

# UP Xtreme i12

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Maker Board  
UPX-ADLP01

User's Manual 3rd Ed

## Copyright Notice

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# Packing List

Before setting up your product, please make sure the following items have been shipped:

| Item                                       | Quantity |
|--------------------------------------------|----------|
| ● UPX-ADLP01 (UP Xtreme i12) with Heatsink | 1        |

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

## About this Document

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This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page at [AAEON.com](http://AAEON.com) for the latest version of this document.

## Safety Precautions

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Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
  - i. Damaged power cord or plug
  - ii. Liquid intrusion to the device
  - iii. Exposure to moisture
  - iv. Device is not working as expected or in a manner as described in this manual
  - v. The device is dropped or damaged
  - vi. Any obvious signs of damage displayed on the device
18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

### **Warning!**



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

### **Caution:**

*There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.*

### **Attention:**

*Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.*

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON 主板/子板/背板

QO4-381 Rev.A2

| 部件名称                                                                                                                                                                                                                                                            | 有毒有害物质或元素 |           |           |                 |               |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------------|---------------|-----------------|
|                                                                                                                                                                                                                                                                 | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 印刷电路板<br>及其电子组件                                                                                                                                                                                                                                                 | ×         | ○         | ○         | ○               | ○             | ○               |
| 外部信号<br>连接器及线材                                                                                                                                                                                                                                                  | ×         | ○         | ○         | ○               | ○             | ○               |
| <p>本表格依据 SJ/T 11364 的规定编制。</p> <p>○：表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572标准规定的限量要求以下。</p> <p>×：表示该有害物质的某一均质材料超出了GB/T 26572的限量要求，然而该部件仍符合欧盟指令2011/65/EU 的规范。</p> <p>环保使用期限(EFUP (Environmental Friendly Use Period))：10年</p> <p>备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。</p> |           |           |           |                 |               |                 |

China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON Main Board/Daughter Board/Backplane

QO4-381 Rev.A2

| Part Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Hazardous Substances |           |           |                 |               |                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------|-----------|-----------------|---------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 铅<br>(Pb)            | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| PCB Assemblies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ×                    | ○         | ○         | ○               | ○             | ○               |
| Connector and Cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ×                    | ○         | ○         | ○               | ○             | ○               |
| <p>The table is prepared in accordance with the provisions of SJ/T 11364.</p> <p>○: Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572.</p> <p>×: Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572.</p> <p>But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1).</p> <p>EFUP (Environment Friendly Use Period) value: 10 years</p> <p>Notes: This product defined period of use is under normal condition.</p> |                      |           |           |                 |               |                 |

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# Chapter 1

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Product Specifications

## 1.1 Specifications

### System

|           |                                                                                                                                                                                                                                                                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor | 12th Gen Intel® Core™ Processor SoC<br>Intel® Core™ i7-1270PE<br>Intel® Core™ i7-1260P<br>Intel® Core™ i5-1250PE<br>Intel® Core™ i5-1240P<br>Intel® Core™ i3-1220PE<br>Intel® Celeron® Processor 7305E<br>13th Gen Intel® Core™ Processor SoC<br>Intel® Core™ i7-1370PE<br>Intel® Core™ i7-1360P<br>Intel® Core™ i5-1340PE<br>Intel® Core™ i3-1320PE |
| Graphics  | Intel® Iris® Xe graphics                                                                                                                                                                                                                                                                                                                             |
| Memory    | Up to 32GB onboard LPDDR5                                                                                                                                                                                                                                                                                                                            |
| Storage   | M.2 2280 M-Key x 2 (PCIe Gen 4.0 [x4])<br>SATA 6Gb/s x 1                                                                                                                                                                                                                                                                                             |
| I/O       | HDMI 2.0b x 1<br>DP 1.4a x 1<br>DP 1.4a x 1 (via USB Type-C)<br>eDP 1.4b x 1<br>Audio Jack x 1 (Mic-in + Line-out)<br>RS-232/422/485 10-pin Header x 2                                                                                                                                                                                               |

| System            |                                                                                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Camera            | MIPI CSI camera via 61-pin wafer w/carrier board<br>(optional for 13th Gen)<br><br>HDMI-in via 61pin wafer w/carrier board (optional for 13th Gen)               |
| USB               | USB 2.0 x 2 (from 10-pin header x 1)<br><br>USB 2.0 (Type-A) x 1<br><br>USB 3.2 Gen 2 (Type-A) x 3<br><br>USB 4.0 (Type-C) x 1                                   |
| Expansion         | 40-pin GPIO x 1<br><br>M.2 2230 E-Key x 1<br><br>M.2 2280 M-Key x 2 (PCIe Gen 4.0 [x4])<br><br>SATA 6Gb/s x 1<br><br>M.2 3052 B-Key x 1<br><br>Nano SIM Slot x 1 |
| Display Interface | HDMI 2.0b x 1<br><br>DP 1.4a x 1<br><br>DP 1.4a x 1 (via USB Type-C)<br><br>eDP 1.4b x 1                                                                         |
| Ethernet          | Intel® I226-IT x 1 (TSN)<br><br>Intel® I219 x 1 (vPRO)                                                                                                           |
| Security          | Onboard TPM 2.0                                                                                                                                                  |
| RTC               | Yes                                                                                                                                                              |
| OS Support        | Windows® 10 Enterprise 2021 LTSC<br><br>Ubuntu 22.04<br><br>Yocto 4.0                                                                                            |

Power Requirement

|                                |                                                                                                                                                |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Power                          | 12-36V DC-in (Lockable plug)                                                                                                                   |
| Power Supply Type              | AT/ATX (ATX as default)                                                                                                                        |
| Power Consumption<br>(Typical) | Intel® Core™ i7-1270PE, LPDDR5 4800MHz 16GB,<br>5.86A@+ 12V (Typical)<br><br>Intel® Core™ i7-1270PE, LPDDR5 4800MHz 16GB,<br>8.05A@+ 12V (Max) |

Mechanical

|              |                                    |
|--------------|------------------------------------|
| Dimension    | 4.74" x 4.82" (120.35mm x 122.5mm) |
| Net Weight   | 0.88lb (0.4Kg)                     |
| Gross Weight | 1.32lb (0.6Kg)                     |

Environment

|                       |                                                        |
|-----------------------|--------------------------------------------------------|
| Operating Temperature | With Heatsink: 32°F ~ 140°F (0°C ~ 60°C) / 0.5 airflow |
| Operating Humidity    | 0% ~ 90% relative humidity, non-condensing             |
| MTBF (Hours)          | 362,068 Hours                                          |
| Certification         | CE/FCC Class A, RoHS Compliant, REACH                  |

# Chapter 2

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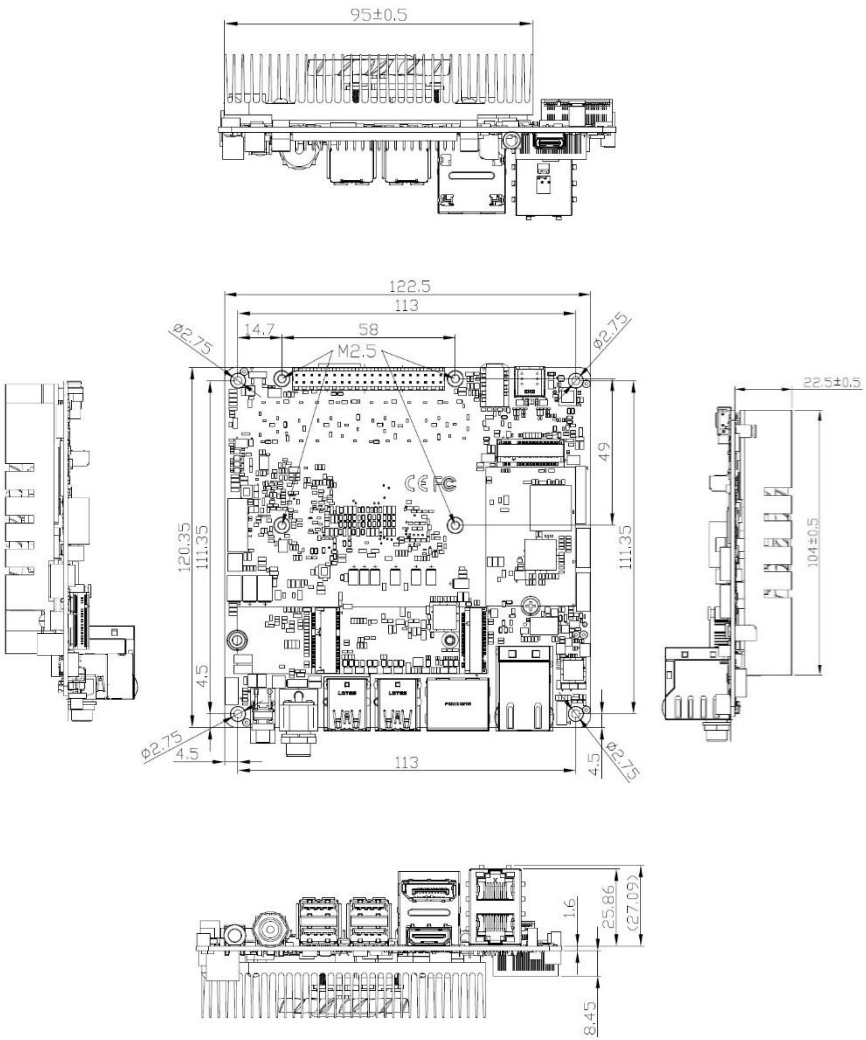
Hardware Information

## 2.1 Dimensions

Maker Board

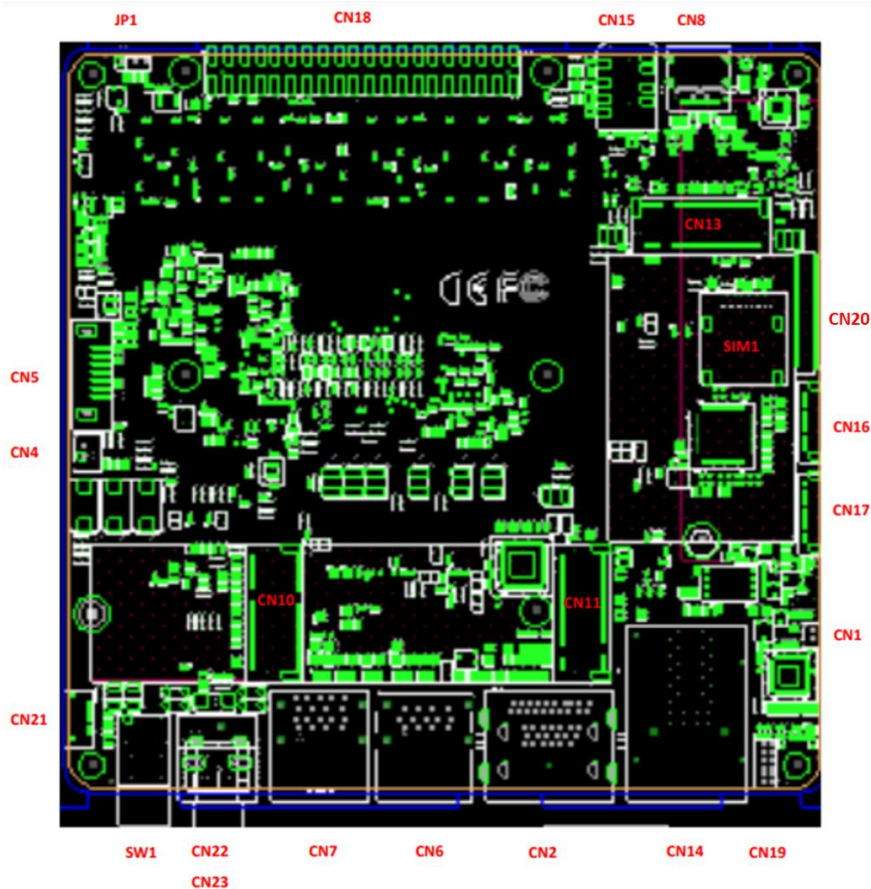
UP Xtreme i12

UPX-ADLP01

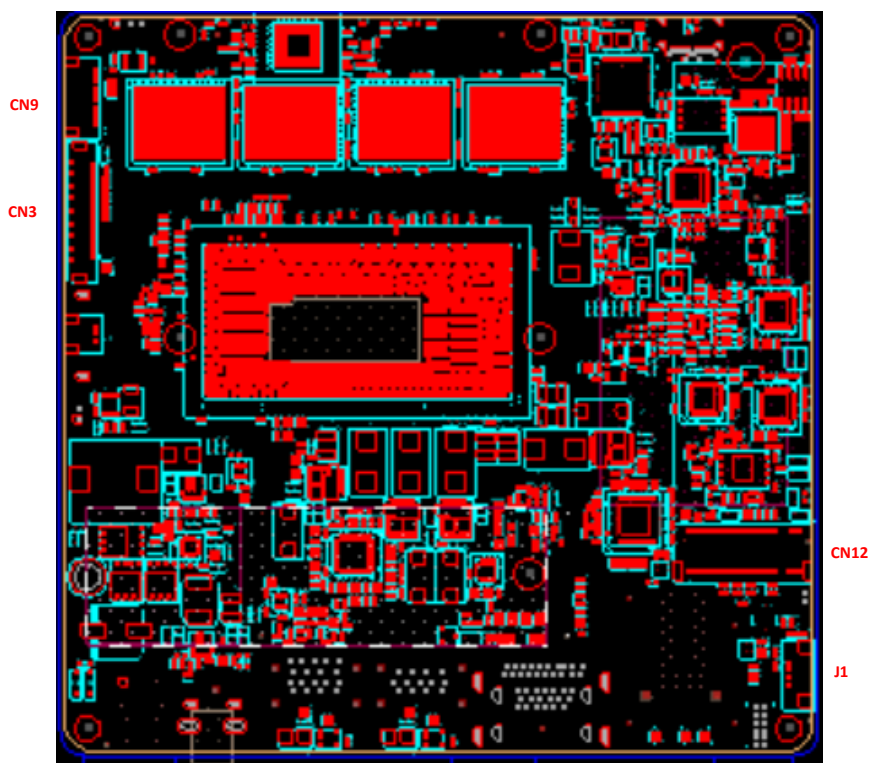


## 2.2 Jumpers and Connectors

Top:



Bottom:



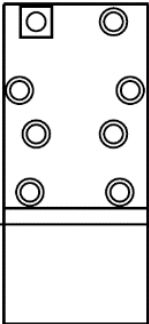
## 2.3 List of Jumpers and Connectors

Please refer to the table below for all of the board's jumpers and connectors that you can configure for your application

| Label | Function                   |
|-------|----------------------------|
| SW1   | Power Button               |
| CN1   | RTC Connector              |
| CN2   | HDMI/DP                    |
| CN3   | eDP                        |
| CN4   | SATA Power                 |
| CN5   | SATA Connector             |
| CN6   | Dual USB Type-A            |
| CN7   | Dual USB Type-A            |
| CN8   | USB Type C                 |
| CN9   | USB 2.0/UART 1x10P Wafer   |
| CN10  | M.2 2230 E-Key Slot        |
| CN11  | M.2 2280 M-Key Slot        |
| CN12  | M.2 2280 M-Key Slot        |
| CN13  | M.2 3052 B-Key Slot        |
| CN14  | Dual LAN Port              |
| CN15  | Audio Jack                 |
| CN16  | RS-232/422/485 1x10P Wafer |
| CN17  | RS-232/422/485 1x10P Wafer |
| CN18  | 40-Pin HAT Connector       |
| CN19  | CPLD and BIOS update       |
| CN20  | CSI Port                   |
| CN21  | Front Panel 1x6P Wafer     |

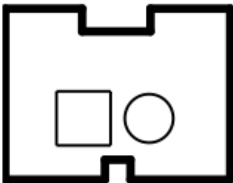
| Label | Function          |
|-------|-------------------|
| CN22  | DC Power Jack     |
| CN23  | DC Terminal Block |
| J1    | Fan Connector     |
| JP1   | AT/ATX Mode       |
| SIM1  | Nano SIM Card     |

2.3.1 Power Button (SW1)



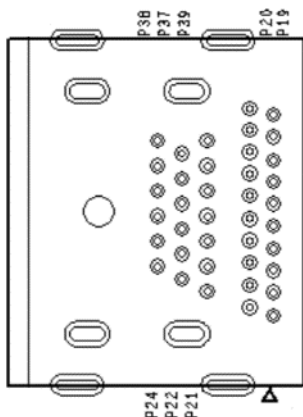
| Pin | Signal    | Pin | Signal    | Pin | Signal |
|-----|-----------|-----|-----------|-----|--------|
| 1   | PWR_SW#   | 2   | PWR_SW#   | 3   | GND    |
| 4   | GND       | 5   | GND       | 6   | GND    |
| L1  | SW1_LED_P | L2  | SW1_LED_N |     |        |

2.3.2 RTC (CN1)



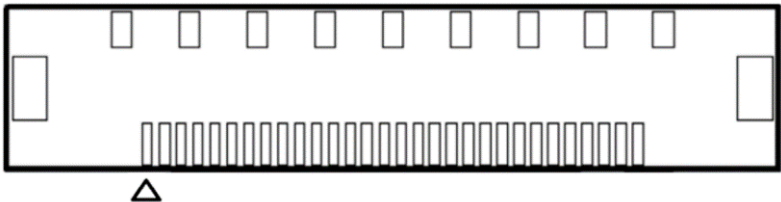
| Pin | Signal  | Pin | Signal |
|-----|---------|-----|--------|
| 1   | RTC_VCC | 2   | GND    |

### 2.3.3 HDMI/DP Port (CN2)



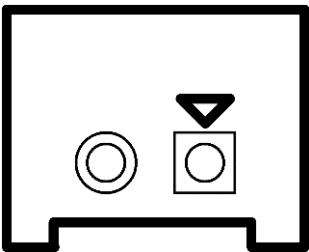
| Pin | Signal  | Pin | Signal    | Pin | Signal    |
|-----|---------|-----|-----------|-----|-----------|
| P1  | DP_TXP0 | P2  | GND       | P3  | DP_TXN0   |
| P4  | DP_TXP1 | P5  | GND       | P6  | DP_TXN1   |
| P7  | DP_TXP2 | P8  | GND       | P9  | DP_TXN2   |
| P10 | DP_CLK+ | P11 | GND       | P12 | DP_CLK-   |
| P13 | CONFIG1 | P14 | CONFIG2   | P15 | DP_AUX_P  |
| P16 | GND     | P17 | DP_AUX_N  | P18 | DP_HPD    |
| P19 | GND     | P20 | 3.3V      | P21 | HDMI_TXP2 |
| P22 | GND     | P23 | HDMI_TXN2 | P24 | HDMI_TXP1 |
| P25 | GND     | P26 | HDMI_TXN1 | P27 | HDMI_TXP0 |
| P28 | GND     | P29 | HDMI_TXN0 | P30 | HDMI_CLK+ |
| P31 | GND     | P32 | HDMI_CLK- | P33 | HDMI_CEC  |
| P34 | NC      | P35 | DDC_CLK   | P36 | DDC_DATA  |
| P37 | GND     | P38 | 5V        | P39 | HDMI_HPD  |

2.3.4 eDP (CN3)



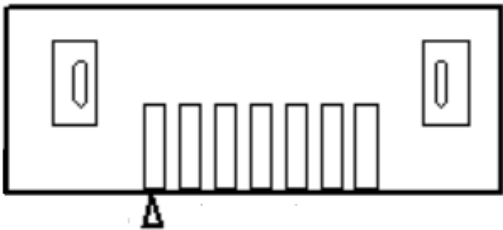
| Pin | Signal   | Pin | Signal    |
|-----|----------|-----|-----------|
| 1   | +VDD_3V3 | 2   | +VDD_3V3  |
| 3   | NC       | 4   | GND       |
| 5   | EDP_TXN2 | 6   | EDP_TXP2  |
| 7   | GND      | 8   | EDP_TXN1  |
| 9   | EDP_TXP1 | 10  | GND       |
| 11  | EDP_TXN0 | 12  | EDP_TXP0  |
| 13  | GND      | 14  | EDP_TXN3  |
| 15  | EDP_TXP3 | 16  | GND       |
| 17  | EDP_AUXN | 18  | EDP_AUXP  |
| 19  | GND      | 20  | BKLT_CTRL |
| 21  | NC       | 22  | BKLT_EN   |
| 23  | EDP_HPD  | 24  | GND       |
| 25  | GND      | 26  | GND       |
| 27  | +10V     | 28  | +10V      |
| 29  | +10V     | 30  | +10V      |

### 2.3.5 SATA Power (CN4)



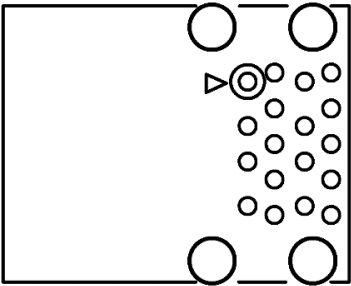
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | 5V     | 2   | GND    |

### 2.3.6 SATA Connector (CN5)



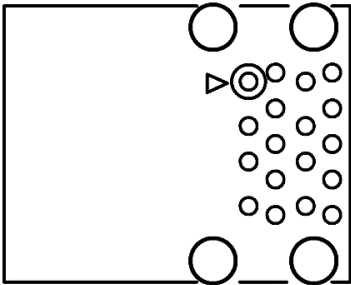
| Pin | Signal    | Pin | Signal    |
|-----|-----------|-----|-----------|
| 1   | GND       | 2   | SATA_TXP0 |
| 3   | SATA_TXN0 | 4   | GND       |
| 5   | SATA_RXN0 | 6   | SATA_RXP0 |
| 7   | GND       | -   | -         |

### 2.3.7 Dual USB Type A Port (CN6)



| Pin | Signal | Pin | Signal    | Pin | Signal    |
|-----|--------|-----|-----------|-----|-----------|
| 1   | +5V    | 2   | USB2_D1-  | 3   | USB2_D1+  |
| 4   | GND    | 5   | USB3_RX1- | 6   | USB3_RX1+ |
| 7   | GND    | 8   | USB3_TX1- | 9   | USB3_TX1+ |
| 10  | +5V    | 11  | USB2_D2-  | 12  | USB2_D2+  |
| 13  | GND    |     |           |     |           |

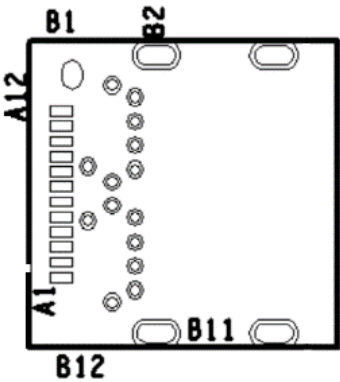
### 2.3.8 Dual USB Type A Port (CN7)



| Pin | Signal | Pin | Signal    | Pin | Signal    |
|-----|--------|-----|-----------|-----|-----------|
| 1   | +5V    | 2   | USB2_D3-  | 3   | USB2_D3+  |
| 4   | GND    | 5   | USB3_RX3- | 6   | USB3_RX3+ |

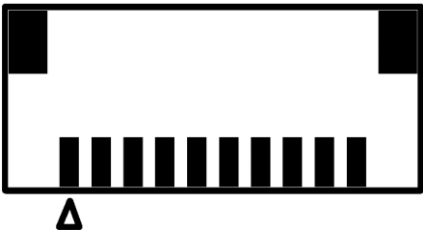
| Pin | Signal | Pin | Signal    | Pin | Signal    |
|-----|--------|-----|-----------|-----|-----------|
| 7   | GND    | 8   | USB3_TX3- | 9   | USB3_TX3+ |
| 10  | +5V    | 11  | USB2_D4-  | 12  | USB2_D4+  |
| 13  | GND    | 14  | USB3_RX4- | 15  | USB3_RX4+ |
| 16  | GND    | 17  | USB3_TX4- | 18  | USB3_TX4+ |

2.3.9 USB Type C Port (CN8)



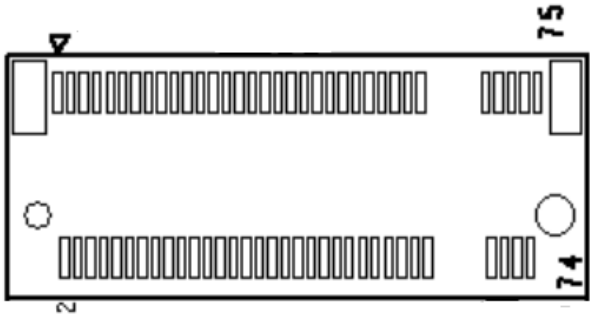
| Pin | Signal | Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|-----|--------|
| A1  | GND    | A2  | SSTXP1 | A3  | SSTXN1 |
| A4  | +5V    | A5  | CC1    | A6  | DP1    |
| A7  | DN1    | A8  | SBU1   | A9  | +5V    |
| A10 | SSRXN2 | A11 | SSRXP2 | A12 | GND    |
| B1  | GND    | B2  | SSTXP2 | B3  | SSTXN2 |
| B4  | +5V    | B5  | CC2    | B6  | DP2    |
| B7  | DN2    | B8  | SBU2   | B9  | +5V    |
| B10 | SSRXN1 | B11 | SSRXP1 | B12 | GND    |

2.3.10 USB 2.0/UART 1x10P Wafer (CN9)



| Pin | Signal   | Pin | Signal   | Pin | Signal   |
|-----|----------|-----|----------|-----|----------|
| 1   | +5V      | 2   | USB2_D5- | 3   | USB2_D5+ |
| 4   | GND      | 5   | +5V      | 6   | USB2_D6- |
| 7   | USB2_D6+ | 8   | GND      | 9   | UART_RX  |
| 10  | UART_TX  |     |          |     |          |

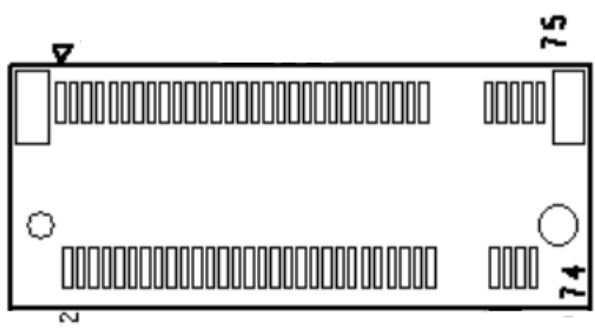
2.3.11 M.2 2230 E-Key Slot (CN10)



| Pin | Signal      | Pin | Signal          | Pin | Signal          |
|-----|-------------|-----|-----------------|-----|-----------------|
| 1   | GND         | 2   | +3.3V           | 3   | USB2_D10+       |
| 4   | +3.3V       | 5   | USB2_D10-       | 6   | NC              |
| 7   | GND         | 8   | NC              | 9   | CNV_WR_LANE1_DN |
| 10  | CNV_RF_RST# | 11  | CNV_WR_LANE1_DP | 12  | NC              |
| 13  | GND         | 14  | CNV_CLKREQ_R    | 15  | CNV_WR_LANE0_DN |

| Pin | Signal          | Pin | Signal          | Pin | Signal        |
|-----|-----------------|-----|-----------------|-----|---------------|
| 16  | NC              | 17  | CNV_WR_LANE0_DP | 18  | GND           |
| 19  | GND             | 20  | NC              | 21  | CNV_WR_CLK_DN |
| 22  | CNV_RGI_RSP_R   | 23  | CNV_WR_CLK_DP   | 24  | NC            |
| 25  | NC              | 26  | NC              | 27  | NC            |
| 28  | NC              | 29  | NC              | 30  | NC            |
| 31  | NC              | 32  | CNV_RGI_DT      | 33  | GND           |
| 34  | CNV_RGI_RSP     | 35  | PCIE9_TXP       | 36  | CNV_BRI_DT    |
| 37  | PCIE9_TXN       | 38  | NC              | 39  | GND           |
| 40  | NC              | 41  | PCIE9_RXP       | 42  | NC            |
| 43  | PCIE9_RXN       | 44  | NC              | 45  | GND           |
| 46  | NC              | 47  | PCIE5_CLKP      | 48  | NC            |
| 49  | PCIE5_CLKN      | 50  | SUS_CLK         | 51  | GND           |
| 52  | WIFI_RST#       | 53  | PCIE_CLKREQ#    | 54  | BT_EN         |
| 55  | PCIE_WAKE#      | 56  | WIFI_EN         | 57  | GND           |
| 58  | NC              | 59  | CNV_WT_LANE1_DN | 60  | NC            |
| 61  | CNV_WT_LANE1_DP | 62  | NC              | 63  | GND           |
| 64  | NC              | 65  | CNV_WT_LANE0_DN | 66  | NC            |
| 67  | CNV_WT_LANE0_DP | 68  | NC              | 69  | GND           |
| 70  | NC              | 71  | CNV_WT_CLK_DN   | 72  | +3.3V         |
| 73  | CNV_WT_CLK_DP   | 74  | +3.3V           | 75  | GND           |

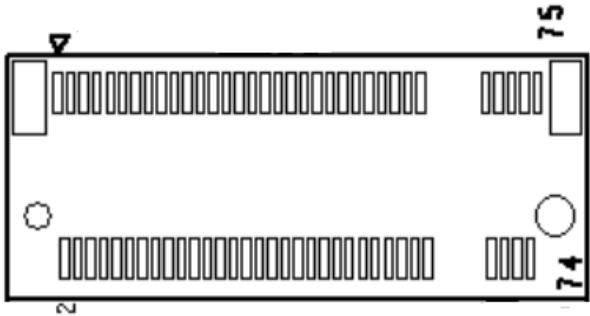
2.3.12 M.2 2280 M-Key Slot (CN11)



| Pin | Signal       | Pin | Signal         | Pin | Signal          |
|-----|--------------|-----|----------------|-----|-----------------|
| 1   | GND          | 2   | +3.3V          | 3   | NC              |
| 4   | +3.3V        | 5   | PCIE4_A_RXN3   | 6   | FULL_CARD_POWER |
| 7   | PCIE4_A_RXP3 | 8   | NC             | 9   | GND             |
| 10  | NC           | 11  | PCIE4_A_TXN3   | 12  | +3.3V           |
| 13  | PCIE4_A_TXP3 | 14  | +3.3V          | 15  | GND             |
| 16  | +3.3V        | 17  | PCIE4_A_RXN2   | 18  | +3.3V           |
| 19  | PCIE4_A_RXP2 | 20  | NC             | 21  | GND             |
| 22  | NC           | 23  | PCIE4_A_TXN2   | 24  | NC              |
| 25  | PCIE4_A_TXP2 | 26  | NC             | 27  | GND             |
| 28  | NC           | 29  | PCIE4_A_RXN1   | 30  | NC              |
| 31  | PCIE4_A_RXP1 | 32  | NC             | 33  | GND             |
| 34  | NC           | 35  | PCIE4_A_TXN1   | 36  | NC              |
| 37  | PCIE4_A_TXP1 | 38  | NC             | 39  | GND             |
| 40  | SMB_CLK_1V8  | 41  | PCIE4_A_RXN0   | 42  | SMB_DATA_1V8    |
| 43  | PCIE4_A_RXP0 | 44  | NC             | 45  | GND             |
| 46  | NC           | 47  | PCIE4_A_TXN0   | 48  | NC              |
| 49  | PCIE4_A_TXP0 | 50  | PLT_RST#       | 51  | GND             |
| 52  | PCIE_CLKREQ# | 53  | PCIE4_A_CLK_DN | 54  | PCIE_WAKE#      |

| Pin | Signal         | Pin | Signal | Pin | Signal |
|-----|----------------|-----|--------|-----|--------|
| 55  | PCIE4_A_CLK_DP | 56  | NC     | 57  | GND    |
| 58  | NC             | 59  | NC     | 60  | NC     |
| 61  | NC             | 62  | NC     | 63  | NC     |
| 64  | NC             | 65  | NC     | 66  | NC     |
| 67  | NC             | 68  | NC     | 69  | NC     |
| 70  | +3.3V          | 71  | GND    | 72  | +3.3V  |
| 73  | GND            | 74  | +3.3V  | 75  | GND    |

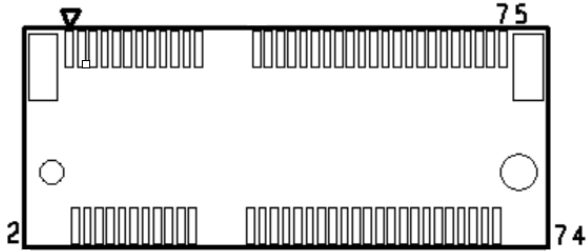
2.3.13 M.2 2280 M-Key Slot (CN12)



| Pin | Signal       | Pin | Signal       | Pin | Signal          |
|-----|--------------|-----|--------------|-----|-----------------|
| 1   | GND          | 2   | +3.3V        | 3   | NC              |
| 4   | +3.3V        | 5   | PCIE4_B_RXN3 | 6   | FULL_CARD_POWER |
| 7   | PCIE4_B_RXP3 | 8   | NC           | 9   | GND             |
| 10  | NC           | 11  | PCIE4_B_TXN3 | 12  | +3.3V           |
| 13  | PCIE4_B_TXP3 | 14  | +3.3V        | 15  | GND             |
| 16  | +3.3V        | 17  | PCIE4_B_RXN2 | 18  | +3.3V           |
| 19  | PCIE4_B_RXP2 | 20  | NC           | 21  | GND             |
| 22  | NC           | 23  | PCIE4_B_TXN2 | 24  | NC              |
| 25  | PCIE4_B_TXP2 | 26  | NC           | 27  | GND             |

| Pin | Signal         | Pin | Signal         | Pin | Signal       |
|-----|----------------|-----|----------------|-----|--------------|
| 28  | NC             | 29  | PCIE4_B_RXN1   | 30  | NC           |
| 31  | PCIE4_B_RXP1   | 32  | NC             | 33  | GND          |
| 34  | NC             | 35  | PCIE4_B_TXN1   | 36  | NC           |
| 37  | PCIE4_B_TXP1   | 38  | NC             | 39  | GND          |
| 40  | SMB_CLK_1V8    | 41  | PCIE4_B_RXN0   | 42  | SMB_DATA_1V8 |
| 43  | PCIE4_B_RXP0   | 44  | NC             | 45  | GND          |
| 46  | NC             | 47  | PCIE4_B_TXN0   | 48  | NC           |
| 49  | PCIE4_B_TXP0   | 50  | PLT_RST#       | 51  | GND          |
| 52  | PCIE_CLKREQ#   | 53  | PCIE4_B_CLK_DN | 54  | PCIE_WAKE#   |
| 55  | PCIE4_B_CLK_DP | 56  | NC             | 57  | GND          |
| 58  | NC             | 59  | NC             | 60  | NC           |
| 61  | NC             | 62  | NC             | 63  | NC           |
| 64  | NC             | 65  | NC             | 66  | NC           |
| 67  | NC             | 68  | NC             | 69  | NC           |
| 70  | +3.3V          | 71  | GND            | 72  | +3.3V        |
| 73  | GND            | 74  | +3.3V          | 75  | GND          |

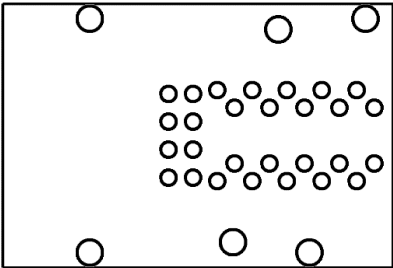
### 2.3.14 M.2 3052 B-Key Slot (CN13)



| Pin | Signal       | Pin | Signal         | Pin | Signal                   |
|-----|--------------|-----|----------------|-----|--------------------------|
| 1   | NC           | 2   | +3.3V          | 3   | GND                      |
| 4   | +3.3V        | 5   | GND            | 6   | FULL_CARD_PWR_OFF#(1.8V) |
| 7   | USB2_D8+     | 8   | W_DISABLE#1    | 9   | USB2_D8-                 |
| 10  | NC           | 11  | GND            | 12  | NC                       |
| 13  | NC           | 14  | NC             | 15  | NC                       |
| 16  | NC           | 17  | NC             | 18  | NC                       |
| 19  | NC           | 20  | NC             | 21  | NC                       |
| 22  | NC           | 23  | NC             | 24  | NC                       |
| 25  | NC           | 26  | NC             | 27  | GND                      |
| 28  | NC           | 29  | USB3_RX-       | 30  | UIM_RST                  |
| 31  | USB3_RX+     | 32  | UIM_CLK        | 33  | GND                      |
| 34  | UIM_DAT      | 35  | USB3_PX-       | 36  | UIM_PWR                  |
| 37  | USB3_PX+     | 38  | NC             | 39  | GND                      |
| 40  | NC           | 41  | PCIE10_RXN     | 42  | NC                       |
| 43  | PCIE10_RXP   | 44  | NC             | 45  | GND                      |
| 46  | NC           | 47  | PCIE10_TXN     | 48  | NC                       |
| 49  | PCIE10_TXP   | 50  | PLT_RST#(3.3V) | 51  | GND                      |
| 52  | PCIE_CLKREQ# | 53  | PCIE4_CLKN     | 54  | PCIE_WAKE#               |
| 55  | PCIE4_CLKP   | 56  | NC             | 57  | GND                      |
| 58  | NC           | 59  | NC             | 60  | NC                       |

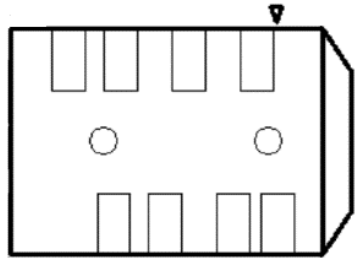
| Pin | Signal         | Pin | Signal | Pin | Signal |
|-----|----------------|-----|--------|-----|--------|
| 61  | NC             | 62  | NC     | 63  | NC     |
| 64  | NC             | 65  | NC     | 66  | NC     |
| 67  | PLT_RST#(1.8V) | 68  | NC     | 69  | NC     |
| 70  | +3.3V          | 71  | GND    | 72  | +3.3V  |
| 73  | GND            | 74  | +3.3V  | 75  | GND    |

2.3.15 Dual LAN Port (CN14)



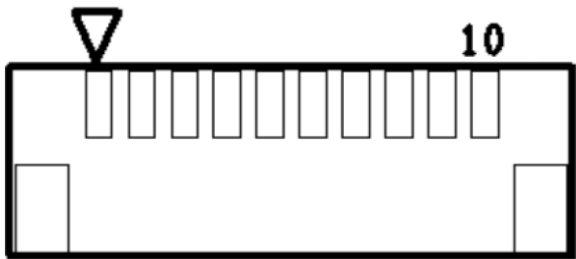
| Pin  | Signal         | Pin | Signal         | Pin  | Signal        |
|------|----------------|-----|----------------|------|---------------|
| R1A  | LAN1_MDIO+     | R2A | LAN1_MDIO-     | R3A  | LAN1_MDI1+    |
| R4A  | LAN1_MDI1-     | R5A | LAN1_MDI2+     | R6A  | LAN1_MDI2-    |
| R7A  | LAN1_MDI3+     | R8A | LAN1_MDI3-     | R9A  | Center TAP    |
| R10A | GND            | L1A | LAN1_ACTLED-   | L2A  | LAN1_ACTLED+  |
| L3A  | LAN1_LINK100#  | L4A | LAN1_LINK1000# | R1B  | LAN2_MDIO+    |
| R2B  | LAN2_MDIO-     | R3B | LAN2_MDI1+     | R4B  | LAN2_MDI1-    |
| R5B  | LAN2_MDI2+     | R6B | LAN2_MDI2-     | R7B  | LAN2_MDI3+    |
| R8B  | LAN2_MDI3-     | R9B | Center TAP     | R10B | GND           |
| L1B  | LAN2_ACTLED-   | L2B | LAN2_ACTLED+   | L3B  | LAN2_LINK100# |
| L4B  | LAN2_LINK1000# |     |                |      |               |

2.3.16 Audio Jack (CN15)



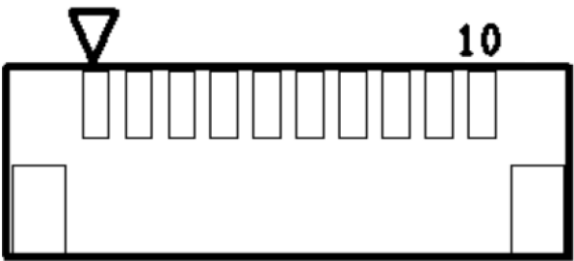
| Pin | Signal | Pin | Signal   |
|-----|--------|-----|----------|
| 1   | MIC_LR | 2   | GND      |
| 3   | LOUT_R | 4   | NC       |
| 5   | NC     | 6   | AUDIO-JD |
| 7   | NC     | 8   | LOUT_L   |

2.3.17 RS-232/422/485 1x10P Wafer (CN16)



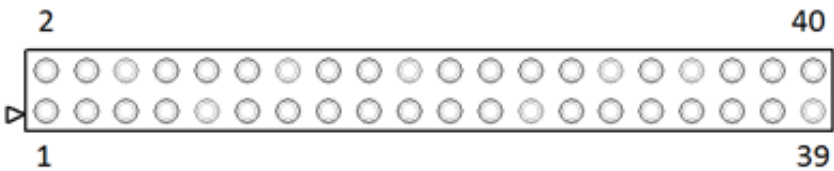
| Pin | Signal                 | Pin | Signal                 |
|-----|------------------------|-----|------------------------|
| 1   | DCD / RS422TX- / S485- | 2   | RX / RS422TX+ / RS485+ |
| 3   | TX / RS422RX+          | 4   | DTR / RS422RX-         |
| 5   | GND                    | 6   | DSR                    |
| 7   | RTS                    | 8   | CTS                    |
| 9   | RI                     | 10  | NC                     |

2.3.18 RS-232/422/485 1x10P Wafer (CN17)



| Pin | Signal                 | Pin | Signal                 |
|-----|------------------------|-----|------------------------|
| 1   | DCD / RS422TX- / S485- | 2   | RX / RS422TX+ / RS485+ |
| 3   | TX / RS422RX+          | 4   | DTR / RS422RX-         |
| 5   | GND                    | 6   | DSR                    |
| 7   | RTS                    | 8   | CTS                    |
| 9   | RI                     | 10  | NC                     |

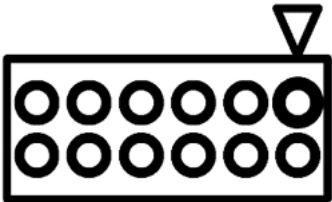
2.3.19 40-Pin HAT Connector (CN18)



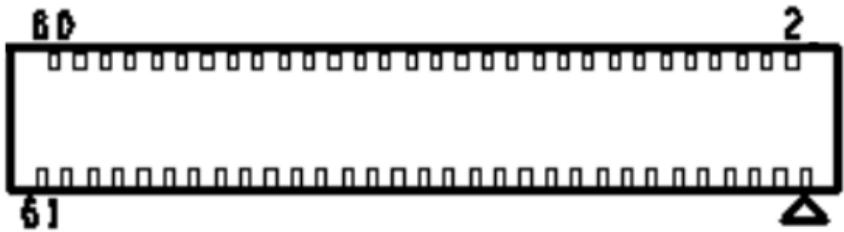
| Pin | Signal              | Pin | Signal            |
|-----|---------------------|-----|-------------------|
| 1   | +3.3V               | 2   | +5V               |
| 3   | I2C1_DAT / GPIO1    | 4   | +5V               |
| 5   | I2C1_CLK / GPIO2    | 6   | GND               |
| 7   | ANALOG_DATA / GPIO3 | 8   | UART_TX / GPIO16  |
| 9   | GND                 | 10  | UART_RX / GPIO17  |
| 11  | GPIO4               | 12  | I2S_BCLK / GPIO18 |

| Pin | Signal             | Pin | Signal            |
|-----|--------------------|-----|-------------------|
| 13  | GPIO5 / TIME_SYNC0 | 14  | GND               |
| 15  | GPIO6 / TIME_SYNC1 | 16  | GPIO19            |
| 17  | +3.3V              | 18  | GPIO20            |
| 19  | SPI_MOSI / GPIO7   | 20  | GND               |
| 21  | SPI_MISO / GPIO8   | 22  | GPIO21            |
| 23  | SPI_CLK / GPIO9    | 24  | SPI_CS0 / GPIO22  |
| 25  | GND                | 26  | GPIO23            |
| 27  | I2C0_DAT / GPIO10  | 28  | I2C0_CLK / GPIO24 |
| 29  | GPIO11             | 30  | GND               |
| 31  | GPIO12             | 32  | PWM0 / GPIO25     |
| 33  | PWM1 / GPIO13      | 34  | GND               |
| 35  | I2S_SYNC / GPIO14  | 36  | GPIO26            |
| 37  | GPIO15             | 38  | I2S_SDI / GPIO27  |
| 39  | GND                | 40  | I2S_SDO / GPIO28  |

2.3.20 CPLD and BIOS Update (CN19)

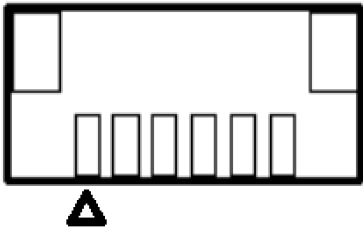


| Pin | Signal   | Pin | Signal   | Pin | Signal   |
|-----|----------|-----|----------|-----|----------|
| 1   | JTAG_TCK | 2   | GND      | 3   | JTAG_TDO |
| 4   | 1.8V     | 5   | JTAG_TMS | 6   | SPI_CS   |
| 7   | SPI_CLK  | 8   | SPI_MISO | 9   | JTAG_TDI |
| 10  | GND      | 11  | SPI_MOSI | 12  | SPI_HOLD |



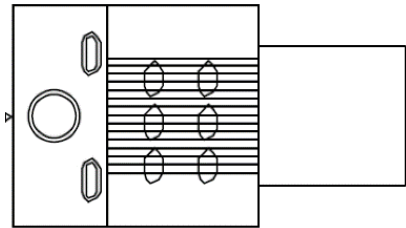
| Pin | Signal       | Pin | Signal       | Pin | Signal            |
|-----|--------------|-----|--------------|-----|-------------------|
| 55  | PRIVACY_CAM1 | 56  | CAM_I2C2_SDA | 57  | SUSCLK            |
| 58  | PM_SLP_S3#   | 59  | HDMI_IN_INT  | 60  | BUF_PLT_RST(1.8V) |
| 61  | HDMI_IN_RST  |     |              |     |                   |

2.3.22 Front Panel (CN21)



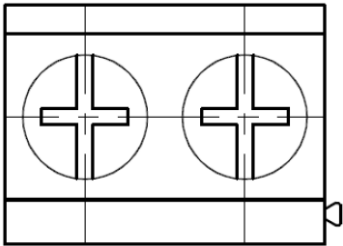
| Pin | Signal | Pin | Signal    |
|-----|--------|-----|-----------|
| 1   | GND    | 2   | RESET     |
| 3   | GND    | 4   | POWER S/W |
| 5   | GND    | 6   | +3.3V     |

2.3.23 DC Jack (CN22)



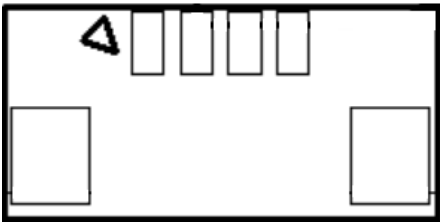
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | DC_IN  | 2   | GND    |
| 3   | GND    | -   | -      |

2.3.24 DC Terminal Block (CN23)



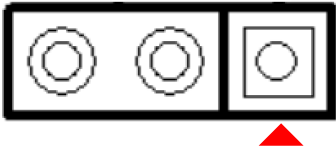
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | DC_IN  | 2   | GND    |

2.3.25 Fan Connector (J1)

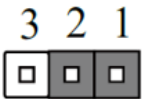


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | PWM    | 2   | TACH   |
| 3   | GND    | 4   | 10V    |

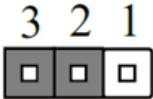
2.3.26 AT/ATX Mode (JP1)



| Pin | Signal   | Pin | Signal |
|-----|----------|-----|--------|
| 1   | ATX_MODE | 2   | PWRBTN |
| 3   | AT_MODE  | -   | -      |

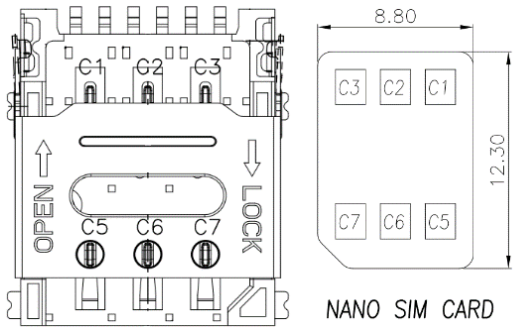


ATX Mode (Default)



AT Mode

2.3.27 Nano SIM Slot (SIM1)



| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| C1  | VCC    | C2  | RST    |
| C3  | CLK    | C5  | GND    |
| C6  | VPP    | C7  | I/O    |

# Chapter 3

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Software Installation

### 3.1 Linux Setup

---

The UP Xtreme i12 supports Linux operating systems (see Chapter 1 for specifications). For instructions on how to install a Linux OS onto your UP Xtreme i12, you can find several guides and tutorials in the wiki section of the UP Board website at <https://up-board.org> for both installing supported distributions as well as porting your own Linux build.

### 3.2 Windows Drivers Installation

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Drivers for the UP Xtreme i12 can be downloaded from the UP Board website by following the link <https://up-board.org> and navigating to the Downloads section, then clicking on the UP Xtreme i12 to find all relevant drivers.

### 3.3 Dummy Driver Information

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#### 3.3.1 Dummy Driver Installation

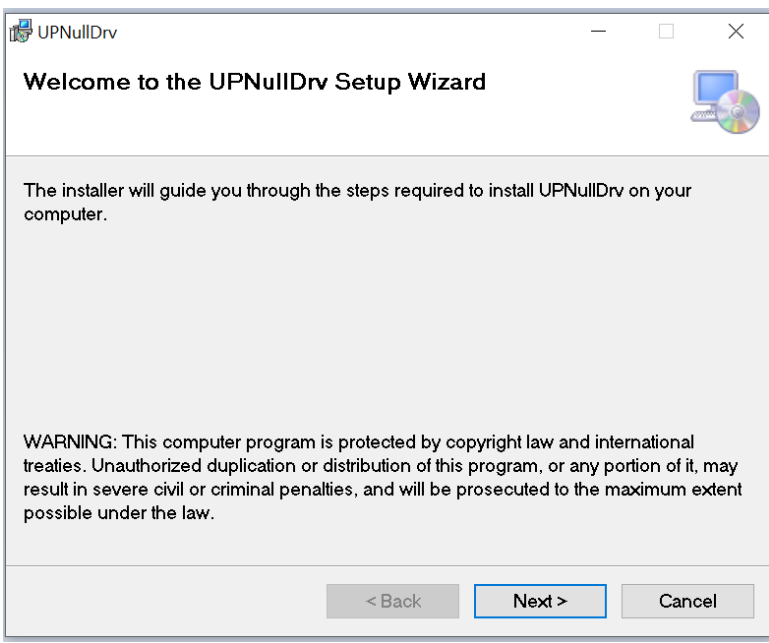
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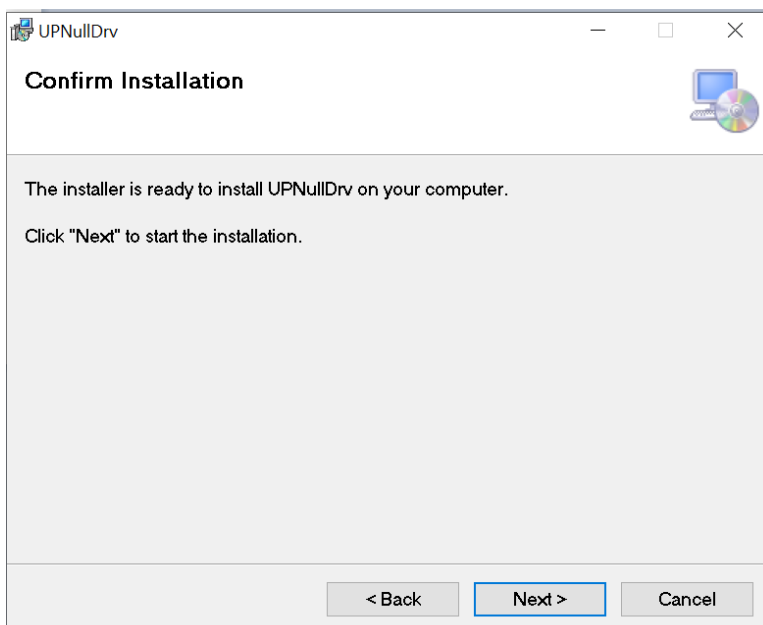
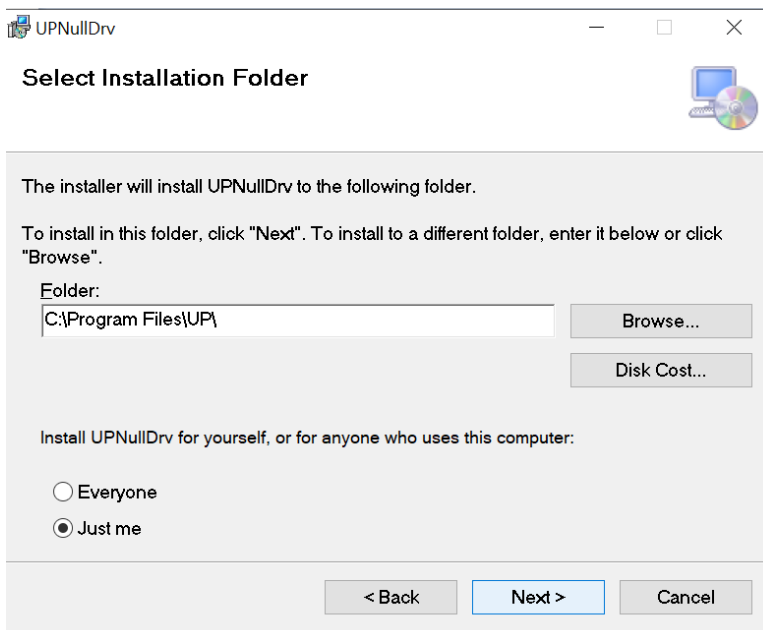
The following instructions detail how to install the dummy driver for your UP Xtreme i12 (UPX-ADLP01).

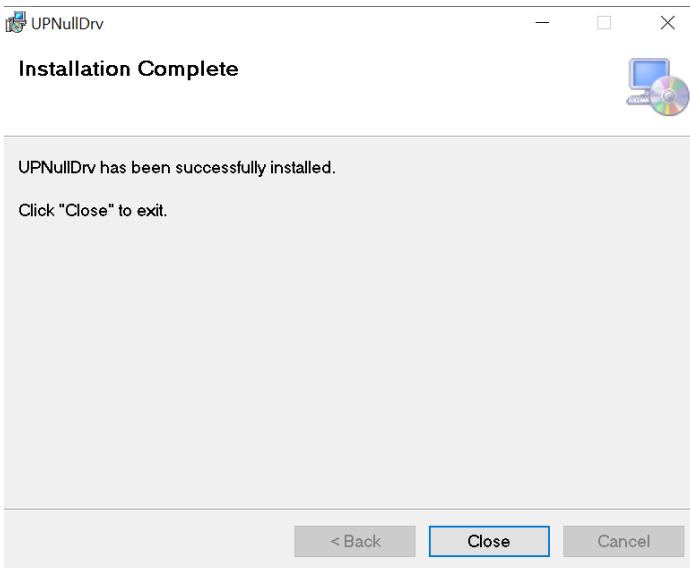
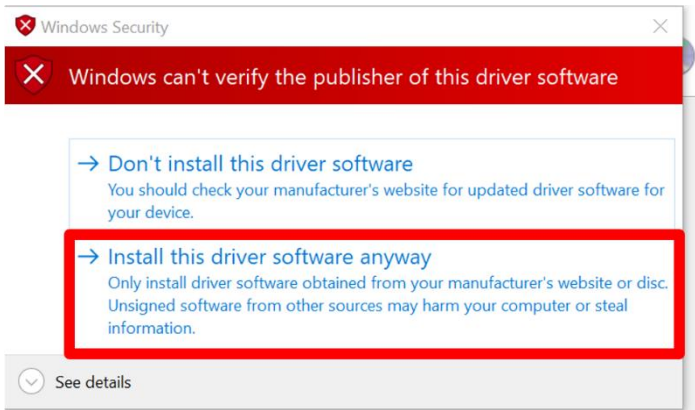
**Step 1 – Download UPNullDrv.msi.**

|                                                                                                 |                    |                         |        |
|-------------------------------------------------------------------------------------------------|--------------------|-------------------------|--------|
|  UPNullDrv.msi | 10/17/2022 2:18 AM | Windows Installer Pa... | 200 KB |
|-------------------------------------------------------------------------------------------------|--------------------|-------------------------|--------|

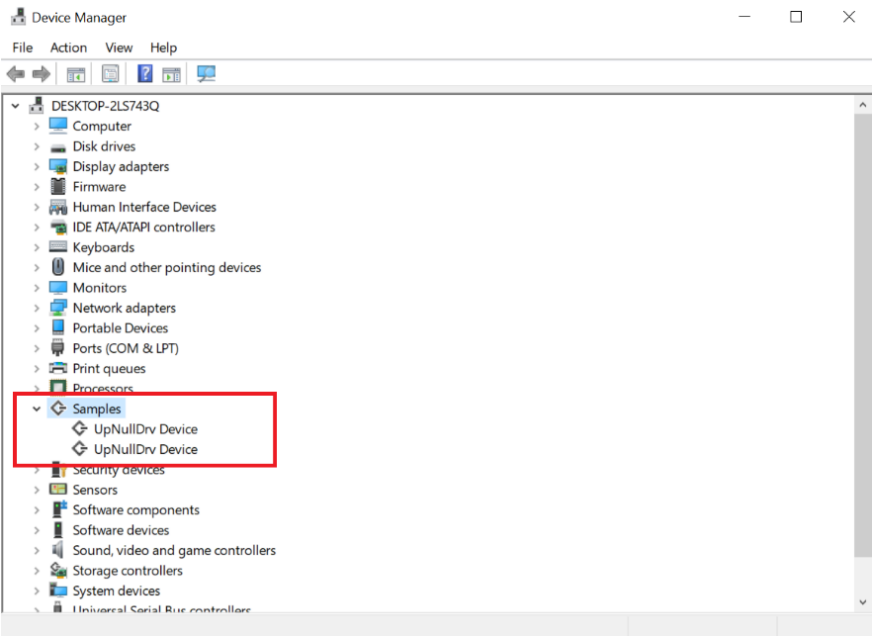
**Step 2 – Click UPNullDrv.msi** and follow the steps as per the below images to install Driver.





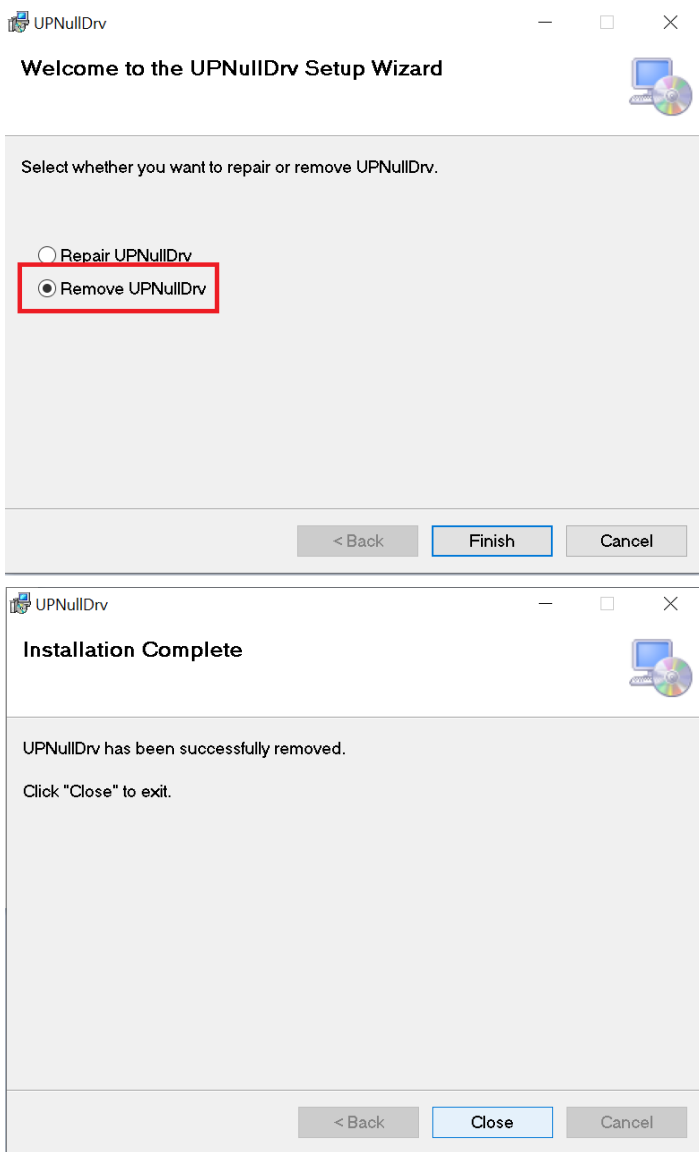


Once you have successfully installed the dummy driver, you will be able to locate it via your system's Device Manager, as shown below.



### 3.3.2 Uninstalling the Dummy Driver

Click **UPNullDrv.msi** to uninstall driver, then select **Remove UPNullDrv**.



# Appendix A

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UP Framework SDK Installation

## A.1 Introduction

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This section provides instructions for the installation of the UP Framework SDK. Instructions are provided for Windows 10. You can download the latest version of UP Framework SDK from the UP community:

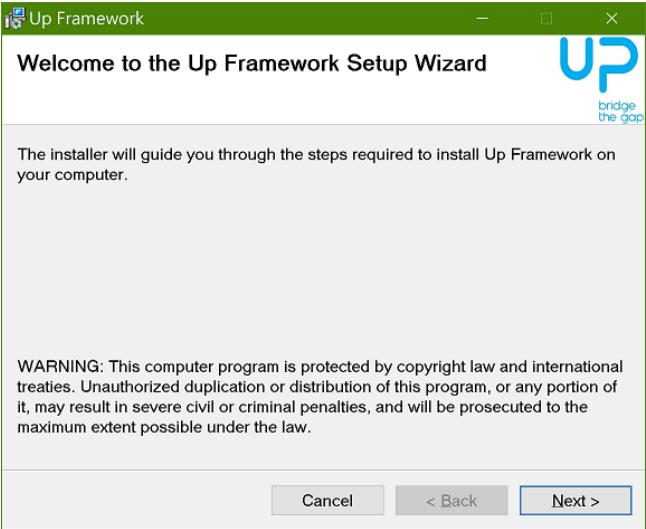
<https://downloads.up-community.org/download/up-sdk-for-windows-10-and-windows-iot/>

## A.2 Installation for Windows 10

---

### Step 1

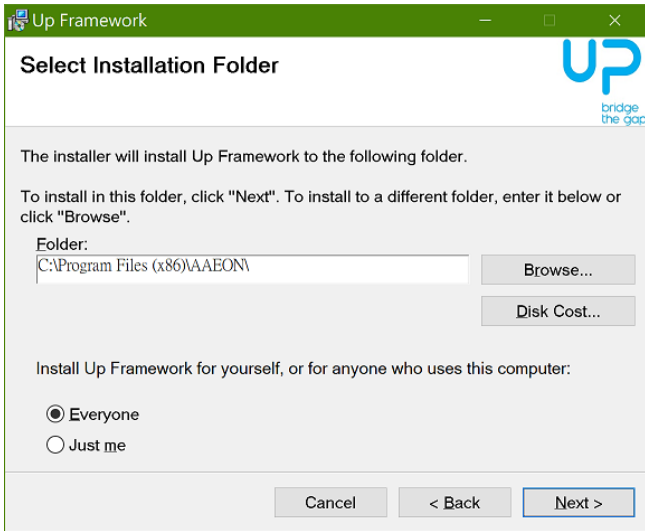
Locate the downloaded file UpFrameworkSetup.msi and run the installer. Press "Next" to begin the setup process.



## Step 2

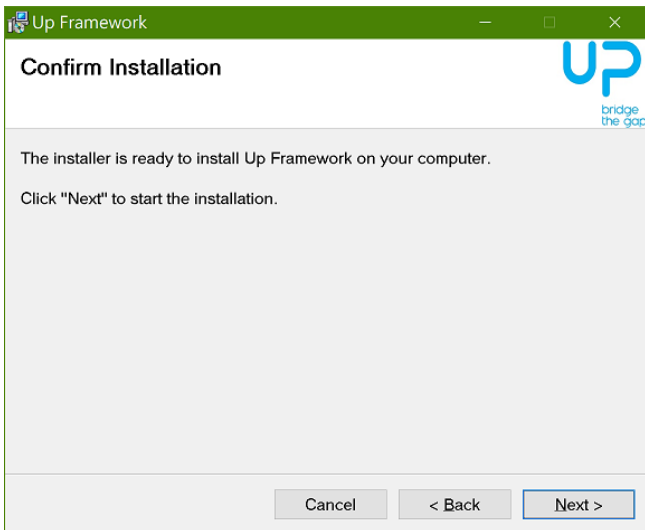
Select the installation folder. Default destination path is C:\Program Files(x86)\AAEON\

You may also choose to install the UP Framework SDK for all users or only the current user. Press "Next" to continue installation.



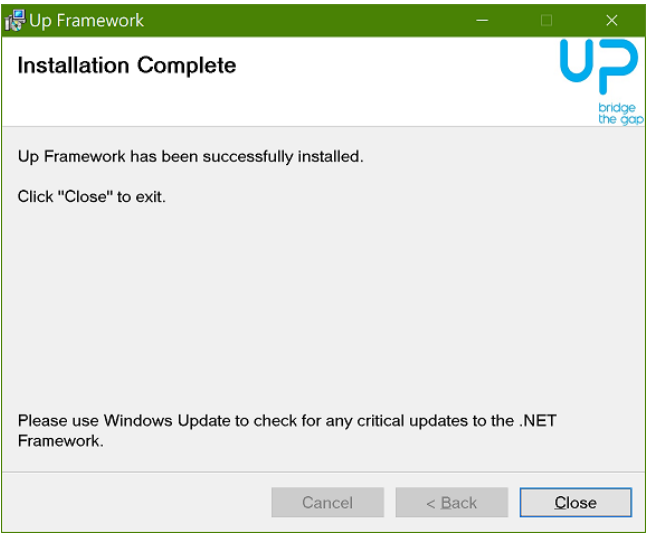
## Step 3

Press "Next" to confirm the installation.



### Step 4

Press "Close" to exit once setup is complete.



# Appendix B

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Cables and Connectors

## B.1 Cables and Connectors

This table provides detailed information about the cables and connectors used by the UP Xtreme i12 (UPX-ADLP01). If you have any questions about the configuration of your board, please contact your AAEON sales representative.

| Label | Connector PN | Description                         | Mating Cable PN | Mating Cable Description                                                                |
|-------|--------------|-------------------------------------|-----------------|-----------------------------------------------------------------------------------------|
| CN1   | 1655X00019   | RTC Battery Connector               | 175011301K      | Lithium Battery.<br>CR2032H.3V.240mAH.w/cable 90mm. DIP.Battery power.BP-CR2032-M90-001 |
| CN2   | 1654403931   | HDMI 2.0 + DP 1.2                   | -               | -                                                                                       |
| CN3   | 1653530130   | eDP Connector                       | -               | -                                                                                       |
| CN4   | 1655302025   | WAFER BOX.2P.<br>SATA power (DC 5V) | 1702150155      | Power Cable.15P SATA(F).2P 2.0mm Housing(PH).15cm                                       |
| CN5   | 1654907009   | SATA CONN                           | 1700070200      | SATA CABLE.7P 180D(F)<br>w/lock.to 7P 90D(F) w/o lock<br>SATA.20cm                      |
| CN6   | 1654801330   | Type A.USB3.2 x1 +<br>USB2.0 x1     | -               | -                                                                                       |
| CN7   | 1654801832   | Type A.USB3.2 x2                    | -               | -                                                                                       |
| CN8   | 16548X0015   | Type C.USB4.0<br>Connector          | -               | -                                                                                       |
| CN9   | 1655X00031   | USB 2.0/UART 1x10P<br>Wafer         | 170010015G      | (TF)USB Cable.10P 1.0mm<br>Housing.USB A(F). 15cm                                       |
| CN10  | 1654207533   | M.2 Key-E Slot                      | -               | -                                                                                       |
| CN11  | 165420753B   | M.2 Key-M Slot                      | -               | -                                                                                       |
| CN12  | 165420753B   | M.2 Key-M Slot                      | -               | -                                                                                       |

| Label | Connector PN | Description                                  | Mating Cable PN | Mating Cable Description                                           |
|-------|--------------|----------------------------------------------|-----------------|--------------------------------------------------------------------|
| CN13  | 165420753A   | M.2 Key-B Slot                               | -               | -                                                                  |
| CN14  | 16528X0015   | GbE RJ-45 x2                                 | -               | -                                                                  |
| CN15  | 1652708203   | Audio Jack (Line out + Mic in)               | -               | -                                                                  |
| CN16  | 1655901000   | Wafer Box.10P. COM port                      | 170X000255      | COM Port.9PCOM Cable to VGA.210mm.FLYINGWAY.FW AA-1375.            |
| CN17  | 16530X0041   | Wafer Box.10P. COM port                      | 170X000255      | COM Port.9PCOM Cable to VGA.210mm.FLYINGWAY.FW AA-1375.            |
| CN18  | 1653006205   | 40-pin HAT Connector                         | 170X000277      | Cable.40PPitch=3.81mm.16P -to-40P header.300mm.FLYINGWAY.FWAA-1418 |
| CN21  | 165250320K   | Wafer Box.6P. Front Panel (Power on + Reset) | -               | -                                                                  |
| CN22  | 1652602105   | DC Power Jack                                | -               | -                                                                  |
| CN23  | 1655803131   | DC terminal block                            | -               | -                                                                  |
| J1    | 1655804030   | WAFER BOX.4P. Fan Connector                  | TH1UPAD010      | System Cooler.12V.5500.Smart FAN                                   |
| SW1   | 1601615600   | Power Button with LED                        | -               | -                                                                  |
| SIM1  | 1654900693   | Nano SIM Slot                                | -               | -                                                                  |