# AVerMedia OOB Management Module

Out-of-Band Module


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**Preface**

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**Revision History**

| Revision | Date | Updates |
|---|---|---|
| Version 0.1 | Dec, 24, 2024 | 1st Released |
| | | |

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https://www.avermedia.com/professional/contact-us

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## Limited Product Warranty

AVerMedia provides product warranty. Should this product, in AVerMedia's opinion, fail to be in the good working order during the warranty period, AVerMedia will, at its option, repair or replace it at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster, or non-AVerMedia authorized modification or repair.

You may obtain the warranty service by delivering this product to an authorized AVerMedia business partner or to AVerMedia along with the proof of purchase. Product returned to AVerMedia must be pre-authorized by AVerMedia with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured, and packaged for the safe shipment. AVerMedia will return the product by prepaid shipment service.

It is not recommended to disassemble the box PC, which will impact the warranty. The limited product warranty is only valid over the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, AVerMedia reserves the right to substitute an equivalent product if available or to retract the product warranty if no replacement is available.

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## ESD Warning

Electronic components and circuits are sensitive to Electrostatic Discharge (ESD). When handling any circuit board assemblies including AVerMedia AVerMedia products, it is highly recommended that ESD safety precautions can be observed. ESD safe best practices can include, but are not limited to the following ones.

1. Leave the circuit board in the antistatic package until it is ready to be installed.
2. Use a grounded wrist strap when handling the circuit board. At a minimum, you need to touch a grounded metal object to dissipate any static charge, which may be present on you.
3. Avoid handling the circuit board in the carpeted areas.
4. Handle the board by the edges and avoid the contact with the components.
5. Only handle the circuit boards in ESD safe areas, which may include ESD floor and/or table mats, wrist strap stations, and ESD safe lab coats.

## Safety Precaution:

1. All cautions and warnings on the device should be noted.
2. For safety consideration, do NOT open the device if not a qualified service stuff.
3. Place the device on a solid surface during installation to prevent falls.
4. Keep the device away from humidity.
5. Do NOT leave this device in an un-controlled environment with temperatures beyond the device's permitted storage temperature to avoid damage.
6. All adaptors and cables supplied by AVerMedia are verified. Do NOT use any others not supplied by AVerMedia to avoid any malfunction or fires.
7. Make sure the power source matches the power rating of the device.
8. Place the power cord where people cannot step on it. Do not put anything on the power cord.
9. Always completely disconnect the power while the device is not usage or idle for a long time.

10. Disconnect the device from any AC supply before cleaning. While cleaning, use a damp cloth instead of liquid or spray detergents.
11. Make sure the device is installed near a power outlet and easy for accessible.
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out the heatsink or heat spreader of the device when the system is running.
14. Never pour any liquid into the openings. This could cause fire or electric shock.
15. The static electricity should be noted while installing any internal components. Consider to use a grounding wrist strap and put all electronic parts in static-shielded containers.

If the following situations occur, please contact our service personnel:

(1) The device is dropped or damaged

(2) Damaged power cord or plug

(3) Exposure to moisture

(4) Liquid intrusion into the device

(5) Any obvious signs of damage displayed on the device

(6) Device is not working as expected or in a manner as described in this manual

## *1.0 Introduction*

AVerMedia D135-OB is a hardware module that provides secure Out-Of-Band device monitoring and management functions over the connected edge system.

### *1.1Features*

- ARM9 microprocessor embedded
- Low power consumption of less than 0.5 W
- Built-in Allxon Out-Of-Band (OOB) service agent, capable of supporting both public and local network environment architectures
- Includes a fully secure central portal for remote device management
- Supports complete power control over the edge system when the system is unresponsive

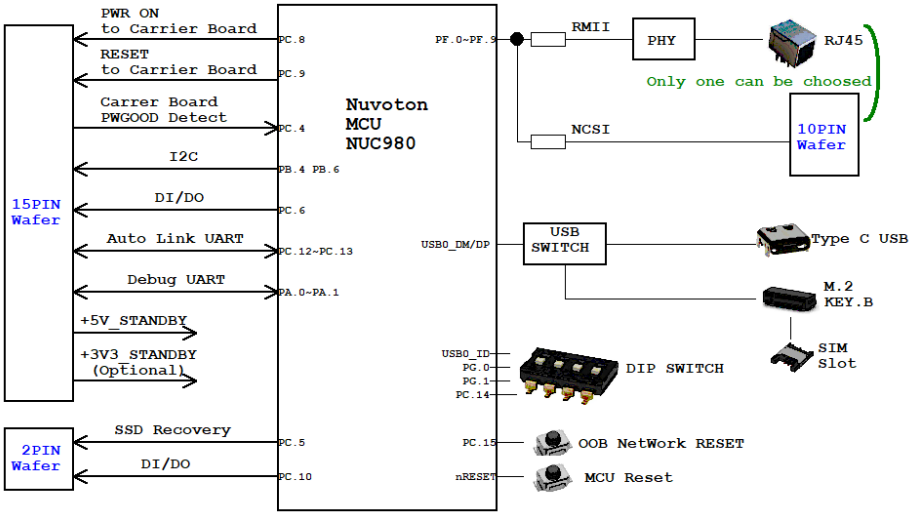
## 1.1 Product Specifications

| | |
|---|---|
| Model | D135-OB<br>D130-OB-NCSI |
| MCU | Nuvoton NUC980 |
| External I/O | - 1 x RJ45 10/100Mb (LED indicator)<br>- 1 x Micro SIM slot for 4G module<br>- 1 x Type C Connector for MCU update |
| Internal I/O | - 1 x 15pin wafer for (PWB*、RST*、5V、3V3、 Sys Debug UART、I2C、auto- link UART、Power detecting pin、GPIO)...Note1<br>- 1 x 10pin wafer for NC-SI...Note2<br>- 1 x 2pin wafer for SSD recovery (for Apacer SSD)...Note3<br>- 1 x Pin header for MCU debug UART<br>- 1 x MCU Reset button<br>- 1x OOB Reset button<br>- 1 x DIP switch for function setting |
| Expansion | 1 x M.2 Key. B 3042 (only USB2.0) for wifi or LTE module<br>(We will support this feature upon customer request) |
| Power Input | - 5V standby power<br>- 3V3 standy power (reserved) |

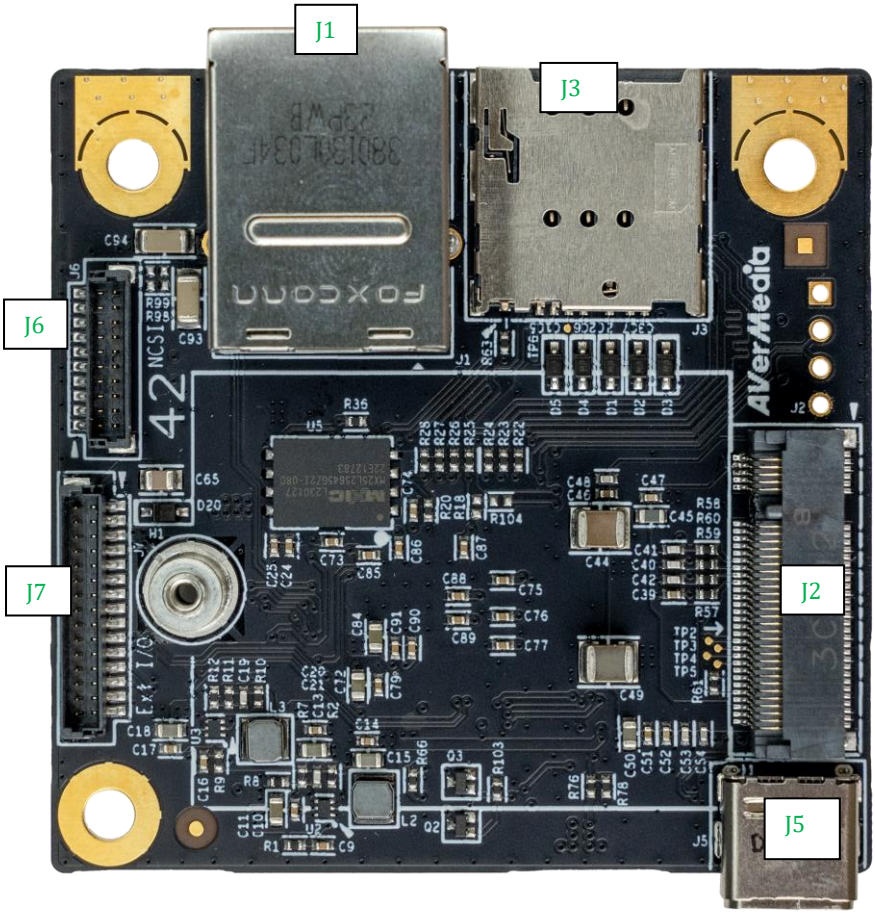
| | |
|---|---|
| Note | 1. must be connected for OOB function<br>2. only connected for NC-SI<br>3. We will support this feature upon customer request |
| Environment | - Operating temperature -40°C ~ 85°C<br>(The actual situation depends on the box PC spec. )<br>- Storage temperature -40°C ~ 85°C |
| PCB | 55 x 56.2mm |

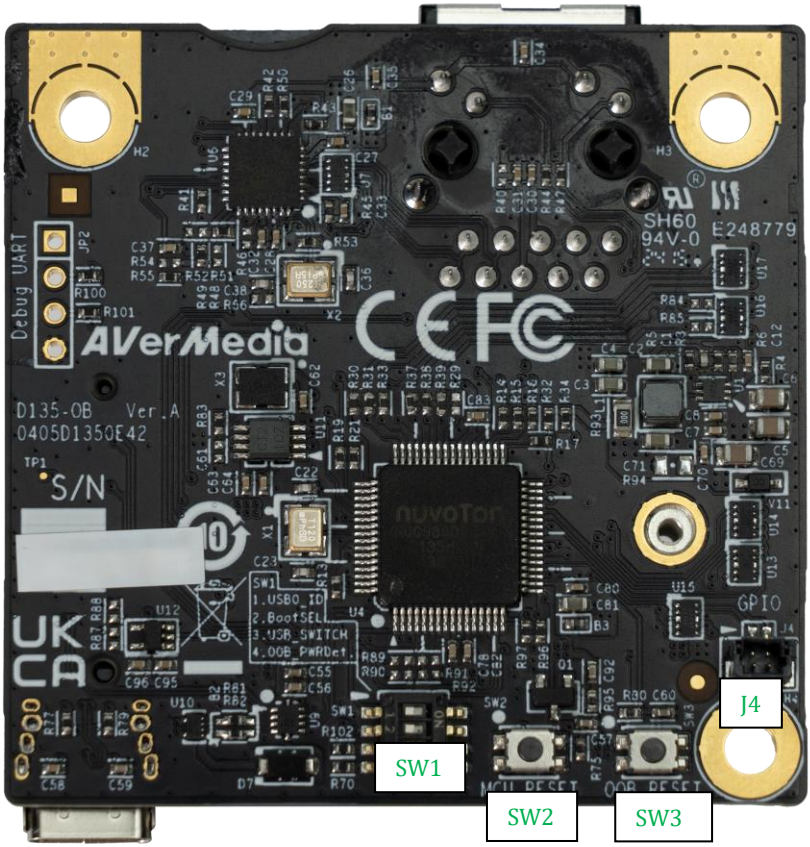
## *2.0 Product Overview*

### 2.1 Block Diagram



## 2.2 Top View and Bot View of OOB board



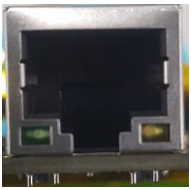

J4
SW1
SW2
SW3

## 2.3 Connector Summary

| | |
|---|---|
| J1 | JACK_RJ45_TRANSFORMER+LED_90°_DIP |
| J2 | SOCKET_M.2 KEYB_75PIN_90°_SMD |
| J3 | SOCKET_MICRO SIM_8PIN_90°_SMD |
| J4 | WAFER_1*2PIN_1 ㎜_180°_SMD |
| J5 | JACK_USB_C TYPE(F)_90°_PIP-L1.45 ㎜ |
| J6 | WAFER_1*10PIN_1 ㎜_180°_SMD |
| J7 | WAFER_1*15PIN_1 ㎜_180°_SMD |
| SW1 | SW_SLIDE DIP_DHN-04F-T-Q-T/R_SMD8 |
| SW2 | SW_TACT_TS106V1M-018BR-R_SMD |
| SW3 | SW_TACT_TS106V1M-018BR-R_SMD |

## *3.0 Feature Description*

### 3.1 10/100M Ethernet Connector

| | | |
|---|---|---|
| Function | 10/100M Ethernet connector, used to connect to the OOB |  |
| Location | J1 | |
| Type Description | JACK_RJ45_TRANSFORMER+LED_90°_DIP | |
| Manufacturer and Part Number | Foxconn_JFM38013-0L03-4F_1G-LEFT(G)+RIGHT(Y)-DOWN | |
| Mating Connector | Any standard 10/100M Ethernet mating connector can be applicable. | |
| Pinout | Comply with Ethernet standards. | |

**Remarks**

- Only used when without NC-SI
- NCSI (Network Controller Sideband Interface), when using the NCSI function, this RJ45 Port will be disabled, and the network signal will transmit data through the network connector of the AI system host.

| OOB Power Indicator-Green | Ethernet Indicator-Yellow | Status |
|---|---|---|
| Blinking | Blinking | -OOB power ON<br>-No Internet connection<br>-OOB is not connected to Allxon Portal |
| Solid Green | N/A | -OOB power ON and connecte to Internet<br>-Trying to connect to Allxon Portal |
| Solid Green | Solid Yellow | OOB power ON and connecte to Allxon Portal for Allxon Services |

### 3.2 M.2 key B Connector

| | | |
|---|---|---|
| Function | 4G LTE /WIFI (**The feature upon customer request.)** |  |
| Location | J2 | |
| Type Description | SOCKET_M.2 KEYB_75PIN_90°_SMD | |
| Manufacturer and Part Number | Foxconn, 2E0BC21-S85BB-7H | |
| Mating Connector | Any M.2 key B 3042 card standard interface device. | |
| Pinout | Please refer to M.2 key B card standard for the pinout details. | |
| Remarks | Only supports USB 2.0 interface<br>WIFI / 4G function needs to be customized | |

### 3.3 Micro SIM Card slot

| | | |
|---|---|---|
| Function | SIM Card Slot |  |
| Location | J3 | |
| Type Description | Micro Sim Push Push Type, H=1.42, SMT | |
| Manufacturer and Part Number | FG-0271AAAG06A | |
| Mating Connector | Any Micro SIM standard Type interface adapter or device. | |
| Pinout | Please refer to SIM Card standard | |
| Remarks | Need to be used with 4G module | |

### 3.4 GPIO expansion

| | | |
|---|---|---|
| Function | GPIO Expansion connector |  |
| Location | J4 | |
| Type Description | WAFER_1*2PIN_1 ㎜_180°_SMD | |
| Manufacturer and Part Number | ACES 50228-00271-001 | |
| Mating Connector | ACES 50233-015H0H0-001 | |
| Pinout | PIN# / Description<br>Pin1 / GPIO PC.10<br>Pin2 / SSD_Recovey | |
| Remarks | SSD_Recovery, This function requires Apacer specific SSD. If you need to use it, please contact AVerMedia technical service. | |

### 3.5 USB- C Connector

| | | |
|---|---|---|
| Function | MCU FW update |  |
| Location | J5 | |
| Type Description | JACK_USB_C TYPE(F)_90°_PIP-L1.45 ㎜ | |
| Manufacturer and Part Number | ACES 57988-0240D-001 | |
| Mating Connector | Any USB-C standard interface cable or device. | |
| Pinout | Please refer to USB-C standard for the pinout details. | |
| Remarks | ● Only supports USB 2.0 transfer speeds.<br>● This Port can provide USB WIFI Dongle for use. If necessary, customized services are required. | |

### 3.6 Network Controller Sideband Interface

| | | |
|---|---|---|
| Function | NCSI Interface | |
| Location | J6 | |
| Type Description | WAFER_1*10PIN_1 ㎜_180°_SMD | |
| Manufacturer and Part Number | ACES 50228-01071-001 | |
| Mating Connector | ACES 50233-010H0H0-001 | |
| Pinout | |  |

| PIN# | Description |
|---|---|
| Pin1 | NC_SI_TXD0 |
| Pin2 | NC_SI_TXD1 |
| Pin3 | NC_SI_TX_EN |
| Pin4 | GND |
| Pin5 | NC_SI_CLK |
| Pin6 | GND |
| Pin7 | NC_SI_RXD0 |
| Pin8 | NC_SI_RXD1 |
| Pin9 | NC_SI_CRS_DV |
| Pin10 | GND |

| | |
|---|---|
| Remarks | ● NCSI (Network Controller Sideband Interface), when using the NCSI function, this RJ45 Port will be disabled, and the network signal will transmit data through the network connector of the AI system host.<br>● This function HOST PC requires Intel I210 Chipset |

### 3.7 OOB Interface

| | | |
|---|---|---|
| Function | OOB Interface | |
| Location | J7 | |
| Type Description | WAFER_1*15PIN_1 ㎜_180°_SMD | |
| Manufacturer and Part Number | ACES 50228-01571-001 | |
| Mating Connector | ACES 50233-015H0H0-001 | |
| Pinout | <table><tr><th>PIN#</th><th>Description</th></tr><tr><td>Pin1</td><td>GND</td></tr><tr><td>Pin2</td><td>GND</td></tr><tr><td>Pin3</td><td>UART1_RX (to SOM Debug UART_TX)</td></tr><tr><td>Pin4</td><td>UART1_TX (to SOM Debug UART_RX)</td></tr><tr><td>Pin5</td><td>UART8_RX (Auto-link via UART)</td></tr><tr><td>Pin6</td><td>UART8_TX (Auto-link via UART)</td></tr><tr><td>Pin7</td><td>I2C1_SCL (reserved)</td></tr><tr><td>Pin8</td><td>I2C1_SDA (reserved)</td></tr><tr><td>Pin9</td><td>GPIO PC.6 (reserved)</td></tr><tr><td>Pin10</td><td>CarrierBoard_PGOOD<br>3.3V Active High</td></tr><tr><td>PIN11</td><td>CarrierBoard_Reset<br>3.3V Low Active</td></tr><tr><td>Pin12</td><td>CarrierBoard_PowerOn<br>3.3V Low Active, Host PC Please follow Nvidia carrier board design for power button behavior.</td></tr><tr><td>Pin13</td><td>+3V3_STANDBY</td></tr><tr><td>Pin14</td><td>+5V_STANDBY</td></tr></table> |  |
| Remarks | 3.3V capable I/O include UART & I2C | |

### 3.8 DIP Switch Setting

<table>
<tr><td>Function</td><td colspan="4">Function Setting DIP switch connector</td><td rowspan="4">  </td></tr>
<tr><td>Location</td><td colspan="4">SW1</td></tr>
<tr><td>Type Description</td><td colspan="4">SW_SLIDE DIP_DHN-04F-T-Q-T/R_SMD8</td></tr>
<tr><td>Manufacturer and Part Number</td><td colspan="4">DIPTRONICS DHN-04F-T-Q-T/R</td></tr>
<tr><td>Mating Connector</td><td colspan="4">NA</td><td></td></tr>
<tr><td>PIN OUT</td><td colspan="5"><table>
<tr><td>No.</td><td>Description</td><td>ON</td><td>OFF</td></tr>
<tr><td>1</td><td>USB-mode</td><td>Host</td><td>Device</td></tr>
<tr><td>2</td><td>Boot-SEL</td><td>Boot from USB</td><td>Boot from SPI</td></tr>
<tr><td>3</td><td>USB-SWITCH</td><td>USB to KEY-B</td><td>USB to USB-C</td></tr>
<tr><td>4</td><td>edge device power detection function</td><td>Enable</td><td>Disable</td></tr>
</table></td></tr>
<tr><td>Remarks</td><td colspan="5">None</td></tr>
</table>

### 3.9 MCU Reset Button

| | | |
|---|---|---|
| Function | MCU Reset |   |
| Location | SW2 | |
| Type Description | DHN-04F-T-Q-T/R | |
| Manufacturer and Part Number | DIPTRONICS DHN-04F-T-Q-T/R | |
| Mating Connector | NA | |
| Pinout | NA | |
| Remarks | None | |

### 3.10 OOB Network Reset Button

| | | |
|---|---|---|
| Function | OOB Network Reset |   |
| Location | SW3 | |
| Type Description | DHN-04F-T-Q-T/R | |
| Manufacturer and Part Number | DIPTRONICS DHN-04F-T-Q-T/R | |
| Mating Connector | NA | |
| Pinout | NA | |
| Remarks | After a long press, the RJ45 LED will blink rapidly and then turn off | |

## Other Switches and Jumpers

Other switches and jumpers listed on the boards but not mentioned in this manual are reserved for the internal use by AVerMedia. They are not open to the client application.

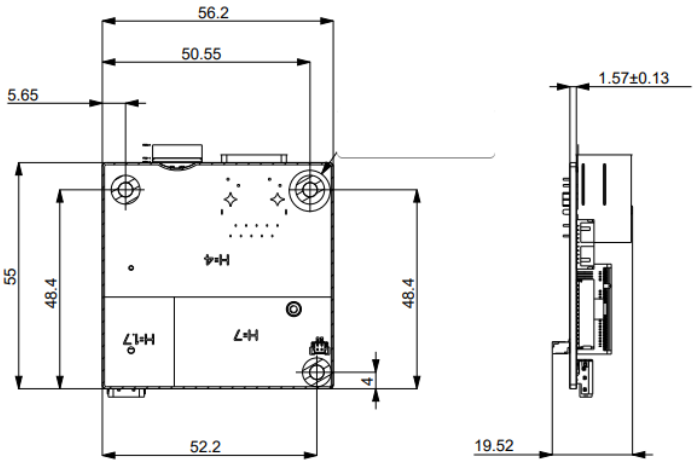
## *4.0 OOB Software Settings*

Please refer to Getting Started with Allxon Remote Management Service

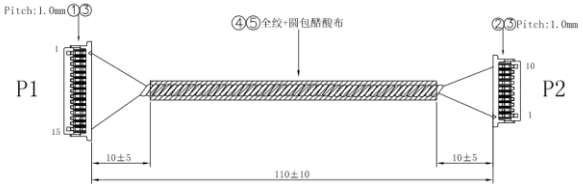
For more Allxon support, see https://www.allxon.com or contact them at service@allxon.com.

## *5.0 Dimension Drawings*

### 5.1Dimension Drawings of carrier board

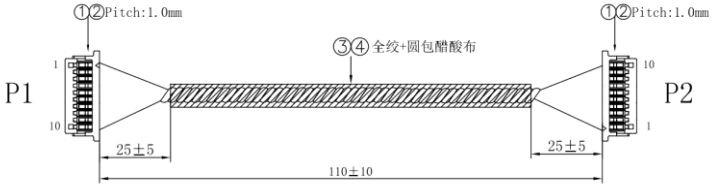


## *6.0 Accessory Drawings*




WIRING TABLE

| P1 | WIRE COLOR | | P2 |
|---|---|---|---|
| 15 | BLACK 黑 | | 10 |
| 12 | BROWN 棕 | | 9 |
| 11 | RED 红 | | 8 |
| 10 | ORANGE橙 | | 7 |
| 5 | YELLOW黄 | 对绞 | 6 |
| 6 | GREEN 绿 | | 5 |
| 3 | BLUE 蓝 | 对绞 | 4 |
| 4 | PURPLE紫 | | 3 |
| 9 | GRAY 灰 | | 2 |
| 1 | WHITE 白 | | 1 |




## *7.0 Package list*

### 7.1 D135-OB

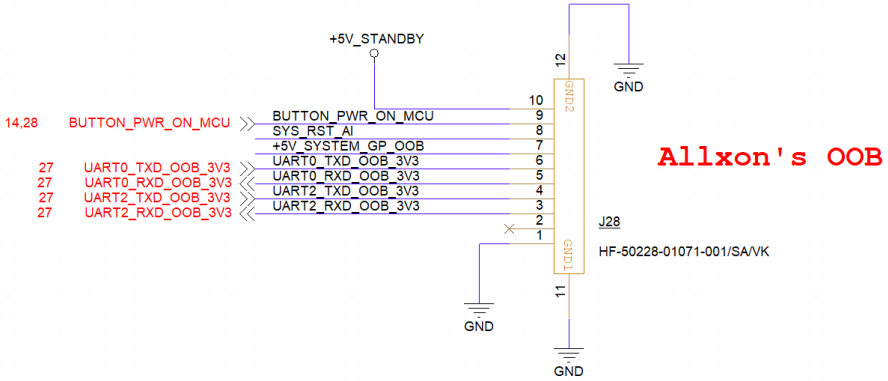
| Item | Description | Quality |
|---|---|---|
| D135-OB Module | Module | 1 |
| OOB Cable | WIRE_28AWG-HSG1*15 TO 1*10P-P1_110 ㎜ | 1 |

### 7.2 D135-OB-NCSI

| Item | Description | Quality |
|---|---|---|
| D135-OB-NCSI Module | Module | 1 |
| OOB Cable | WIRE_28AWG-HSG1*15 TO 1*10P-P1_110 ㎜ | 1 |
| NCSI Cable | WIRE_30AWG-HSG1*10P-P1_110 ㎜ | 1 |

OOB & NCSI cable is a special definition, Host edge PC needs to follow the following design to use this cable

## 8.1 OOB host edge PC wafer pin definition.



**8.2 NCSI host edge PC wafer pin definition.**