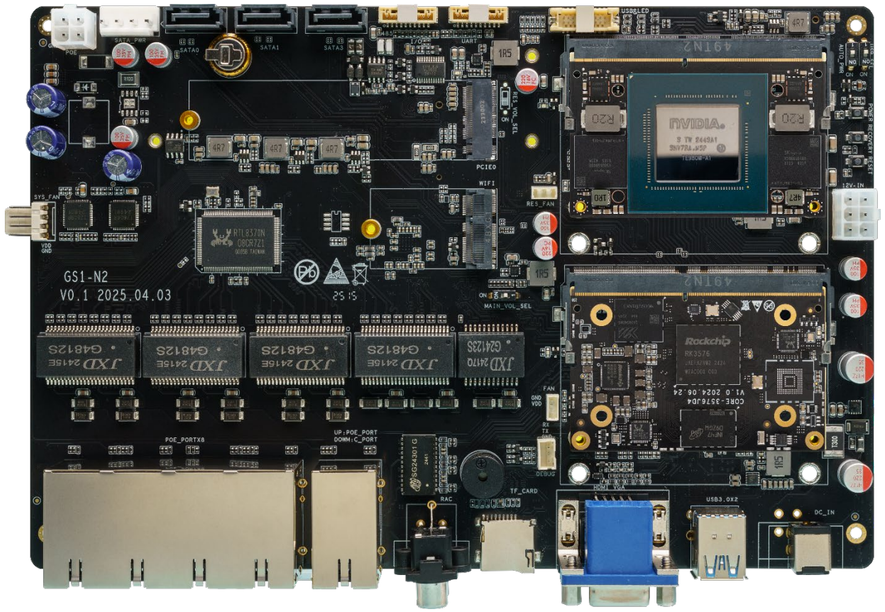
AIO-GS1N2

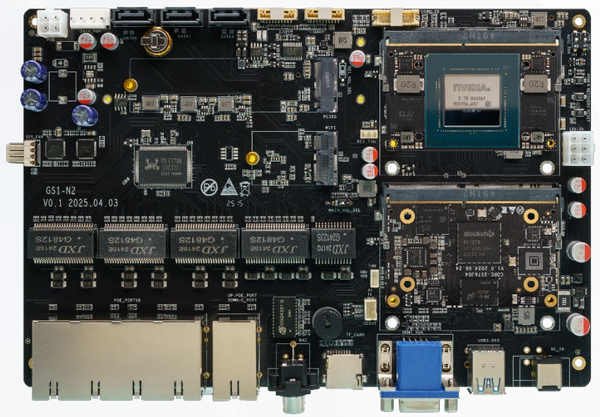
Gateway Server Mainboard



V0.1　2025-6-11

T-CHIP INTELLIGENCE TECHNOLOGY

Product features



High-performance dual-core board module design

It adopts dual-core heterogeneous architecture. One core is responsible for video recording, and the other is for AI processing. It supports real-time inference of AI models. The two core modules work independently, optimizing resource allocation and enabling parallel processing of multiple tasks, which significantly improves the system performance.

Provide 6TOPs ~157TOPs powerful computing power

It can provide 6TOPs ~ 157TOPs computing power, with edge computing and real-time decision-making, intelligent gateway AI empowerment, large-scale data forwarding and processing, complex network protocol and secure computing, visual development and other functions.

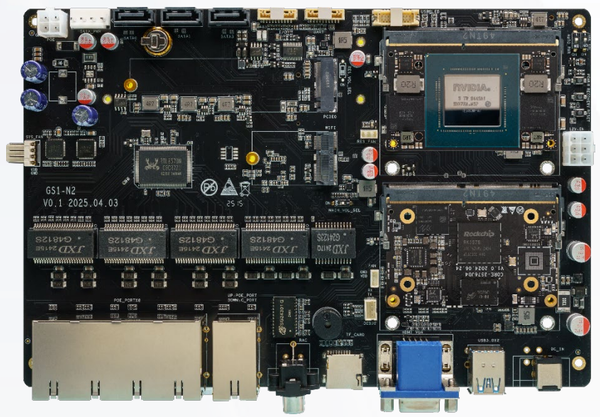
Support H.265 video codec, saving bandwidth and storage space

It can support up to 8K@60fps H.265 video decoding. Under normal network conditions, H.265 video transmission is clearer and smoother. With the same resolution, the storage volume is smaller, which saves storage space and reduces procurement costs.

Configure 10 PSE Gigabit Ethernet ports

It is configured with 10 Gigabit Ethernet ports, supports PSE (Power Sourcing Equipment) function, has strong compatibility, and can connect to network cameras of many mainstream manufacturers that comply with ONVIF and RTSP standards.

Product features



Onboard SATA3.0/M.2 PCIe for extended storage space

The onboard SATA3.0 interface can be expanded to 3.5 “/2.5” SSD/HDD, and the M.2 PCIe interface can be expanded with PCIe NVMe SSD, allowing the device to easily expand to terabyte-level ultra-large capacity.

Complete development materials

Provide supporting source code, tutorials, technical data and development tools, users can efficiently carry out secondary development, making development easier and more convenient.

Abundant expansion interfaces

It has HDMI2.0, VGA, M.2(PCIe), M.2(WiFi), RS485, SATA, USB3.0, IO, UART, audio input/output and other expansion interfaces, which is convenient for connecting various peripherals.

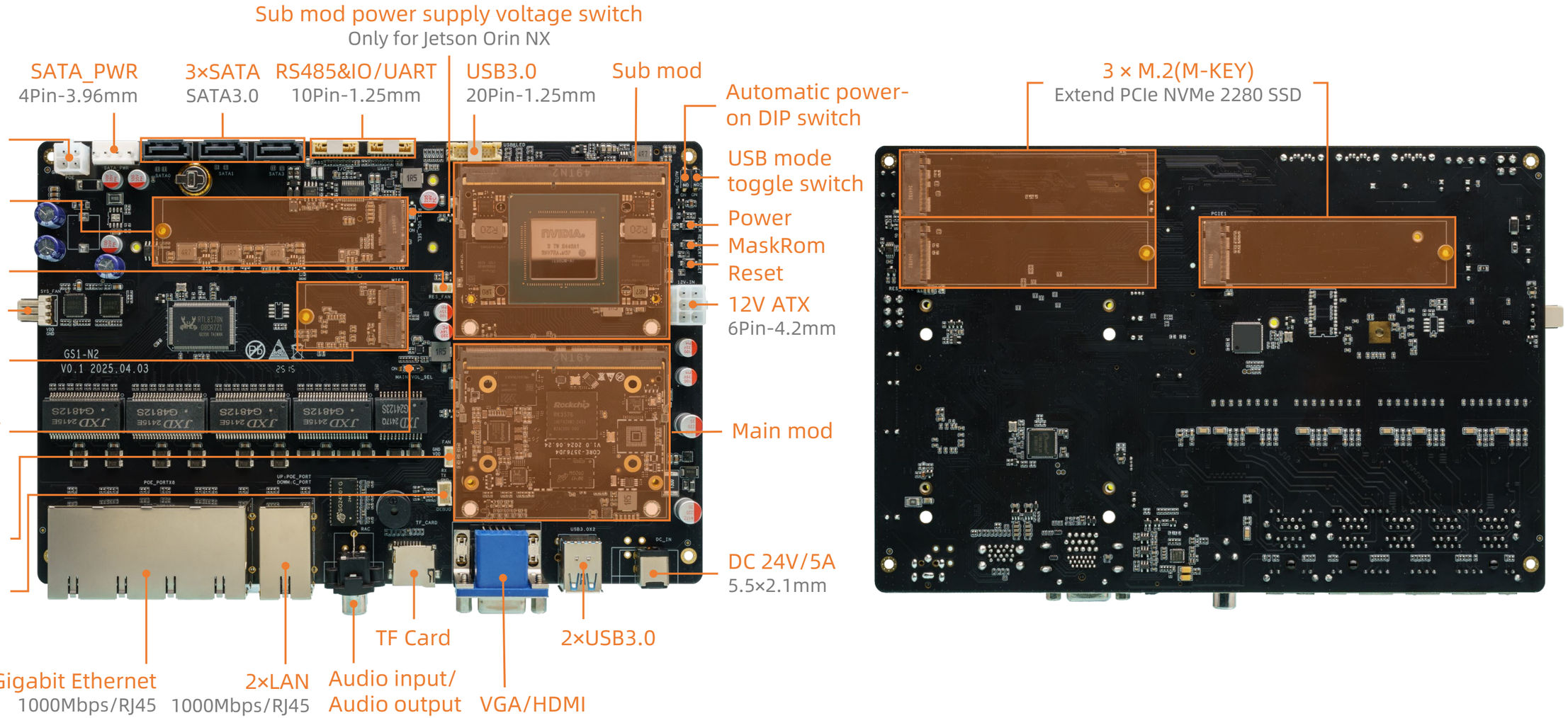
Wide range of application scenarios

It is widely used in intelligent gateway servers, industrial automation and robots, enterprise security, traffic management, smart cities, home storage and other types of products and fields.

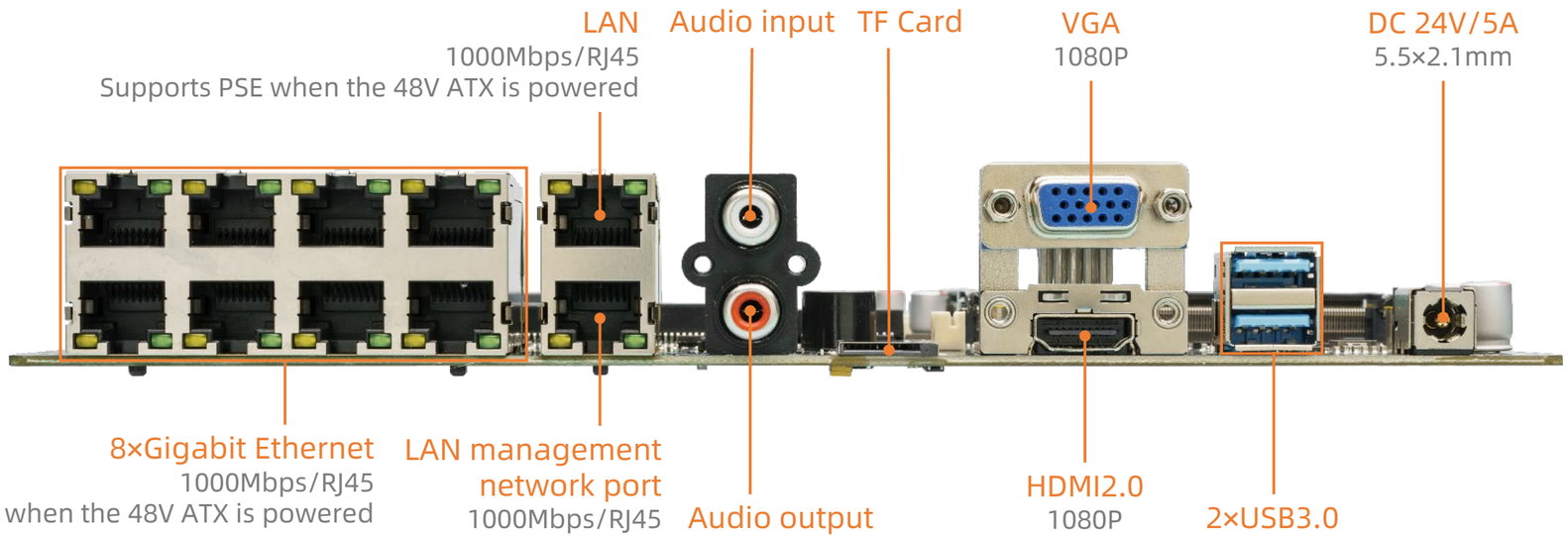
Specifications

Specifications							
Basic Specifications	Main mod	Optional mods	Memory	Storage	AI perf.	Video decoding	Video encoding
		Core-3576JD4	LPDDR4/LPDDR4x (2/4/8/16GB)	eMMC (16/32/64/128/256GB)	6T	8K@30fps H.265/VP9/AVS2/AV1 4K@120fps H.265/VP9/AVS2/AV1 4K@60fps H.264/AVC	4K@60fps H.265/H.264
		Core-3588JD4	LPDDR4/LPDDR4x (4/8/16/32GB)	eMMC (32/64/128/256GB)	6T	8K@60fps H.265/VP9/AVS2 8K@30fps H.264 AVC/MVC 4K@60fps AV1 1080P@60fps MPEG-2/-1/VC-1/VP8	8K@30fps H.265/H.264
		Core-1688JD4	LPDDR4 (4/8/16GB)	eMMC (32/64/128/256GB)	16T	8K@30fps H.265/H.264	8K@15fps H.265/H.264
		Jetson Orin Nano	LPDDR5 (8GB)	Not	67T	1×4K60, 2×4K30, 5×1080p60 H.265	1080p30 H.265
		Jetson Orin NX	LPDDR5 (16GB)	Not	157T	1×8K30, 2×4K60, 9×1080p60 H.265	1×4K60, 3×4K30, 6×1080p60 H.265
	Sub mod	1) You can choose any of the main mods 2) The sub mod can be empty					
	Storage expansion	3 × SATA3.0 (Multiplexed with PCIe, expandable with 3.5" or 2.5" SSD/HDD, SATA2 is only available when the main mod is Core-3588JD4) 2 × M.2 M-KEY (Multiplexed with SATA3.0, expandable PCIe NVMe 2280 SSD) * M.2 PCIe and SATA are multiplexed, please refer to page 6 of the datasheet for specific functions 2 × M.2 M-KEY (Expandable PCIe 2280 SSD, this M.2 M-KEY port is only available when the sub mod is optional) 1 × TF Card						
	Power	1) DC 24V/5A (5.5 × 2.1mm) 2) 280W AC power supply (Input: 100V AC ~ 240V AC, 50Hz ~ 60Hz, 6A; Output 1: 12V DC, 5A; Output 2: 52V DC, 4.6A; Does not support hot-swapping) 3) 1 × 12V ATX (6Pin-4.2mm) 4) 1 × 48V ATX (4Pin-4.2mm)					
	OS	Linux					
	Size	231.27mm × 164.13mm × 33.57mm					
	Weight	≈350g					
	Environment	Operating Temperature: -20℃ ~ 60℃, Storage Temperature: -20℃ ~ 70℃, Storage Humidity: 10% ~ 90%RH (non-condensing)					
Interface Specifications	Internet	8 × Gigabit Ethernet (RJ45, PSE is supported when powered by a 48V ATX) 2 × LAN (RJ45/1000Mbps, the upper LAN supports PSE when the 48V ATX is powered) Support 2.4GHz/5GHz dual-band WiFi (Extended via M.2 E-KEY, multiplexed with SATA3.0)					
	Video output	1 × VGA (Maximum resolution 1080P), 1 × HDMI2.0 (Default support for 1080P)					
	audio	1 × Audio input, 1 × Audio output					
	USB	2 × USB3.0, 1 × USB3.0 (20Pin-1.25mm wafer)					
	Button	1 × Power, 1 × MaskRom, 1 × Reset					
	DIP switch	1 × Main mod power supply voltage switch (For Jetson Orin NX use only) 1 × Sub mod power supply voltage switch (For Jetson Orin NX use only) 1 × USB mode toggle switch (ON: USB HOST; Off: USB Device) 1 × Automatic power-on DIP switch (ON: Automatically turn on after powering; Off: Press the power button to manually power on after powering on)					
	Other interfaces	1 × RS485&IO (10Pin-1.25mm), 1 × SATA_PWR (4Pin-3.96mm), 1 × UART (10Pin-1.25mm), 2 × FAN (4Pin-1.25mm), 1 × SYS_FAN (4Pin-2.54mm), 1 × Debug (3Pin-2mm)					

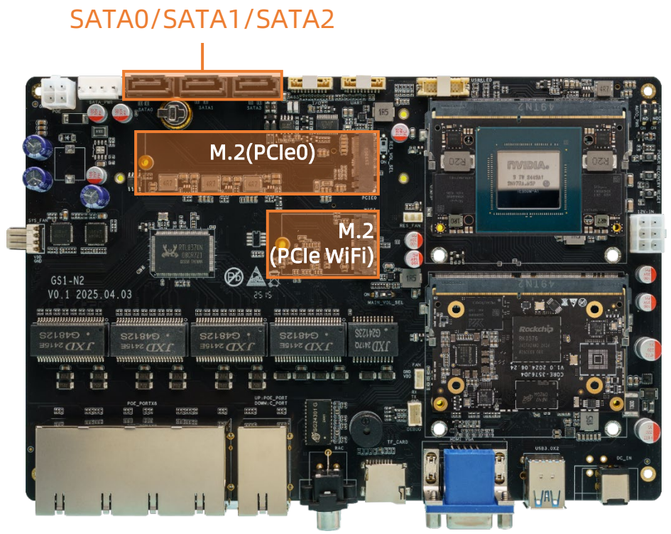
Interface description

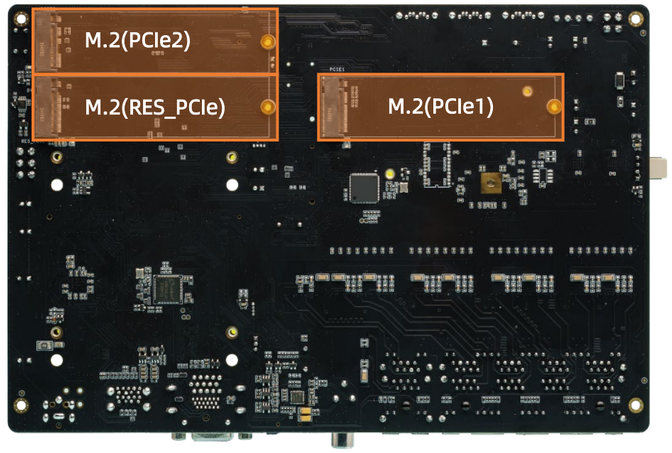


Interface description



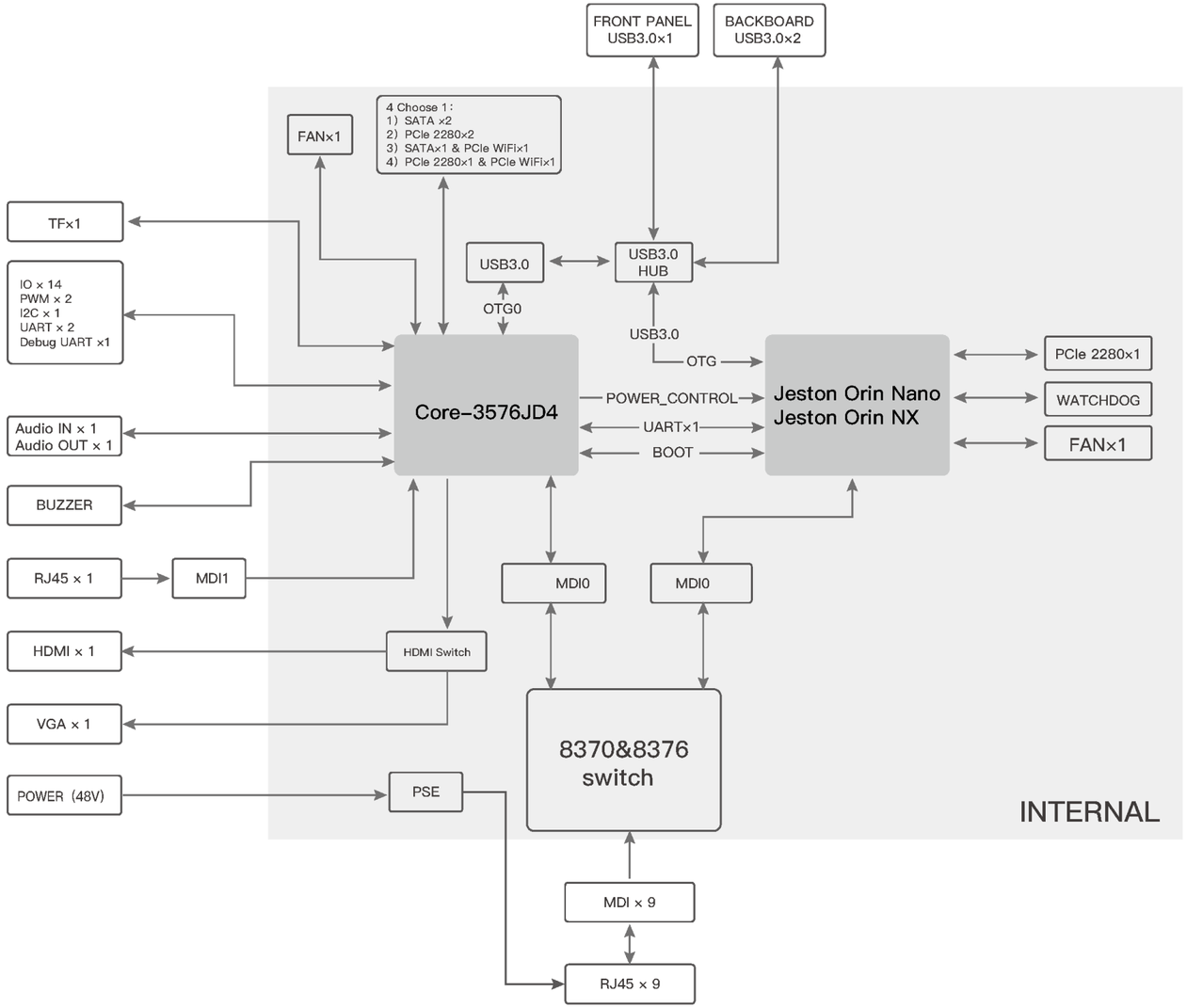
Interface description



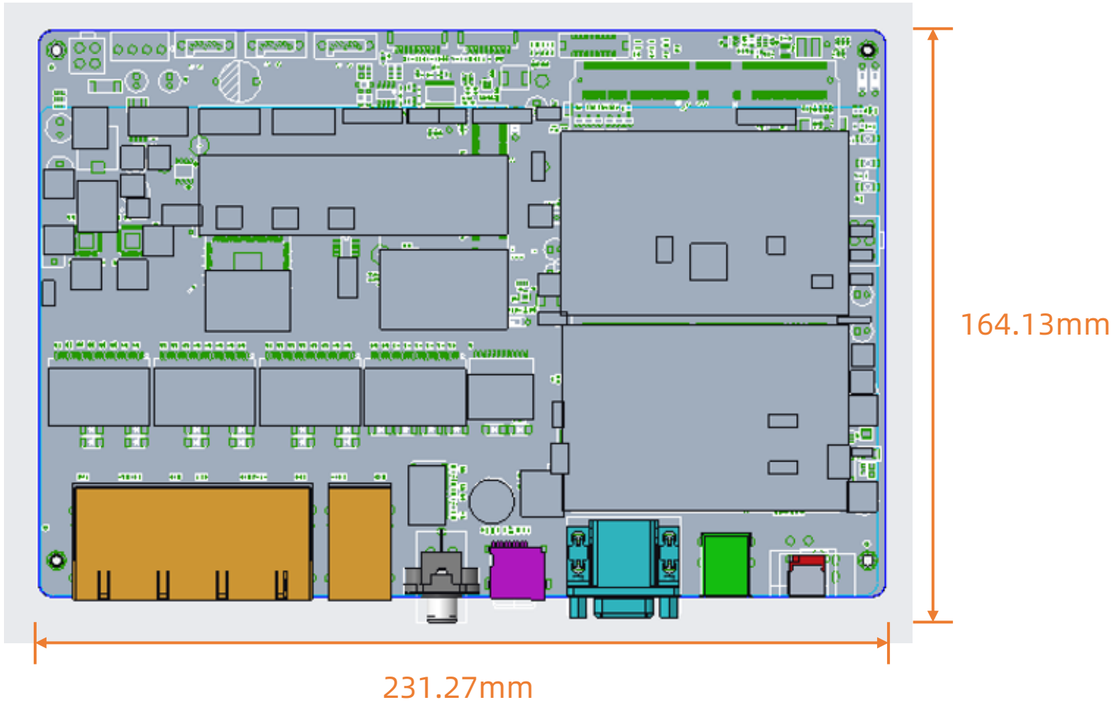


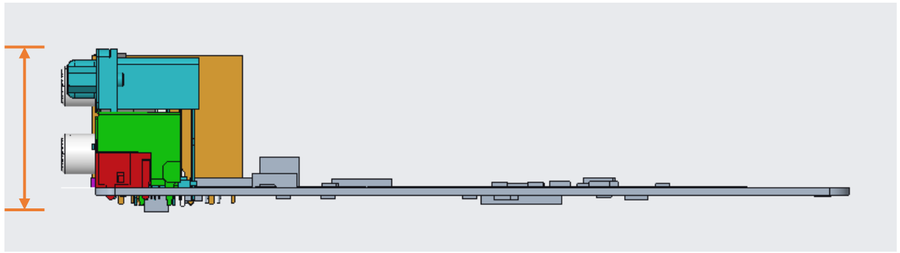
Main mod	When only installing the main mod	Sub mod	When installing the sub mod
Core-3588JD4	1) SATA0, PCIe0, PCIe WiFi(M.2) : Choose one of three 2) SATA1, PCIe1, Connect the sub mod: Choose one of three 3) SATA2 available (dedicated to the main mod Core-3588JD4, not available for other modules) 4) Other PCIe/SATA are not available	1) You can choose anyone of the main mod 2) The sub mod can be empty	1) RES_PCIe are available 2) PCIe2 is only available if the sub mod is: Core-3588JD4 / Jetson Orin Nano / Jetson Orin NX
Core-3576JD4	1) SATA0, PCIe0, PCIe WiFi(M.2) : Choose one of three 2) SATA1, PCIe1: Choose one of two 3) Other PCIe/SATA are not available		
Core-1688JD4	1) SATA0, PCIe0, PCIe WiFi(M.2) : Choose one of three 2) PCIe1: available 3) Other PCIe/SATA are not available		
Jetson Orin Nano/ Jetson Orin NX	1) PCIe0, PCIe WiFi(M.2) : Choose one of two 2) PCIe1: available 3) TF Card, management network port: not available 4) Other PCIe/SATA are not available		

Topology diagram



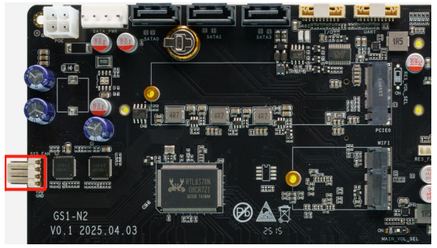
Dimension





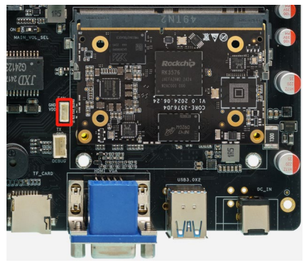
Interface definition

1.(J23)FAN: 4PIN 2.54mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	FAN TACH Input	3.3
2	VSYS_12V (12V Output)	12	4	FAN_PWM Output	3.3

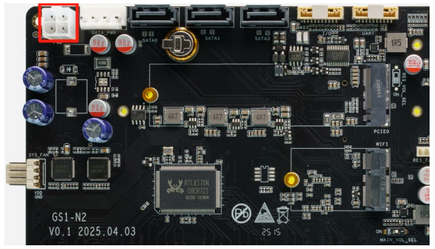
2.(J6)FAN: 4PIN 1.25mm Pitch wafer



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	FG Input	3.3
2	FAN+(5V Output)	5	4	FAN_PWM Output	5

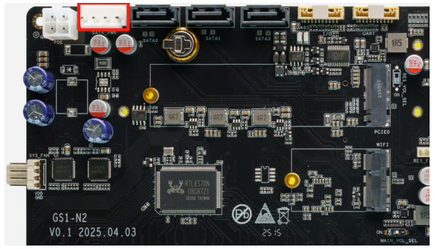
Interface definition

3.(J15)POE Power Input: 4PIN 4.2mm Pitch (WHITE)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	POE_48V(48V~53V Intput)	48~53
2	GND		4	POE_48V(48V~53V Intput)	48~53

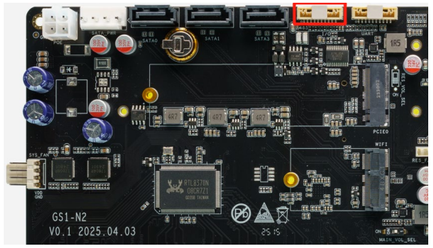
4.(J7)SATA_POWER Output: 4PIN 3.96mm Pitch (WHITE)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	VSYS_12V(12V Output)	12	3	GND	
2	GND		4	VCC5V0_SYS(5V Output)	5

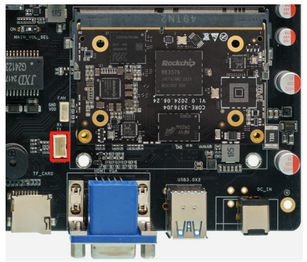
Interface definition

5.(J21)I/O PORT: 10PIN 1.25mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	VSYS_12V(12V Output)	12	6	IO4	1.8
2	RS485_B	3.3	7	IO3	1.8
3	RS485_A	3.3	8	IO2	1.8
4	GND		9	IO1	1.8
5	IO5	1.8	10	VCC5V0_SYS(5V Output)	5

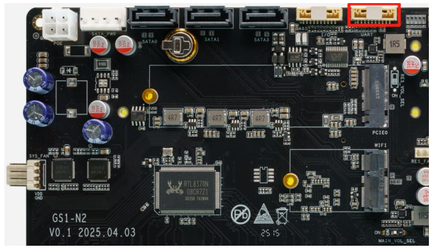
6.(J19)DEBUG_UART: 3PIN 2.0mm Pitch wafer



NO.	Definition	Power/V	NO.	Definition	Power/V
1	UART0_RXD	3.3	3	GND	
2	UART0_TXD	3.3			

Interface definition

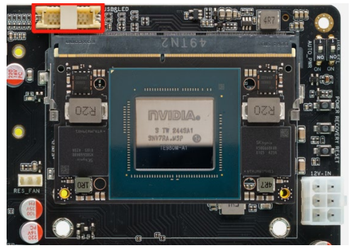
7.(J16)UART PORT: 10PIN 1.25mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	UART4_TX	1.8	6	UART0_RXD	3.3
2	UART4_RX	1.8	7	VCC5V0_SYS(5V Output)	5
3	UART7_TX	1.8	8	VCC5V0_SYS(5V Output)	5
4	UART7_RX	1.8	9	GND	
5	UART0_TXD	3.3	10	GND	

Interface definition

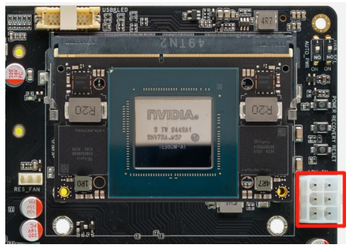
8.(J13)USB&LED: 20PIN(10*2) 1.25mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC5V0_USB_HOST2	5	2	HUB_USB1_SSTX_N	-
3	VCC5V0_USB_HOST2	5	4	HUB_USB1_SSTX_P	-
5	USB20_DM	-	6	GND	
7	USB20_DP	-	8	HUB30_USB1_SSRX_N	-
9	PWR_LED	1.8	10	HUB30_USB1_SSRX_P	-
11	SATA_LED	1.8	12	GND	
13	NET_LED	1.8	14	POWER_KEY_IN(POWER_KEY Input)	5
15	WARN_LED	1.8	16	POWER_KEY_OUT(POWER_KEY Output)	5
17	RES_LED	1.8	18	VCC5V0_SYS(5.0V Output)	5
19	GND		20	GND	

Interface definition

9.(J11)12V_IN: 6PIN 4.2mm Pitch (WHITE)



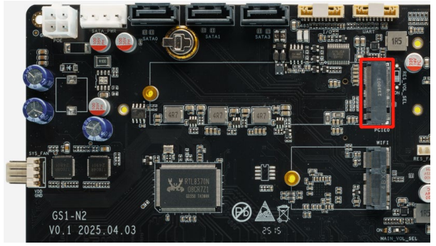
NO.	Definition	Power/V	NO.	Definition	Power/V
1	DC_IN(12V Intput)	12	4	GND	
2	DC_IN(12V Intput)	12	5	GND	
3	DC_IN(12V Intput)	12	6	GND	

10.(J24) RES_FAN: 4PIN 1.25mm Pitch wafer

NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	RES_FAN_TACH Input	5
2	RES_FAN+	5	4	RES_PWM Output	5

Interface definition

11.(U16) PCIE M.2 NGFF M-KEY SOCKET



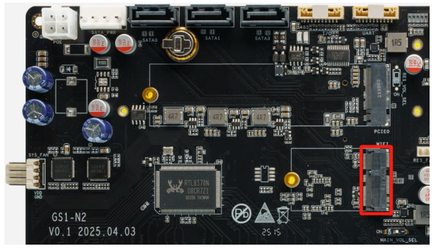
NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	VCC3V3_PCIE1 (3.3V Output)	3.3
3	GND		4	VCC3V3_PCIE1 (3.3V Output)	3.3
5	NC		6	NC	
7	NC		8	NC	
9	GND		10	DAS/DSS [pull up resistor10K]	3.3
11	NC		12	VCC3V3_PCIE1 (3.3V Output)	3.3
13	NC		14	VCC3V3_PCIE1 (3.3V Output)	3.3
15	NC		16	VCC3V3_PCIE1 (3.3V Output)	3.3
17	NC		18	VCC3V3_PCIE1 (3.3V Output)	3.3
19	NC		20	NC	
21	GND		22	NC	
23	NC		24	NC	
25	NC		26	NC	
27	GND		28	NC	

Interface definition

29	NC		30	NC	
31	NC		32	NC	
33	GND		34	NC	
35	NC		36	NC	
37	NC		38	DEVSLP1	3.3
39	GND		40	NC	
41	PCIE0_RX0_P / SATA_RX0_P	-	42	NC	
43	PCIE0_RX0_N / SATA_RX0_N	-	44	NC	
45	GND		46	NC	
47	PCIE0_TX0_N / SATA_TX0_N	-	48	NC	
49	PCIE0_TX0_P / SATA_TX0_P	-	50	PCIE0_RST*	3.3
51	GND		52	PCIE0_CLKREQ*	3.3
53	PCIE0_EP_CLK_N	-	54	PCIE_WAKE*	3.3
55	PCIE0_EP_CLK_P	-	56	NC	
57	GND		58	NC	
67	NC		68	NC	
69	GND		70	VCC3V3_PCIE1 (3.3V Output)	3.3
71	GND		72	VCC3V3_PCIE1 (3.3V Output)	3.3
73	GND		74	VCC3V3_PCIE1 (3.3V Output)	3.3
75	GND				

Interface definition

12.(U52) PCIE-WIFI M.2 Module E-KEY



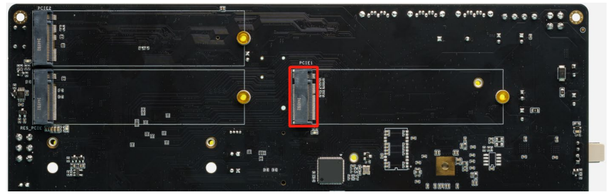
NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	WIFI_3V3 (3.3V Output)	3.3
3	NC		4	WIFI_3V3 (3.3V Output)	3.3
5	NC		6	NC	
7	NC		8	NC	
9	NC		10	NC	
11	NC		12	NC	
13	NC		14	NC	
15	NC		16	NC	
17	NC		18	GND	
19	NC		20	NC	
21	NC		22	NC	
23	NC		32	NC	
33	NC		34	NC	
35	PCIE0_TX0_P / SATA_TX0_P (Series capacitor 220nF)	-	36	NC	

Interface definition

37	PCIE0_TX0_N / SATA_TX0_N (Series capacitor 220nF)	-	38	NC	
39	GND		40	NC	
41	PCIE0_RX0_P / SATA_RX0_P	-	42	NC	
43	PCIE0_RX0_N / SATA_RX0_N	-	44	NC	
45	GND		46	NC	
47	PCIE0_EP_CLK_P	-	48	NC	
49	PCIE0_EP_CLK_N	-	50	32KOUT_WIFI	1.8
51	GND		52	PCIE0_RST*	3.3
53	PCIE0_CLKREQ*	3.3	54	NC	
55	PCIE_WAKE*	3.3	56	WIFI_DISABLE_L	3.3
57	GND		58	NC	
59	NC		60	NC	
61	NC		62	NC	
63	GND		64	NC	
65	NC		66	NC	
67	NC		68	NC	
69	GND		70	NC	
71	NC		72	WIFI_3V3 (3.3V Output)	3.3
73	NC		74	WIFI_3V3 (3.3V Output)	3.3
75	GND				

Interface definition

13.(U4) PCIE M.2 NGFF M-KEY SOCKET



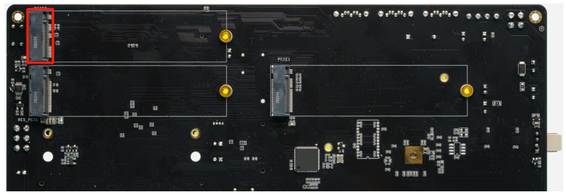
NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	VCC3V3_PCIE0 (3.3V Output)	3.3
3	GND		4	VCC3V3_PCIE0 (3.3V Output)	3.3
5	PCIE1_RX3_N	-	6	NC	
7	PCIE1_RX3_P	-	8	NC	
9	GND		10	DAS/DSS [pull up resistor10K]	3.3
11	PCIE1_TX3_N	-	12	VCC3V3_PCIE0 (3.3V Output)	3.3
13	PCIE1_TX3_P	-	14	VCC3V3_PCIE0 (3.3V Output)	3.3
15	GND		16	VCC3V3_PCIE0 (3.3V Output)	3.3
17	PCIE1_RX2_N	-	18	VCC3V3_PCIE0 (3.3V Output)	3.3
19	PCIE1_RX2_P	-	20	NC	
21	GND		22	NC	
23	PCIE1_TX2_N	-	24	NC	
25	PCIE1_TX2_P	-	26	NC	
27	GND		28	NC	
29	PCIE1_RX1_N	-	30	NC	

Interface definition

31	PCIE1_RX1_P	-	32	NC	
33	GND		34	NC	
35	PCIE1_TX1_N	-	36	NC	
37	PCIE1_TX1_P	-	38	DEVSLP1 [pull up resistor10K]	3.3
39	GND		40	NC	
41	PCIE1_RX0_N	-	42	NC	
43	PCIE1_RX0_P	-	44	NC	
45	GND		46	NC	
47	PCIE1_TX0_N	-	48	NC	
49	PCIE1_TX0_P	-	50	PCIE1_RST*	3.3
51	GND		52	PCIE1_CLKREQ*	3.3
53	PCIE30_PORT0_CLKN	-	54	PCIE_WAKE*	3.3
55	PCIE30_PORT0_CLKP	-	56	NC	
57	GND		58	NC	
67	NC		68	NC	
69	GND		70	VCC3V3_PCIE0 (3.3V Output)	3.3
71	GND		72	VCC3V3_PCIE0 (3.3V Output)	3.3
73	GND		74	VCC3V3_PCIE0 (3.3V Output)	3.3
75	GND				

Interface definition

14.(U60) PCIE M.2 NGFF M-KEY SOCKET



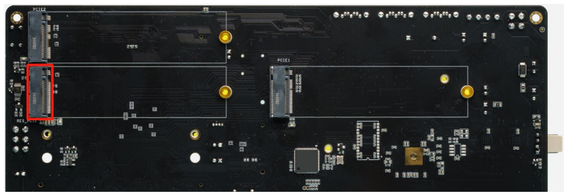
NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	VCC3V3_PCIE2 (3.3V Output)	3.3
3	GND		4	VCC3V3_PCIE2 (3.3V Output)	3.3
5	NC		6	NC	
7	NC		8	NC	
9	GND		10	DAS/DSS [pull up resistor10K]	3.3
11	NC		12	VCC3V3_PCIE2 (3.3V Output)	3.3
13	NC		14	VCC3V3_PCIE2 (3.3V Output)	3.3
15	GND		16	VCC3V3_PCIE2 (3.3V Output)	3.3
17	NC		18	VCC3V3_PCIE2 (3.3V Output)	3.3
19	NC		20	NC	
21	GND		22	NC	
23	NC		24	NC	
25	NC		26	NC	
27	GND		28	NC	
29	PCIE2_RX1_N	-	30	NC	

Interface definition

31	PCIE2_RX1_P	-	32	NC	
33	GND		34	NC	
35	PCIE2_TX1_N (Series capacitor 220nF)	-	36	NC	
37	PCIE2_TX1_P (Series capacitor 220nF)	-	38	NC	
39	GND		40	NC	
41	PCIE2_RX0_N	-	42	NC	
43	PCIE2_RX0_P	-	44	NC	
45	GND		46	NC	
47	PCIE2_TX0_N (Series capacitor 220nF)	-	48	NC	
49	PCIE2_TX0_P (Series capacitor 220nF)	-	50	PCIE2_RST*	3.3
51	GND		52	PCIE2_CLKREQ*	3.3
53	PCIE2_CLK_N	-	54	PCIE_WAKE*	3.3
55	PCIE2_CLK_P	-	56	NC	
57	GND		58	NC	
67	NC		68	NC	
69	GND		70	VCC3V3_PCIE2 (3.3V Output)	3.3
71	GND		72	VCC3V3_PCIE2 (3.3V Output)	3.3
73	GND		74	VCC3V3_PCIE2 (3.3V Output)	3.3
75	GND				

Interface definition

15.(U24) PCIE M.2 NGFF M-KEY SOCKET



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	VCC3V3_PCIE0_RES(3.3V Output)	3.3
3	GND		4	VCC3V3_PCIE0_RES(3.3V Output)	3.3
5	NC		6	NC	
7	NC		8	NC	
9	GND		10	DAS/DSS [pull up resistor10K]	3.3
11	NC		12	VCC3V3_PCIE0_RES(3.3V Output)	3.3
13	NC		14	VCC3V3_PCIE0_RES(3.3V Output)	3.3
15	GND		16	VCC3V3_PCIE0_RES(3.3V Output)	3.3
17	NC		18	VCC3V3_PCIE0_RES(3.3V Output)	3.3
19	NC		20	NC	
21	GND		22	NC	
23	NC		24	NC	
25	NC		26	NC	
27	GND		28	NC	
29	NC		30	NC	

Interface definition

31	NC		32	NC	
33	GND		34	NC	
35	NC		36	NC	
37	NC		38	RES_DEVSLP [pull up resistor10K]	3.3
39	GND		40	NC	
41	PCIE2_RX0_N	-	42	NC	
43	PCIE2_RX0_P	-	44	NC	
45	GND		46	NC	
47	RES_PCIE1_TX0_N (Series capacitor 100nF)	-	48	NC	
49	RES_PCIE1_TX0_P (Series capacitor 100nF)	-	50	RES_PCIE1_RST*	3.3
51	GND		52	RES_PCIE1_CLKREQ*	3.3
53	RES_PCIE1_EP_CLK_N	-	54	PCIE_WAKE*	3.3
55	RES_PCIE1_EP_CLK_P	-	56	NC	
57	GND		58	NC	
67	NC		68	NC	
69	GND		70	VCC3V3_PCIE0_RES (3.3V Output)	3.3
71	GND		72	VCC3V3_PCIE0_RES (3.3V Output)	3.3
73	GND		74	VCC3V3_PCIE0_RES (3.3V Output)	3.3
75	GND				

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