



AI Development Carrier Board

Y-C28

Datasheet



Version V1.0

Date 2025-08-20

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Y-C28 Product Manual Revision History

Version	Date	Description of Change	Hardware Version
V 1.0	2025-08-20	Create a document	V 1.0

Product Hardware Revision History

Version	Date	Description of Change
V 1.0	2025-08-20	Y-C28 Product launch

Electronic components and circuits are very sensitive to electrostatic discharge, although the company will design the main interface on the board card to do anti-static protection design, but it is difficult to do anti-static safety protection for all components and circuits. Therefore, it is recommended that you take ESD safety measures when handling any circuit board component.

ESD safety measures include but are not limited to the following:

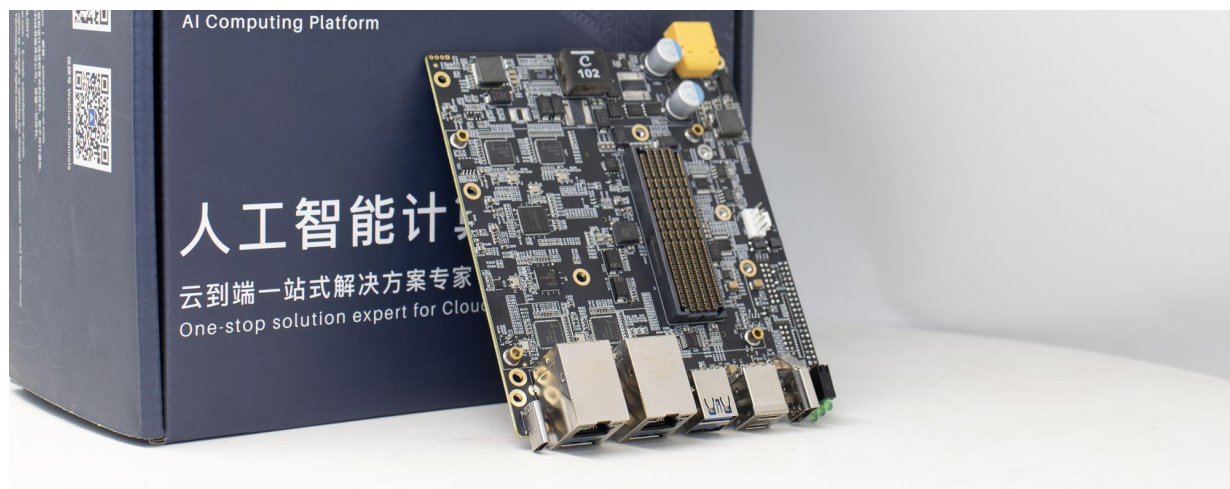


1. Put the card in an ESD bag during transportation or storage. Do not take out the card until installation and deployment.
2. Before touching the board, release the static electricity stored in the body: Wear a grounding wrist strap.
3. Operate circuit boards only in electrostatic discharge safe areas.
4. Avoid moving circuit boards in carpeted areas.
5. Avoid direct contact with electronic components on the board through edge contact.

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Product Introduction



The Y-C28 is a carrier board that is compatible with the NVIDIA Jetson AGX Thor series core modules. It is suitable for compact deployment requirements. The main interfaces have been designed with electrostatic safety protection, and a highly reliable power application scheme has been adopted. The input power has overvoltage and reverse polarity protection functions, and it has a rich set of external interfaces. All the components on the board are of wide-temperature models. To facilitate the design of the enclosure structure, the important interfaces of the Y-C28 carrier board are all designed to be led out on one side.

In terms of communication and network expansion, the carrier board is equipped with a 3050-sized M.2 Key B connector and a flip-up Nano SIM card slot, which can be compatible with 4G/5G modules; at the same time, a MiniPCle connector is provided for installing Wi-Fi modules, and there is a network expansion pin connector and an MGBE expansion signal connector for expanding gigabit Ethernet functionality. In addition, the two RJ45 connectors onboard further enhance the wired network access capability.

The storage expansion options include a 2280-sized M.2 Key M interface, which can be used to install NVMe SSDs, significantly increasing storage capacity and read/write speed.

The multimedia has excellent connection capabilities with external devices, providing one HDMI video output interface and four USB 3.0 connectors, which fully meet the requirements for display output and high-speed peripheral access. The dedicated camera connector also facilitates the integration of camera modules, making it suitable for machine vision-related applications.

In terms of industrial and functional expansion, the development board provides a multi-functional signal expansion interface, integrating various common signals such as SPI, GPIO, CAN, and UART, which greatly facilitates secondary development and the realization of customized functions. Additionally, it also offers a power expansion output connector, which can supply power to peripheral devices.

To ensure the reliability of the system, the development board also incorporates an RTC power supply connector, which is used to connect the RTC battery, ensuring that the real-time clock can continue to operate even in the event of power failure.

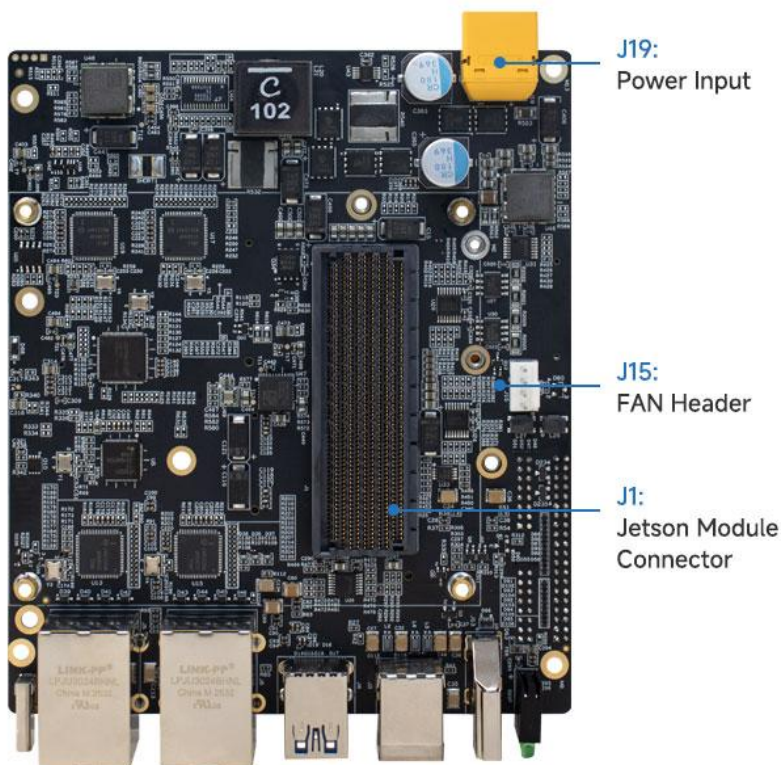
Basic parameters and IO interfaces

Basic parameters	
Carrier Board	Y-C28
Adaptive Module	NVIDIA Jetson AGX Thor Modules
Temperature	-40 ~ +85°C
Dimensions (L×W×H)	153mm * 120mm * 38mm (Including I/O ports and mounting holes)
Weight	208g
Power Input	DC 9~36V

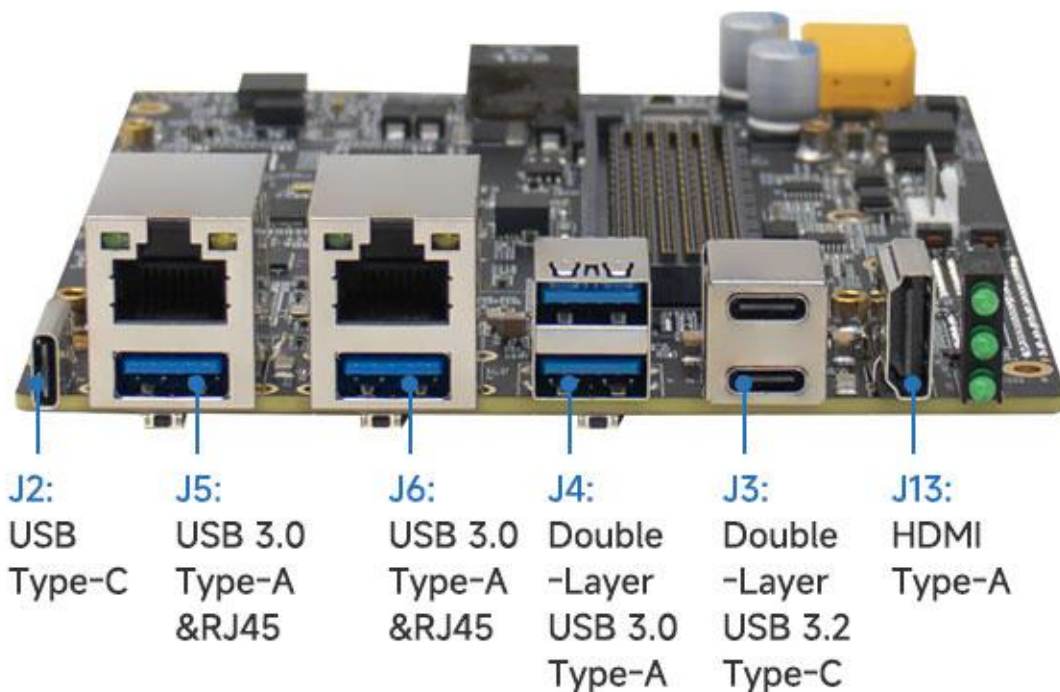
IO Interface

Interface	Quantity	Interface	Quantity
USB3.0 Type-A	4	USB 3.2 Type-C	2
miniPCle Slot	1	USB Type-C(OTG)	1
M.2 Key M Slot (2280)	1	Nano SIM Card	1
RTC Battery Connector	1	HDMI	1
Camera Connector	1	Power Jack	1
Fan Header	1	M.2 Key B Slot (3050)	1
40pin Expansion Header	1 (1*SPI /1* I2S 2*I2C 4*CAN 2*GPIO 4*UART)	Ethernet	4(2*RJ45 2*16pin Header)

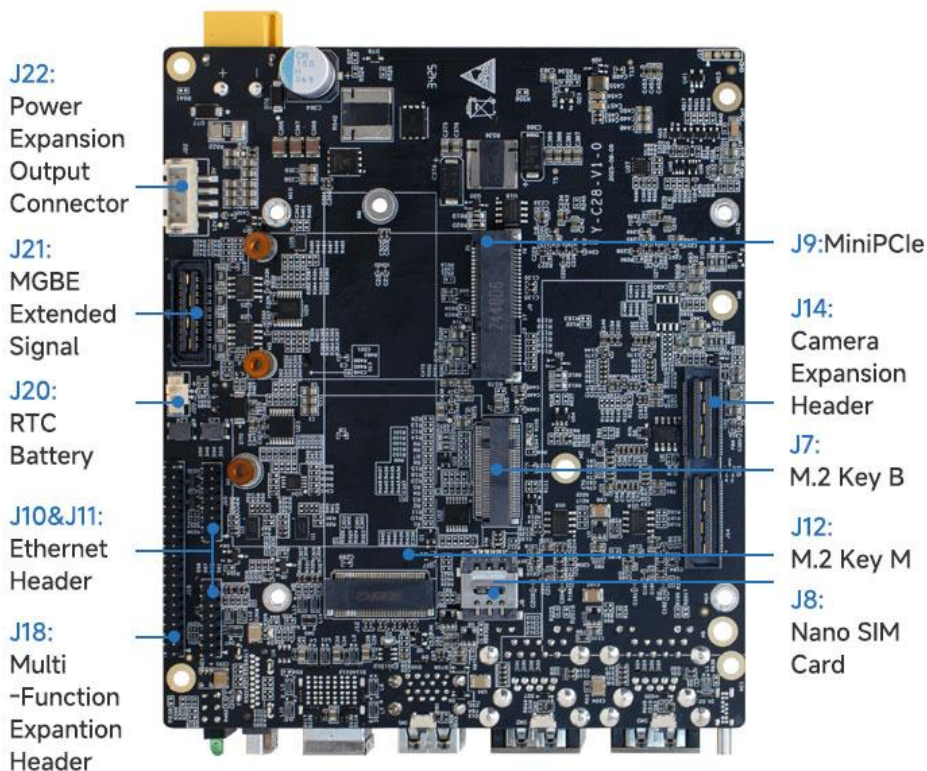
External interfaces and functions



Sign	Function	Sign	Function
J1	Jetson Module Connector	J15	Fan Header
J19	Power Input		



Sign	Function	Sign	Function
J13	HDMI Type-A	J3	Double-Layer USB 3.2 Type-C
J5	RJ45&USB3.0 Type-A	J6	RJ45&USB3.0 Type-A
J4	Double-Layer USB 3.0 Type-A	J2	USB Type-C(flash system)



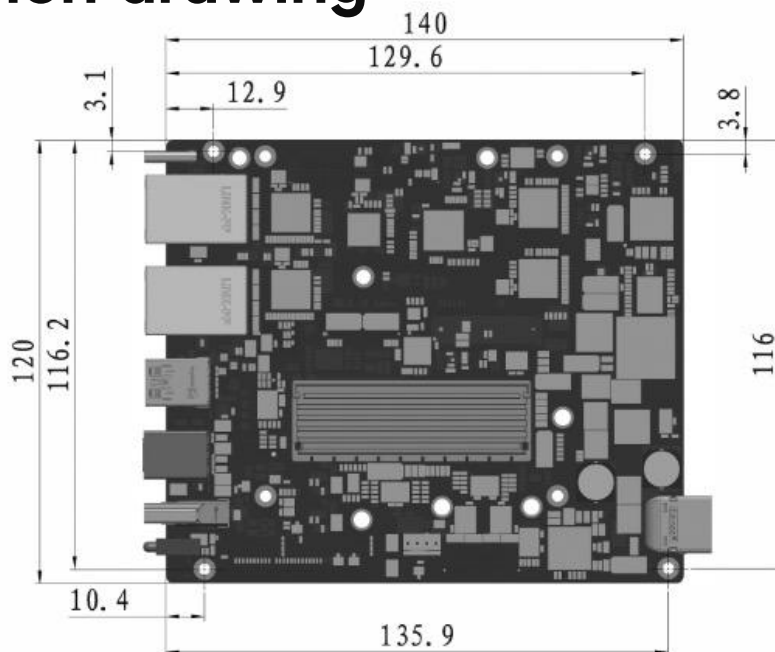
Sign	Function	Sign	Function
J14	Camera Expansion Header	J7	3050 M.2Key B
J9	Minipcie	J12	2280 M.2Key M
J10/J11	Ethernet Header	J8	Nano SIM Card
J18	Multi-Function Expansion Header	J20	RTC Battery
J21	MGBE Extender Signal	J22	Power Expansion Output Connector
SW1	POWER	SW2	RESET
SW3	FORCE_RECOVERY		

AdaptationJetson AGX Thor T5000

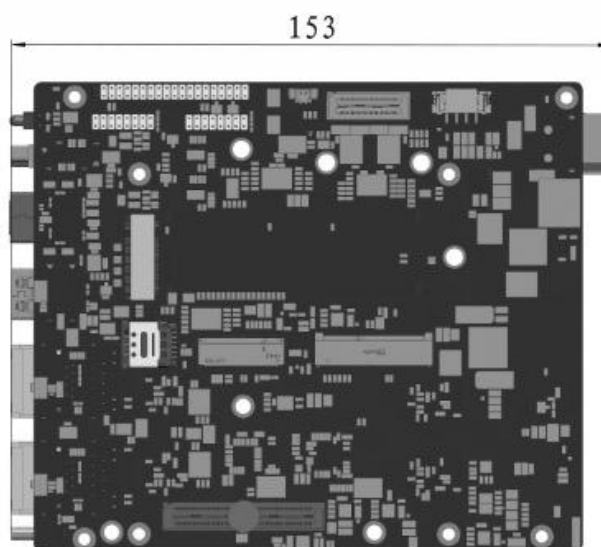
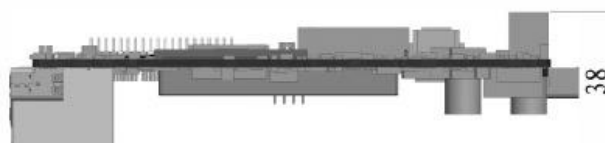
Module parameters

Module	Jetson AGX Thor T5000
AI Performance	2070 TFLOPS (FP4—sparse)
GPU	2560-core NVIDIA Blackwell architecture GPU with 96 fifth-gen Tensor Cores Multi-Instance GPU with 10 TPCs
GPU Max Frequency	1.57 GHz
CPU	14-core Arm® Neoverse®-V3AE 64-bit CPU 64 KB I-Cache, 64 KB D-Cache 1 MB L2 cache per core 16 MB shared system L3 cache
CPU Max Frequency	2.6 GHz
Memory	128 GB 256-bit LPDDR5X 273 GB/s
Storage	Supports NVMe through PCIe Supports SSD through USB3.2
Video Encode	6x 4Kp60 (H.265) 12x 4Kp30 (H.265) 24x 1080p60 (H.265) 50x 1080p30 (H.265) 48x 1080p30 (H.264) 6x 4Kp60 (H.264)
Video Decode	4x 8Kp30 (H.265) 10x 4Kp60 (H.265) 22x 4Kp30 (H.265) 46x 1080p60 (H.265) 92x 1080p30 (H.265) 82x 1080p30 (H.264) 4x 4Kp60 (H.264)
Power	40 W–130 W

Dimension drawing



unit: mm



Y-C28 Interface description

Jetson Module Connector (J1)

Function	Connection NVIDIA Jetson Thor T5000 module	
Sign	J1	
Type/Model	2034560003	
Pin definition	The pin definitions of this connector can be found in the pin definition description section of the NVIDIA Jetson Thor T5000 series core module data manual.	

USB Type-C(flash system) (J2)

Function	USB TYPEC Connector(flash system)																																										
Sign	J2																																										
Type/Model	Standard Type C USB connector (Used for burning the operating system)																																										
Pin definition	<table border="1"> <thead> <tr> <th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr> </thead> <tbody> <tr> <td>B12</td><td>GND</td><td>B1</td><td>GND</td></tr> <tr> <td>A12</td><td>GND</td><td>A1</td><td>GND</td></tr> <tr> <td>B6</td><td>USB0_P</td><td>B7</td><td>USB0_N</td></tr> <tr> <td>A6</td><td>USB0_P</td><td>A7</td><td>USB0_N</td></tr> <tr> <td>B5</td><td>NC</td><td>A5</td><td>NC</td></tr> <tr> <td>B9</td><td>VBUS_B</td><td>B4</td><td>VBUS_B</td></tr> <tr> <td>A9</td><td>VBUS_A</td><td>A4</td><td>VBUS_A</td></tr> <tr> <td>25</td><td>TAB</td><td>26</td><td>TAB</td></tr> <tr> <td>27</td><td>TAB</td><td>28</td><td>TAB</td></tr> </tbody> </table>		Pin	Signal	Pin	Signal	B12	GND	B1	GND	A12	GND	A1	GND	B6	USB0_P	B7	USB0_N	A6	USB0_P	A7	USB0_N	B5	NC	A5	NC	B9	VBUS_B	B4	VBUS_B	A9	VBUS_A	A4	VBUS_A	25	TAB	26	TAB	27	TAB	28	TAB	
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Double-Layer USB 3.2 Type-C （J3）																																																												
Function	Double-Layer USB 3.2 Type-C connector																																																											
Sign	J3																																																											
Type /Model	XUBF-0336-24B02																																																											
Pin definition	<table><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr><tr><td>B12</td><td>GND</td><td>B1</td><td>GND</td></tr><tr><td>A12</td><td>GND</td><td>A1</td><td>GND</td></tr><tr><td>B6</td><td>USB1_P</td><td>B7</td><td>USB1_N</td></tr><tr><td>A6</td><td>USB1_P</td><td>A7</td><td>USB1_N</td></tr><tr><td>B2</td><td>TYPECO_TX2_P</td><td>B3</td><td>TYPECO_TX2_N</td></tr><tr><td>A11</td><td>TYPECO_RX2_P</td><td>A10</td><td>TYPECO_RX2_N</td></tr><tr><td>A2</td><td>TYPECO_TX1_P</td><td>A3</td><td>TYPECO_TX1_N</td></tr><tr><td>B11</td><td>TYPECO_RX1_P</td><td>B10</td><td>TYPECO_RX1_N</td></tr><tr><td>B8</td><td>NC</td><td>A8</td><td>NC</td></tr><tr><td>B5</td><td>TYPECO_CC2</td><td>A5</td><td>TYPECO_CC1</td></tr><tr><td>B9</td><td>VBUS_B</td><td>B4</td><td>VBUS_B</td></tr><tr><td>A9</td><td>VBUS_A</td><td>A4</td><td>VBUS_A</td></tr><tr><td>1</td><td>TAB</td><td>2</td><td>TAB</td></tr></table>				Pin	Signal	Pin	Signal	B12	GND	B1	GND	A12	GND	A1	GND	B6	USB1_P	B7	USB1_N	A6	USB1_P	A7	USB1_N	B2	TYPECO_TX2_P	B3	TYPECO_TX2_N	A11	TYPECO_RX2_P	A10	TYPECO_RX2_N	A2	TYPECO_TX1_P	A3	TYPECO_TX1_N	B11	TYPECO_RX1_P	B10	TYPECO_RX1_N	B8	NC	A8	NC	B5	TYPECO_CC2	A5	TYPECO_CC1	B9	VBUS_B	B4	VBUS_B	A9	VBUS_A	A4	VBUS_A	1	TAB	2	TAB
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	B2	TYPECO_TX2_P	B3	TYPECO_TX2_N																																																								
	A11	TYPECO_RX2_P	A10	TYPECO_RX2_N																																																								
	A2	TYPECO_TX1_P	A3	TYPECO_TX1_N																																																								
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	A9	VBUS_A	A4	VBUS_A																																																								
	1	TAB	2	TAB																																																								
Note: J3B (lower layer) B6B7A6A7 use USB 2. TYPE uses TYPEC1. The other pins are the same.																																																												





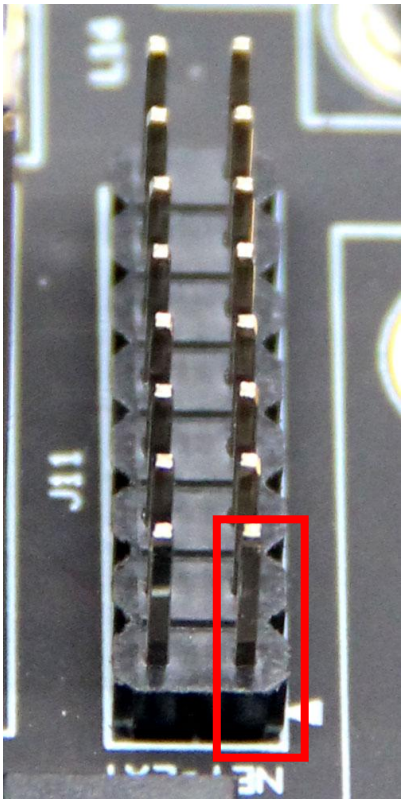
Double-Layer USB 3.0 Type-A (J4)

Function	Double-Layer USB 3.0 Type-A Connector				
Sign	J4				
Type/Model	USB-303WSD-BRW				
Pin definition	Pin	Signal	Pin	Signal	
	1	VBUS	2	DN	
	3	DP	4	GND	
	5	RX_N	6	RX_P	
	7	GND	8	TX_N	
	9	TX_P	19	TAB	
	20	TAB1			

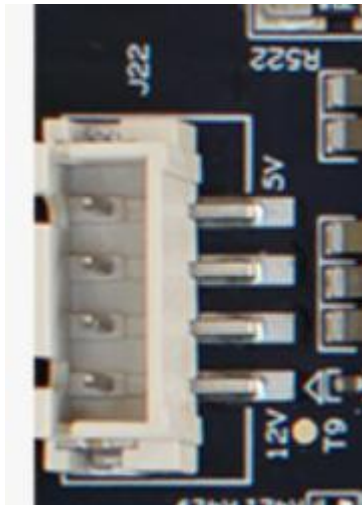
RJ45&USB3.0 Type-A (J6/J5)

Function	RJ45&USB3.0 Type-A Connector			
Sign	J6/J5			
Type/Model	Standard RJ45 type network cable connector / USB connector			
Pin definition	The definitions of J5A/J6A are as follows. J5B/J6B are the same as the USB definitions mentioned above.			
	Pin	Signal	Pin	Signal
	1	GND	L1	VCC_3V3
	L2	LED2_3V3	L3	VCC_3V3
	2	MDI0_P	3	MDI0_N
	4	MDI1_P	5	MDI1_N
	6	MDI2_P	7	MDI2_N
	8	MDI3_P	9	MDI3_N
	L4	LED1_3V3	10	GND

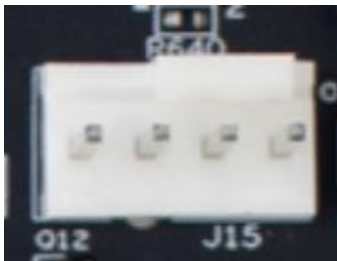
Ethernet Header (J10/J11)				
Function	Ethernet Header			
Sign	J10/J11			
Type/Model	2.0 mm pitch, 2*8-pin dual-row straight-mount pins HDR200M-2X8			
Pin definition	Pin	Signal	Pin	Signal
	1	GND	2	VCC_3V3
	3	VCC_3V3	4	VCC_3V3
	5	LED1_3V3	6	LED2_3V3
	7	NC	8	NC
	9	MDI0_N	10	MDI0_P
	11	MDI1_N	12	MDI1_P
	13	MDI2_N	14	MDI2_P
	15	MDI3_N	16	MDI3_P
	Pin 1 position: At the marked area on the right image.			



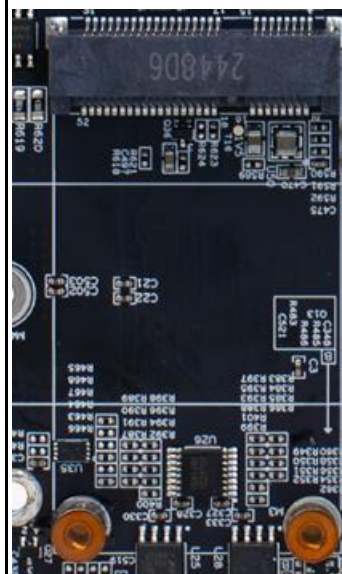
Power Expansion Output Connector (J22)					
Function		Power Expansion Output Connector			
Sign		J22			
Type/Model		HC-XH-4ALT			
Pin definition					
		Pin	Signal	Pin	Signal
		1	VCC (12V)	2	GND
		3	GND	4	VCC (5V)



HDMI Type-A (J13)				
Function	HDMI Type-A			
Sign	J13			
Type/Model	HDMI-001C			
Pin definition	Pin	Signal	Pin	Signal
	1	D2_P	2	GND
	3	D2_N	4	D1_P
	5	GND	6	D1_N
	7	D0_P	8	GND
	9	D0_N	10	TXC_P
	11	GND	12	TXC_N
	13	CEC_1V8	14	NC
	15	DDC_SCL_1V8	16	DDC_SDA_1V8
	17	GND	18	VCC
	19	HPD_1V8		
				

Fan Header (J15)				
Function	Connect the external cooling fan			
Sign	J15			
Type/Model	47053-1000			
Pin definition	Pin	Signal	Pin	Signal
	1	GND	2	POWER(12V)
	3	TACH	4	PWM
				

MiniPCle (J9)				
Function	MiniPCle Connector			
Sign	J9			
Type/Model	MiniPCle connector supporting full-length and half-length expansion cards (PCIE-52P90H)			
Pin definition	Pin	Signal	Pin	Signal
	1	PEX_WAKE_N_3V3	2	VCC_3V3_PCIE
	3	NC	4	GND
	5	NC	6	VCC_1V5_PCIE
	7	PXE_C2_CLKREQ_N	8	NC
	9	GND	10	NC
	11	UPHY_REFCLK5_P	12	NC
	13	UPHY_REFCLK5_N	14	NC
	15	GND	16	NC
	17	NC	18	GND
	19	NC	20	NC
	21	GND	22	PXE_C2_RST_N_3V3
	23	UPHY_RX4_N	24	VCC_3V3_PCIE
	25	UPHY_RX4_P	26	GND
	27	GND	28	VCC_1V5_PCIE
	29	GND	30	NC
	31	UPHY_TX4_N	32	NC
	33	UPHY_TX4_P	34	GND
	35	GND	36	NC
	37	GND	38	NC
	39	VCC_3V3_PCIE	40	GND
	41	VCC_3V3_PCIE	42	NC
	43	GND	44	NC
	45	NC	46	NC
	47	NC	48	VCC_1V5_PCIE
	49	NC	50	GND
	51	NC	52	VCC_3V3_PCIE



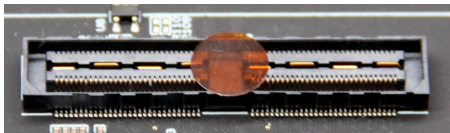
M.2 Key M (J12)

Function	M.2 Key M Slot							
Sign	J12							
Type /Model	Key M , 2280							
Pin definition	Standard M.2 Key M							
	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
	1	GND	2	VCC_3V3	3	GND	4	VCC_3V3
	5	UPHY_RX11_N	6	NC	7	UPHY_RX11_P	8	NC
	9	GND	10	NC	11	UPHY_TX11_N	12	VCC_3V3
	13	UPHY_TX11_P	14	VCC_3V3	15	GND	16	VCC_3V3
	17	UPHY_RX10_N	18	VCC_3V3	19	UPHY_RX10_P	20	NC
	21	GND	22	NC	23	UPHY_TX10_N	24	NC
	25	UPHY_TX10_P	26	NC	27	GND	28	NC
	29	UPHY_RX9_N	30	NC	31	UPHY_RX9_P	32	NC
	33	GND	34	NC	35	UPHY_TX9_N	36	NC
	37	UPHY_TX9_P	38	NC	39	GND	40	NC
	41	UPHY_RX8_N	42	NC	43	UPHY_RX8_P	44	NC
	45	GND	46	NC	47	UPHY_TX8_N	48	NC
	49	UPHY_TX8_P	50	PXE_C5_RST_N_3V3	51	GND	52	_PXE_C5_CLKREQ_N_3V3
	53	UPHY_REFCLK3_N	54	PXE_WAKE_N_3V3	55	UPHY_REFCLK3_P	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	VCC_3V3	71	GND	72	VCC_3V3
	73	GND	74	VCC_3V3	75	GND		

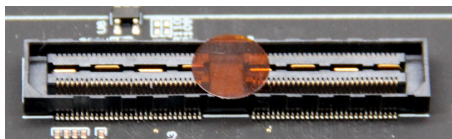
M.2 Key B (J7)

Function	M.2 Key B Slot																																																																																																																																																																							
Sign	J7																																																																																																																																																																							
Type /Model	B Key , 3050																																																																																																																																																																							
Pin definition	<table><thead><tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr></thead><tbody><tr><td>1</td><td>NC</td><td>2</td><td>VCC_3V9</td><td>3</td><td>GND</td></tr><tr><td>4</td><td>VCC_3V9</td><td>5</td><td>GND</td><td>6</td><td>FULL_CARD_POWER_OFF</td></tr><tr><td>7</td><td>USB20_D_P3</td><td>8</td><td>W_DISABLE1</td><td>9</td><td>USB20_D_N3</td></tr><tr><td>10</td><td>WWAN_LED</td><td>11</td><td>GND</td><td>12</td><td>NC</td></tr><tr><td>13</td><td>NC</td><td>14</td><td>NC</td><td>15</td><td>NC</td></tr><tr><td>16</td><td>NC</td><td>17</td><td>NC</td><td>18</td><td>NC</td></tr><tr><td>19</td><td>NC</td><td>20</td><td>NC</td><td>21</td><td>NC</td></tr><tr><td>22</td><td>NC</td><td>23</td><td>WAKE_WAN_N_1V8</td><td>24</td><td>NC</td></tr><tr><td>25</td><td>NC</td><td>26</td><td>W_DISABLE2</td><td>27</td><td>GND</td></tr><tr><td>28</td><td>NC</td><td>29</td><td>USB30_RX_N3</td><td>30</td><td>USIM1_RESET</td></tr><tr><td>31</td><td>USB30_RX_P3</td><td>32</td><td>USIM1_CLK</td><td>33</td><td>GND</td></tr><tr><td>34</td><td>USIM1_DATA</td><td>35</td><td>USB30_TX_N3</td><td>36</td><td>USIM1_VDD</td></tr><tr><td>37</td><td>USB30_TX_P3</td><td>38</td><td>NC</td><td>39</td><td>GND</td></tr><tr><td>40</td><td>NC</td><td>41</td><td>NC</td><td>42</td><td>NC</td></tr><tr><td>43</td><td>NC</td><td>44</td><td>NC</td><td>45</td><td>GND</td></tr><tr><td>46</td><td>NC</td><td>47</td><td>NC</td><td>48</td><td>NC</td></tr><tr><td>49</td><td>NC</td><td>50</td><td>NC</td><td>51</td><td>GND</td></tr><tr><td>52</td><td>NC</td><td>53</td><td>NC</td><td>54</td><td>NC</td></tr><tr><td>55</td><td>NC</td><td>56</td><td>NC</td><td>57</td><td>GND</td></tr><tr><td>58</td><td>NC</td><td>59</td><td>NC</td><td>60</td><td>NC</td></tr><tr><td>61</td><td>NC</td><td>62</td><td>NC</td><td>63</td><td>NC</td></tr><tr><td>64</td><td>NC</td><td>65</td><td>NC</td><td>66</td><td>NC</td></tr><tr><td>67</td><td>RM_RESET_N</td><td>68</td><td>NC</td><td>69</td><td>NC</td></tr><tr><td>70</td><td>VCC_3V9</td><td>71</td><td>GND</td><td>72</td><td>VCC_3V9</td></tr><tr><td>73</td><td>GND</td><td>74</td><td>VCC_3V9</td><td>75</td><td>NC</td></tr><tr><td>76</td><td>GND</td><td></td><td></td><td></td><td></td></tr></tbody></table>						Pin	Signal	Pin	Signal	Pin	Signal	1	NC	2	VCC_3V9	3	GND	4	VCC_3V9	5	GND	6	FULL_CARD_POWER_OFF	7	USB20_D_P3	8	W_DISABLE1	9	USB20_D_N3	10	WWAN_LED	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	WAKE_WAN_N_1V8	24	NC	25	NC	26	W_DISABLE2	27	GND	28	NC	29	USB30_RX_N3	30	USIM1_RESET	31	USB30_RX_P3	32	USIM1_CLK	33	GND	34	USIM1_DATA	35	USB30_TX_N3	36	USIM1_VDD	37	USB30_TX_P3	38	NC	39	GND	40	NC	41	NC	42	NC	43	NC	44	NC	45	GND	46	NC	47	NC	48	NC	49	NC	50	NC	51	GND	52	NC	53	NC	54	NC	55	NC	56	NC	57	GND	58	NC	59	NC	60	NC	61	NC	62	NC	63	NC	64	NC	65	NC	66	NC	67	RM_RESET_N	68	NC	69	NC	70	VCC_3V9	71	GND	72	VCC_3V9	73	GND	74	VCC_3V9	75	NC	76	GND				
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	16	NC	17	NC	18	NC																																																																																																																																																																		
	19	NC	20	NC	21	NC																																																																																																																																																																		
	22	NC	23	WAKE_WAN_N_1V8	24	NC																																																																																																																																																																		
	25	NC	26	W_DISABLE2	27	GND																																																																																																																																																																		
	28	NC	29	USB30_RX_N3	30	USIM1_RESET																																																																																																																																																																		
	31	USB30_RX_P3	32	USIM1_CLK	33	GND																																																																																																																																																																		
	34	USIM1_DATA	35	USB30_TX_N3	36	USIM1_VDD																																																																																																																																																																		
	37	USB30_TX_P3	38	NC	39	GND																																																																																																																																																																		
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	43	NC	44	NC	45	GND																																																																																																																																																																		
	46	NC	47	NC	48	NC																																																																																																																																																																		
	49	NC	50	NC	51	GND																																																																																																																																																																		
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	73	GND	74	VCC_3V9	75	NC																																																																																																																																																																		
76	GND																																																																																																																																																																							

Camera Expansion Header (J14)

Func tion	Camera Expansion Header					
Sign	J14					
Type /Mod el	0.5mm pitch, 120-pin QSH-060-01-H-D-A-K-TR connector					
Pin defin ition	Pin	Signal	Pin	Signal	Pin	Signal
	1	CSI0_D0_P	2	CSI1_D0_P	3	CSI0_D0_N
	4	CSI1_D0_N	5	GND	6	GND
	7	CSI0_CLK_P	8	CSI1_CLK_P	9	CSI0_CLK_N
	10	CSI1_CLK_N	11	GND	12	GND
	13	CSI0_D1_P	14	CSI1_D1_P	15	CSI0_D1_N
	16	CSI1_D1_N	17	GND	18	GND
	19	CSI2_D0_P	20	CSI3_D0_P	21	CSI2_D0_N
	22	CSI3_D0_N	23	GND	24	GND
	25	CSI2_CLK_P	26	CSI3_CLK_P	27	CSI2_CLK_N
	28	CSI3_CLK_N	29	GND	30	GND
	31	CSI2_D1_P	32	CSI3_D1_P	33	CSI2_D1_N
	34	CSI3_D1_N	35	GND	36	GND
	37	CSI4_D0_P	38	CSI6_D0_P	39	CSI4_D0_N
	40	CSI6_D0_N	41	GND	42	GND
	43	CSI4_CLK_P	44	CSI6_CLK_P	45	CSI4_CLK_N
	46	CSI6_CLK_N	47	GND	48	GND
	49	CSI4_D1_P	50	CSI6_D1_P	51	CSI4_D1_N
	52	CSI6_D1_N	53	GND	54	GND
	55	VCC_CAM_12V	56	VCC_CAM_12V	57	VCC_CAM_12V
	58	VCC_CAM_12V	59	CSI5_D0_P	60	CSI7_D0_P
	61	CSI5_D0_N	62	CSI7_D0_N	63	GND
	64	GND	65	CSI5_CLK_P	66	CSI7_CLK_P
	67	CSI5_CLK_N	68	CSI7_CLK_N	69	GND

Camera Expansion Header (J14)

Func tion	Camera Expansion Header																																																																																																																															
Sign	J14																																																																																																																															
Type /Mod el	0.5mm pitch, 120-pin QSH-060-01-H-D-A-K-TR connector																																																																																																																															
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	79	GND	80	GND	81	VCC_2V8																																																																																																																										
	82	VCC_2V8	83	VCC_2V8	84	CAM_ERROR3_1V8																																																																																																																										
	85	CAM_FRSYNC1_1V8	86	CAM_FRSYNC_INPUT_1V8	87	I2C2_CLK_1V8																																																																																																																										
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	94	MCLK04_CAM2_MCLK_1V8	95	CAM0_RST_1V8	96	CAM_FRSYNC4_1V8																																																																																																																										
	97	CAM_FRSYNC3_1V8	98	CAM_FRSYNC2_1V8	99	GND																																																																																																																										
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	124	GND	125	GND	126	GND																																																																																																																										
127	GND	128	GND																																																																																																																													

Nano SIM Card Slot (J8)

Function Flip-top Nano SIM card slot

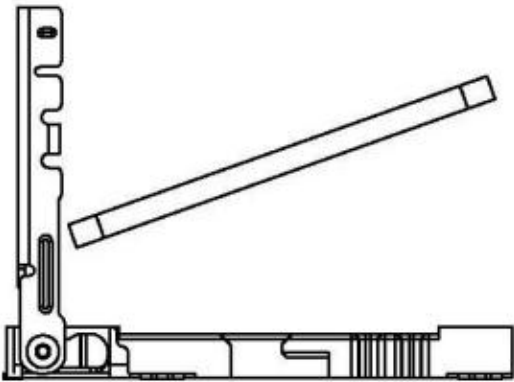
Sign J8

Type/Model XD5M-0639-0250

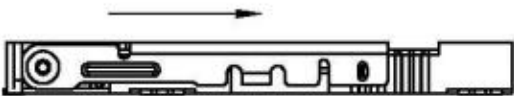


Pin
definition

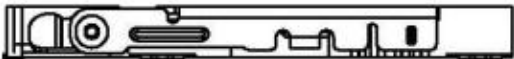
Pin	Signal	Pin	Signal
1	GND	2	GND
3	GND	4	GND
C3	USIM1_CLK	C7	USIM1_D ATA
C2	USIM1_RST	C6	NC
C1	USIM1_VD D	C5	GND



STEP 1 INSERT NANO SIM CARD



STEP 2 PUSH THE SHELL

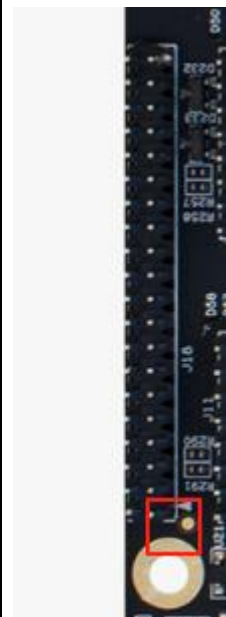


STEP 3 FINISH

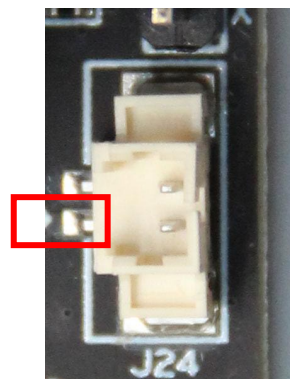
MGBE Extender Signal (J21)				
Function	MGBE Extender Signal Connector			
Sign	J21			
Type/Model	80SH05-40V01G10DPT			
Pin definition	Pin	Signal	Pin	Signal
	1	3.3V	2	5V
	3	3.3V	4	5V
	5	1.8V	6	NC
	7	1.8V	8	NC
	9	NC	10	I2C3_SDA_1V8
	11	NC	12	I2C3_SCL_1V8
	13	XFI3_MDC_1V8	14	XFI0_MDC_1V8
	15	XFI3_MDIO_1V8	16	XFI0_MDIO_1V8
	17	XFI3_RST_N_1V8	18	XFI0_RST_N_1V8
	19	XFI3_INT_N_1V8	20	XFI0_INT_N_1V8
	21	UPHY_REFCLK2_N	22	XFI_DETECT_N_1V8
	23	UPHY_REFCLK2_P	24	NC
	25	UPHY_TX15_N	26	UPHY_TX12_N
	27	UPHY_TX15_P	28	UPHY_TX12_P
	29	UPHY_RX15_N	30	UPHY_RX12_N
	31	UPHY_RX15_P	32	UPHY_RX12_P
	33	UPHY_TX14_N	34	UPHY_TX13_N
	35	UPHY_TX14_P	36	UPHY_TX13_P
	37	UPHY_RX14_N	38	UPHY_RX13_N
	39	UPHY_RX14_P	40	UPHY_RX13_P
	41	GND	42	GND
	43	GND	44	GND



Multi-Function Expantion Header (J18)				
Function	Multi-Function Expantion Header			
Sign	J18			
Type/Model	2.0mm pitch, 2*20-pin dual-row straight-pin arrangement			
Pin definition	Pin	Signal	Pin	Signal
	1	3.3V	2	5V
	3	3.3V	4	GND
	5	UART1_TX_3V3	6	SPI1_CLK_3V3
	7	UART1_RX_3V3	8	SPI1_MISO_3V3
	9	UART2_TX_3V3	10	SPI1_MOSI_3V3
	11	UART2_RX_3V3	12	SPI1_CS0_N_3V3
	13	UART3_TX_3V3	14	SPI1_CS1_N_3V3
	15	UART3_RX_3V3	16	GND
	17	UART5_TX_3V3	18	I2S4_DIN_3V3
	19	UART5_RX_3V3	20	I2S4_DOUT_3V3
	21	I2C4_SDA_3V3	22	I2S4_FS_3V3
	23	I2C4_SCL_3V3	24	I2S4_SCLK_3V3
	25	I2C7_SDA_3V3	26	GPIO08_3V3
	27	I2C7_SCL_3V3	28	GPIO09_3V3
	29	GND	30	GND
	31	CAN0_H	32	CAN2_H
	33	CAN0_L	34	CAN2_L
	35	CAN1_H	36	CAN3_H
	37	CAN1_L	38	CAN3_L
	39	GND	40	GND
Pin 1 position: At the marked area on the right image.				
Device name	UART1	UART2	UART5	UART3
	/dev/ttyAMA9	/dev/ttyAMA10	/dev/ttyAMA5	debugport,115200, 8N1
	Note: All serial ports are TTL serial ports.			
	GPIO08	GPIO09	I2c4	I2c7
	PDD.03	PDD.04	/dev/i2c-3	/dev/i2c-7
	SPI1	/dev/spidev0.0		



RTC Battery (J20)				
Function	Provide power support for the coreboard clock circuit			
Sign	J20			
Pin definition	Pin	Signal	Pin	Signal
	1	VCC (3.3V)	2	GND
	Pin 1 position: At the marked area on the right image.			



Indicator light		
Function	Indicator light	
Pin definition	Above: The user-defined status indicator light S is controlled by GPIO20 pin. GPIO20 system mapping number: PP.05 Middle: Power Supply Indicator Light P Lower: Module power-on indicator light R	



Ordering Information

Order Type	Function
Y-C28	NVIDIA® Jetson™ AGX Thor T5000 Interface expansion board for the core modules of the series.

E-commerce Platform

Taobao store Address: <https://shop333807435.taobao.com/>

Jingdong Store Address: <https://mall.jd.com/index-11467104.html?from=pc>

Ali International Station Address: <https://plink-ai.en.alibaba.com/>

Recovery Mode

The Jetson core module can operate in normal mode and Recovery mode. In Recovery mode, operations such as file system update, kernel update, Bootloader/UEFI update, and BCT update can be performed.

The steps to enter Recovery mode are as follows:

Shut off the power supply of the system.

- Connect the TYPEC cable to the TYPEC port (J2) of Y-C28 and the USB port of the Jetson development host.
- Press and hold the "Recovery" button (SW3), then supply power to the system. After powering on, keep the Recovery button pressed for more than 3 seconds, and then release the button.
- The system has entered the Recovery mode. At this point, you can proceed with the subsequent operations.

Method of Application

- Make sure that the voltages of all external systems have been turned off.
- Install the Jetson core module onto the J1 high-speed connector. During the installation process, pay attention to aligning the connectors properly and apply force evenly. After the module is installed in place, install the core module fixing screws.
- Install the necessary external cables. (For example: the display cable connected to the HDMI monitor, the power input cable for powering the system, the USB cable linking the keyboard and mouse, the camera, the MiniPCle function expansion module...)
- Connect the power cord to the power supply. (Before powering on, please make sure that the cooling device on the core module has been installed.)
- For systems without protective enclosures, after powering on the system, please avoid moving the hardware components and strictly prohibit touching the circuit boards and any electronic components on them with your body.

GPIO Test

The Y-C28, when paired with the Jetson module, comes with 2 GPIO ports. It can output 3.3V voltage programmatically. Please note that the input voltage should not exceed 3.3V.

When using the AGX Thor T5000 module, for example, with L4T 38.2 and GPIO 08:

- The content following the "#" symbol in the following commands is a comment and does not need to be included when executing the commands.
- `sudo apt update`
- `sudo apt install gpiod`
- `sudo gpiofind "PDD.03" #Here, it will return its group and number.`
- `# This is the measurement output method`
- `sudo gpiowrite --mode=wait `gpiofind "PDD.03"`=1`
 - # Use a multimeter to measure the voltage between this pin and GND, and it should be 3.3V.
 - # This is the measurement input method
- `sudo gpioget gpiochip0 21`
 - # After connecting this GPIO pin to 3.3V, the return value becomes 1
 - # After connecting this GPIO pin to GND, the return value becomes 0, which indicates that it is correct.

CAN Test

- When Y-C28 is equipped with the Jetson module, it comes with 4 channels of CAN signals. It can test two CAN channels by connecting them together, or it can connect to external devices for testing. During the test, please connect the CAN_H of the device to the CAN_H of the tested device, and CAN_L to the CAN_L of the tested device. The test command is as follows:
- `sudo apt-get install busybox can-utils`

```
sudo modprobe can
```

```
sudo modprobe can_raw
```

```
sudo modprobe mttcan
```

```
sudo ip link set can3 type can bitrate 500000 loopback  
off
```

```
sudo ip link set up can3
```

```
cansend can3 123#11223344aabbccdd
```

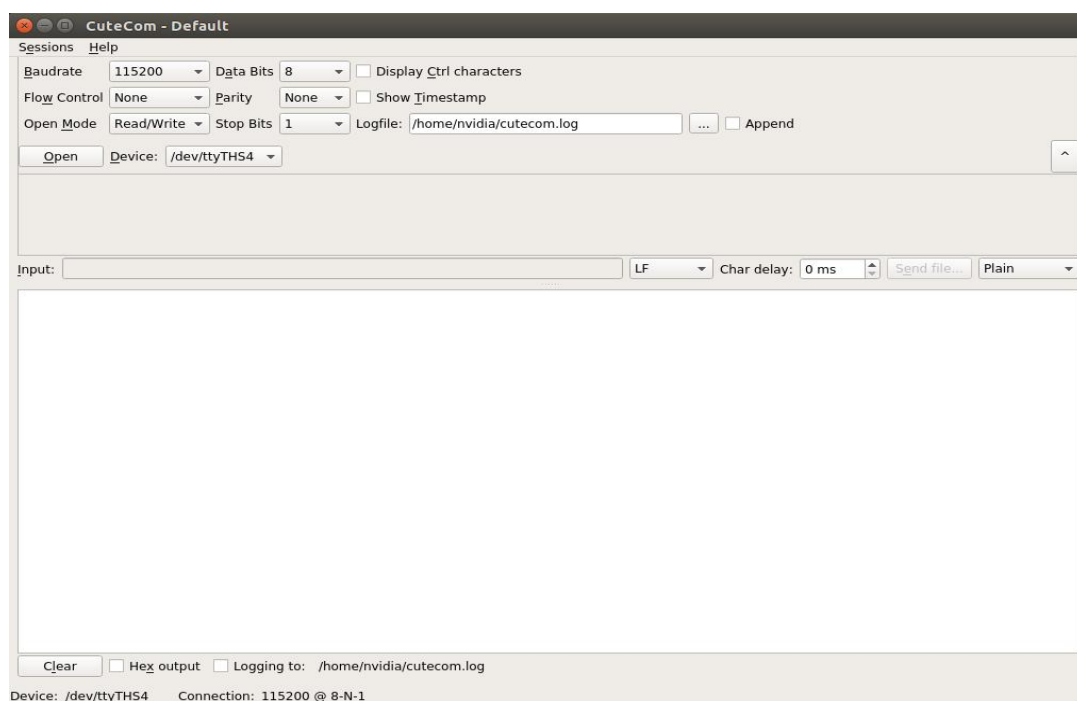
```
candump can3
```

Please refer to the link for the values of the module registers:

Controller Area Network (CAN) — Jetson Linux Developer Guide
documentation (nvidia.com)

Serial Port Test

- When the Y-C28 is equipped with the Jetson module, it comes with 3 TTL serial ports as standard. It can perform self-reception and self-transmission tests for a single serial port, as well as two serial port connection tests. The commands are as follows:
- `sudo apt-get install cutecom` #Install the serial port test tool
- `sudo cutecom` #For a single-serial port test, you only need to open one cutecom interface on each terminal. For a two-serial port connection test, use two terminals and open two cutecom interfaces.
- When conducting a single serial port test, please connect the RX and TX pins of the individual serial port. When testing the connection between two serial ports, connect the RX pin of COM1 to the TX pin of COM2, and the TX pin of COM1 to the RX pin of COM2.
- During the test, the serial port parameters were set in the Cutecom interface and the serial port was opened. After entering the data in the input box and sending it, the single serial port test would have data display reflected at the bottom of the Cutecom interface.
- The interface of the serial port testing tool cutecom is as follows:



Special Instructions

- Initial system username: **nvidia** , password: **nvidia**, no password su. If root permissions are required, use sudo to grant permissions, or use sudo su to access the root user.
- The pre-installed system is pure by default and does not contain Jetpack software. You can use the following command to install the software. Do not replace or modify the default software source before installation:
 - `sudo apt-get update`
 - `sudo apt-get install nvidia-jetpack`
- It can also be installed over the network using SDKmanager software.
- For more information please refer to :Jetson wiki (plink-ai.com)