

# 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.

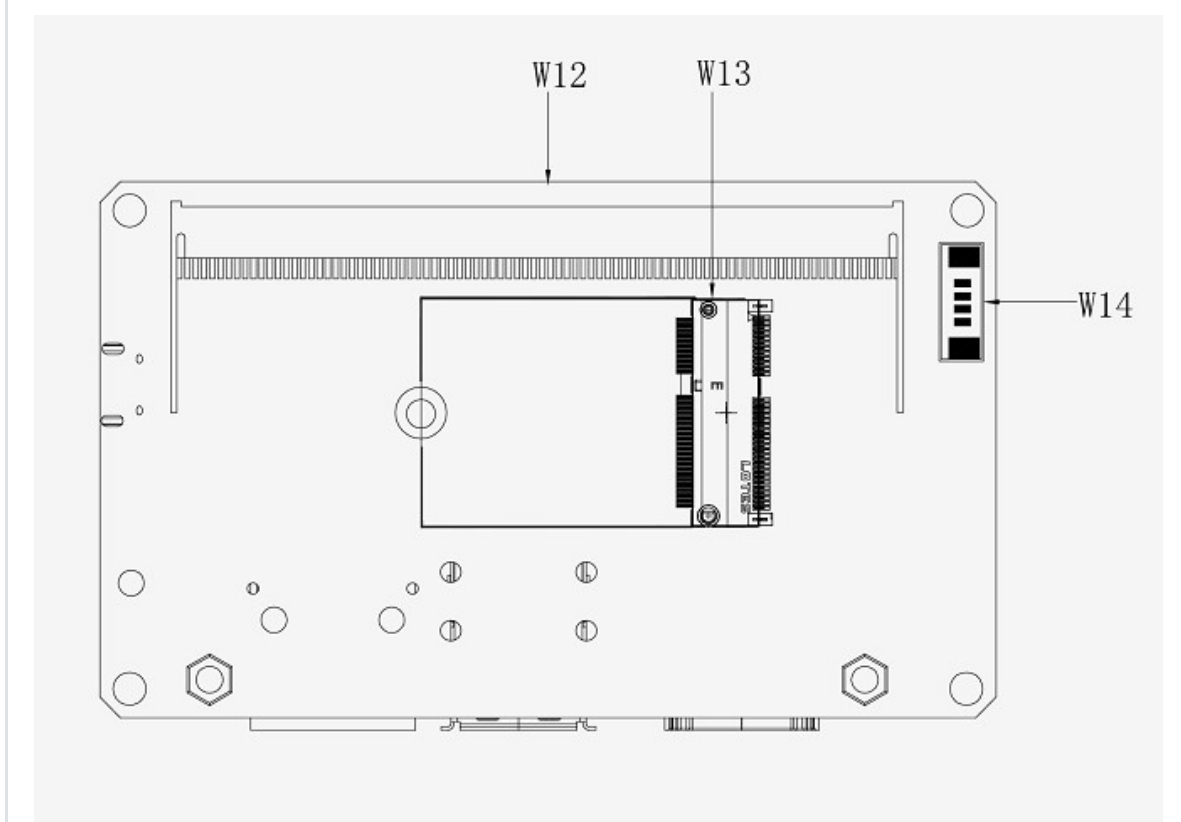
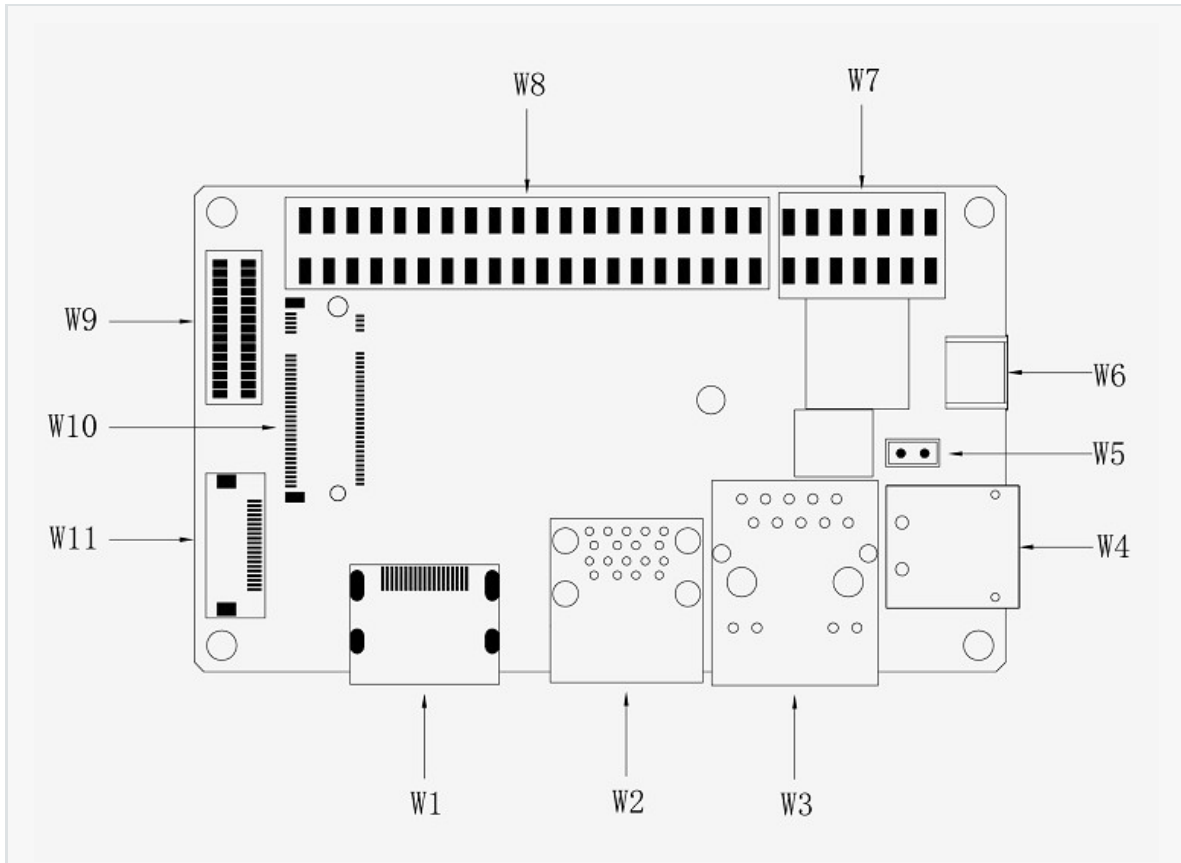
The board supports a wide input range of 9-20V DC, and has been designed in small size of 87mm\*52mm\*26mm, making it flexible and easy to integrate into a variety of applications, saving space.

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

## Specifications

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