# TBOX-1E15

**TBOX-1xx5 Series | Powerful Performance & Compact | Fanless Box Mini PC**

**Intel Elkhart Lake J6412 Platform**

# User Manual

Version 2.0

Last Update Date: 24th –September. 2024

# Table of Content

**THANKS** ..... **3**

**COPYRIGHT AND TRADEMARK** ..... **3**

**NOTE:** ..... **4**

**ELECTRICAL SAFETY** ..... **4**

**OPERATIONAL SAFETY** ..... **5**

**VERSION UPDATE:** ..... **5**

**1 PRODUCT INTRODUCTION** ..... **6**

1.1 Product Description ..... 6
1.2 TBOX-1E15 Name Decoder ..... 6
1.3 Ordering Information ..... 6
1.4 Key Features ..... 7
1.5 Packing List ..... 7

**2 SPECIFICATION & DIMENSIONS** ..... **7**

2.1 Product Images ..... 7
2.2 TBOX-1E15 Specification ..... 8
2.3 Product Dimensions ..... 9

**3 IO INTERFACE DEFINITION** ..... **9**

3.1 IO Layout ..... 9
3.2 IO Interface Definition ..... 10
*3.2.1 Power Input: DC Jack 12V ..... 10*
*3.2.2 USB2.0 ..... 10*
*3.2.3 USB3.0 ..... 10*
*3.2.4 HDMI ..... 10*
*3.2.5 RJ45 (LAN 1/2) ..... 11*

**4 INSTALLATION SCENARIO** ..... **11**

**5 MAINBOARD DESCRIPTION** ..... **12**

5.1 Functional Block Diagram ..... 12
5.2 Mainboard Mechanical Drawing ..... 13
5.3 Jumpers/Headers and Connectors ..... 14

**6 SIMPLE BIOS INTRODUCTIONS** ..... **16**

**[END]** ..... **16**

# Thanks

Dear user, hello! Thank you very much for purchasing TAICENN modular designed & manufactured Industrial Box PC products.

TAICENN, is a leading global provider and manufacturer of industrial Box PC, industrial display and embedded box computer products, which are designed specifically for systems and applications that require excellent performance, high-level reliability and stability, long supply period and supports.

With a dedication to technology innovation, TAICENN provides our customers qualified products and timely technical support, that the clients can safely deploy with ease and confidence, increasing their ability to bring products to market quickly, and decreasing the maintenance costs without any business risk.

We provide you with this detailed product manual to better understand this TAICENN product and relative technical guidance.

Please read it carefully before installation and using, it will help you to better use this product. In the process of using this product, if you have any questions on technology, after-sales service and product quality, you can gain our flexible & rapid technical support immediately. We will provide you with sincere service.

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# Note:

Product failure or damage caused by the following factors is not covered by the free warranty:

- Damage caused by natural disasters (flood, fire, earthquake, lightning strike, typhoon, etc.), force majeure or accidental operation
- Disassemble, repair, or send the product to a non-TAICENN certified service point for inspection and maintenance
- The user arbitrarily or ask a third person to modify, repair, change the specifications and packaging, add or expand the failure and damage caused by accessories not sold, authorized or approved by the company's original factory.
- Problems and malfunctions caused by users installing software and improper settings.
- Problems and malfunctions caused by calculator viruses.
- The company's warranty identification sticker is torn or unrecognizable, and the warranty service card is altered or does not match the product.

The product names mentioned in the product manual are for identification purposes only, and these names may be registered trademarks or copyrights of other companies.

For the latest upgrade information of product specifications, please visit the official website of TAICENN or contact TAICENN support team directly.

# Electrical safety

1) In order to avoid possible electric shock causing serious damage, please temporarily disconnect the computer power supply from the power socket;
2) When you want to add a hardware device to the system or remove a hardware device from the system, you must firstly connect the device's data cable, and then connect the power cable. If possible, unplug the computer's power cable before installing hardware devices.
3) When you want to connect or unplug any data cables from the mainboard, please make sure that all power cables have been unplugged in advance.
4) Before using an expansion card, we suggest you to seek professional engineer's assistance first. These devices may will interfere with the ground loop.
5) Please confirm that the voltage setting of the power supply has been adjusted to the voltage standard value in your country and region. If you are not sure about the voltage value in your region, then please ask the local staff of electric company nearby.
6) If the power supply is damaged, please do not try to repair it yourself. Please hand it over to professional engineers or dealers.

# Operational safety

1) Before you install the accessories or add hardware devices, please be sure to read the relevant information provided in this manual.
2) Before using the product, please confirm that all cables and power cords have been properly connected. If you find any major defects, please contact your dealer as soon as possible.
3) To avoid short-circuit situations, please be sure to put away all unused screws, paper clips and other parts, and do not leave them on the mainboard or in the host computer.
4) Dust, humidity and drastic temperature changes will affect the life span of the Box PC system, so please avoid placing it in these places.
5) Do not place the industrial Box PC in a place that is easy to shake.
6) If you plan to use DC 24v voltage input, and connect the power from the field, please make sure that you have confirmed **the positive and negative** anodes of the computer system. It is very important!!!
7) If you have any technical problems during the use of this product, please contact a certified or experienced technician.

# Version Update:

| Version | Description | Date |
|---|---|---|
| V1.0 | First version; Draft version format | 1st -Jan. 2022 |
| V2.0 | New user manual format; | 16th -March 2024 |

# 1 Product Introduction

## 1.1 Product Description

TAICENN TBOX-1E15 is a new palm-sized fanless Box PC model, it adapts Intel Elkhart Lake J6412 Quad-core CPU, having advanced computing performance and low power consumption. TBOX-1E15 storage can support 1* M.2 NVMe SSD; The design has rich IO interfaces, with 2* LAN ports, 3* USB3.0, 3* USB2.0, 2*HDMI and 1* Audio ports; The power input is DC 12V voltage, and has over-current, over-voltage and reverse-polarity protection.

TAICENN TBOX-1E15 operating temp. is -20°C~+60°C, can be suitable for longer-time operating and harsh environment industrial application projects. TAICENN TBOX-1E15 can be compatible with Windows10, Windows 11, Linux Operating system and embedded Operating system, and it is also compatible with application software based on those operating systems.

## 1.2 TBOX-1E15 Name Decoder

**TBOX-1E15 Series Box PC Name decoder**

| TBOX | - | 1 | E | 1 | 5 | G | D | W | R | - | 4G | - | 64GS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAICENN Box PC | | Series Type | CPU Platform | CPU | Mainboard/Design Type | Wireless Optional | Optional | Optional | Optional | | Memory | | SSD | | HDD | |
| | | 1 Mini Size | E Elkhart Lake | 0 Celeron | 5 SEAVO \| 1 Layer | F WIFI | D GPIO | W Wide voltage | R Din-Rail Mount | | 4G | | 64GS 64GB | | 512GH 512GB | |
| | | 2 Common model | T Tiger Lake UP3 | 1 Atom/Celeron/i3 | 6 SEAVO \| 2-Layer | B WIFI+BT | | | | | 8G | | 128GS 128GB | | 1TH 1TB | |
| | | 3 Multiple GLAN | | 2 i5 | | G 3G/4G | | | | | 16G | | 256GS 256GB | | 2TH 2TB | |
| | | | | 3 i7 | | A 5G | | | | | 32GB | | 512GS 512GB | | | |
| | | | | | | C WIFI 6 | | | | | | | 1TS 1TB | | | |
| | | | | | | T DC Fixed | | | | | | | 2TS 2TB | | | |

**Note:**

1. There are Celeron, Core i3, i5, i7 CPUs on Whiskey Lake & Tiger Lake UP3 platforms;

## 1.3 Ordering Information

| Part no. | Description |
|---|---|
| TBOX-1E15 | Intel Celeron J6412, 2 RJ45, 3 USB3.0, 3 USB2.0, 2 HDMI, Audio, DC 12V (DC Jack), PSU |
| Memory | Memory: SO-DIMM, DDR4,4GB/8GB/16GB/32GB |
| Storage | M.2 NVMe SSD: 128GB/256GB/512GB |
| Wireless Modules | Wi-Fi module, with Antenna (Mini-PCIe) |
| | Wi-Fi module with BT integrated, with antenna (Mini-PCIe) |
| | All network 4G module, with Antenna (Mini-PCIe) |
| | 5G Module, with Antenna (M.2 B-key 3052) |
| TDRK-BOX1-35 | Din 35 mount clip (1 set per unit) |

## 1.4 Key Features

- Rugged, Ultra-small, fanless designed box structure;
- Intel Elkhart Lake J6412 Quad-core processor;
- DC 12V power input, with DC jack;
- Industrial -20 ~ + 60°C operating range;
- 2 GLAN, optional with 3G/4G, and Wi-Fi/BT expansion;
- 3 USB3.0, 3 USB2.0, 2 HDMI, Audio;
- 1 Mini-PCIe slot, and optional 1 M.2 Key-B 3052 slot.

## 1.5 Packing List

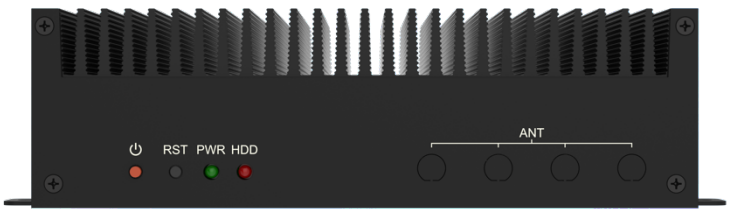
After you get this product packaging box, please check whether the standard accessories listed below are complete. If it is missing or damaged, please contact the dealer where you purchased the product or directly contact TAICENN after-sales service.

| Description | Quantity |
|---|---|
| Standard TBOX-1E15 Box PC Product | 1 |
| 40W PSU (Power supply) | 1 |
| Power cable & Plug | 1 |
| Certificate of Quality | 1 |

Please be noted that: we **don't** provide the Driver CD Disc anymore by default, only if customers' PO have such requirement. In the process of using this product, if you have any questions on drivers, you can gain our flexible & rapid technical support immediately. We will provide you with sincere service.

# 2 Specification & Dimensions

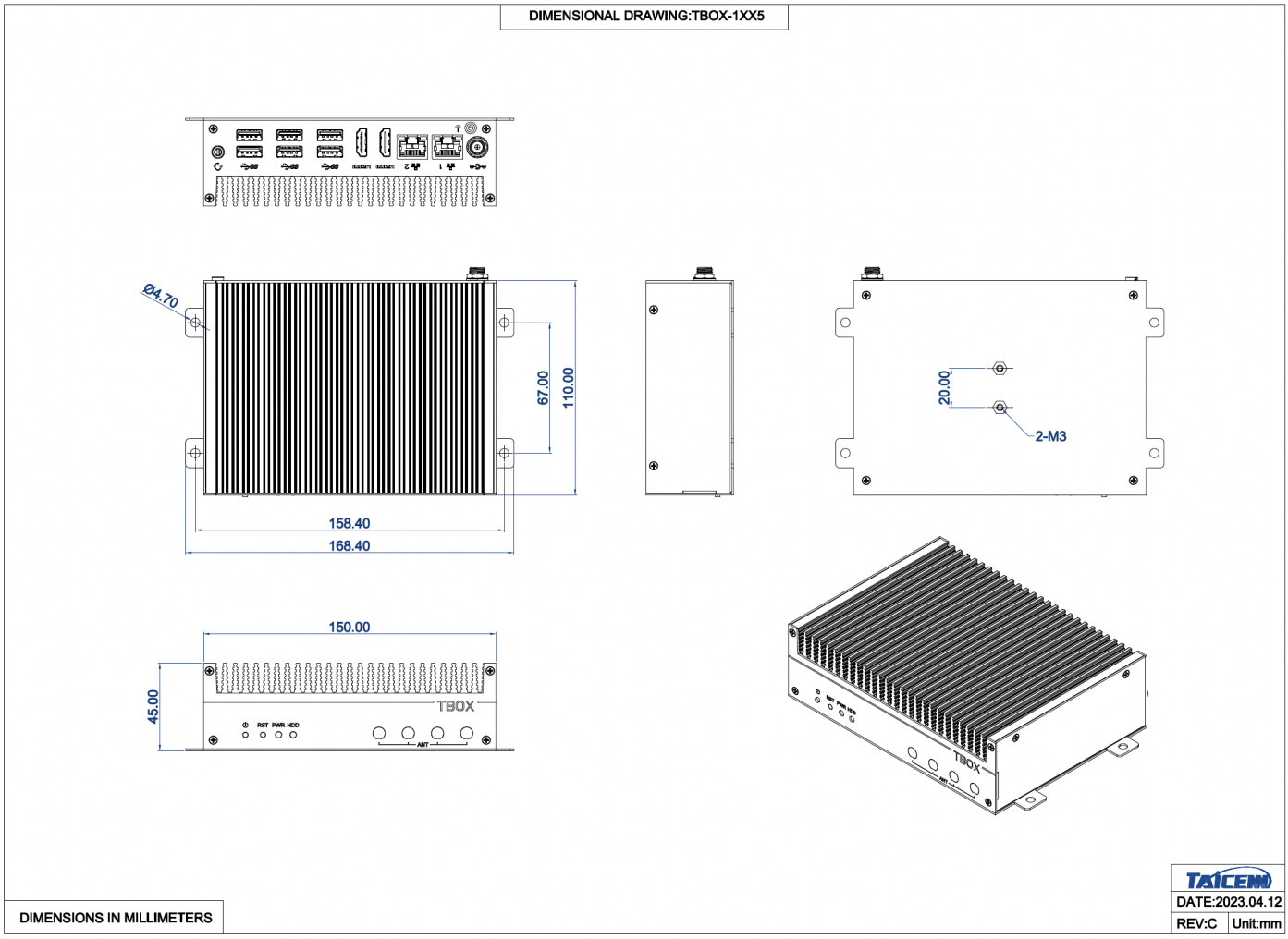
## 2.1 Product Images



## 2.2 TBOX-1E15 Specification

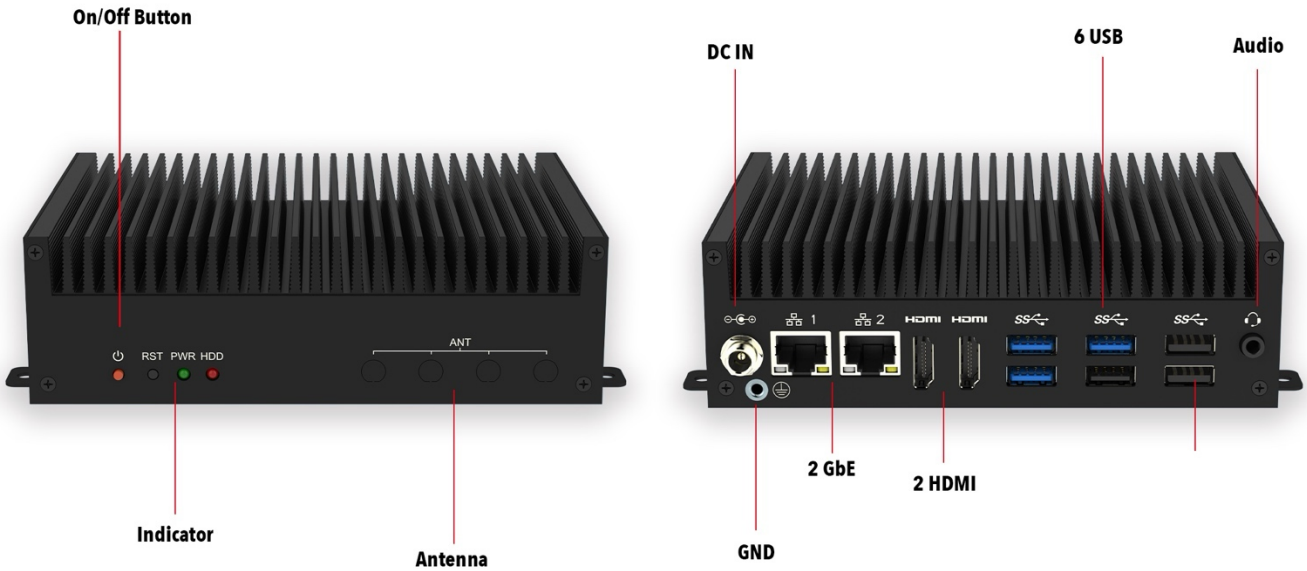
| | | |
|---|---|---|
| **System** | BIOS | SPI AMI EEI BIOS |
| | CPU | Intel Elkhart Lake J6412 processor |
| | CPU Ghz | Quad-core 2.0Ghz, burst to 2.6Ghz, TDP=10W |
| | TPM | Intel PTT TPM2.0 |
| | Memory | SO-DIMM, DDR4-2666/2933/3200Mt/s, Single slot, max. up to 32GB |
| | Storage | 1* M.2 2280 M-Key slot (PCIe Gen.III x2, NVMe) SSD |
| | Graphic | Intel UHD Graphics for 10th Gen. Intel processors |
| | Network | 1* Intel I226V, 1* Intel I210AT GbE, optional Wi-Fi/BT/3G/4G, 5G (M.2 Key-B 3042/3052) |
| | Audio | On-board Realtek ACL897 Audio controller |
| | Expansion | 1* Mini-PCIe slot. 1* M.2 3052 key-B slot |
| | Watchdog | 0 ~ 256 seconds programmable |
| | Operating system | Win10, Win11, Linux |
| **IO interface** | Serial port | N/A |
| | Ethernet | 2* RJ45, 10/100/1000 Mbps |
| | Audio | 1* Mic-in/Line-out (2 in 1 Jack) |
| | USB | 3* USB3.0, 3* USB2.0 |
| | Display | 2* HDMI |
| | Power input | DC Jack, lockable 5.5 * 2.5 |
| | GPIO | N/A |
| **Structure** | Box structure and surface | Aluminum alloy, anodizing and anti-scratch treatment |
| | Color | Black |
| | Mount method | Desktop, wall mount, optional with Din-rail mount |
| | Cooling system | Finned aluminum heatsinks |
| | Indicator & Button | Power switch, Power LED, HDD LED |
| | Dimension | 168.40 * 110.00 * 45.00 (mm) |
| | Net weight | About 0.85 KG |
| **Power & Environmental** | Operating temp. | -20 ~ + 60 (°C) |
| | Storage temp. | -40 ~ + 70 (°C) |
| | Humidity | 10 ~ 95% @ 10C (No condensation) |
| | Vibration | 50 ~ 500 Hz, 1.5G, 0.15mm peak to peak |
| | Shock | 10G/Peak (11 ms) |
| | Power input | DC 12V |
| | Power consumption | About 20W |
| | EMC | CE/FCC/ROHS |

## 2.3 Product Dimensions




# 3 IO Interface Definition

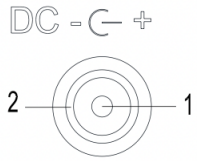
## 3.1 IO Layout



# 3.2 IO Interface Definition

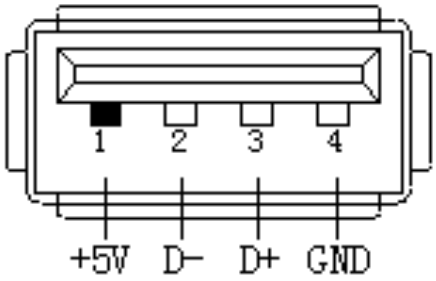
### 3.2.1 Power Input: DC Jack 12V

| Pin # | Signal |
|---|---|
| 1 | V+ |
| 2 | V- |



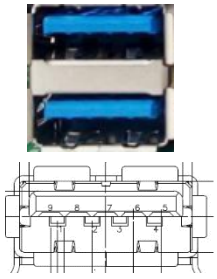

### 3.2.2 USB2.0

| Pin # | Signal |
|---|---|
| 1 | +5V |
| 2 | Data- |
| 3 | Data+ |
| 4 | GND |



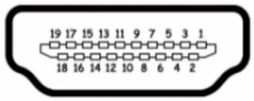

### 3.2.3 USB3.0

| Pin # | Signal | | Pin # | Signal |
|---|---|---|---|---|
| 1 | Vbus | | 6 | StdA_SSRX+ |
| 2 | D- | | 7 | GND_DRAIN |
| 3 | D+ | | 8 | StdA_SSTX- |
| 4 | GND | | 9 | StdA_SSTX+ |
| 5 | Std A_SSRX- | | | |



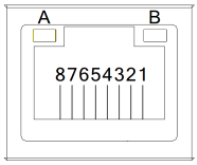
### 3.2.4 HDMI

| Pin # | Signal | | Pin # | Signal |
|---|---|---|---|---|
| 1 | TMDS data 2+ | | 11 | TMDS clockGND |
| 2 | TMDS data 2GND | | 12 | TMDS clock- |
| 3 | TMDS data 2- | | 13 | CEC |
| 4 | TMDS data 1+ | | 14 | No connected |
| 5 | TMDS data 1GND | | 15 | DDC clock |
| 6 | TMDS data 1- | | 16 | DDC data |
| 7 | TMDS data 0+ | | 17 | Ground |
| 8 | TMDS data 0GND | | 18 | +5V Power |
| 9 | TMDS data 0- | | 19 | Hot plug detect |
| 10 | TMDS clock 0+ | | | |



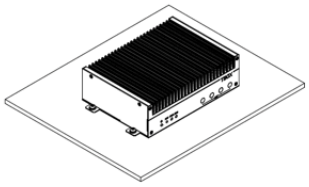
### 3.2.5 RJ45 (LAN 1/2)

- 2* Intel I225
- LAN 1 support Wake on Lan (WoL) function

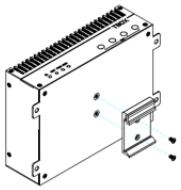
| Pin # | | | Signal | | | |
|---|---|---|---|---|---|---|
| 1 | | | MDI0_1+ | | |   |
| 2 | | | MDI0_1- | | | |
| 3 | | | MDI1_1+ | | | |
| 4 | | | MDI2_1+ | | | |
| 5 | | | MDI2_1- | | | |
| 6 | | | MDI1_1- | | | |
| 7 | | | MDI3_1+ | | | |
| 8 | | | MDI3_1- | | | |
| A | Active LED | ACT: Twinkling Yellow | B | Speed LED | 1000M: Turn Yellow | |
| | | Only Link: Lights On | | | 100M: Turn Green | |
| | | Stop: Lights Off | | | 10M: Lights Off | |

# 4 Installation Scenario

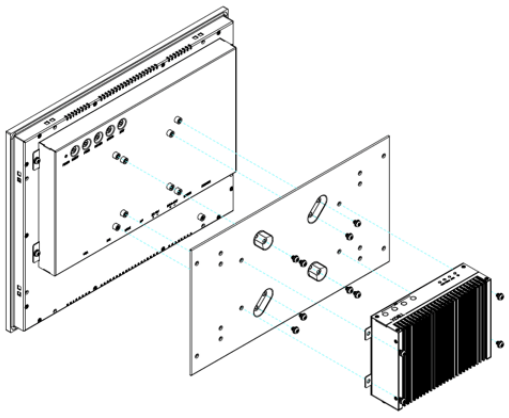
Stand/Wall Mount



DIN-Rail Mount (Optional)

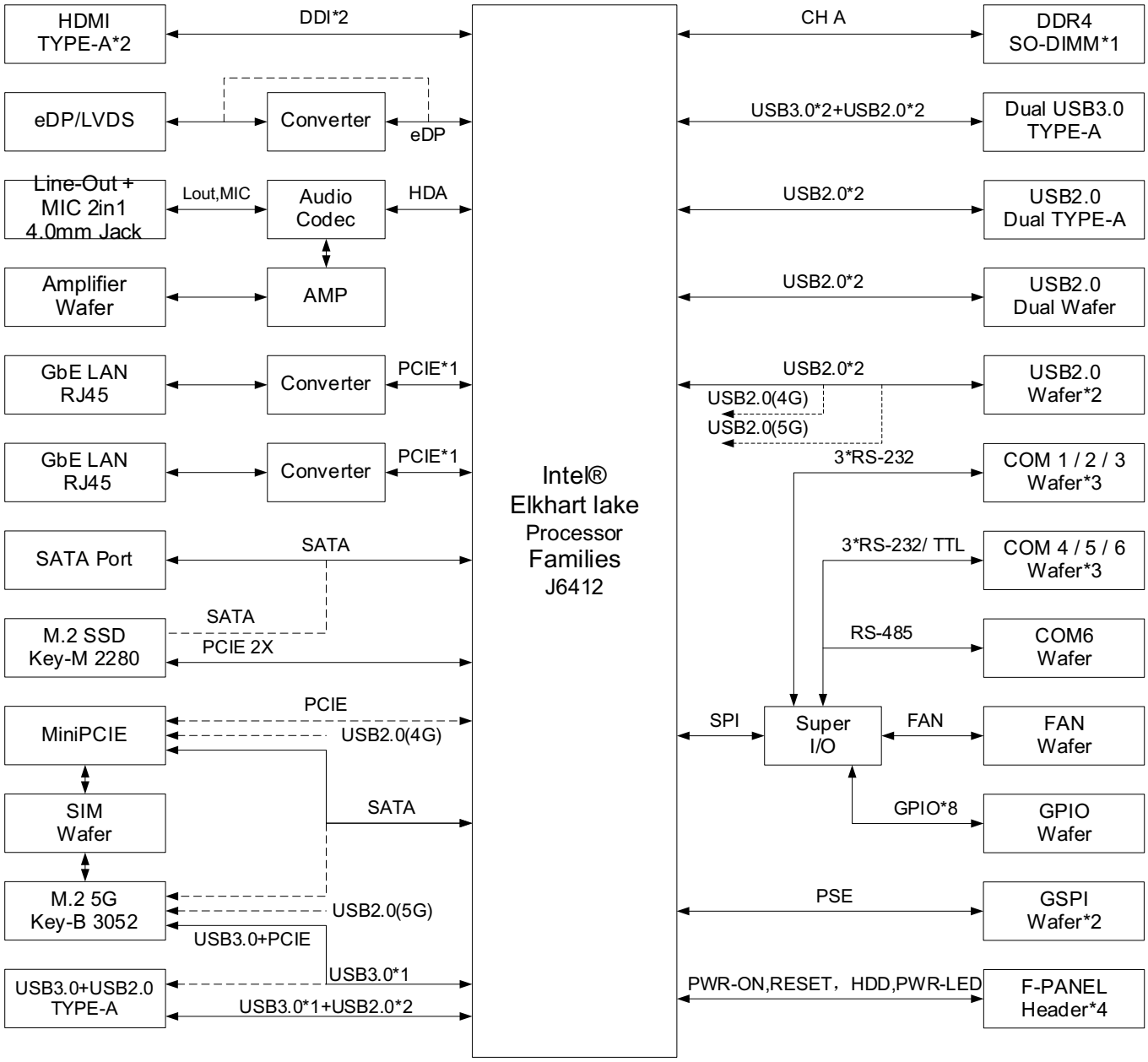


VESA Mount (Optional)

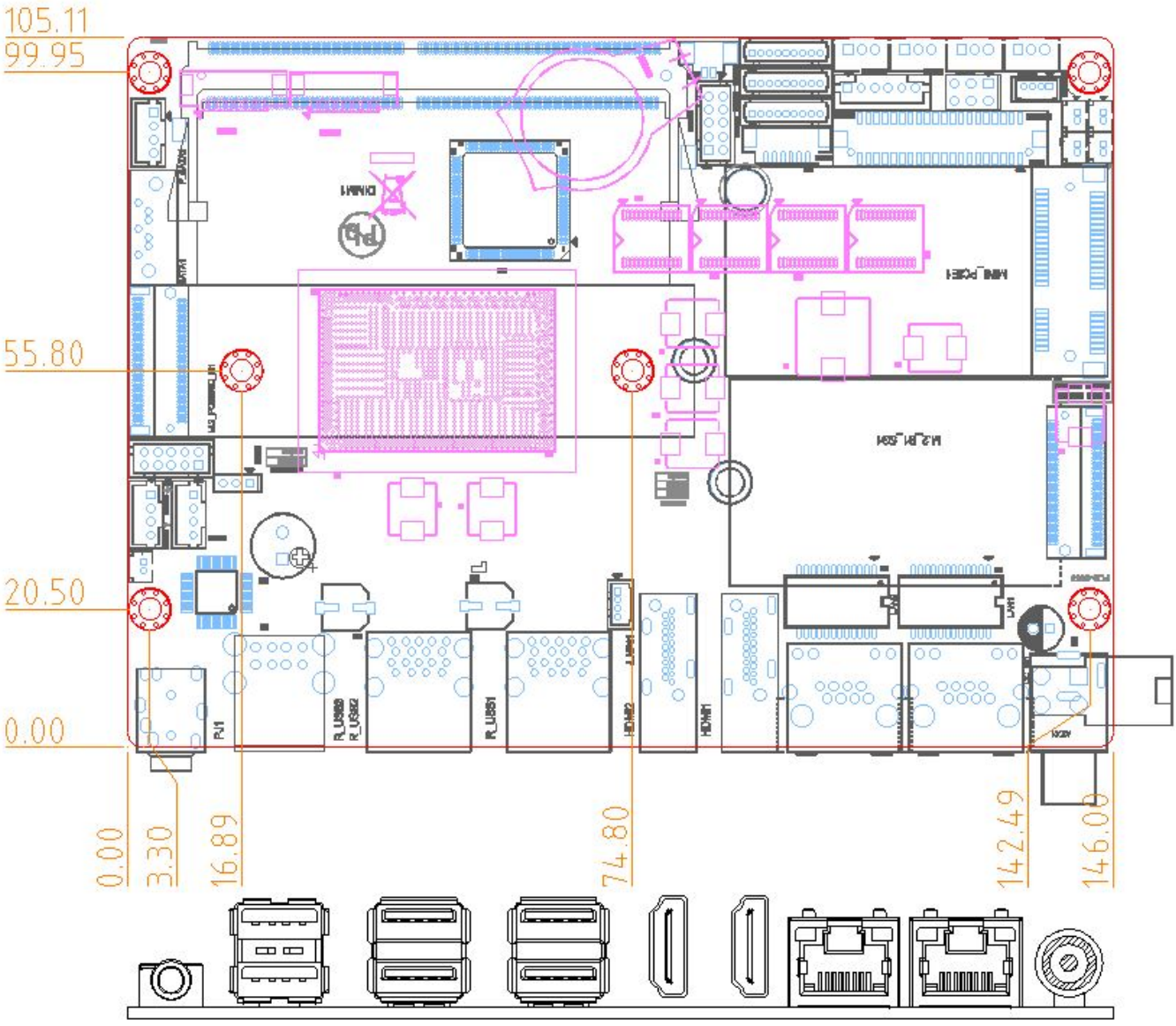


# 5 Mainboard Description

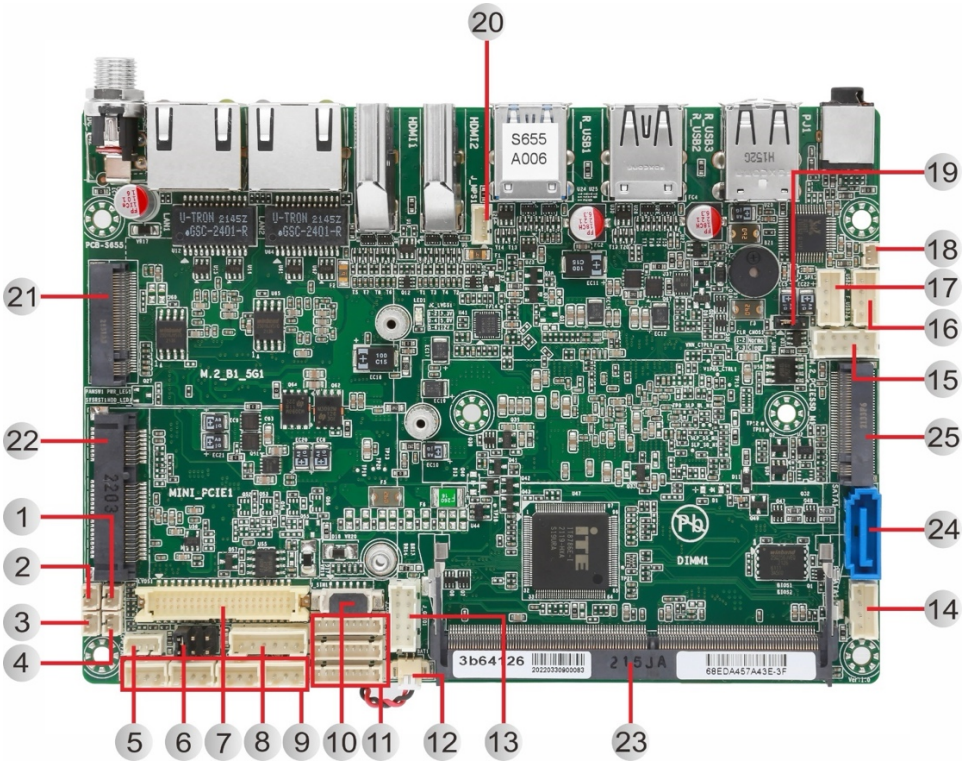
## 5.1 Functional Block Diagram

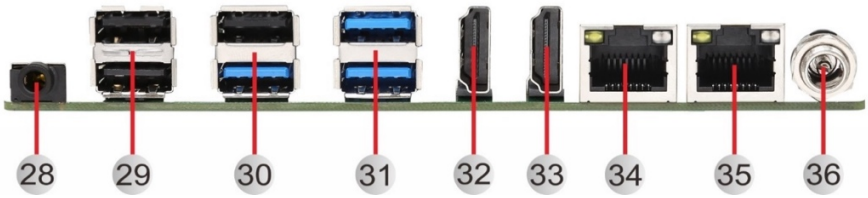


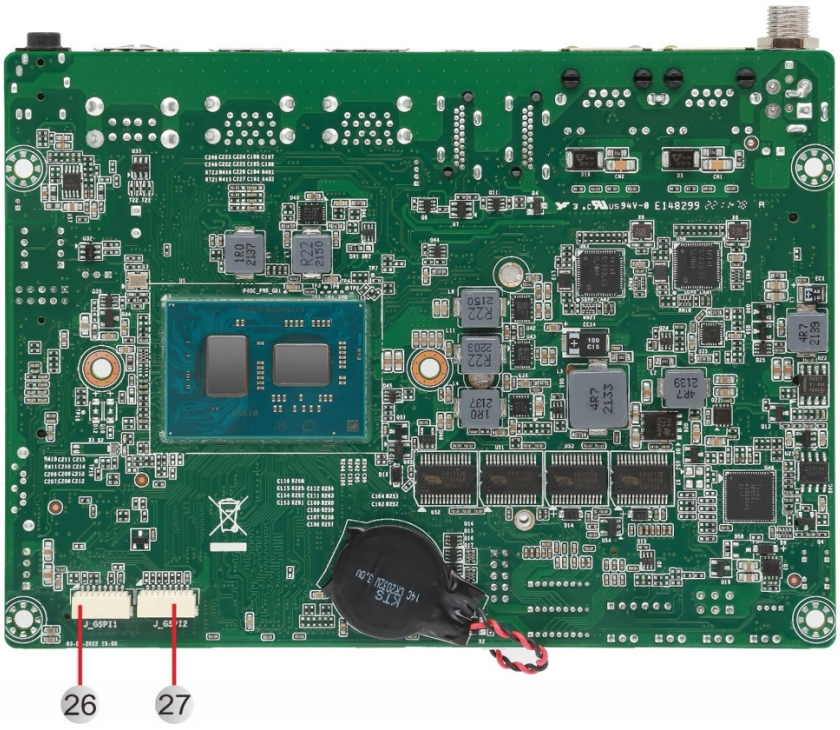
## 5.2 Mainboard Mechanical Drawing



## 5.3 Jumpers/Headers and Connectors



| Jumpers / Headers and Connectors | | |
|---|---|---|
| 1 | PWR_LED1 | Power LED Header |
| 2 | PANSW1 | Power Button Header |
| 3 | SYSRST1 | System Reset Header |
| 4 | HDD_LED1 | HDD LED Header |
| 5 | CPU_FAN1 | CPU FAN Header |
| 6 | JC_LVDS1 | LVDS VDD Select Jumper |
| 7 | LVDS1 | LVDS Signal Header |
| 8 | LVDS_P1 | LVDS Backlight Control Header |
| 9 | J_COM4/5/6/6_1 | COM4/5/6/6_1 Header |
| 10 | J_SIM1 | SIM Card Header |
| 11 | J_COM1/2/3 | COM1/2/3 Header |
| 12 | BAT1 | CMOS Battery Header |
| 13 | J_GPIO1 | GPIO Header |
| 14 | P_SATA1 | SATA Power Header |
| 15 | F_USB1 | Front USB2.0 Header1 |
| 16 | F_USB2 | Front USB2.0 Header2 |
| 17 | F_USB3 | Front USB2.0 Header3 |
| 18 | J_SPK1 | Amplifier Header |
| 19 | CLR_CMOS1 | CMOS Clear Jumper |
| 20 | J_MPS1 | MPS Header |
| 21 | M.2_B1_5G1 | M.2 (NGFF) Key-B Slot (PCIE/USB3.0+USB2.0, 3052/3042, Support 4G/5G) |
| 22 | MINI_PCIE1 | Mini PCI-E Slot (mSATA) |
| 23 | DIMM1 | DDR4 SO-DIMM Slot |
| 24 | SATA1 | SATA3.0 7P Connector |
| 25 | M.2_PCIESSD_M1 | M.2 (NGFF) Key-M Slot (PCIe x2 NVMe SSD, 2280) |
| 26 | J_GSPI1 | GSPI Header1 |
| 27 | J_GSPI2 | GSPI Header2 |
| 28 | PJ1 | Line-Out + MIC 2in1 Φ3.5mm Jack |
| 29 | R_USB3 | Dual USB2.0 TYPE-A Connector |
| 30 | R_USB2 | Dual USB3.0 TYPE-A Connector |
| 31 | R_USB1 | Dual USB3.0 TYPE-A Connector |
| 32 | HDMI2 | HDMI Upright TYPE-A Connector2 |
| 33 | HDMI1 | HDMI Upright TYPE-A Connector1 |
| 34 | LAN2 | GBE LAN RJ45 Connector2 |
| 35 | LAN1 | GBE LAN RJ45 Connector1 |
| 36 | DC_IN1(ATX1/DC_IN2) | DC 12V Power Input Φ2.5mm Jack (ATX 4P/ Wafer optional) |

# 6 Simple BIOS Introductions

- Press F2 key to enter bios when starting up;
- Press the F12 key when starting up to bring up the device boot menu;
- After entering the bios, the shortcut key F9 is equivalent to initializing the BIOS settings.

**[END]**