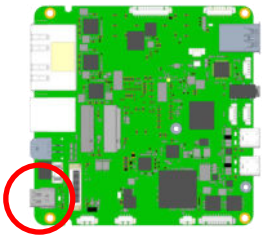


Fig. 14: Mini-DP++ Connector Detail

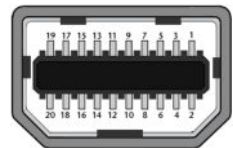
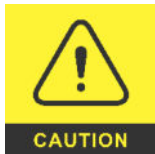


Fig. 15: Mini-DP++ Connector Schematic



Important Note:

There are two types of DisplayPort cables:

If you connect the display **directly** to the Mini DP, please use cable with **Pin 20 not connected**.

If you use **active cables/adapters** (e.g. Mini DP to DP, Mini DP to HDMI), please use cable with **Pin 20** (supply voltage) on both ends that are **connected**.

Possible effects if wrong cable is used:

System might not start up properly.

Dongle does not work properly (black display).

4.3 2.5 Gigabit Ethernet Ports

The Dual-Ethernet socket uses two Intel® i226 controllers. The single Ethernet socket uses the Intel® i226 controller and supports Wake-on-LAN.

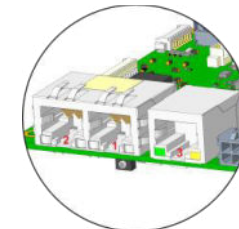
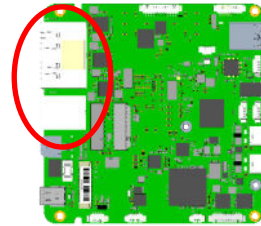


Fig. 16: Ethernet Dual-Port Detail

Yellow LED

Speed-LED is on during 2.5 and 1 Gbit transmission and switched off during 10/100 Mb/s transmission.

Green LED

Link-/Activity-LED is permanently on to indicate an active connection on the Ethernet port. LED blinks during communication with the Ethernet network.

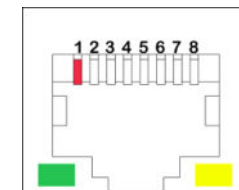


Fig. 17: Ethernet Port Schematic

4.4 USB 3.2 Ports



USB 3.2 type A ports providing max. 1.5 A per port (OCP).
 USB 3.2 type C ports providing max. 3 A per port (OCP).
 Support for USB 2.0 and USB 3.2 Gen1/Gen2 (up to 10 Gb/s).

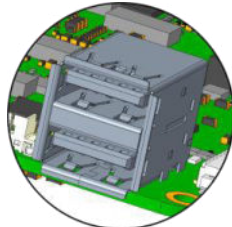
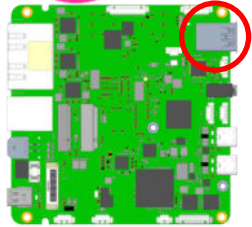


Fig. 18: Dual-USB-A 3.2 Port Detail

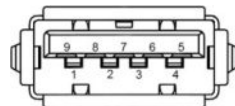


Fig. 19: USB-A 3.2 Port Schematic

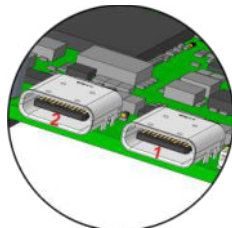
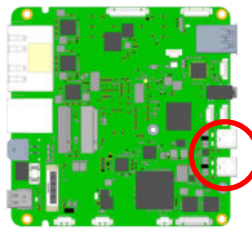


Fig. 20: USB-C 3.2 Ports Detail

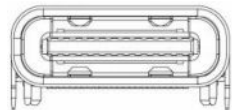


Fig. 21: USB-C 3.2 Port Schematic

4.5 Internal USB 2.0 Connectors



USB 2.0 (480 Mb/s) internal connectors providing max. 900 mA (OCP).

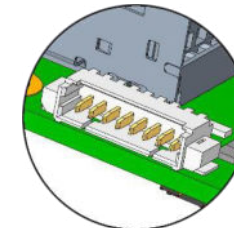
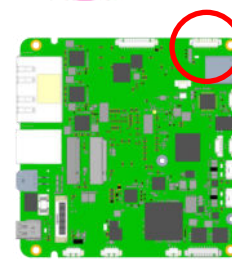


Fig. 22: Molex USB internal Connector Detail



Counterpart – plug:
MOLEX Pico Blade
 0510210900

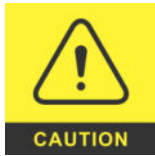


Fig. 23: Molex USB internal Connector Schematic

Pin	Signal
1	VCC_USB2_3 → 5V +/- 5%, OCP = 900 mA
2	USB2_3_N
3	USB2_3_P
4	GND
5	VCC_USB2_4 → 5V +/-5%, OCP = 900 mA
6	USB2_4_N
7	USB2_4_P
8	GND

Tab. 1: USB internal Connector

4.6 Power Connector



For a stable operation:
 Please ensure a system power supply of min. 90 W.
 Power source must be capable to respond to fast load changes!
 Variants without eDP: supply voltage (V_{in}) min. 8 V / max. 32 V
 Variants with eDP: supply voltage (V_{in}) min. 14 V / max. 32 V

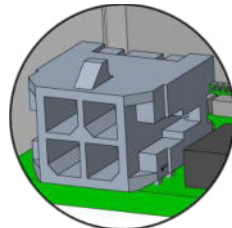
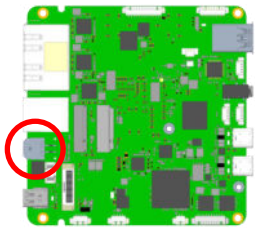


Fig. 24: Power Connector Detail



Counterpart – plug:
 MOLEX 43045 Series
 or compatible 3.00 mm
 Micro MF connector
 with lock, max. 8.5 A

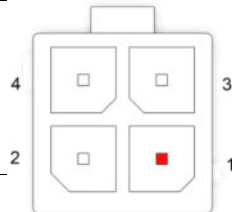


Fig. 25: Power Connector Schematic

Pin	Signal
1	GND_IN, max. 7.5 A
2	GND_IN, max. 7.5 A
3	PVIN, max. 7.5 A
4	KL_15*, max. 7.5 A

Tab. 2: Power Connector

*KL_15 is ignition enable pin required for automotive applications:

KL_15 is default off in BIOS setup.

When enabled:

- Switching on the PC with ignition
- Switching off when the ignition is off with adjustable timers (Timer 1 – shutdown; timer 2 – hard off, if shutdown times out; Countdown timer between 1 and 65535 seconds)

The timers can be set via the “ignition signal” BIOS menu. Default is 180 seconds: 180 seconds after the ignition is off, the board is shut down by the onboard microcontroller.

4.7 Audio Connectors

S/PDIF

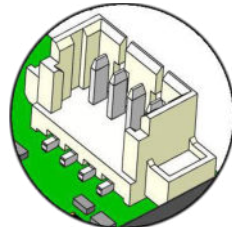
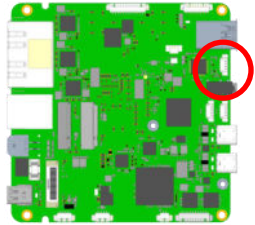


Fig. 26: Molex S/PDIF Connector Detail



Counterpart – plug:
MOLEX Pico Blade
0510211200

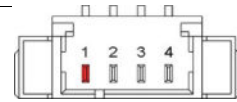


Fig. 27: Molex S/PDIF Connector Schematic

Pin	Signal
1	SPDIFO
2	GND
3	SPDIFI
4	GND

Tab. 3: S/PDIF

Audio Jack

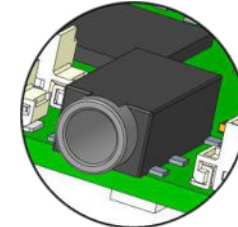
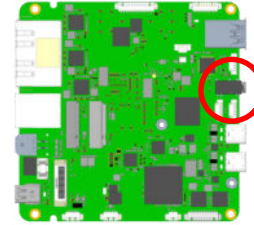
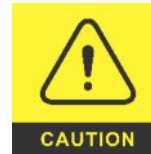


Fig. 28: Audio Jack Detail



For optimum audio performance:

Please ensure to use cables provided by E.E.P.D.

4.8 M.2 Sockets

M.2 Socket Key M

2280, PCIe Gen3 x2 NVMe, P3V3 max. 3.5 A, not fused

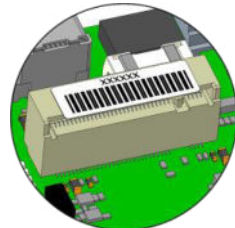
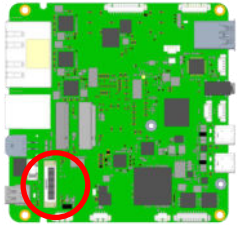


Fig. 29: M.2 Key M Connector Detail

M.2 Socket Key E

2230, PCIe Gen3 x1 and USB 2.0, P3V3 max. 2 A, not fused

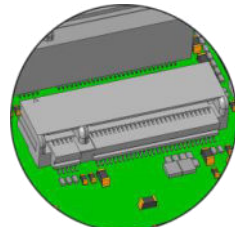
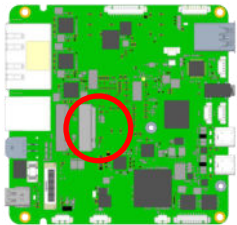


Fig. 30: M.2 Key E Connector Detail

M.2 Socket Key B

3042, USB 2.0 and USB 3.2 Gen2, P3V3 max. 2.5 A, not fused

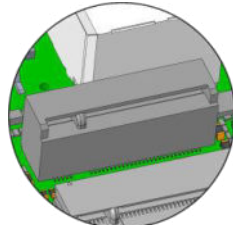
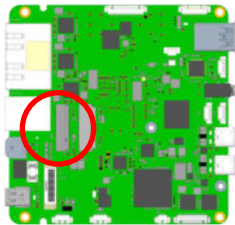


Fig. 31: M.2 Key B Connector Detail

Installing M.2 modules

Insert the M.2 module into the corresponding slot at an angle. Press it down on the side that protrudes and secure it with the screw provided.

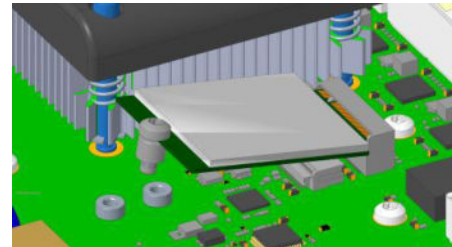


Fig. 32: M.2 Module Assembly Example

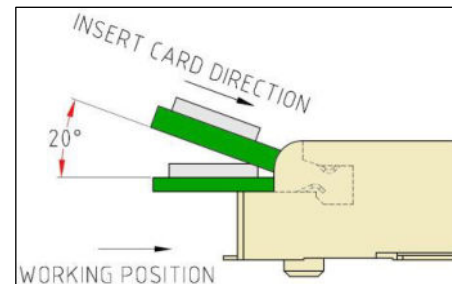


Fig. 33: M.2 Module Assembly Angle

4.9 eDP Connector

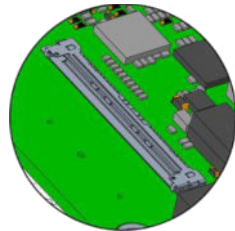
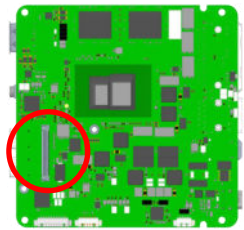


Fig. 34: eDP Connector Detail

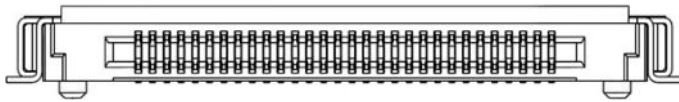


Fig. 35: eDP Connector Schematic



Counterpart – plug:
e. g. ACES 50204-40

Pin	Signal	Pin	Signal
1	NC	21	VDD_LCD*1
2	GND	22	eDP_SELF_TEST
3	eDP_TX3_N	23	GND
4	eDP_TX3_P	24	GND
5	GND	25	GND
6	eDP_TX2_N	26	GND
7	eDP_TX2_P	27	eDP_HPD
8	GND	28	GND
9	eDP_TX1_N	29	GND
10	eDP_TX1_P	30	GND
11	GND	31	GND
12	eDP_TX0_N	32	eDP_BKLEN
13	eDP_TX0_P	33	eDP_BKLCTL_μC_OUT
14	GND	34	NC
15	eDP_AUX_P	35	NC
16	eDP_AUX_N	36	VDD_BKL*2
17	GND	37	VDD_BKL*2
18	VDD_LCD*1	38	VDD_BKL*2
19	VDD_LCD*1	39	VDD_BKL*2
20	VDD_LCD*1	40	NC

Tab. 4: eDP Connector

*1 VDD_LCD = 10.4 V +/-5%, I_max = 1.5 A, not fused (other on request)

*2 VDD_BKL = 12 V +/-5%, I_max = 1.5 A, not fused

4.10 Feature Connector

This feature requires Linux driver or Windows Library for OEM customers on request.

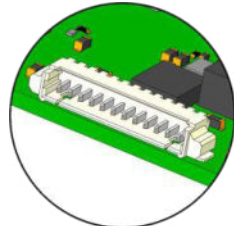
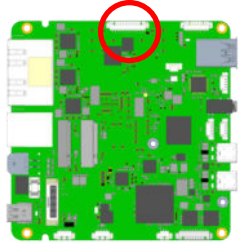


Fig. 36: Molex Feature Connector Detail



Counterpart – plug:
MOLEX Pico Blade
0510211200



Fig. 37: Molex Feature Connector Schematic

Pin	Signal
1	3.3 V +/- 5% 200 mA max. not fused
2	VDD_FAN: 5 V +/-5% 250 mA max. not fused
3	GPIO0
4	GPIO1
5	GPIO2
6	GPIO3
7	GPO4
8	GPO5
9	GPO6
10	STATUS_LED_ANODE 3.3 V +/- 5% with 100 Ω series resistor (1/16W), 33 mA max., not fused
11	STATUS_LED_CATHODE
12	GND

Tab. 5: Feature Connector

4.11 Battery Connector

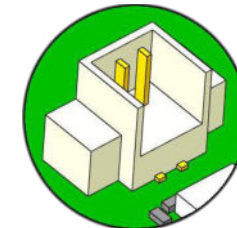
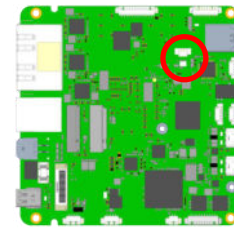


Fig. 38: Molex Battery Connector Detail

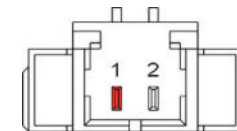


Fig. 39: Molex Battery Connector Schematic



Counterpart – plug:

MOLEX Pico Blade 0510210200
Battery with cable ordering number: W-BATCR1A

Pin	Signal
1	BATT
2	GND

Tab. 6: Battery Connector

4.12 RS232/485 Connectors

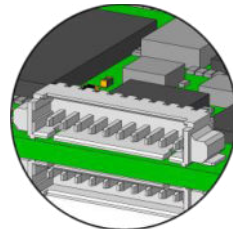
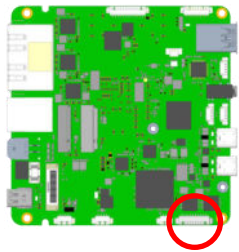


Fig. 40: Molex RS232/485 Connector Top Side Detail

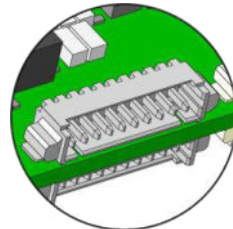
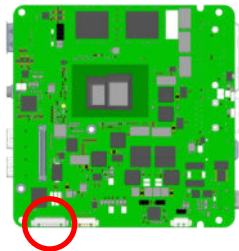


Fig. 41: Molex RS232/485 Connector Bottom Side Detail



Counterpart – plug:
MOLEX Pico Blade
0510211000

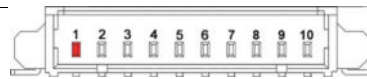


Fig. 42: Molex RS232/485 Connectors Schematic

Pin	Signal RS232*	Signal RS485/FDX*	Signal RS485/HDX for Windows 10/11 only*
1	DCD	RS485-TX_N	RS485-RX/TX_N
2	DSR	-	-
3	RXD	RS485-TX_P	RS485-RX/TX_P
4	RTS	-	-
5	TXD	RS485-RX_P	-
6	CTS	-	-
7	DTR	RS485-RX_N	-
8	-	-	-
9	VCC 5 V +/-5%, max. 500 mA not fused	VCC 5 V +/-5%, max. 500 mA not fused	VCC 5 V +/-5%, max. 500 mA not fused
10	GND	GND	GND

Tab. 7: RS232/485 Connectors

*see BIOS setting

4.13 FAN Connectors

CPU FAN

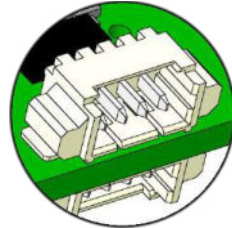
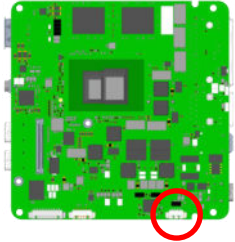


Fig. 43: Molex CPU FAN Connector Detail

Auxiliary FAN (e. g. for SSD)

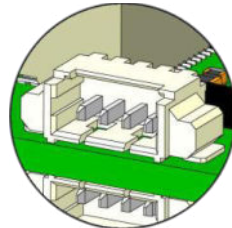
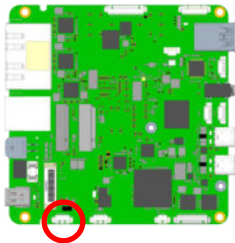


Fig. 44: Molex Auxiliary FAN Connector Detail



Counterpart – plug:
MOLEX Pico Blade
0510210400

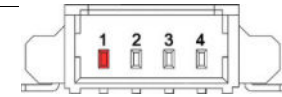
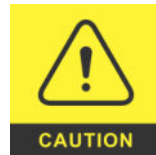


Fig. 45: Molex FAN Connector Schematic

Pin	Signal
1	GND
2	VDD_FAN 5V +/- 5% max. 250 mA not fused
3	FAN_TACHO
4	FAN_PWM

Tab. 8: FAN Connectors



An incorrectly connected fan can cause damage to the fan and the board!

4.14 Ambient Light Sensor Connector

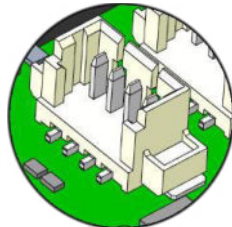
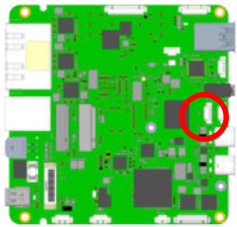


Fig. 46: Molex ALS Connector Detail



Counterpart – plug:
MOLEX Pico Blade
0510210400

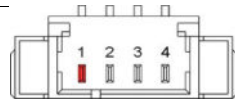


Fig. 47: Molex ALS Connector Detail

Pin	Signal
1	P3V3
2	I2C_ALS_CLK
3	I2C_ALS_DATA
4	GND

Tab. 9: Ambient Light Sensor

4.15 Power Button, Power and SSD Activity LEDs

Press power button once to start up.

Press power button to shut down into S3/S4/S5 (Standby/Hibernate/OFF; depending on OS setting).

Hold power button (> 4 sec.) for hard shut down into S5 (OFF), may result in data loss.

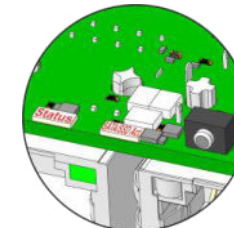
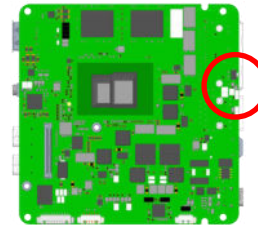


Fig. 48: Power Button/Power and SATA/SSD Activity LEDs Detail

4.16 Reset Button Connector

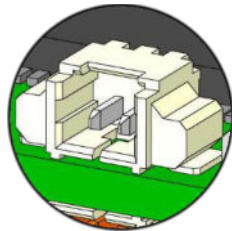
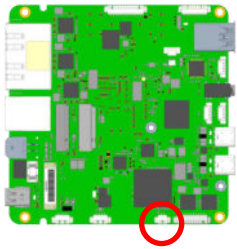


Fig. 49: Molex Reset Button Connector Detail



Counterpart – plug:
MOLEX Pico Blade
0510210200

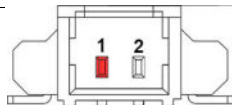


Fig. 50: Molex Reset Button Connector Schematic

Pin	Signal
1	GND
2	RESET_IN_m

Tab. 10: Reset Button

4.17 Power Button Connector

Press power button once to start up.

Press power button to shut down into S3/S4/S5 (Standby/Hibernate/OFF; depending on OS setting).

Hold power button (> 4 sec.) for hard shut down into S5 (OFF). May result in data loss.

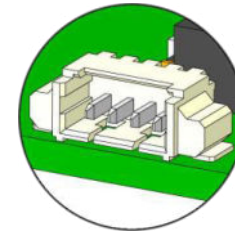
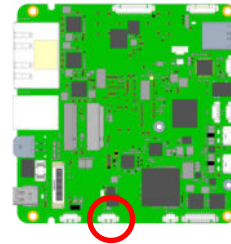


Fig. 51: Molex Power Button Connector Detail



Counterpart – plug:
MOLEX Pico Blade
0510210400



Fig. 52: Molex Power Button Connector Schematic

Pin	Signal
1	PWR_LED_ANODE 3.3V +/- 5% with 100 Ω series resistor max. 33 mA, not fused
2	PWR_LED_CATHODE
3	GND
4	POWERBUTTON

Tab. 11: Power Button Connector

Index of Figures

Fig. 1: System Overview 11
 Fig. 2: Top View..... 12
 Fig. 3: Bottom View..... 12
 Fig. 4: Front View..... 13
 Fig. 5: Recommended cutouts front panel, approx. values [mm] 13
 Fig. 6: Rear View 13
 Fig. 7: Recommended cutouts rear panel, approx. values [mm]..... 13
 Fig. 8: Mechanical Mounting..... 13
 Fig. 9: Dimensions of the Board, approx. values [mm] 14
 Fig. 10: Dimensions of the mounting points, approx. values [mm] 14
 Fig. 11: Dimensions of the CPU, approx. values [mm] 14
 Fig. 12: Connection Overview Top Side..... 16
 Fig. 13: Connection Overview Bottom Side..... 17
 Fig. 14: Mini-DP++ Connector Detail 18
 Fig. 15: Mini-DP++ Connector Schematic..... 18
 Fig. 16: Ethernet Dual-Port Detail..... 18
 Fig. 17: Ethernet Port Schematic..... 18
 Fig. 18: Dual-USB-A 3.2 Port Detail..... 19
 Fig. 19: USB-A 3.2 Port Schematic 19
 Fig. 20: USB-C 3.2 Ports Detail..... 19
 Fig. 21: USB-C 3.2 Port Schematic 19
 Fig. 22: Molex USB internal Connector Detail..... 19
 Fig. 23: Molex USB internal Connector Schematic..... 19
 Fig. 24: Power Connector Detail..... 20
 Fig. 25: Power Connector Schematic 20
 Fig. 26: Molex S/PDIF Connector Detail 21
 Fig. 27: Molex S/PDIF Connector Schematic..... 21
 Fig. 28: Audio Jack Detail..... 21
 Fig. 29: M.2 Key M Connector Detail 22
 Fig. 30: M.2 Key E Connector Detail..... 22
 Fig. 31: M.2 Key B Connector Detail..... 22

Fig. 32: M.2 Module Assembly Example 22
 Fig. 33: M.2 Module Assembly Angle..... 22
 Fig. 34: eDP Connector Detail 23
 Fig. 35: eDP Connector Schematic..... 23
 Fig. 36: Molex Feature Connector Detail..... 24
 Fig. 37: Molex Feature Connector Schematic 24
 Fig. 38: Molex Battery Connector Detail..... 24
 Fig. 39: Molex Battery Connector Schematic 24
 Fig. 40: Molex RS232/485 Connector Top Side Detail 25
 Fig. 41: Molex RS232/485 Connector Bottom Side Detail 25
 Fig. 42: Molex RS232/485 Connectors Schematic 25
 Fig. 43: Molex CPU FAN Connector Detail 26
 Fig. 44: Molex Auxiliary FAN Connector Detail..... 26
 Fig. 45: Molex FAN Connector Schematic 26
 Fig. 46: Molex ALS Connector Detail 27
 Fig. 47: Molex ALS Connector Detail 27
 Fig. 48: Power Button/Power and SATA/SSD Activity LEDs Detail 27
 Fig. 49: Molex Reset Button Connector Detail..... 28
 Fig. 50: Molex Reset Button Connector Schematic 28
 Fig. 51: Molex Power Button Connector Detail 28
 Fig. 52: Molex Power Button Connector Schematic..... 28

Index of Tables

Tab. 1: USB internal Connector..... 19
 Tab. 2: Power Connector 20
 Tab. 3: S/PDIF 21
 Tab. 4: eDP Connector 23
 Tab. 5: Feature Connector 24
 Tab. 6: Battery Connector 24
 Tab. 7: RS232/485 Connectors 25
 Tab. 8: FAN Connectors..... 26
 Tab. 9: Ambient Light Sensor 27
 Tab. 10: Reset Button 28
 Tab. 11: Power Button Connector 28

Terminology

BT	Bluetooth
CPU	Central Processing Unit or processor
DC	Direct Current
DP	Display port
ECC	Error Correcting Code
EMI	Electro Magnetic Interference
eMMC	Embedded Multi Media Card
2.5 Gigabit Ethernet	Ethernet connection with a frame transfer speed up to 2500 Mbit/s
GND	Ground
MIC	Microphone
M.2	Next generation mSATA
OCP	Over Current Protection
PWM	Pulse-Width Modulation
RAM	Random Access Memory
RS-232	Serial standard interface
RS-485	Serial standard interface
SoC	System on a Chip means the integration of all or a large part of the functions of a programmable electronic system on a single chip
S/PDIF	Sony/Philips Digital Interface
SSD	Solid State Drive
TSN	Time-Sensitive Networking
USB	Universal Serial Bus
Watchdog	A watchdog (timer) is a computer hardware timing device that triggers a system reset if the main program hangs, in order to keep the computer running
WLAN	Wireless Local Area Network
WWAN	Wireless Wide Area Network

Classified Index

-A-	
Ambient Light Sensor Connector.....	27
Assembly.....	12
Audio Connectors.....	21
-B-	
Battery Connector.....	24
-C-	
Connection Overview.....	16
-D-	
Dimensions.....	14
-E-	
eDP Connector.....	23
Environmental Specification.....	10
-F-	
FAN Connectors.....	26
Feature Connector.....	24
Feature Details.....	15
Feature Overview.....	8
-G-	
Gigabit Ethernet Ports.....	18
-M-	
M.2 Sockets.....	22
Mechanical Mounting.....	13
Mini-DP++ Connector.....	18
-P-	
Power Button Connector.....	28
Power Button, Power and SATA/SSD Act. LEDs.....	27
Power Connector.....	20
Product Views.....	12
-R-	
Reset Button Connector.....	28
RS232/485 Connectors.....	25
-S-	
System Overview.....	11
-U-	
USB 2.0 Connectors.....	19
USB 3.2 Ports.....	19

E.E.P.D.  [®]
...just embedded!


p . o . f . i . v . e