
reComputer Robotics J501 Datasheet



Introduction

reComputer Robotics J501 is a powerful edge box with NVIDIA Jetson AGX Orin. It is equipped with rich IOs such as USB, Ethernet, CAN, RS-232/422/485, DI/DO and GMSL(optional). It has M.2 Key B slot for 5G modules, making it a perfect candidate to be the brain of sophisticated mobile robots or autonomous vehicles. It can be directly used in 48V systems and has interfaces for most common sensors.

Part list

- reComputer Robotics J501X (GMSL Extension Optional) x1
- Power Terminal Block x1
- 2-Pin to DC power connector x1
- USB Type-C to Type-A cable x1
- Terminal Block x1
- User Manual x1
- DIN Bracket x1
- Panel Bracket x2

Table of Contents

Introduction	2
Part list	2
Table of Contents	3
reComputer J501 Robotics	4
Jetson AGX Orin Module Specifications	6
Carrier Board Specifications	7
GMSL Extension Board Specifications (Optional)	9
Pin Connector Descriptions	10
USB Ports	10
USB Port List	10
USB 3.0 Type-A Connector Pin Description- J10	11
USB 3.0 Type-A Connector Pin Description - J11	13
USB 3.0 Type-C Connector Pin Description - J26	14
USB 2.0 Type-C - J27	16
Ethernet	17
Ethernet Port List	17
10 Gigabit Ethernet - J24	17
Gigabit Ethernet - J25-1	19
Gigabit Ethernet - J25-2	20
Gigabit Ethernet - J25-3	21
Gigabit Ethernet - J25-4	22
M.2 Key M Slot 1 - J19	23
M.2 Key M Slot 2 - J18	28
M.2 Key E Slot - J21	33
M.2 Key B Slot - J17	38
12V Fan Connector - J2	42
5V Fan Connector - J1	42
RTC 2-Pin Header - J13	43
Serial DB9 Connectors - J8, J9	44
RS-232	44
RS-422	45
RS-485	45
Serial DB9 Mode Switch	46
Pin header - J16 (Debug UART/USB Boot)	49
Pin header - J20 (I2C/SPI/I2S)	51
Terminal Block IO - J7 (CAN/DI/DO)	53

reComputer J501 Robotics

Side View 1



Side View 2



Bottom View



- 1 M.2 Key B Slot
- 2 M.2 Key M Slot 1 (128G SSD Included)
- 3 M.2 Key M Slot 2
- 4 M.2 Key E Slot
- 5 I2C x 1 I2S x 1 SPI x 1
- 6 RS-232/422/485 Mode Switch
- 7 RTC Coin Cell Socket

Jetson AGX Orin Module Specifications

Product	reComputer Robotics J5011	reComputer Robotics J5012
Module	Jetson AGX Orin 32GB	Jetson AGX Orin 64GB
AI Performance	200 TOPS (INT8)	275 TOPS (INT8)
GPU	1792-core NVIDIA CUDA® cores with 56 Tensor Cores	2048-core NVIDIA CUDA® cores with 64 Tensor cores
CPU	8-core Arm® Cortex-A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3	12-core Arm® Cortex-A78AE v8.2 64-bit CPU 3MB L2 + 6MB L3
DL Accelerator	2x NVDLA v2.0	
Vision Accelerator	PVA v2.0	
Memory	32GB 256-bit LPDDR5 204.8GB/s	64GB 256-bit LPDDR5 204.8GB/s
Storage	64GB eMMC 5.1	
Video Encode	1x 4K60 (H.265) 3x 4K30 (H.265) 6x 1080p60 (H.265) 12x 1080p30 (H.265)	2x 4K60 4x 4K30 8x 1080p60 16x 1080p30 (H.265)
Video Decode	1x 8K30 (H.265) 2x 4K60 (H.265) 4x 4K30 (H.265) 9x 1080p60 (H.265) 18x 1080p30 (H.265)	1x 8K30 3x 4K60 6x 4K30 11x 1080p60 22x 1080p30 (H.265)

Power	15W-60W
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Carrier Board Specifications

Module Compatibility	Jetson AGX Orin™ 32GB / 64GB
Box Dimension	210mm*180mm*87mm (with stands)
Display	1x HDMI 2.1
USB	3x USB 3.0 Type-A 1x USB 2.0 Type C (Debug) 1x USB 3.0 Type C (Device)
Ethernet	1x RJ45 10GbE 4x RJ45 1GbE
M.2 Key M	1x M.2 Key M, for NVMe 2280 SSD
M.2 Key E	1x M.2 Key E, for M.2 2230 WIFI Module
M.2 Key B	1x M.2 Key B, for 5G Module
SIM Card	1x Nano-SIM Card Slot
FAN	1x 4 Pin Fan Connector(12V PWM) 1x 4 Pin Fan Connector(5V PWM)

Terminal Block	4x CAN (CAN-FD supported) 4x DI 4x DO
RTC	RTC Socket, 2-pin connector
LED	1x PWR LED, Green 1x SSD LED, Green 1x USR LED, RGB
Button	1x Recovery Button 1x RST Button
GMSL	2x Mini-Fakra Connector (For 8x GMSL2 Cameras) (Optional)
Temperature	-10°C~60°C
Power supply	Terminal Block DC 19-48V
Jetpack	Jetpack 6.2

GMSL Extension Board Specifications (Optional)

De-serializer	MAX96712
GMSL Interface	2x Robotics-Fakra Male Connector
GMSL Input	Up to 8x GMSL2 Cameras
Connection Method	GMSL2 Fakra 1-to-4 M-M Cable
POC Interface Feature	Supports simultaneous power and data transmission

Pin Connector Descriptions

USB Ports

The carrier board supports several USB Connectors. One of them is a USB 2.0 Type-C connector for debug. The other USB Type-C connector is for recovery mode. There are three USB 3.0 Type A connectors with 5Gbps speed for Host mode only.

USB Port List

2 x	USB 3.0 Type-A	Host Mode	J10
1 x	USB 3.0 Type-A	Host Mode	J11
1 x	USB 3.0 Type-C	Recovery, For Flashing	J26
1 x	USB 2.0 Type-C	Debug	J27
Note: The USB Type-A connectors share 5Gbps bandwidth, and only support USB Host mode.			

USB 3.0 Type-A Connector Pin Description- J10

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
1	-	-	-	VBUS Supply	Power
2	USB3_N	G10	HUB_HSD1_N	USB 2.0 Data #1 from Hub	Bidir
3	USB3_P	G11	HUB_HSD1_P		
4	-	-	-	Ground	Ground
5	UPHY_RX20_N	C35	HUB_SSRX1_N	USB3.0 Receive #1 Data from Hub	Input
6	UPHY_RX20_P	C34	HUB_SSRX1_P		
7	-	-	-	Ground	Ground
8	UPHY_TX20_N	K33	HUB_SSTX1_N	USB3.0 Transmit #1 Data from Hub	Output
9	UPHY_TX20_P	K32	HUB_SSTX1_P		
10	-	-	-	VBUS Supply	Power
11	USB3_N	G10	HUB_HSD2_N	USB 2.0 Data #2 from Hub	Bidir
12	USB3_P	G11	HUB_HSD2_P		

13	-	-	-	Ground	Ground
14	UPHY_RX20_N	C35	HUB_SSRX2_N	USB3.0 Receive #2	Input
15	UPHY_RX20_P	C34	HUB_SSRX2_P	Data from Hub	
16	-	-	-	Ground	Ground
17	UPHY_TX20_N	K33	HUB_SSTX2_N	USB3.0 Transmit #2	Output
18	UPHY_TX20_P	K32	HUB_SSTX2_P	Data from Hub	

USB 3.0 Type-A Connector Pin Description - J11

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
1	-	-	-	VBUS Supply	Power
2	USB3_N	G10	HUB_HSD3_N	USB 2.0 Data #3 from Hub	Bidir
3	USB3_P	G11	HUB_HSD3_P		
4	-	-	-	Ground	Ground
5	UPHY_RX20_N	C35	HUB_SSRX3_N	USB3.1 Receive #3 Data from Hub	Input
6	UPHY_RX20_P	C34	HUB_SSRX3_P		
7	-	-	-	Ground	Ground
8	UPHY_TX20_N	K33	HUB_SSTX3_N	USB3.1 Transmit #3 Data from Hub	Output
9	UPHY_TX20_P	K32	HUB_SSTX3_P		

USB 3.0 Type-C Connector Pin Description - J26

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
A4/A9				VBUS Supply	Power
B4/B9					
A5	-	-	CC1	USB Type-C	-
B5	-	-	CC2	Configuration Channel	
B10	UPHY_RX1_N	C22	UPHY_RX1_N	UPHY block 0,	Input
B11	UPHY_RX1_P	C23	UPHY_RX1_P	Receive Lane 1	
A3	UPHY_TX1_N	G22	UPHY_TX1_N	UPHY block 0,	Output
A2	UPHY_TX1_P	G23	UPHY_TX1_P	Transmit Lane 0	
A10	UPHY_RX1_N	C22	UPHY_RX1_N	UPHY block 0,	Input
A11	UPHY_RX1_P	C23	UPHY_RX1_P	Receive Lane 1	
B3	UPHY_TX1_N	G22	UPHY_TX1_N	UPHY block 0,	Output
B2	UPHY_TX1_P	G23	UPHY_TX1_P	Transmit Lane 0	
A7/B7	USB0_N	F13	USB2_0_N	USB 2.0 Port 0 Data	Bidir
A6/B6	USB0_P	F12	USB2_0_P		

A1/B1	-	-	-	Ground	Ground
A12/B12	-	-	-	Ground	Ground

USB 2.0 Type-C - J27

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir Default
B9/B4	-	-	-	VBUS Supply	Power
A5	-	-	CC1_2	-	-
B5	-	-	CC2_2	-	-
A7/B7	-	-	UART_USB_D N	-	Bidir
A6/B6	-	-	UART_USB_D P	-	
B1/B12	-	-	-	Ground	Ground

Ethernet

Ethernet Port List

1 x	10 GbE	J24
4 x	1 GbE	J25

10 Gigabit Ethernet - J24

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
1	TCT3	-	-	-	-
2	TD3-	-	-	-	Bidir
3	TD3+	-	-	-	Bidir
4	TD2+	-	-	-	Bidir
5	TD2-	-	-	-	Bidir
6	TCT2	-	-	-	-
7	TCT4	-	-	-	-
8	TD4+	-	-	-	Bidir
9	TD4-	-	-	-	Bidir

10	TD1-	-	-	-	Bidir
11	TD1+	-	-	-	Bidir
12	TCT1	-	-	-	-
13	YLWA	-	RJ45_YLWA	Yellow LED Anode	Input
14	YLWC	-	RJ45_YLWC	Yellow LED Cathode. On indicates activity	Output
15	GRNA	-	RJ45_GRNA	Green LED Anode	Input
16	GRNC	-	RJ45_GRNC	Green LED Cathode	Output
S1	-	-	-	Shield Ground	Ground
S2					

Note:

1. 10 Gigabit Ethernet

2. Normal working condition: Green LED: Always on, Yellow LED: Flashing

Gigabit Ethernet - J25-1

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
1	MXA_P	-	-	-	Bidir
2	MXA_N	-	-	-	Bidir
3	MXB_P	-	-	-	Bidir
4	MXC_P	-	-	-	Bidir
5	MXC_N	-	-	-	Bidir
6	MXB_N	-	-	-	Bidir
7	MXD_P	-	-	-	Bidir
8	MXD_N	-	-	-	Bidir
A9	GRNA	-	-	-	Input
A10	GRNC	-	-	Yellow LED	Output
A11	YELA	-	-	-	Input
A12	YELC	-	-	Green LED	Output

Note:

1. Gigabit Ethernet (10/100/1000M)

2. Normal working condition: Green LED: Always on, Yellow LED: Flashing

Gigabit Ethernet - J25-2

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
1	MXA_P	-	-	-	Bidir
2	MXA_N	-	-	-	Bidir
3	MXB_P	-	-	-	Bidir
4	MXC_P	-	-	-	Bidir
5	MXC_N	-	-	-	Bidir
6	MXB_N	-	-	-	Bidir
7	MXD_P	-	-	-	Bidir
8	MXD_N	-	-	-	Bidir
A9	GRNA	-	-	-	Input
A10	GRNC	-	-	Yellow LED	Output
A11	YELA	-	-	-	Input
A12	YELC	-	-	Green LED	Output

Note:

1. Gigabit Ethernet (10/100/1000M)

2. Normal working condition: Green LED: Always on, Yellow LED: Flashing

Gigabit Ethernet - J25-3

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
1	MXA_P	-	-	-	Bidir
2	MXA_N	-	-	-	Bidir
3	MXB_P	-	-	-	Bidir
4	MXC_P	-	-	-	Bidir
5	MXC_N	-	-	-	Bidir
6	MXB_N	-	-	-	Bidir
7	MXD_P	-	-	-	Bidir
8	MXD_N	-	-	-	Bidir
A9	GRNA	-	-	-	Input
A10	GRNC	-	-	Yellow LED	Output
A11	YELA	-	-	-	Input
A12	YELC	-	-	Green LED	Output

Note:

1. Gigabit Ethernet (10/100/1000M)

2. Normal working condition: Green LED: Always on, Yellow LED: Flashing

Gigabit Ethernet - J25-4

Pin #	Module Pin Name	Module Pin #	Net Name	Usage/Description	Type/Dir
1	MXA_P	-	-	-	Bidir
2	MXA_N	-	-	-	Bidir
3	MXB_P	-	-	-	Bidir
4	MXC_P	-	-	-	Bidir
5	MXC_N	-	-	-	Bidir
6	MXB_N	-	-	-	Bidir
7	MXD_P	-	-	-	Bidir
8	MXD_N	-	-	-	Bidir
A9	GRNA	-	-	-	Input
A10	GRNC	-	-	Yellow LED	Output
A11	YELA	-	-	-	Input
A12	YELC	-	-	Green LED	Output

Note:

1. Gigabit Ethernet (10/100/1000M)

2. Normal working condition: Green LED: Always on, Yellow LED: Flashing

M.2 Key M Slot 1 - J19

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground
3				
5	UPHY_RX15_N	A27	UPHY block 1, Receive Lane 3	Input
7	UPHY_RX15_P	A26		
9	-	-	Ground	Ground
11	UPHY_TX15_N	J27	UPHY block 1, Transmit Lane 3	Output
13	UPHY_TX15_P	J26		
15	-	-	Ground	Ground
17	UPHY_RX14_P	C26	UPHY block 1, Receive Lane 2	Input
19	UPHY_RX14_N	C27		
21	-	-	Ground	Ground
23	UPHY_TX14_P	G27	UPHY block 1, Transmit Lane 2	Output
25	UPHY_TX14_N	G26		
27	-	-	Ground	Ground
29	UPHY_RX13_P	B25	UPHY block 1, Receive Lane 1	Input

31	UPHY_RX13_N	B24		
33	-	-	Ground	Ground
35	UPHY_TX13_P	K25	UPHY block 1, Transmit Lane 1	Output
37	UPHY_TX13_N	K24		
39	-	-	Ground	Ground
41	UPHY_RX12_N	D25	UPHY block 1, Receive Lane 0	Input
43	UPHY_RX12_P	D24		
45	-	-	Ground	Ground
47	UPHY_TX12_N	H25	UPHY block 1, Transmit Lane 0	Output
49	UPHY_TX12_P	H24		
51	-	-	Ground	Ground
53	PEX_CLK5_N	F25	PCIe output Reference Clock for controller #5	Output
55	PEX_CLK5_P	F24		
57	-	-	Ground	Ground
59	-	-	Unused (Key)	Unused
61				
63				
65				

67	-	-	Unused	Unused
69				
71	-	-	Ground	Ground
73				
75				

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2	-	-	Main 3.3V Supply	Power
4				
6	-	-	Unused	Unused
8				
10				
12	-	-	Main 3.3V Supply	Power
14				
16				
18				
20	-	-	Unused	Unused

22				
24				
26				
28				
30				
32				
34				
36				
38				
40	I2C2_CLK	J61	General I2C 2 Clock	Bidir/OD, 1.8V
42	I2C2_DAT	K61	General I2C 2 Data	
44	GPIO24	J51	M.2 Key M Alert	Input, 1.8V
46	-	-	Unused	Unused
48				
50	PEX_C5_RST_N	H10	PCIe Reset for controller #5	Output, 3.3V
52	PEX_C5_CLKREQ_N	C8	PCIe Clock Request for controller #5	Bidir/OD, 3.3V
54	PEX_WAKE_N	A8	PCIe Wake	Input/OD, 3.3V

56	-	-	Unused	Unused
58				
60	-	-	Unused (Key)	Unused (Key)
62				
64				
66				
68	-	-	32KHz Suspend Clock	Output, 3.3V
70	-	-	Main 3.3V Supply	Power
72				
74				

Note:

For NVMe SSD, 2280.

Supports PCIe Gen4.0.

M.2 Key M Slot 2 - J18

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground
3				
5	UPHY_RX22_N	D32	UPHY block 0, Receive Lane 4	Input
7	UPHY_RX22_P	D33		
9	-	-	Ground	Ground
11	UPHY_TX22_N	J34	UPHY block 0, Transmit Lane 4	Output
13	UPHY_TX22_P	J35		
15	-	-	Ground	Ground
17	UPHY_RX23_N	A35	UPHY block 0, Receive Lane 5	Input
19	UPHY_RX23_P	A34		
21	-	-	Ground	Ground
23	UPHY_TX23_N	H33	UPHY block 0, Transmit Lane 5	Output
25	UPHY_TX23_N	H32		
27	-	-	Ground	Ground

29	UPHY_RX10_N	B13	UPHY block 0, Receive Lane 6	Input
31	UPHY_RX10_P	B12		
33	-	-	Ground	Ground
35	UPHY_TX10_N	K12	UPHY block 0, Transmit Lane 6	Output
37	UPHY_TX10_P	K13		
39	-	-	Ground	Ground
41	UPHY_RX11_N	D13	UPHY block 0, Receive Lane 7	Input
43	UPHY_RX11_P	D12		
45	-	-	Ground	Ground
47	UPHY_TX11_N	H13	UPHY block 0, Transmit Lane 7	Output
49	UPHY_TX11_P	H12		
51	-	-	Ground	Ground
53	PCIE4_CLK_N	E22	PCIe output Reference Clock for controller #4	Output
55	PCIE4_CLK_P	E23		
57	-	-	Ground	Ground
59	-	-	Unused (Key)	Unused
61				
63				

65				
67	-	-	Unused	Unused
69				
71	-	-	Ground	Ground
73				
75				

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2	-	-	Main 3.3V Supply	Power
4				
6	-	-	Unused	Unused
8				
10				
12	-	-	Main 3.3V Supply	Power
14				
16				
18				

20	-	-	Unused	Unused
22				
24				
26				
28				
30				
32				
34				
36				
38				
40	I2C2_CLK	J61	General I2C 2 Clock	Bidir/OD, 1.8V
42	I2C2_DAT	K61	General I2C 2 Data	
44	GPIO34	A55	M.2 Key M Alert	Input, 1.8V
46	-	-	Unused	Unused
48				
50	PEX_C4_RST_N	J9	PCIe Reset for controller #4	Output, 3.3V
52	PEX_C4_CLKREQ_N	G8	PCIe Clock Request for controller #4	Bidir/OD,3.3V

54	PEX_WAKE_N	A8	PCIe Wake	Input/OD, 3.3V
56	UFS0_REF_CLK	A6	-	Output
58	UFS0_RST_N	C6	-	Output
60	-	-	Unused (Key)	Unused (Key)
62				
64				
66				
68	-	-	32KHz Suspend Clock	Output, 3.3V
70	-	-	Main 3.3V Supply	Power
72				
74				

Note:

For NVMe SSD, 2280.

Supports PCIe Gen4.0.

M.2 Key E Slot - J21

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground
3			USB 2.0 #3 Data from hub	Bidir
5				
7	-	-	Ground	Ground
9	SDCARD_CLK	B6	SD Card (or SDIO) Clock	Output
11	SDCARD_CMD	A5	SD Card (or SDIO) Command	Bidir
13	SDCARD_D0	E8	SD Card (or SDIO) Data 0	Bidir
15	SDCARD_D1	F8	SD Card (or SDIO) Data 1	Bidir
17	SDCARD_D2	A4	SD Card (or SDIO) Data 2	Bidir
19	SDCARD_D3	D6	SD Card (or SDIO) Data 3	Bidir
21	GPIO02	L6	SD Card Card Detect	Bidir
23	GPIO21	B58	SD Power Enable	Output
25	-	-	Unused (Key)	Unused (Key)
27				
29				

31				
33	-	-	Ground	Ground
35	UPHY_TX21_P	G35	UPHY block 0, Transmit Lane 3	Output
37	UPHY_TX21_N	G34		
39	-		Ground	Ground
41	UPHY_RX21_P	B33	UPHY block 0, Receive Lane 3	Input
43	UPHY_RX21_N	B32		
45	-		Ground	Ground
47	PEX_CLK6_P	D49	PCIe Output Reference Clock for controller #1	Output
49	PEX_CLK6_N	D48		
51	-		Ground	Ground
53	PEX_C7_CLKREQ_N	B37	PCIe Clock Request for controller #1	Input, 3.3V
55	-	-	Unused	-
57	-	-	Ground	Ground
59	GPIO04	B59	M2E_SAR_TOUT	Output
61	GPIO05	A59	M2E_AP_WAKE_BT	Output
63	-	-	Ground	Ground

65	-	-	Unused	Unused
67	-	-	Unused	Unused
69	-	-	Ground	Ground
71	-	-	Unused	Unused
73	-	-	Unused	Unused
75	-	-	Ground	Ground

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2	-	-	Main 3.3V Supply	Power
4	-	-	Main 3.3V Supply	Power
6	-	-	Unused	
8	I2S3_SCLK	C59	Audio I2S Port 3 Clock	Bidir
10	I2S3_FS	C60	I2S Audio Port 3 Left/Right Clock	Bidir
12	I2S3_DIN	J59	Audio I2S #1 Data in	Input
14	I2S3_DOUT	K59	Audio I2S #1 Data Out	Output
16	-	-	Unused	
18	-	-	Ground	

20	GPIO32	J55	M2E_BT_WAKE	Input
22	UART5_RX	H58	UART 2 Receive	Input
24	-	-	Unused (Key)	
26				
28				
30				
32	UART5_TX	J58	UART 5 Transmit	Output
34	UART5_CTS	H57	UART 5 Clear to Send	Input
36	UART5_RTS	K58	UART 5 Request to Send	Output
38	-	-	Unused	-
40	-	-	Unused	-
42	GPIO05	A59	M2E_AP_WAKE_BT	Output
44	-	-	Unused	-
46				
48				
50	-	-	SUSCLK_32KHZ_M2E	
52	PEX_C7_RST_N	B36	PCIe Reset for controller #1	Output
54	SP3_CLK	F55	M2E_BT_DISABLE_N	Output

56	GPIO01	J4	M2E_WIFI_DISABLE_N	Output
58	-	-	Unused	-
60				
62	GPIO30	B55	M2E_M_ALERT	Input
64	-	-	Unused	-
66				
68				
70				
72	-	-	Main 3.3V Supply	Power
74				Power
Note: For 2230 WiFi Module.				

M.2 Key B Slot - J17

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Unused	-
3	-	-	Ground	Ground
5				
7	-	-	HUB_HSD4_P	Bidir
9	-	-	HUB_HSD4_N	Bidir
11	-	-	Ground	Ground
21	-	-	Unused	-
23	GPIO13	G7	M2B_WOWWAN_N	Bidir
25	-	-	Unused	-
27	-	-	Ground	Ground
29	UPHY_RX20_P	C34	M2B_SSRX4_N	Input
31	UPHY_RX20_N	C35	HUB_SSRX4_P	Input
33	-	-	Ground	Ground
35	UPHY_TX20_P	K32	M2B_SSTX4_N	Output
37	UPHY_TX20_N	K33	M2B_SSTX4_P	Output

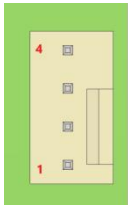
39	-	-	Ground	Ground
41/43	-	-	Unused	-
45	-	-	Ground	Ground
47/49	-	-	Unused	-
51	-	-	Ground	Ground
53/55	-	-	Unused	-
57	-	-	Ground	Ground
59/61	-	-	Unused	-
63/65				
67	-	-	M2B_PCl_e_RST	Input
69	-	-	Unused	-
71/73	-	-	Ground	Ground
75	-	-	Unused	-
76/77	-	-	Ground	Ground

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2/4	-	-	VDD_3V3_SYS	Power

6	-	-	M2B_POWER_OFF	Output
8	-	-	W_DISABLE1	Output
10	-	-	M2B_STATUS_LED	-
20/22	-	-	Unused	-
24				
26	-	-	W_DISABLE2	-
28	-	-	Unused	-
30	-	-	M2B_USIM_RST	-
32	-	-	M2B_USIM_CLK	-
34	-	-	M2B_USIM_DATA	-
36	-	-	M2B_USIM_PWR	-
38	GPIO22	F54	M.2_WLAN_Tx_EN	Input
40/42	-	-	Unused	-
44/46				
48/50				
52/54				
56/58				
60	SPI3_MOSI	G56	LAA_n79_Tx_EN	Output

62/64	-	-	Unused	-
66	-	-	SIM_DETECT	-
68	-	-	Unused	-
70/72/ 74	-	-	VDD_3V3_SYS	Power

12V Fan Connector - J2



Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground
2	-	-	12V Power Supply	Power
3	FAN_TACH	E54	Fan Tachometer signal	Bidir
4	FAN_PWM	K62	Fan Pulse Width Modulation signal	Bidir

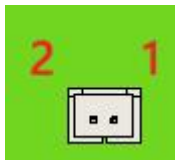
5V Fan Connector - J1



Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground
2	-	-	5V Power Supply	Power
3	FAN_TACH	E54	Fan Tachometer signal	Bidir

4	FAN_PWM	K62	Fan Pulse Width Modulation signal	Bidir
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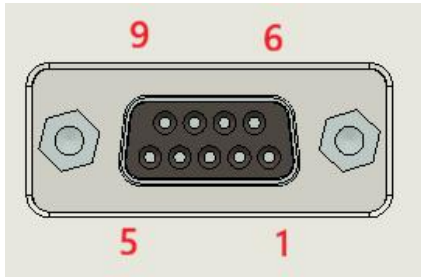
RTC 2-Pin Header - J13



Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Ground	Ground
2	PMIC_BBATT	D37	Real-Time Clock: Optionally used to provide back-up power for RTC in the Power Sequencer.	Input

Note: RTC socket also available (J3)

Serial DB9 Connectors - J8, J9



RS-232

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	-	Unused
2	-	-	RXD	Input
3	-	-	TXD	Output
4	-	-	-	Unused
5	-	-	Ground	Ground
6	-	-	-	Unused
7	-	-	RTS	Output
8	-	-	CTS	Input
9	-	-	-	Unused

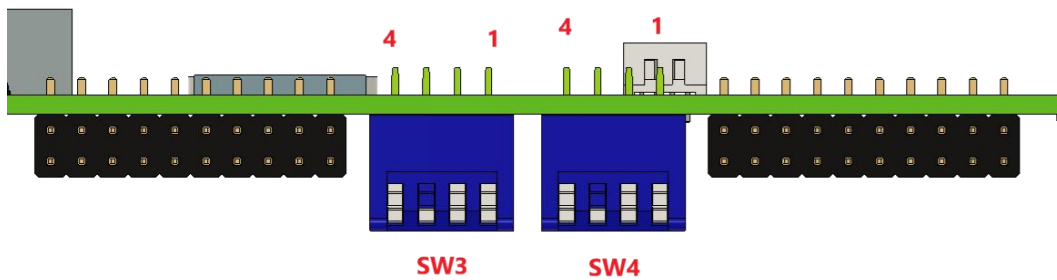
RS-422

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	TXD-	Output
2	-	-	TXD+	Output
3	-	-	RXD+	Input
4	-	-	RXD-	Input
5	-	-	Ground	Ground
6/7/8/9	-	-	-	Unused

RS-485

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	Data -	Bidir, RS485 B
2	-	-	Data +	Bidir, RS485 A
3	-	-	-	Unused
4	-	-	-	Unused
5	-	-	Ground	Ground
6/7/8/9	-	-	-	Unused

Serial DB9 Mode Switch



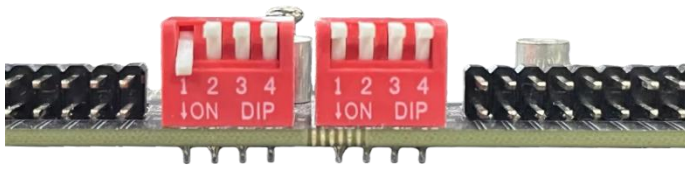
SW4 - Mode Switch for J8

Pin #	Usage/Description
1	Mode_0
2	Mode_1
3	Mode_2
4	Slew

SW3 - Mode Switch for J9

Pin #	Usage/Description
1	Mode_0
2	Mode_1
3	Mode_2
4	Slew

Mode Select Configuration



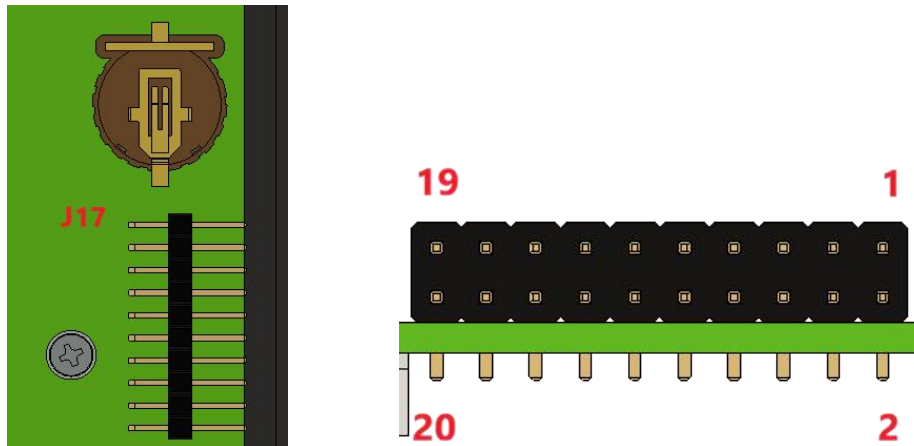
Note: When the switch is pressed down (ON), the bit is 0; When not pressed, the bit is 1

Mode_0	Mode_1	Mode_2	Mode	Status
0	0	0	RS-422 Full Duplex	1T/1R RS-422
0	0	1	Pure RS-232	3T/5R RS-232
0	1	0	RS-485 Half Duplex	1T/1R RS-485, TX ENABLE Low Active
0	1	1	RS-485 Half Duplex	1T/1R RS-485, TX ENABLE High Active
1	0	0	RS-422 Full Duplex	RS-422 with termination resistor
1	0	1	RS-232	1T/1R RS-232 co-exists with RS485 application without the need for the bus switch bus (for special usage)
1	1	0	RS-485	1T/1R RS-485 with termination resistor, TX ENABLE Low Active
1	1	1	Shutdown	All I/O pins are high impedance

Slew pin configuration

Slew		Mode
1		RS-232: Max data rate 1.5 Mbps RS-485/RS-422: Max data rate 10 Mbps
0		RS-232: Max data rate 250 Kbps RS-485/RS-422: Max data rate 250 Kbps

Pin header - J16 (Debug UART/USB Boot)



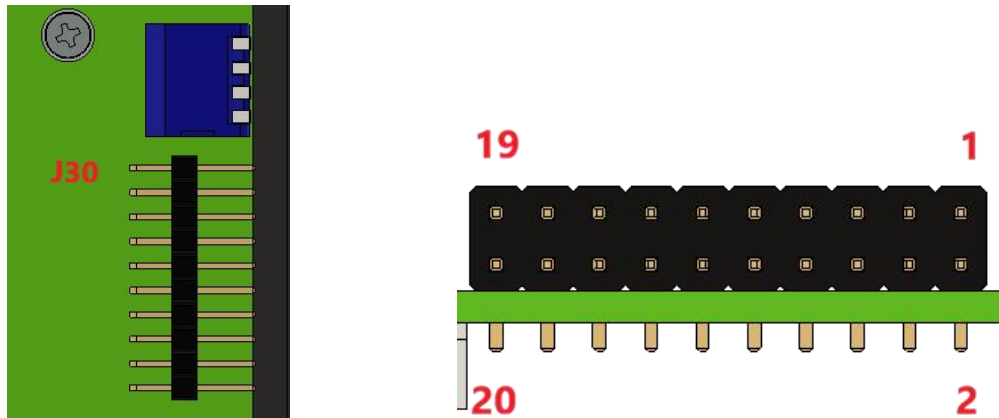
Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1/3/5/ 7	-	-	Ground	Ground
9/11/1 3/15				
17	-	-	USB UART RX	Input
19	-	-	USB UART TX	Output

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2	SYSTEM_OC_N	A61	System Over-current Thermal warning	Input
4	SYS_RESET_N	L60	System Reset: Driven by power sequencer reset during	Bidir

			power-on. Can be asserted by the carrier board to reset the SoC, Boot device, etc., but not the power sequencer.	
6	FORCE_RECOVERY_N	L10	Force Recovery strap pin: Held low when SYS_RESET_N goes inactive (power-on or reset button press) to enter force recovery mode.	Input
8	-	-	BUTTON_POWER_ON_N	Input
10	-	-	ACOK_CON	Input
12	-	-	ETH_WOL_EN_N	Input
14	-	-	Unused	-
16	-	-	MCU_BOOT_MOD_N	Input
18	-	-	BMCU_UART_TX	Output

20	-	-	BMCU_UART_RX	Input
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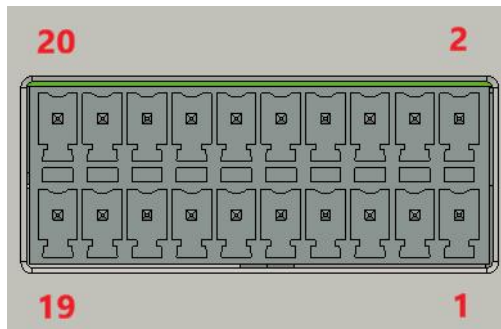
Pin header - J20 (I2C/SPI/I2S)



Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	VDD_3V3	Power
3	-	-	VDD_1V8	Power
5	SPI1_CS1_N	B56	CAM_SPI_CS1	
7	I2C1_CLK	K5	General I2C 1 Clock	Bidir
9	I2C1_DAT	L8	General I2C 1 Data	Bidir
11/13/ 15/17/ 19	-	-	Ground	Ground

Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
2	-	-	VDD_3V3	Power
4	SPI1_CLK	J57	SPI 1 Clock	Bidir
6	SPI1_MISO	A56	SPI 1 Initiator In / Target Out	Bidir
8	SP11_MOSI	D55	SPI 1 Initiator Out / Target In	Bidir
10	SPI1_CS0_N	E55	SPI 1 Chip Select 0	Bidir
12	MCLK01	H9	Audio Codec Reference Clock	Output
14	I2S1_FS	D8	I2S Audio Port 1 Left/Right Clock	Bidir
16	I2S1_CLK	L14	I2S Audio Port 1 Clock	Bidir
18	I2S1_SDOUT	C7	I2S Audio Port 1 Data Out	Output
20	I2S1_SDIN	H8	I2S Audio Port 1 Data In	Input

Terminal Block IO - J7 (CAN/DI/DO)



Pin #	Module Pin Name	Module Pin #	Usage/Description	Type/Dir Default
1	-	-	DI_12V_1	DI1
2	-	-	DO_40V_1	DO1
3	-	-	DI_12V_1	DI1
4	-	-	DO_40V_2	DO1
5	-	-	DI_12V_3	DI1
6	-	-	DO_40V_3	DO1
7	-	-	DI_12V_4	DI1
8	-	-	DO_40V_4	DO1
9	-	-	GND_DI	Reference GND for 12V digital input
10	-	-	GND_DO	Reference GND for digital output
11	-	-	CAN2_H_ISO	CAN2 High

12	-	-	CAN3_H_ISO	CAN3 High
13	-	-	CAN2_L_ISO	CAN2 Low
14	-	-	CAN3_L_ISO	CAN3 Low
15	-	-	GND_ISO	Reference GND for CAN
16				
17	-	-	CAN0_H_ISO	CAN0 High
18	-	-	CAN1_H_ISO	CAN1 High
19	-	-	CAN0_L_ISO	CAN0 Low
20	-	-	CAN1_L_ISO	CAN1 Low

Note:

1. All DI pins are 12V digital input, ground signal needs to be connected to GND_DI
2. All DO pins withstand maximum 40V, ground signal needs to be connected to GND_DO
3. CAN bus signals are standard differential signals, ground signal needs to be connected to GND_ISO
4. All CANs support CAN FD