

A603 Carrier Board for Jetson Orin NX/Nano



Datasheet V1.0

Product Description

A603 Jetson Carrier Board features networking capability that it is equipped with a Gigabit Ethernet (10/100/1000) port for fast data transfer speed. It also comes with two USB 3.0 Type-A ports, one USB 3.0 0.5mm pitch 20P ZIF, and one USB 2.0 Micro-AB for versatile connectivity options.

This extension board supports NVIDIA Jetson Orin™ NX/Nano module, allowing multiple peripherals. It can enable users to capture and display high-quality video content with the 15-pin CSI camera connector and the HDMI port.

You can expand storage and wireless connectivity with onboard M.2 KEY M and PCIE M.2 Key E interfaces. There also includes a FAN connector (5V PWM) for cooling purposes, and one RTC socket with for reliable timekeeping.

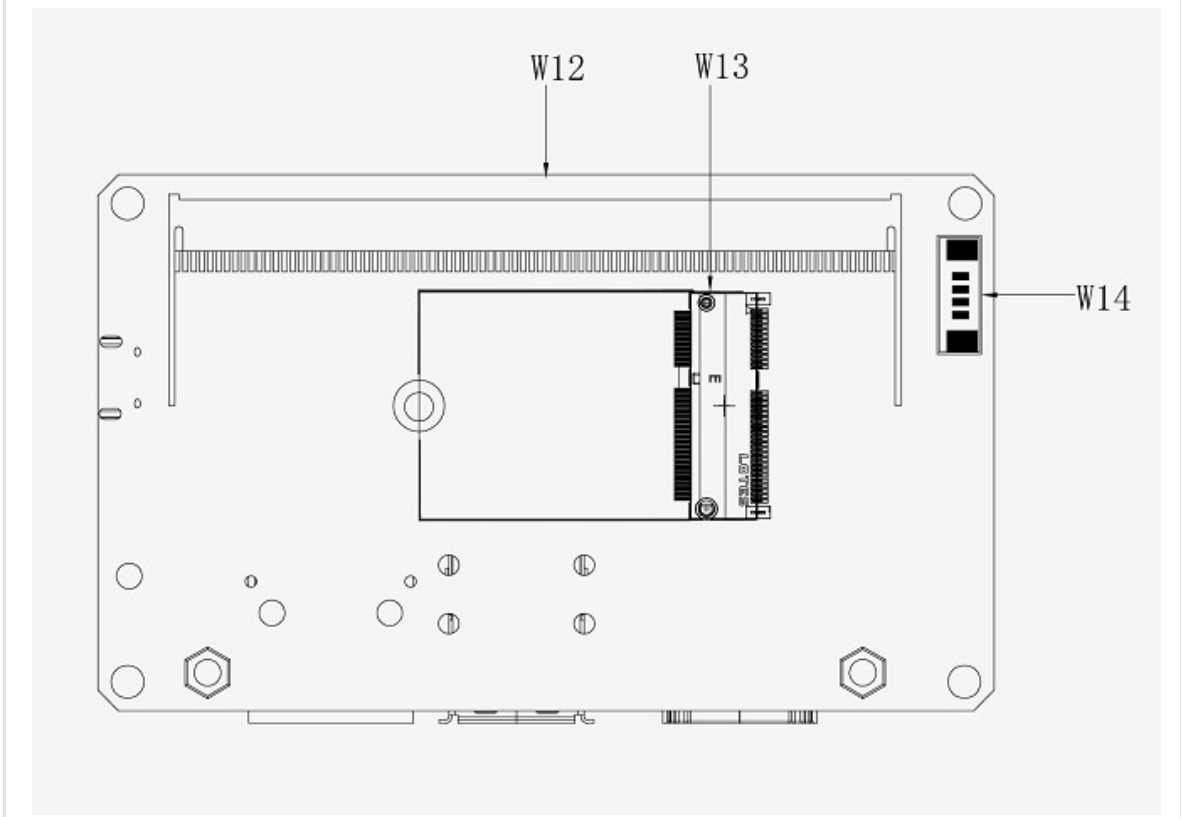
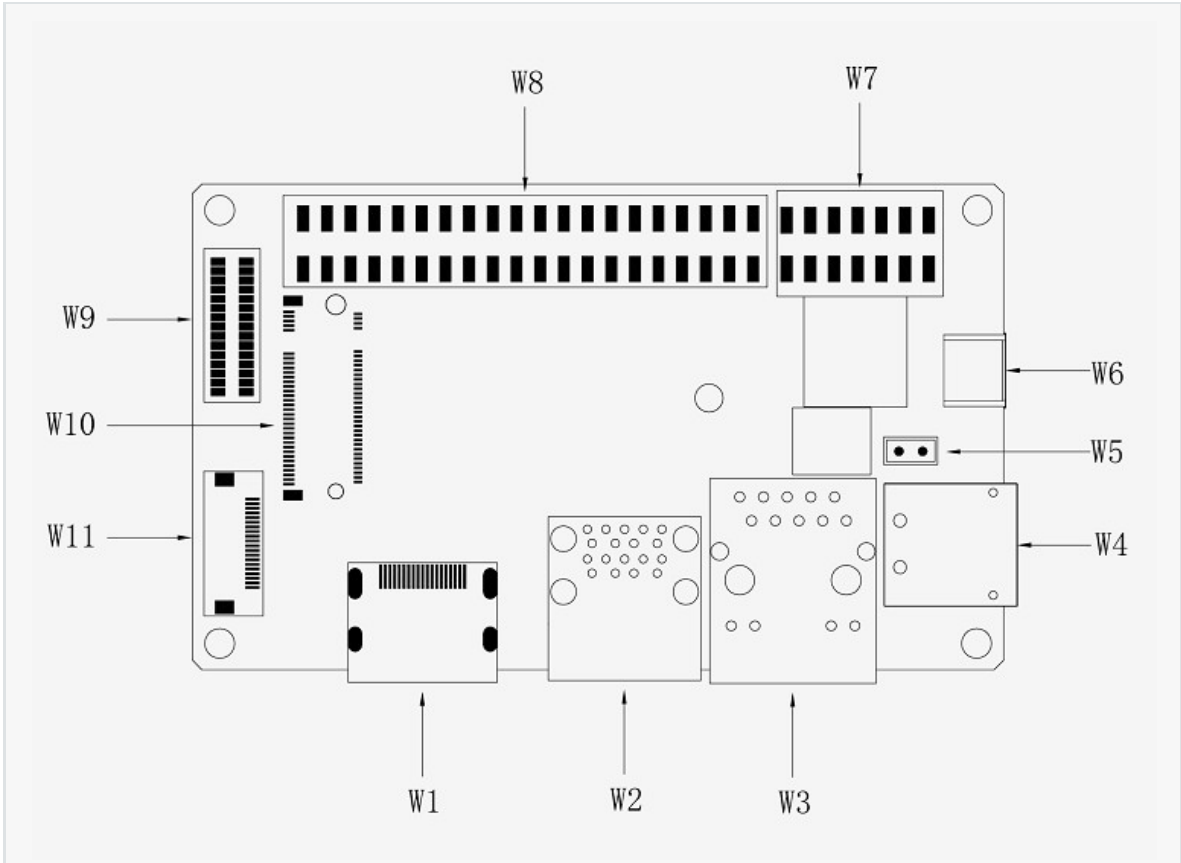
The board supports a wide input range of 9-20V DC, and has been designed in small size of 87mm*52mm*26mm, making it flexible and easy to integrate into a variety of applications, saving space.

It maintains operation in the temperature range from -25°C to 65°C, which offers a robust mechanical construction.

Specifications

| | |
|--------------------------------|---|
| Module Compatibility | NVIDIA Jetson Orin NX |
| PCB Size / Overall Size | 87mm x 52mm |
| Display | 1x HDMI |
| Ethernet | 1x Gigabit Ethernet (10/100/1000) |
| USB | 2x USB 3.0 Type A (Integrated USB 2.0) 1x USB 3.0 0.5mm pitch 20P ZIF 1x USB 2.0 Micro-AB |
| M.2 KEY M | M.2 KEY M (NVMe SSD) (2242) |
| CAN | 1x CAN |
| Camera | 1x CSI Camera |
| M.2 KEY E PCIe | 1x PCIE 2230 SIZE |
| I2S | 1x I2S (3.3V Level) |
| Misc. | 2x I2C Link (+3.3V I/O) 6x GPIO 1x UART 2x SPI |
| Power Requirements | +9V to +20V DC Input @ 7A |
| Operating Temperature | -25°C to +65° |
| Weight | 50g |

Interface Location



External Interface

| Designator | Connector | Description |
|------------|---|---|
| W1 | HDMI Port | HDMI Right Angle Vertical Connector |
| W2 | USB 3.0 Type A | USB 3.0 Link 1 Type A Connector |
| W3 | NVIDIA Gigabit Ethernet | RJ45 Gigabit Ethernet Connector (10/100/1000) |
| W4 | DC Power | DC Input Power TE Connector |
| W5 | 3V LITHIUM BATTERY | 3V Lithium Battery Connector |
| W6 | USB 2.0 | USB 2.0 Link 0 Micro-AB Connector |
| W7 | Multifunctional port 2.54 PITCH 14 PIN | 2.54 PITCH 14 PIN |
| W8 | Multifunctional port | 2.54 PITCH 40 PIN |
| W9 | CSI CAMERA0 CONNECT | 15 pins CSI Camera connect |
| W10 | M.2 KEY M Disk | Disk size 2242 |
| W11 | USB 3.0 ZIF connect | 0.5 PITCH 20 PIN |
| W12 | NX CON | Jetson Orin NX /Nano 266-pin connector |
| W13 | M.2 KEY E | PCIe 2230 SIZE |
| W14 | FAN CONNECT | PicoBlade Header |

Interface Details

HDMI (W1)

| Pin | Signal Name | Pin | Signal Name |
|-----|-----------------|-----|----------------|
| 1 | TMDS Data2+ | 2 | TMDS Data2 GND |
| 3 | TMDS Data2- | 4 | TMDS Data1+ |
| 5 | TMDS Data1 GND | 6 | TMDS Data1- |
| 7 | TMDS Data0+ | 8 | TMDS Data0 GND |
| 9 | TMDS Data0- | 10 | TMDS Clock+ |
| 11 | TMDS Clock GND | 12 | DS Clock- |
| 13 | CEC | 14 | NC |
| 15 | DDC clock | 16 | DDC data |
| 17 | DDC GND | 18 | +5V |
| 19 | Hot Plug Detect | 20 | |

Dual-layer USB3.0 (W2)

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | VBUS | 2 | USB 2.0 D- |
| 3 | USB 2.0 D+ | 4 | GND |
| 5 | SSRX- | 6 | SSRX+ |
| 7 | GND | 8 | SSTX- |
| 9 | SSTX+ | 10 | VBUS |
| 11 | USB 2.0 D- | 12 | USB 2.0 D+ |
| 13 | GND | 14 | SSRX- |
| 15 | SSRX+ | 16 | GND |
| 17 | SSTX- | 18 | SSTX+ |

Network Port (W3)

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | TP0+ | 2 | TP0- |
| 3 | TP1+ | 4 | TP2+ |
| 5 | TP2- | 6 | TP1- |
| 7 | TP3+ | 8 | TP3- |

DC Interface (W4)

| Pin | Signal Name | Pin | Signal Name |
|-----|---------------------------------|-------|-------------|
| 1 | Power supply positive electrode | 2.3.4 | GND |

Note: Power input range: DC +9V - +20V (3A)

When the power LED (LED) is plugged into the power supply, the power LED lights up

Backup Battery (W5)

| PIN | Signal Name | PIN | Signal Name |
|-----|-------------|-----|-------------|
| 1 | B+ | 2 | GND |

Micro-USB (W6)

| PIN | Signal Name | PIN | Signal Name |
|-----|-------------|-----|-------------|
| 1 | VBUS | 2 | USB 2.0 D- |
| 3 | USB 2.0 D+ | 4 | USB ID |
| 5 | GND | | |

14PIN Multi-function Interface (W7)

| PIN | Signal Name | PIN# | Ball Name | PIN | Signal Name | PIN# | Ball Name |
|-----|---------------|------|----------------|-----|--------------|------|-----------|
| 1 | SYS_RST | 239 | SYS_RESET_IN | 2 | GND | | |
| 3 | RECOVERY | 214 | FORCE_RECOVERY | 4 | GND | | |
| 5 | PWR_BTN_ | 240 | BUTTON_PWR_ON | 6 | GND | | |
| 7 | LATCH_SET_BTN | | | 8 | LATCH_SET | | |
| 9 | UART2_TXD_LS | 236 | UART1_TXD | 10 | UART2_RXD_LS | 238 | UART1_RXD |
| 11 | CAN_L | | | 12 | GND | | |
| 13 | CAN_H | | | 14 | GND | | |

Note: "RESET" and "RECOVERY" button short circuit PIN 7 and PIN 8 turn off the power on automatic boot function.

40PIN Multi-function Interface (W8)

| PIN | Signal Name | PIN# | Ball Name | PIN | Signal Name | PIN# | Ball Name |
|-----|---------------------|------|--------------|-----|--------------------|------|--------------|
| 1 | VDD_3V3_SYS | | | 2 | 5V | | |
| 3 | I2C1_SDA | 191 | GEN2_I2C_SDA | 4 | 5V | | |
| 5 | I2C1_SCL | 189 | GEN2_I2C_SCL | 6 | GND | | |
| 7 | GPIO9_(3.3V_LEVEL) | 211 | AUD_MCLK | 8 | UART1_TXD_3.3V | 203 | UART2_TXD |
| 9 | GND | | | 10 | UART1_RXD_3.3V | 205 | UART2_RXD |
| 11 | UART1_RTS_3.3V | 207 | UART2_RTS | 12 | I2S0_SCLK_3.3V | 199 | DAP4_SCLK |
| 13 | SPI1_SCLK_3.3V | 106 | SPI2_SCK | 14 | GND | | |
| 15 | GPIO12_(3.3V_LEVEL) | 218 | LCD_TE | 16 | SPI1_CS1_3.3V | 112 | SPI2_CS1 |
| 17 | VDD_3V3_SYS | | | 18 | SPI1_CS0_3.3V | 110 | SPI2_CS0 |
| 19 | SPI0_MOSI_3.3V | 89 | SPI1_MOSI | 20 | GND | | |
| 21 | SPI0_MISO_3.3V | 93 | SPI1_MISO | 22 | SPI1_MISO_3.3V | 108 | SPI2_MISO |
| 23 | SPI0_SCK_3.3V | 91 | SPI1_SCK | 24 | SPI0_CS0_3.3V | 95 | SPI1_CS0 |
| 25 | GND | | | 26 | SPI0_CS1_3.3V | 97 | SPI1_CS1 |
| 27 | ID_I2C_SDA_3.3V | 187 | GEN1_I2C_SDA | 28 | ID_I2C_SCL | 185 | GEN1_I2C_SCL |
| 29 | GPIO1_(3.3V_LEVEL) | 118 | CAM_AF_EN | 30 | GND | | |
| 31 | GPIO11_(3.3V_LEVEL) | 216 | GPIO_PZ0 | 32 | GPIO7_(3.3V_LEVEL) | 206 | LCD_BL_PWM |
| 33 | GPIO13_(3.3V_LEVEL) | 228 | GPIO_PE6 | 34 | GND | | |
| 35 | I2S0_LRCK_3.3V | 197 | DAP4_FS | 36 | UART1_CTS_3.3V | 209 | UART2_CTS |
| 37 | SPI1_MOSI_3.3V | 104 | SPI2_MOSI | 38 | I2S0_SDIN_3.3V | 195 | DAP4_DIN |
| 39 | GND | | | 40 | I2S0_SDOOUT_3.3V | 193 | DAP4_DOUT |

CSI Camera Interface (W9)

| PIN | Signal Name | PIN | Signal Name |
|-----|--------------|-----|--------------|
| 1 | GND | 2 | GND |
| 3 | CSI0_D0_N | 4 | CSI0_D0_N |
| 5 | CSI0_D0_P | 6 | CSI0_D0_P |
| 7 | GND | 8 | GND |
| 9 | CSI0_D1_N | 10 | CSI0_D1_N |
| 11 | CSI0_D1_P | 12 | CSI0_D1_P |
| 13 | GND | 14 | GND |
| 15 | CSI0_CLK_N | 16 | CSI0_CLK_N |
| 17 | CSI0_CLK_P | 18 | CSI0_CLK_P |
| 19 | GND | 20 | GND |
| 21 | CAM0_PWDN | 22 | CAM0_PWDN |
| 23 | CAM0_MCLK | 24 | CAM0_MCLK |
| 25 | CAM0_I2C_SCL | 26 | CAM0_I2C_SCL |
| 27 | CAM0_I2C_SDA | 28 | CAM0_I2C_SDA |
| 29 | VDD_3V3 | 30 | VDD_3V3 |

M.2 KEY M Interface (W10)

| PIN | Signal Name | PIN | Signal Name |
|-----|-------------|-----|-------------|
| 1 | GND | 2 | 3.3V |
| 3 | GND | 4 | 3.3V |
| 5 | PCIE0_RX3_N | 6 | NC |
| 7 | PCIE0_RX3_P | 8 | NC |
| 9 | GND | 10 | NC |
| 11 | PCIE0_TX3_N | 12 | 3.3V |
| 13 | PCIE0_TX3_P | 14 | 3.3V |
| 15 | GND | 16 | 3.3V |
| 17 | PCIE0_RX2_N | 18 | 3.3V |
| 19 | PCIE0_RX2_P | 20 | NC |
| 21 | GND | 22 | NC |
| 23 | PCIE0_TX2_N | 24 | NC |

| | | | |
|----|-------------|----|----------------|
| 25 | PCIE0_TX2_P | 26 | NC |
| 27 | GND | 28 | NC |
| 29 | PCIE0_RX1_N | 30 | NC |
| 31 | PCIE0_RX1_P | 32 | NC |
| 33 | GND | 34 | NC |
| 35 | PCIE0_TX1_N | 36 | NC |
| 37 | PCIE0_TX1_P | 38 | NC |
| 39 | GND | 40 | I2C2_CLK |
| 41 | PCIE0_RX0_N | 42 | I2C2_DAT |
| 43 | PCIE0_RX0_P | 44 | M2_KEYM_ALERT |
| 45 | GND | 46 | NC |
| 47 | PCIE0_TX0_N | 48 | NC |
| 49 | PCIE0_TX0_P | 50 | PCIE0_RST_N |
| 51 | GND | 52 | PCIE0_CLKREQ_N |
| 53 | PCIE0_CLK_N | 54 | M2_KEYM_PEWAKE |
| 55 | PCIE0_CLK_P | 56 | NC |
| 57 | GND | 58 | NC |
| 59 | NC | 60 | 32.768KHz |
| 61 | NC | 62 | 3.3V |
| 63 | GND | 64 | 3.3V |
| 65 | GND | 66 | 3.3V |
| 67 | GND | 68 | |

20PIN Multi-function Interface (W11)

| PIN | Signal Name | PIN | Signal Name |
|-----|---------------|-----|---------------|
| 1 | 5V | 2 | 5V |
| 3 | 5V | 4 | 5V |
| 5 | 5V | 6 | GND |
| 7 | USB2.0_DN | 8 | USB2.0_DP |
| 9 | GPIO_01 | 10 | GND |
| 11 | USB3.0_SSTX_N | 12 | USB3.0_SSTX_P |

| | | | |
|----|---------------|----|---------------|
| 13 | GND | 14 | USB3.0_SSRX_N |
| 15 | USB3.0_SSRX_P | 16 | GND |
| 17 | GPIO_06 | 18 | GND |
| 17 | GPIO_06 | 18 | GND |

NVIDIA Orin NX/ Nano Core board interface (W12)

The connector of the 260PIN is used for the connection between the NVIDIA Jetson Orin NX/ Nano module and the A603 carrier board.

M.2 KEY E interface (W13)

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1 | GND | 2 | 3V3 |
| 3 | USB1_DP | 4 | 3V3 |
| 5 | USB1_DN | 6 | NC |
| 7 | GND | 8 | I2S1_SCLK |
| 9 | NC | 10 | I2S1_LRCK |
| 11 | NC | 12 | I2S1_SDIN |
| 13 | NC | 14 | I2S1_DOUT |
| 15 | NC | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | BT_M2_WAKE |
| 21 | NC | 22 | UART0_RXD |
| 23 | NC | 24 | UART0_TXD |
| 25 | GND | 26 | UART0_CTS |
| 27 | PCIE1_TX0_P | 28 | UART0_RTS |
| 29 | PCIE1_TX0_N | 30 | NC |
| 29 | PCIE1_TX0_N | 30 | NC |
| 33 | PCIE1_RX0_P | 34 | NC |
| 35 | PCIE1_RX0_N | 36 | NC |
| 37 | GND | 38 | NC |
| 39 | PCIE1_CLK_P | 40 | NC |
| 41 | PCIE1_CLK_N | 42 | CLK_32K |
| 43 | GND | 44 | PCIE1_RST |

| | | | |
|----|--------------|----|------------|
| 45 | PCIE1_CLKREQ | 46 | W_DISABLE2 |
| 47 | PCIE1_WAKE | 48 | W_DISABLE1 |
| 49 | GND | 50 | I2C2_SDA |
| 51 | NC | 52 | I2C2_SCL |
| 53 | NC | 54 | M2_E_ALERT |
| 55 | GND | 56 | NC |
| 57 | NC | 58 | NC |
| 59 | NC | 60 | NC |

| | | | |
|----|-----|----|-----|
| 61 | GND | 62 | NC |
| 63 | NC | 64 | 3V3 |
| 65 | NC | 66 | 3V3 |
| 67 | GND | 68 | |

Fan Interface (W14)

| PIN | Signal Name | PIN | Signal Name |
|-----|-------------|-----|-------------|
| 1 | GND | 2 | +5V |
| 3 | FAN_TACH | 4 | FAN_PWM |

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