

# **UPC-PLUS CPU Board Quick Installation Guide**

## CNREVISION HISTORY

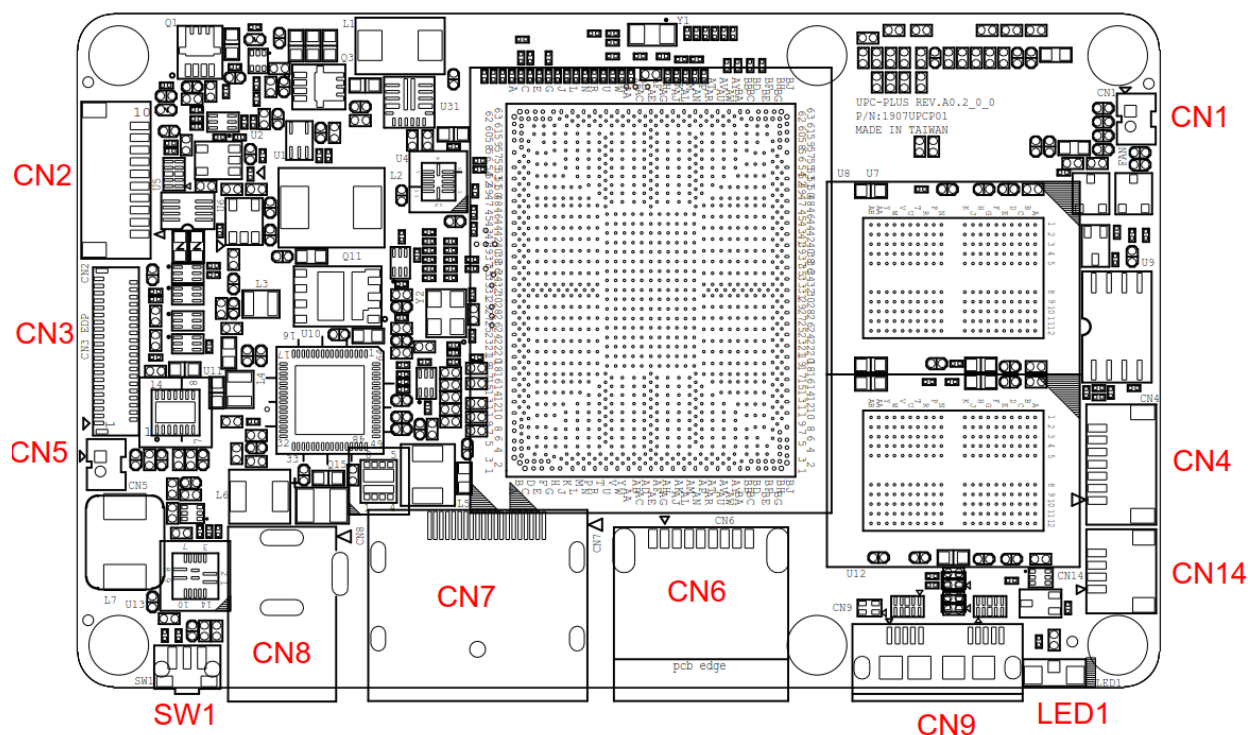
| Revision | Date       | Comments                                                                                                                                                                                                                                                       |
|----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A0.1     | 2018/01/08 | Initial Version                                                                                                                                                                                                                                                |
| A0.2     | 2018/04/16 | Add CN14 description                                                                                                                                                                                                                                           |
| A0.3     | 2018/08/23 | Change Pin11 to BUF_PLT_RST# of DOCKING I (CN10)<br>Change Pin9 Pin10 to NC of DOCKING II (CN12)<br>Change Pin11 to DDI0_HPD of DOCKING II (CN12)<br>Change Pin92 to PMU_RSTBTN_N of DOCKING II (CN12)<br><b>※Change on A0.4 board version or late version</b> |
| A0.4     | 2018/10/12 | Change Pin85 to GPIO_2 of DOCKING I (CN10)<br>Change Pin87 to GPIO_3 of DOCKING I (CN10)<br><b>※Change on A0.4 board version or late version</b>                                                                                                               |
| A0.5     | 2018/10/17 | Correction CN12.44 pin define                                                                                                                                                                                                                                  |
| A0.6     | 2018/10/29 | Modify signal level of CN10 and CN12.                                                                                                                                                                                                                          |
| A0.7     | 2019/03/08 | 1.Modify CN1 FAN pin define.<br>2.Modify CN3 CN7 connector functional description.                                                                                                                                                                             |
| A0.8     | 2019/03/14 | Modify CN12.93 pin define.                                                                                                                                                                                                                                     |
| A0.9     | 2019/03/20 | Correct the Docking I II pin define.                                                                                                                                                                                                                           |

## Table of Content

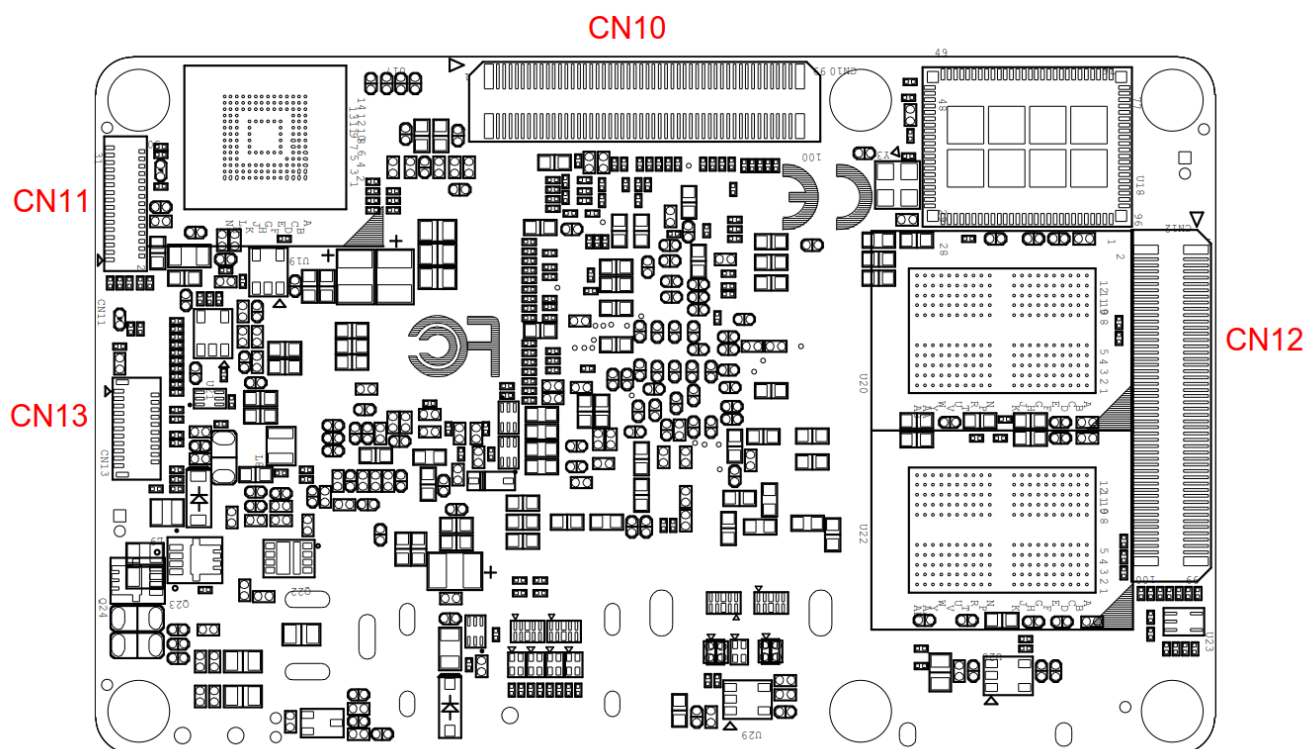
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# 1. UPC-PLUS Board Layout

## Top side



## Bottom side



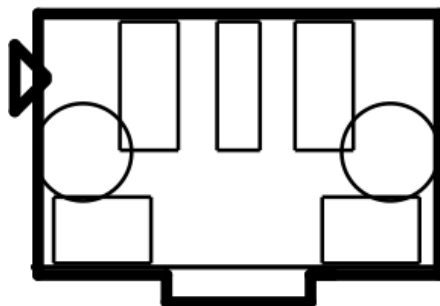
## 2. Connector References

### Connector Index

| Reference Designation | Functional Description | Connector Type                                                                         |
|-----------------------|------------------------|----------------------------------------------------------------------------------------|
| SW1                   | PWR button             | (TF)Push Button Switch.3P.12VDC.50mA.500mohm.Black.SMD.HCH.PTS-099                     |
| CN1                   | FAN                    | (TF)WAFER BOX.2P.180D(M).DIP.1.25mm.PINREX.712-71-02TW01                               |
| CN2                   | Internal USB<br>UART   | (TF)Wafer Box.10P.90D(M).SMD.1.0mm.PINREX.710-74-10TWR6                                |
| CN3                   | eDP                    | (TF)FPC/FFC Conn.41P.90D(F).SMD.0.6mm.Hirose.FH35C-41S-0.3SHW(50)                      |
| CN4                   | BIOS PROGRAM           | (TF)WAFER BOX.7P.180D(M).SMD.1.0mm.W/Cap.PINREX.710-73-07TWE6                          |
| CN5                   | RTC                    | (TF)WAFER BOX.2P.180D(M).DIP.1.25mm.PINREX.712-71-02TW01                               |
| CN6                   | USB3.0                 | (TF)USB3.0 Connector.Single Port.Type A.9P.90D(F).SMD.Trontek.930-00406-A91-21         |
| CN7                   | DP                     | (TF)DisplayPort CON.20P.90D.(F).SMD.FOXCONN.3VD51203-D7JJ-7H                           |
| CN8                   | Power Input            | (TF)DC Power Jack.3P.90D(M).DIP.2.0mm.COXOC.416AEWTJ02004PA                            |
| CN9                   | Micro USB3.0           | (TF)Micro USB 3.0 Conn..10P.90D(M).SMD.B-type.ATTEND.209E-BE01                         |
| CN10                  | DOCKING I              | (TF)Board-Board Connector.100P.180D(M).Pitch=0.5mm.H=5.3mm.SMD.Panasonic.AXK6S0064 7YG |
| CN11                  | MIPI CSI               | (TF)FPC/FFC Conn..31P.90D(F).SMD.0.3mm.Dual Contact.Panasonic.AYF333135                |
| CN12                  | DOCKING II             | (TF)Board-Board Connector.100P.180D(M).Pitch=0.5mm.H=5.3mm.SMD.Panasonic.AXK6S0064 7YG |
| CN13                  | MIPI CSI 2CH           | (TF)FPC/FFC Conn.21P.90D(F).SMD.0.6mm.Hirose.FH35C-21S-0.3SHW(50)                      |
| CN14                  | PWR Button Pin Header  | (TF)WAFER BOX.2P.90D(M).SMD.1.0mm.W/Cap.PINREX.710-74-02TWR6                           |
| LED1                  | SYSTEM Indicator       | (TF)LED.3.0*1.0*1.0mm. Blue.SMD.LITEON. LTST-S320TBKT                                  |

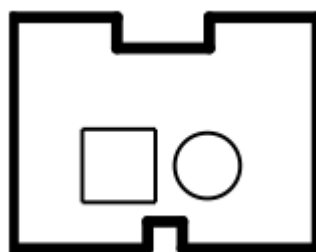
### 3. Connector Pin Assignments

SW1: PWR button



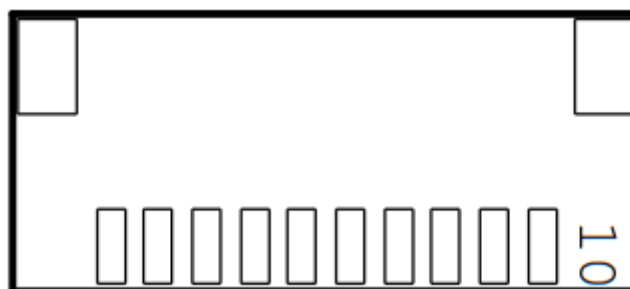
| Pin | Signal Description | Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|-----|--------------------|
| 1   | GND                | 2   | PMU_PWRBTN_N       | 3   | GND                |

CN1: FAN



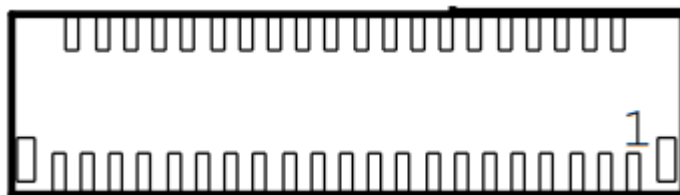
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | FAN_PWR(5V)        | 2   | GND                |

CN2: Internal USB UART



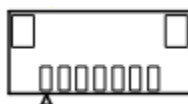
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | +5V                | 2   | USB2_DN6           |
| 3   | USB2_DP6           | 4   | GND                |
| 5   | +5V                | 6   | USB2_DN7           |
| 7   | USB2_DP7           | 8   | GND                |
| 9   | UART0_RXD_3V3      | 10  | UART0_TXD_3V3      |

## CN3: eDP



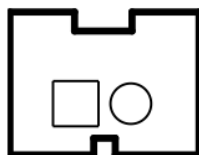
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | NC                 | 2   | NC                 |
| 3   | GND                | 4   | NC                 |
| 5   | NC                 | 6   | GND                |
| 7   | NC                 | 8   | NC                 |
| 9   | GND                | 10  | NC                 |
| 11  | NC                 | 12  | GND                |
| 13  | NC                 | 14  | NC                 |
| 15  | GND                | 16  | EDP_TXP_0          |
| 17  | EDP_TXN_0          | 18  | GND                |
| 19  | EDP_TXP_1          | 20  | EDP_TXN_1          |
| 21  | GND                | 22  | EDP_TXP_2          |
| 23  | EDP_TXN_2          | 24  | GND                |
| 25  | EDP_TXP_3          | 26  | EDP_TXN_3          |
| 27  | GND                | 28  | EDP_AUXP           |
| 29  | EDP_AUXN           | 30  | GND                |
| 31  | EDP_HPD_CONN       | 32  | DDI0_BKLT_CTRL     |
| 33  | DDI0_VDD_EN        | 34  | DDI0_BKLT_EN       |
| 35  | I2C_3V3_SCL7       | 36  | I2C_3V3_SDA7       |
| 37  | +3.3V              | 38  | +3.3V              |
| 39  | +3.3V              | 40  | +3.3V              |
| 41  | +3.3V              |     |                    |

## CN4: BIOS PROGRAM



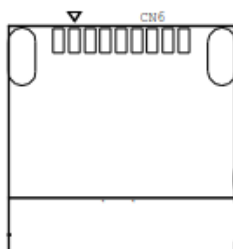
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | SPI_MISO           | 2   | GND                |
| 3   | SPI_CLK            | 4   | +VCC_SPI           |
| 5   | SPI_MOSI           | 6   | SPI_CS0#           |
| 7   | NC                 |     |                    |

## CN5: RTC



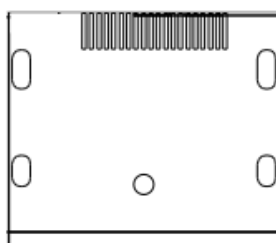
| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | RTC_VCC            | 2   | GND                |

## CN6: USB3.0



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | +V5P0_USB_1        | 2   | USB2_C_DN1         |
| 3   | USB2_C_DP1         | 4   | GND                |
| 5   | USB3_RXN_CON_P1    | 6   | USB3_RXP_CON_P1    |
| 7   | GND                | 8   | USB3_TXN_CON_P1    |
| 9   | USB3_TXP_CON_P1    |     |                    |

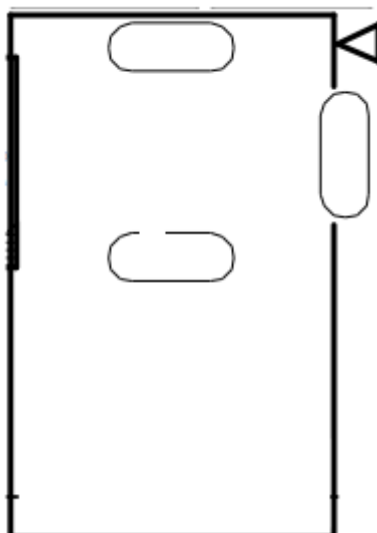
## CN7: DP connector



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | DDI1_TXP_DP_0      | 2   | GND                |
| 3   | DDI1_TXN_DP_0      | 4   | DDI1_TXP_DP_1      |
| 5   | GND                | 6   | DDI1_TXN_DP_1      |
| 7   | DDI1_TXP_DP_2      | 8   | GND                |
| 9   | DDI1_TXN_DP_2      | 10  | DDI1_TXP_DP_3      |
| 11  | GND                | 12  | DDI1_TXN_DP_3      |
| 13  | GND                | 14  | DDI1_AUXP_C        |
| 15  | DDI1_AUXP_C        | 16  | GND                |
| 17  | DDI1_AUXN_C        | 18  | DDI1_HPD           |
| 19  | GND                | 20  | +3.3V              |

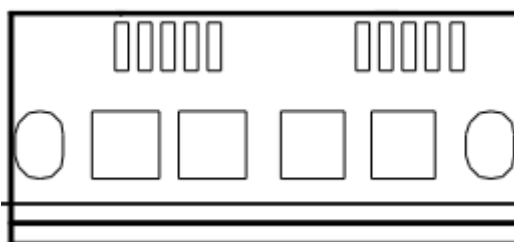


## CN8: Power input



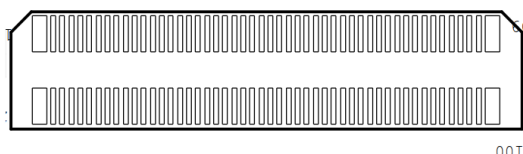
| Pin | Signal Description | Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|-----|--------------------|
| 1   | +12V               | 2   | GND                | 3   | GND                |

## CN9: Micro USB3.0



| Pin | Signal Description | Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|-----|--------------------|
| 1   | +V5P0_USB_OTG      | 2   | USB2_C_DN0         | 3   | USB2_C_DP0         |
| 4   | USB_OTG_R_ID       | 5   | GND                | 6   | USB3_RXN_CON_P0    |
| 7   | USB3_RXP_CON_P0    | 8   | GND                | 9   | USB3_TXN_CON_P0    |
| 10  | USB3_TXP_CON_P0    |     |                    |     |                    |

## CN10: DOCKING I

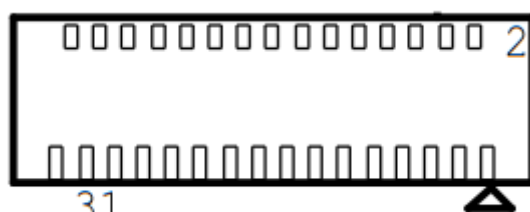


00T

| Pin | Signal Description      | Signal Level | Pin | Signal Description | Signal Level |
|-----|-------------------------|--------------|-----|--------------------|--------------|
| 1   | +V5A                    |              | 2   | +V5A               |              |
| 3   | +V5A                    |              | 4   | +V5A               |              |
| 5   | +V5A                    |              | 6   | +V5A               |              |
| 7   | +V5A                    |              | 8   | +V5A               |              |
| 9   | GND                     |              | 10  | GND                |              |
| 11  | PMU_PLT_RST#            | 3.3V,PU10K   | 12  | LPSS_UART1_RTS     | 1.8V,PU10K   |
| 13  | PMU_PWRBTN_N            | 3.3V,PU10K   | 14  | LPSS_UART1_CTS     | 1.8V         |
| 15  | PM_SLP_S3#_3P3          | 3.3V         | 16  | LPSS_UART1_TXD     | 1.8V,PD10K   |
| 17  | PCIE_CLKREQ3#           | 1.8V,PU10K   | 18  | LPSS_UART1_RXD     | 1.8V         |
| 19  | PCIE_WAKE3_N            | 1.8V,PU4.7K  | 20  | GND                |              |
| 21  | GND                     |              | 22  | CPU_prog_JTAG_TDO  | 1.8V         |
| 23  | SIO_SPI_0_TXD           | 1.8V,PU10K   | 24  | CPU_prog_JTAG_TMS  | 1.8V         |
| 25  | SIO_SPI_0_RXD           | 1.8V         | 26  | HDMI1_CEC_D        | 1.8V,PU27K   |
| 27  | SIO_SPI_0_CLK           | 1.8V,PD10K   | 28  | CPU_prog_JTAG_TCK  | 1.8V         |
| 29  | SIO_SPI_0_FS0           | 1.8V,PD10K   | 30  | CPU_prog_JTAG_TDI  | 1.8V         |
| 31  | SIO_SPI_0_FS1           | 1.8V,PU10K   | 32  | ISH_GPIO_0         | 1.8V         |
| 33  | GND                     |              | 34  | ISH_GPIO_1         | 1.8V         |
| 35  | LPC_R_AD0               | 1.8V         | 36  | ISH_GPIO_2         | 1.8V         |
| 37  | LPC_R_AD1               | 1.8V         | 38  | ISH_GPIO_3         | 1.8V         |
| 39  | LPC_R_AD2               | 1.8V         | 40  | ISH_GPIO_4         | 1.8V         |
| 41  | LPC_R_AD3               | 1.8V,PU10K   | 42  | ISH_GPIO_5         | 1.8V         |
| 43  | GND                     |              | 44  | ISH_GPIO_6         | 1.8V         |
| 45  | AVS_I2S2_MCLK           | 1.8V         | 46  | PWM0               | 1.8V,PD10K   |
| 47  | AVS_I2S2_WS_SYNC        | 1.8V         | 48  | PWM1               | 1.8V,PD10K   |
| 49  | AVS_I2S2_SDI            | 1.8V         | 50  | GND                |              |
| 51  | AVS_I2S2_SDO            | 1.8V,PD4.7K  | 52  | I2C_SDA6           | 1.8V,PU10K   |
| 53  | GND                     |              | 54  | I2C_SCL6           | 1.8V,PU10K   |
| 55  | PCIE_P5_USB3_P2_TX<br>P |              | 56  | GND                |              |
| 57  | PCIE_P5_USB3_P2_TX<br>N |              | 58  | AVS_I2S2_BCLK      | 1.8V         |
| 59  | GND                     |              | 60  | BT_HOST_WAKE       | 1.8V         |

|    |                         |            |     |                  |      |
|----|-------------------------|------------|-----|------------------|------|
| 61 | PCIE_P5_USB3_P2_RX<br>P |            | 62  | GND              |      |
| 63 | PCIE_P5_USB3_P2_RX<br>N |            | 64  | USB2_DP2         |      |
| 65 | GND                     |            | 66  | USB2_DN2         |      |
| 67 | PCIE_REFCLK3_P          |            | 68  | GND              |      |
| 69 | PCIE_REFCLK3_N          |            | 70  | nSTATUS          | 1.8V |
| 71 | GND                     |            | 72  | GND              |      |
| 73 | I2C_SDA0                | 1.8V,PU10K | 74  | ISH_GPIO_7       | 1.8V |
| 75 | I2C_SCL0                | 1.8V,PU10K | 76  | ISH_GPIO_8       | 1.8V |
| 77 | GND                     |            | 78  | ISH_GPIO_9       | 1.8V |
| 79 | I2C_SDA1                | 1.8V,PU10K | 80  | ISH_GPIO_10      | 1.8V |
| 81 | I2C_SCL1                | 1.8V,PU10K | 82  | ISH_GPIO_11      | 1.8V |
| 83 | GND                     |            | 84  | ISH_GPIO_12      | 1.8V |
| 85 | GPIO_2                  | 1.8V       | 86  | ISH_GPIO_13      | 1.8V |
| 87 | GPIO_3                  | 1.8V       | 88  | ISH_GPIO_14      | 1.8V |
| 89 | GND                     |            | 90  | PMIC_IRQ_N       | 1.8V |
| 91 | LPC_FRAME_N             | 1.8V       | 92  | FPGA_CLR         | 1.8V |
| 93 | LPC_R_CLKOUT0           | 1.8V       | 94  | GND              |      |
| 95 | LPC_CLKRU_N             | 1.8V       | 96  | GPIO217/FPGA_OE  | 1.8V |
| 97 | LPC_SERIRQ              | 1.8V       | 98  | GPIO216/FPGA_RST | 1.8V |
| 99 | CONFIG_SEL              | 1.8V       | 100 | FPGA_fw_reload   | 1.8V |

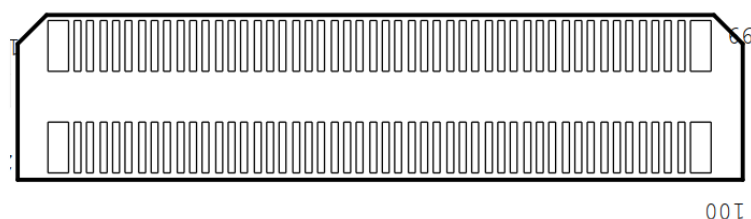
#### CN11: MIPI CSI



| Pin | Signal Description | Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|-----|--------------------|
| 1   | GND                | 2   | CAM1_RST_N         | 3   | NC                 |
| 4   | I2C_SDA4           | 5   | I2C_SCL4           | 6   | GND                |
| 7   | OSC_CLK_OUT_2      | 8   | GND                | 9   | USB3_TXN_CON_P0    |
| 10  | MCSI_RX_DATAP_0    | 11  | GND                | 12  | MCSI_RX_DATAP_0    |
| 13  | MCSI_RX_DATAP_1    | 14  | GND                | 15  | MCSI_RX_CLKN_0     |
| 16  | MCSI_RX_CLKP_0     | 17  | GND                | 18  | MCSI_RX_DATAN_2    |
| 19  | MCSI_RX_DATAP_2    | 20  | GND                | 21  | MCSI_RX_DATAN_3    |
| 22  | MCSI_RX_DATAP_3    | 22  | GND                | 24  | +AVDD_CAM          |

|    |         |    |           |    |           |
|----|---------|----|-----------|----|-----------|
| 25 | GND_CAM | 25 | GND       | 27 | +V1P8_CAM |
| 28 | GND     | 29 | +V2P8_CAM | 30 | +V2P8_CAM |
| 31 | GND     |    |           |    |           |

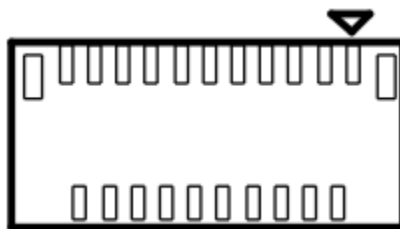
## CN12: DOCKING II



| Pin | Signal Description | Signal Level | Pin | Signal Description      | Signal Level |
|-----|--------------------|--------------|-----|-------------------------|--------------|
| 1   | +12V               |              | 2   | +12V                    |              |
| 3   | +12V               |              | 4   | +12V                    |              |
| 5   | +12V               |              | 6   | +12V                    |              |
| 7   | +12V               |              | 8   | +12V                    |              |
| 9   | NC                 |              | 10  | NC                      |              |
| 11  | DDI0_HPD           |              | 12  | GND                     |              |
| 13  | DDI0_TXP_1         |              | 14  | DDI0_TXP_0              |              |
| 15  | DDI0_TXN_1         |              | 16  | DDI0_TXN_0              |              |
| 17  | GND                |              | 18  | GND                     |              |
| 19  | DDI0_TXP_2         |              | 20  | DDI0_TXP_3              |              |
| 21  | DDI0_TXN_2         |              | 22  | DDI0_TXN_3              |              |
| 23  | GND                |              | 24  | GND                     |              |
| 25  | DDI0_AUXP          |              | 26  | DDI0_DDCCLK             |              |
| 27  | DDI0_AUXN          |              | 28  | DDI0_DDCDATA            |              |
| 29  | GND                |              | 30  | GND                     |              |
| 31  | PCIE_REFCLK0_P     |              | 32  | PCIE_REFCLK1_P          |              |
| 33  | PCIE_REFCLK0_N     |              | 34  | PCIE_REFCLK1_N          |              |
| 35  | GND                |              | 36  | GND                     |              |
| 37  | PCIE_RXP0          |              | 38  | PCIE_RXP1               |              |
| 39  | PCIE_RXN0          |              | 40  | PCIE_RXN1               |              |
| 41  | GND                |              | 42  | GND                     |              |
| 43  | PCIE_TXP0          |              | 44  | PCIE_TXP1               |              |
| 45  | PCIE_TXN0          |              | 46  | PCIE_TXN1               |              |
| 47  | GND                |              | 48  | GND                     |              |
| 49  | PCIE_REFCLK2_P     |              | 50  | PCIE_P3_USB3_P4_TX<br>P |              |
| 51  | PCIE_REFCLK2_N     |              | 52  | PCIE_P3_USB3_P4_TX      |              |

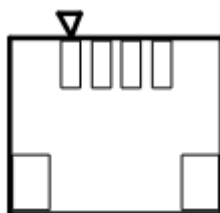
|    |                     |             |     |                         |            |
|----|---------------------|-------------|-----|-------------------------|------------|
|    |                     |             |     | N                       |            |
| 53 | GND                 |             | 54  | GND                     |            |
| 55 | PCIE_TXP2           |             | 56  | PCIE_P3_USB3_P4_RX<br>P |            |
| 57 | PCIE_TXN2           |             | 58  | PCIE_P3_USB3_P4_RX<br>N |            |
| 59 | GND                 |             | 60  | GND                     |            |
| 61 | PCIE_RXP2           |             | 62  | SATA_P1_USB3_P5_RX<br>N |            |
| 63 | PCIE_RXN2           |             | 64  | SATA_P1_USB3_P5_RX<br>P |            |
| 65 | GND                 |             | 66  | GND                     |            |
| 67 | PCIE_P4_USB3_P3_TXP |             | 68  | SATA_P1_USB3_P5_TX<br>N |            |
| 69 | PCIE_P4_USB3_P3_TXN |             | 70  | SATA_P1_USB3_P5_TX<br>P |            |
| 71 | GND                 |             | 72  | GND                     |            |
| 73 | PCIE_P4_USB3_P3_RXP |             | 74  | SATA_RXN0               |            |
| 75 | PCIE_P4_USB3_P3_RXN |             | 76  | SATA_RXP0               |            |
| 77 | GND                 |             | 78  | GND                     |            |
| 79 | USB2_DP3            |             | 80  | SATA_TXP0               |            |
| 81 | USB2_DN3            |             | 82  | SATA_TXN0               |            |
| 83 | GND                 |             | 84  | GND                     |            |
| 85 | USB2_DP4            |             | 86  | USB2_DP5                |            |
| 87 | USB2_DN4            |             | 88  | USB2_DN5                |            |
| 89 | GND                 |             | 90  | GND                     |            |
| 91 | PWRON/PNLVDDEN      | 3.3V,PU10K  | 92  | SATA_LED_N              | 1.8V       |
| 93 | PLTRST/PNLBKLEN     | 3.3V,PU10K  | 94  | DDIO_BKLTCTL            | 1.8V       |
| 95 | PCIE_WAKE0_N        | 1.8V,PU4.7K | 96  | PCIE_CLKREQ0#           | 1.8V,PU10K |
| 97 | PCIE_WAKE1_N        | 1.8V,PU4.7K | 98  | PCIE_CLKREQ1#           | 1.8V,PU10K |
| 99 | PCIE_WAKE2_N        | 1.8V,PU4.7K | 100 | PCIE_CLKREQ2#           | 1.8V,PU10K |

## CN13: MIPI CSI 2CH



| Pin | Signal Description | Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|-----|--------------------|
| 1   | GND                | 2   | MCSI_DN_1          | 3   | MCSI_DP_1          |
| 4   | GND                | 5   | MCSI_CLKN_0        | 6   | MCSI_CLKP_0        |
| 7   | GND                | 8   | MCSI_DN_0          | 9   | MCSI_DP_0          |
| 10  | GND                | 11  | +V1P2_CAM          | 12  | +V1P8_CAM          |
| 13  | GND                | 14  | OSC_CLK_OUT_3      | 15  | GND                |
| 16  | I2C_SCL4           | 17  | I2C_SDA4           | 18  | CAM2_RST_N         |
| 19  | FLASH_RESET_N      | 20  | +V2P8_CAM          | 21  | GND_CAM            |

## CN14: PWR Button Pin Header



| Pin | Signal Description | Pin | Signal Description |
|-----|--------------------|-----|--------------------|
| 1   | PWRBTN_N           | 2   | GND                |
| 3   | RSTBTN_N           | 4   | GND                |