



User Manual

Aicotek NVIDIA Jetson AGX THOR AI BOX AIPC-633

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NVIDIA Jetson AGX THOR AI BOX

AIPC-633 User Manual

History

Revision History	Changes	Date
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Safety Precautions

- (1) Please read and follow the safety precautions before you are going to use it.
- (2) Pay attention to the labels on the product.
- (3) Make sure to use in an environment that meets the design specifications, otherwise, malfunction or partial damage caused by non-compliance with relevant regulations is not covered under the product quality guarantee.
- (4) Please unplug the power cord and do not use liquids to clean the PC.
- (5) Please keep the PC in a safe space to prevent it from falling and damaging its components.
- (6) Please keep the power cord in a safe location to avoid causing personal injury.
- (7) Please do not bundle control wires, communication cables and power wires together, it would be better to keep a distance of at least 100mm between them to avoid mutual interference.
- (8) It is recommended to use wires with isolation, especially in environments with severe electromagnetic interference.
- (9) Please disconnect it from the power socket if the PC is not used for a long time.
- (10) Please make sure that no liquids enter the device to avoid the risk of fire or short circuit.
- (11) Please disconnect the power cord before opening the computer case.
- (12) Please clean the dust regularly.
- (13) Please ask for technical support and return the PC to RMA:
 - The power cord or plug is damaged;
 - Liquid has entered the interior of the PC;
 - PC doesn't work;
 - PC is damaged;
 - Physical damage on the PC.

Chapter 1 System Overview

1.1 System Introduction

AIPC-633 adopts the NVIDIA Jetson Thor module, which is compact in size, powerful in computing power, effectively resistant to interference and shockproof, and features a rich array of interfaces. It is an ideal platform for the brain controller of humanoid robots. It can be widely applied in cutting-edge robot scenarios such as intelligent manufacturing, warehousing and logistics, special operations, home services, medical care, education, and entertainment robots.

1.2 Product Specifications

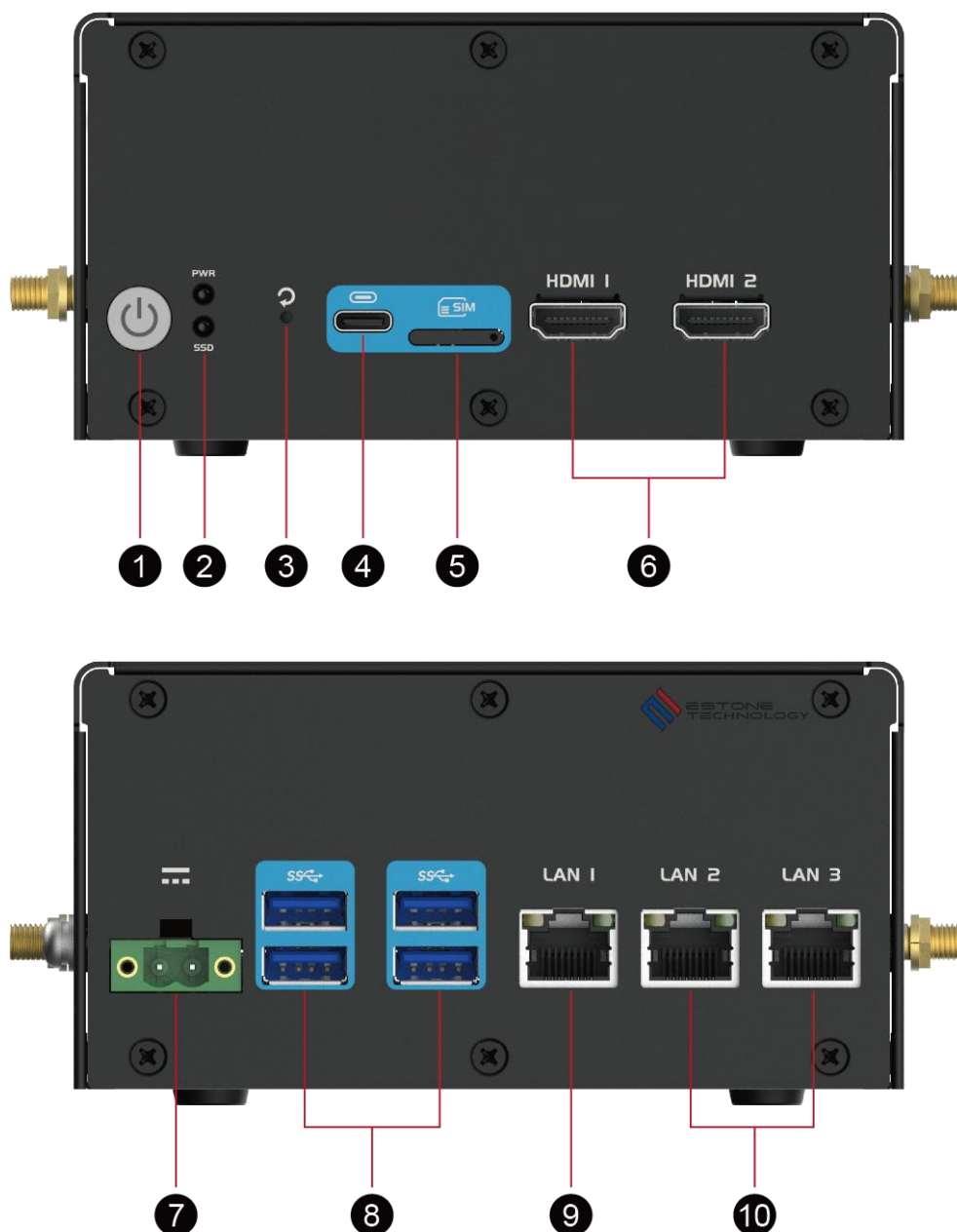
Model Name		AIPC-633
System	CPU	T4000: 12-core Arm® Neoverse®-V3AE 64-bit, T5000: 14-core Arm® Neoverse®-V3AE 64-bit
	GPU	T4000: 1536-core NVIDIA Blackwell architecture GPU with 64 fifth-gen Tensor Cores Multi-Instance GPU (MIG) with 6 TPCs, T5000: 2560-core NVIDIA Blackwell architecture GPU with 96 fifth-gen Tensor Cores Multi-Instance GPU (MIG) with 10 TPCs
	NPU	T4000: 1200 Sparse FP4 TFLOPs, 600 Sparse/300 Dense FP8 TFLOPs, T5000: 2070 Sparse FP4 TFLOPs, 1035 Sparse/500 Dense FP8 TFLOPs
	Memory	T4000: 64GB, T5000: 128GB
	Storage	1 x M.2 M Key 2280 NVMe
	LAN	1 x RJ45, 10/100/1000Mbps, 2 x RJ45, 2.5G/5G/10G optional
	Expansion	1 x M.2 E Key 2230 (for WiFi5/6), 1 x M.2 B Key 3040/3050 (for 4G/5G)
	Display	2 x HDMI 2.1 output, Up to 4096 x 2160@60Hz
	USB	4 x USB3.2 Gen1 Type-A, 1 x USB3.2 Gen1 Type-C
	SIM Card	1 x SIM Card slot
	LED	1 x Power LED, 1 x HDD LED
	Button	1 x Power button, 1 x Recovery
	TPM	TPM2.0
	Watchdog	255 levels of programmable seconds per minute
OS	OS Support	Ubuntu24.04 (Jetpack7.0)
Power	Input Voltage	9~36V DC IN, 5.08mm Phoenix Terminal

Mechanical	Dimensions	130x125x70mm (5.1x4.9x2.8 in)
	Installation	desktop installation, wall-mounted
Environment	Operating Temperature	-25~60℃ (-13~140 °F)
	Storage Temperature	-40~85℃ (-40~185 °F)
	Relative Humidity	10%~90% (non-condensing)
	Vibration	With SSD solid-state drive: Operating state, 2Grs@5~500Hz, IEC 60068-2-64
	Shock	With SSD solid-state drive: working state, 15G@11ms half sine wave
Options	EMC	CE FCC
	Model	Model1: T4000, 1200TOPS, 70W, Model2: T5000, 2070TOPS, 130W
	Storage	M.2 2280 NVMe 128GB, 236GB, 512GB, 1TB
	WiFi & Bluetooth	AP12275_M2P
	4G/5G	RM500U-CNv

1.3 Indicator light status

Indicator light	Status	Description
PWR	Not Lit	The equipment has stopped running
	Steady On	The power-on status of the equipment
SSD	Not Lit	No data transmission
	Lit and Flashing	There is data transmission
LAN	Off	No connection
	Yellow	Connection
	Blinking Green	There is data transmission

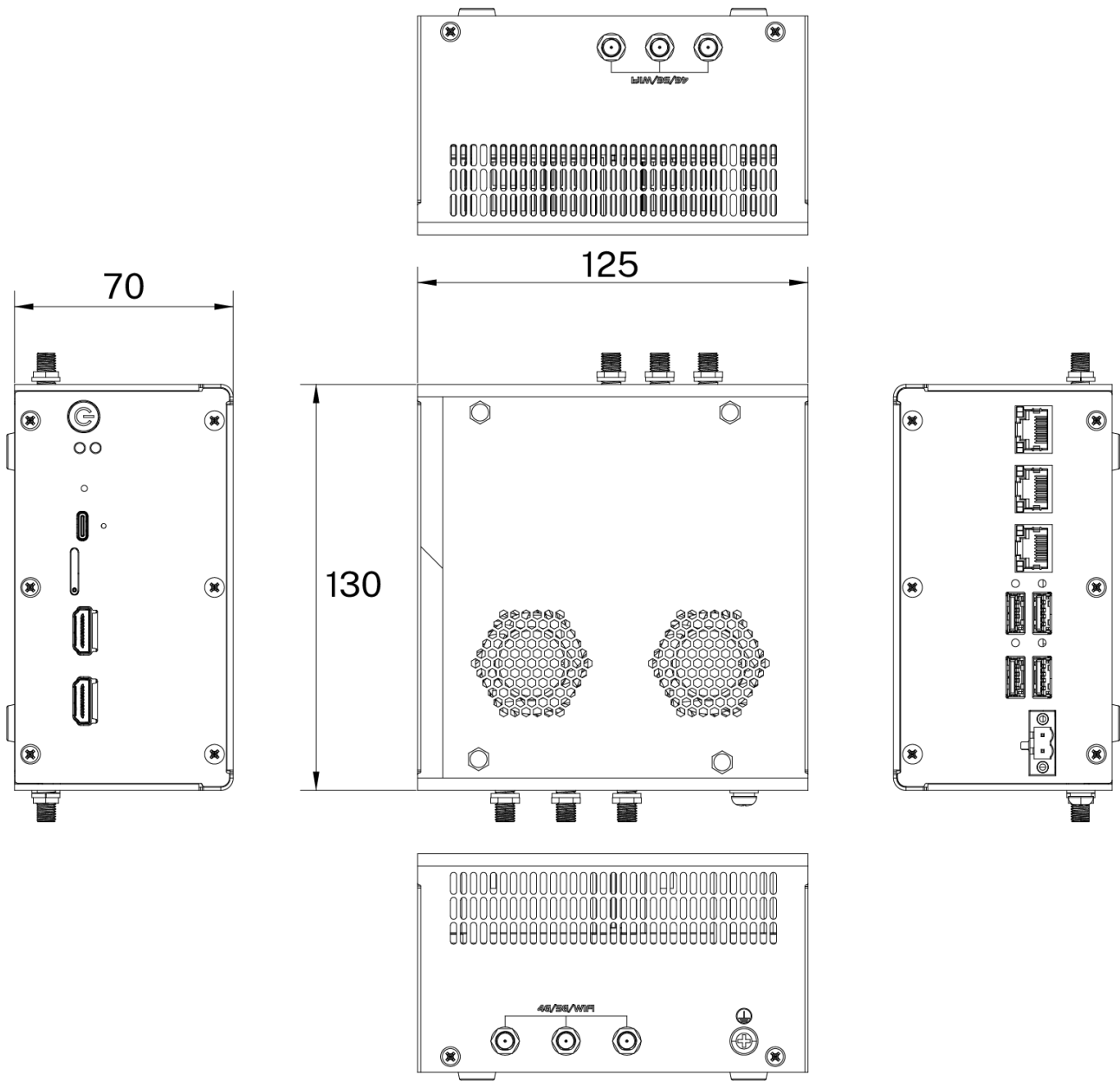
1.4 External I/O



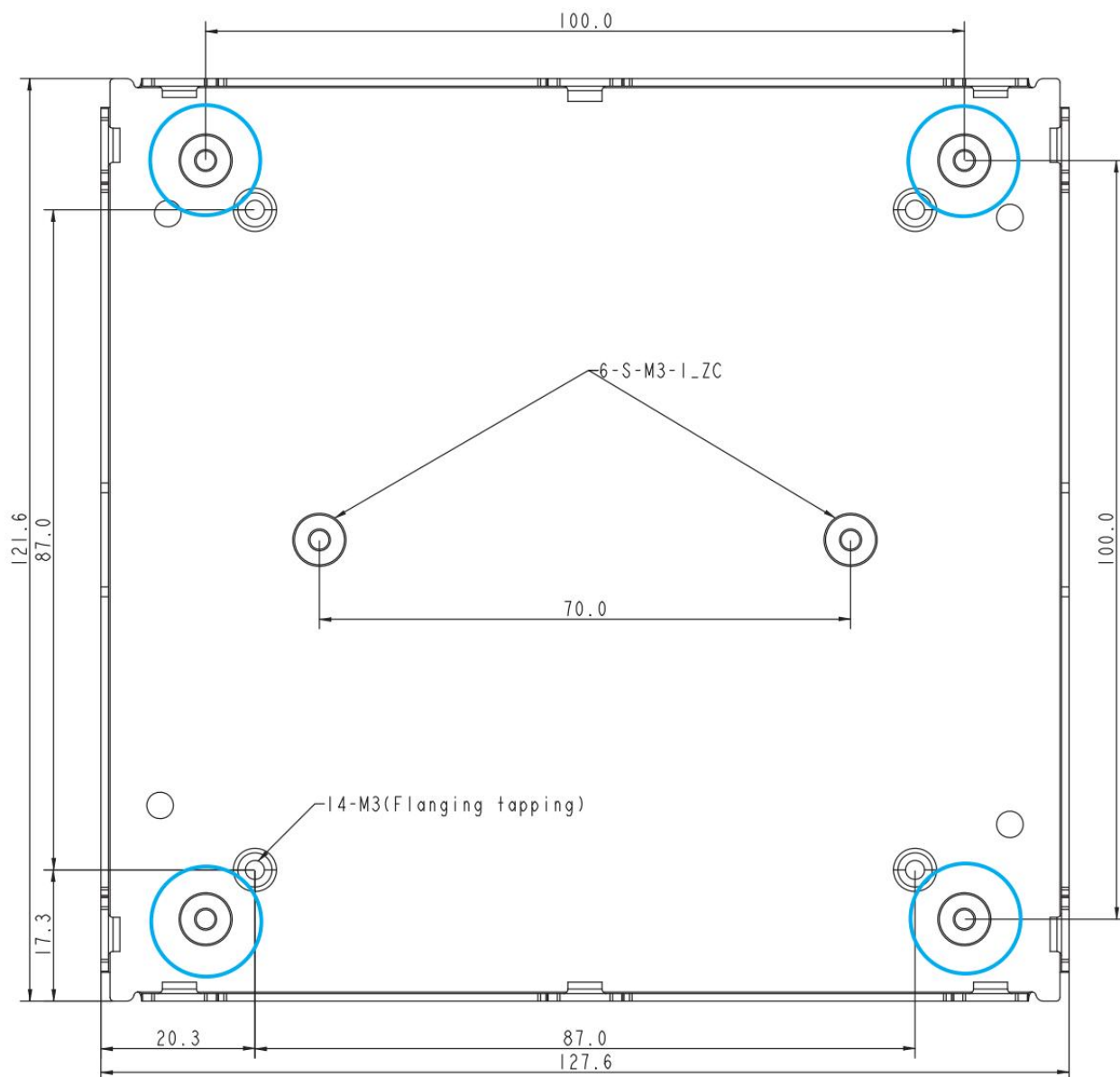
1	Power Button	6	2 x HDMI2.1, 4K@60Hz
2	1 x Power LED, 1 x HDD LED	7	9~36V DC IN
3	Recovery	8	4 x USB3.2 Gen1 Type-A
4	USB3.2 Gen1 Type-C	9	1 x RJ45, 1000Mbps
5	SIM Card slot	10	2 x RJ45, 2.5G/5G/10G options

1.5 Dimensions

Unit: mm

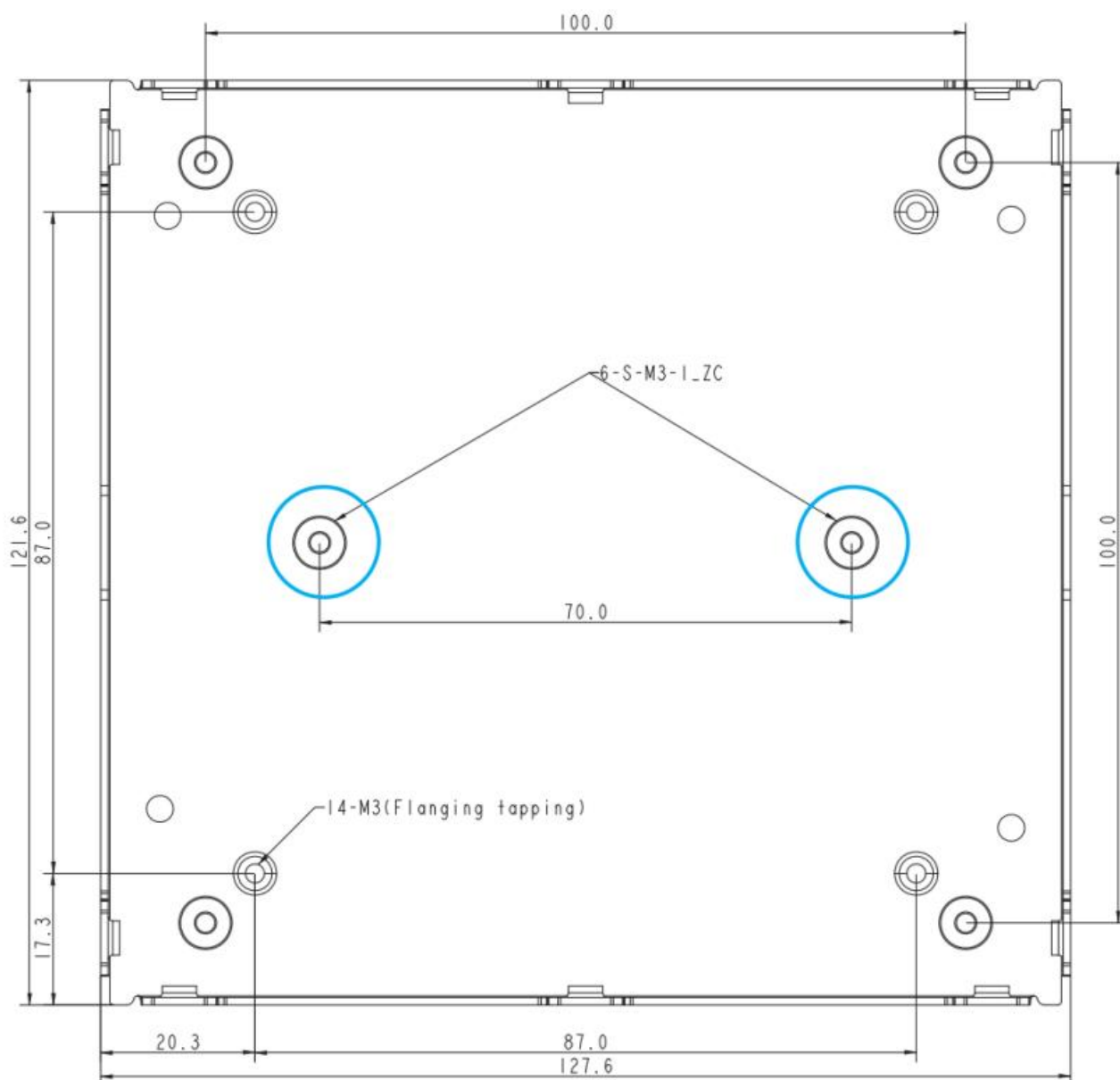


1.6 VESA bracket installation hole location diagram



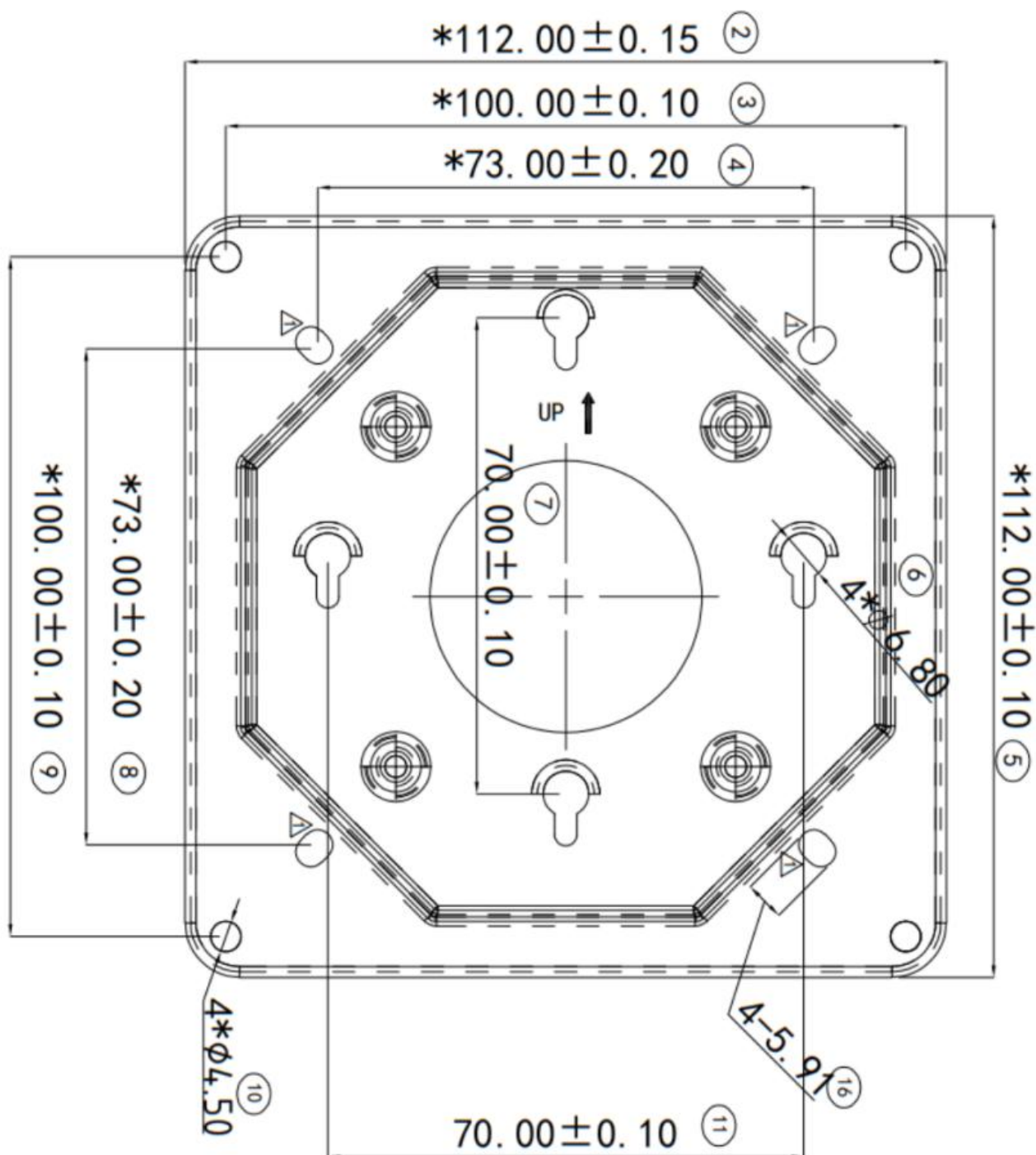
1.7 Wall-mounted

Wall-mounted bracket installation hole position diagram



1.8 Installation bracket

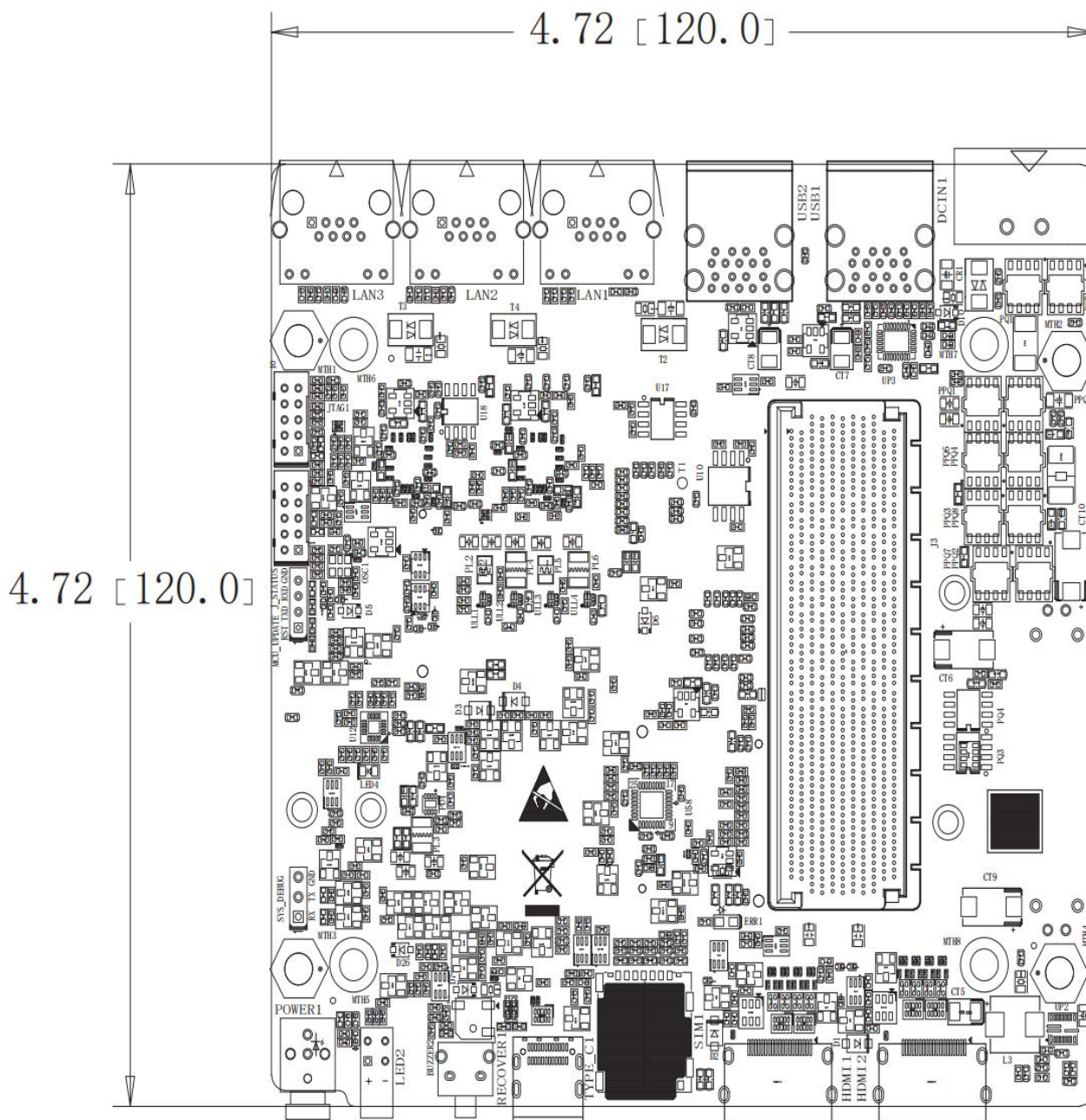
Installation hole position diagram of wall-mounted bracket accessories
(standard configuration upon shipment)



Chapter 2 Motherboard Introduction

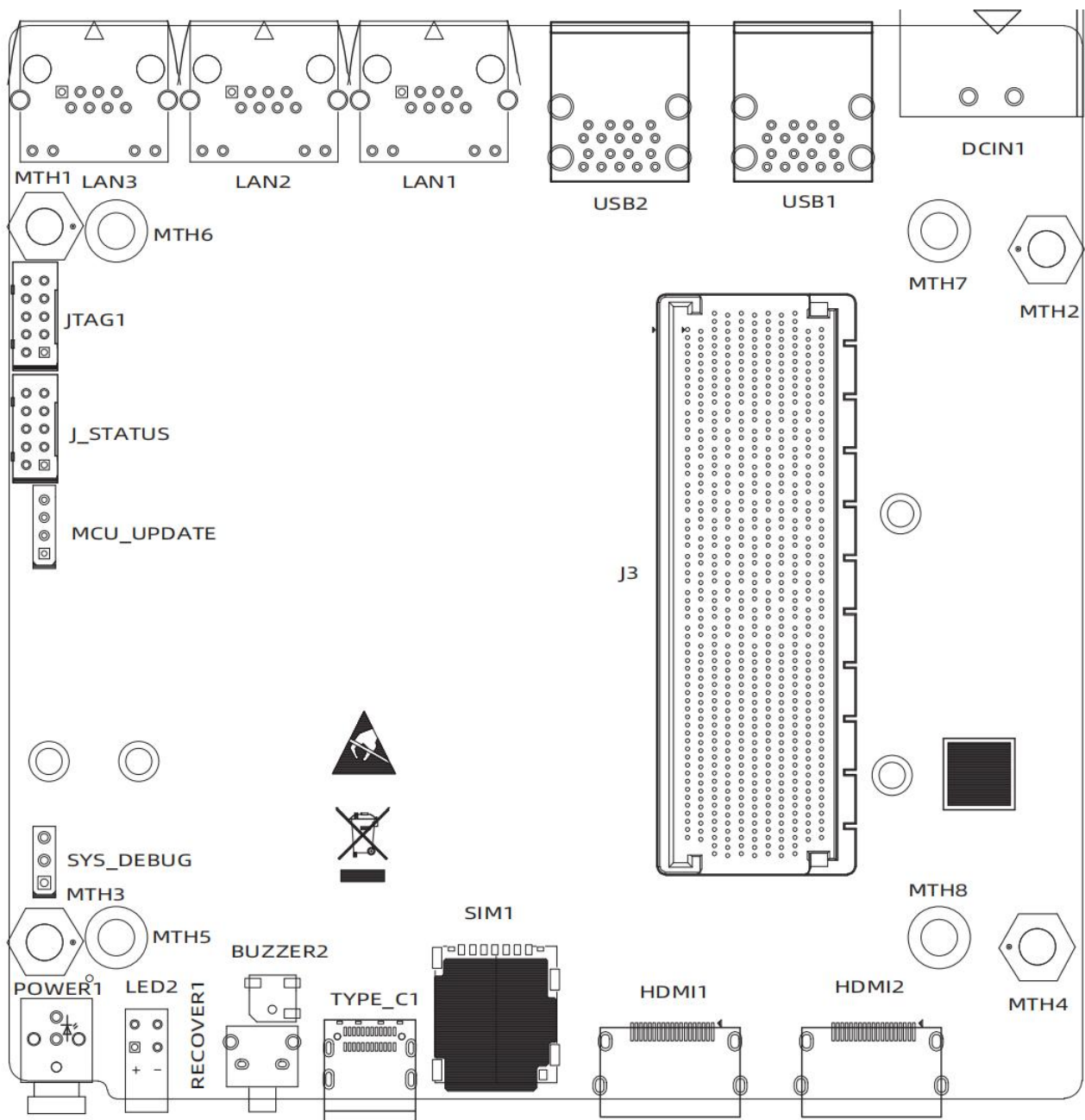
2.1 Motherboard structure diagram

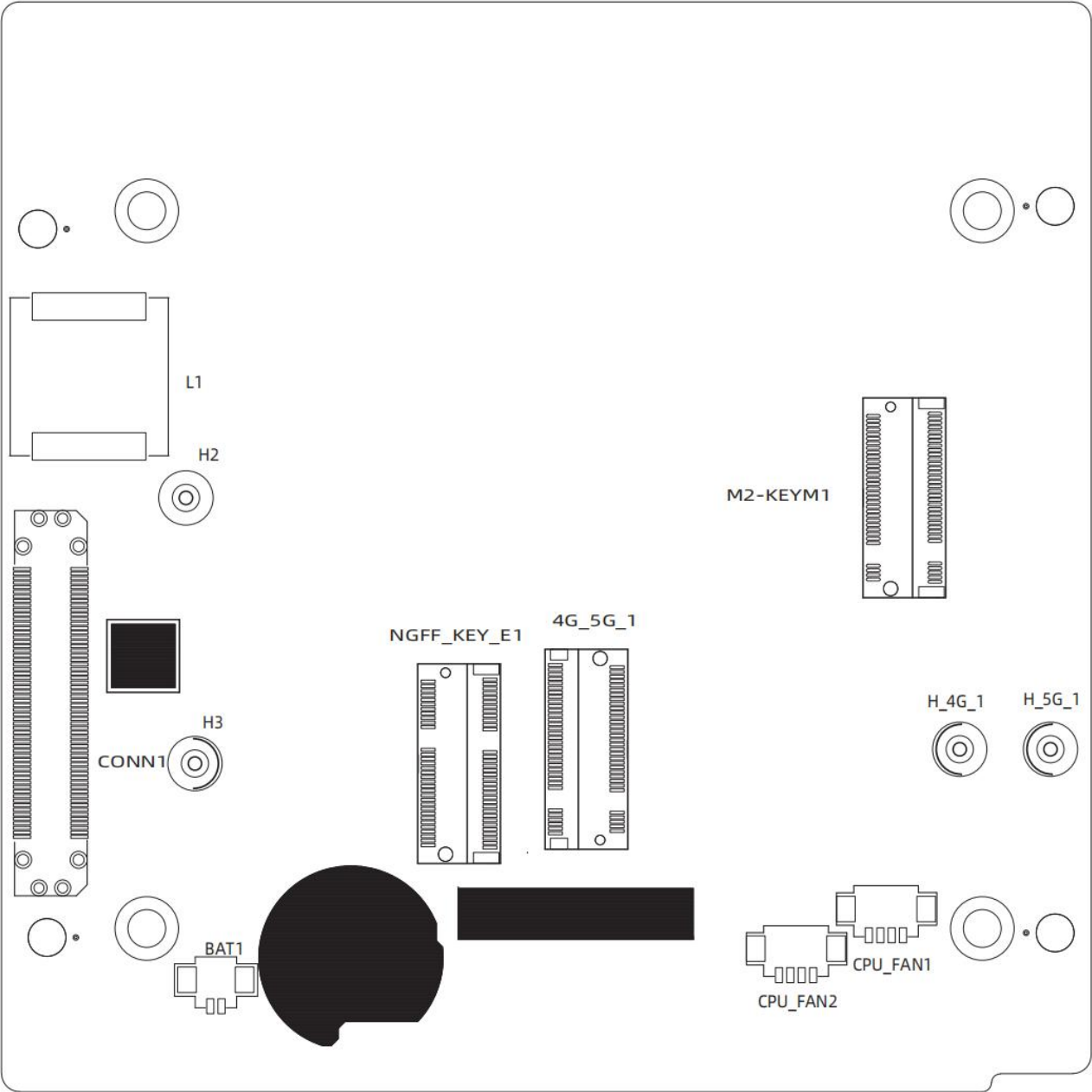
120x120mm (4.72x4.72 in)



(This picture is for reference only. Please refer to the actual product.)

2.2 Motherboard layout diagram





2.3 Onboard interface definition

2.3.1 Jumper and socket introduction

2-pin connector: Inserting the jumper cap into two pins will close it (short circuit). Remove the jumper cap or insert other pins. (Reserved for future expansion) will enable it.

3-pin connector: The jumper cap can be inserted into pins 1 to 2 or pins 2 to 3 to close (short-circuit).

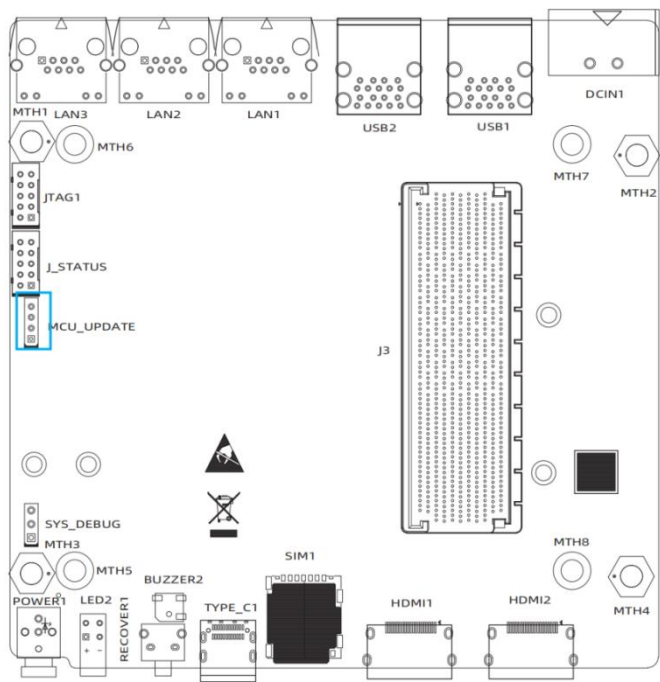


How to identify the position of the first pin of a jumper?

(1) Please carefully inspect the motherboard. Any pin marked with "1" or a thick white line indicates the position of pin 1.

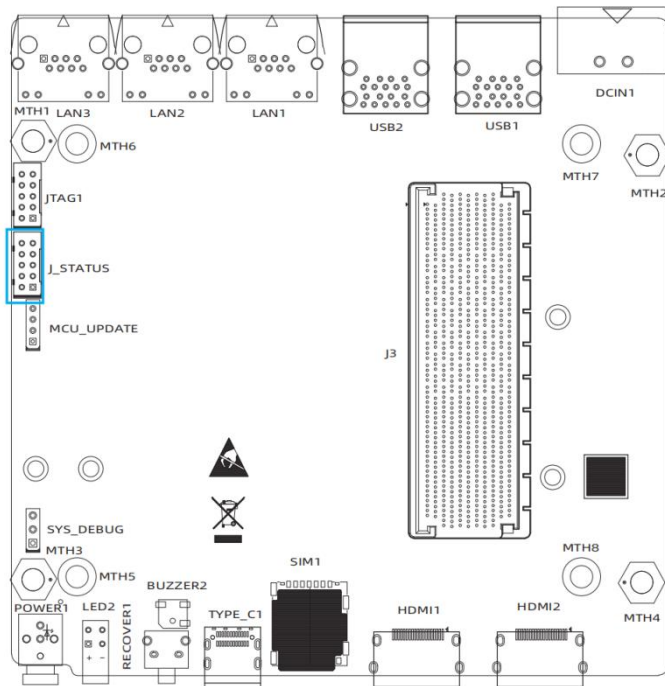
(2) Observe the pads on the backplane. Usually, the square pads are the first pin.

2.3.2 MCU_UPDATE pin interface



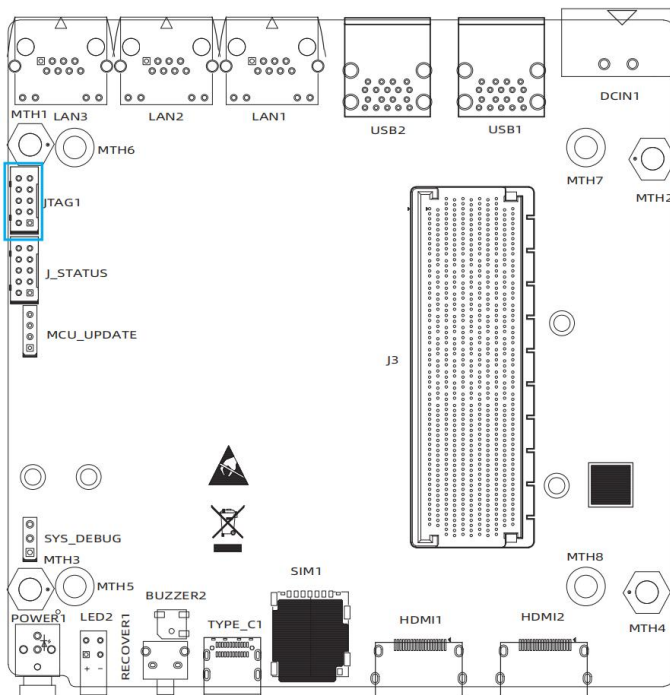
Pin	definition
1	RESET#
2	ICE_DAT
3	ICE_CLK
4	GND

2.3.3 J_STATUS pin interface



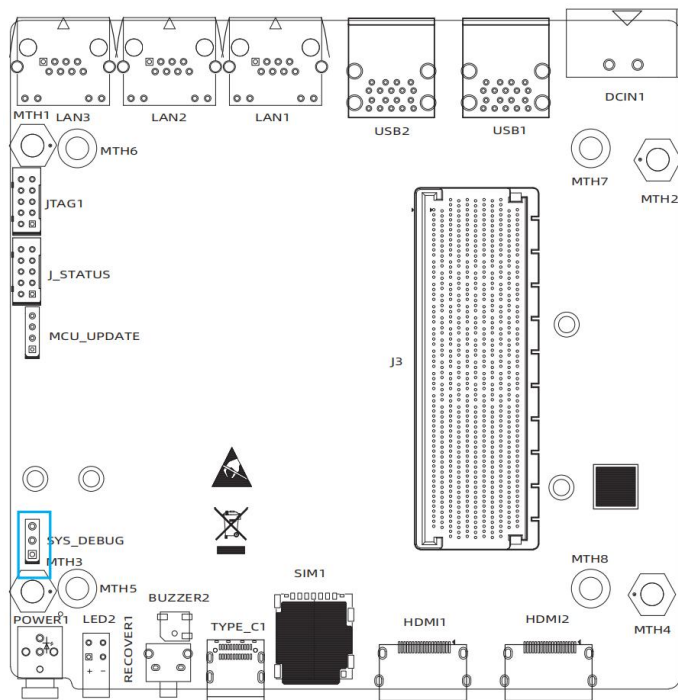
Pin	Definition	Pin	Definition
1	LED+	2	PWRON
3	GND	4	LED-
5	REC	6	STBY
7	SYS_OC	8	WOLEN
9	GND	10	RST

2.3.4 JTAG1 pin interface



Pin	Definition	Pin	Definition
1	+1.8V	2	TMS
3	GND	4	TCK
5	GND	6	TDO
7	GND	8	TDI
9	GND	10	RST

2.3.5 SYS_DEBUG pin interface



Pin	Definition
1	RX
2	TX
3	GND

Chapter 3 List of compatible camera models

NPC-75X2 Controller Whole Machine Camera Adaptation Table					
Camera brand/model	Adaptation status	Output pixels	Synchronous mode	Output data format	Power supply range
Sensing SHF3L	Adapted	1920H*1536V	Hard Sync [Supports 1-30fps]	YUV422	9~16V
Sensing SHW3G-L	In the plan	2064H*1552V	Hard Sync [Supports 1-30fps, MAX125fps]	YUV422	/
Sensing SG3S-ISX031 C-GMSL2F-H xxx	Adapted	1920H*1536V	Hard Sync [Supports 1-30fps]	YUV422	9~16V
Sensing SG2-AR0233 C-5200-G2A-Hxxx	Adapted	1920H*1536V	Hard Sync [Supports 30fps]	YUV422	9~16V
Sensing AR0820C-5300-G2A-Hxxx	In the plan	3840H*2160V	Hard Sync [Supports 1-30fps]	YUV422	9~16V
Orbbec Gemini 336	In the plan	Depth: 1280H*800V@2m	30fps	YUYV & MJPEG	DC 5V & $\geq 1.5A$
Orbbec Gemini 335Le	In the plan	Depth & Infrared: Up to 1280x800@30fps; 848x530@60fps Color: Up to 1280x800@60fps; 1280x720@60fps	/	/	DC 9~24V $\geq 1A$ POE: IEEE802.3af
Orbbec Gemini 335Lg	Adapted	Depth & Infrared: Up to 1280x800@30fps; 1280x530@60fps Color: Up to 1280x800@60fps; 1270x720@60fps	/	/	Best: DC 12V & $\geq 0.7A$ Default: DC12V $\geq 0.5A$

NPC-75X2 Controller Whole Machine Camera Adaptation Table						
Operating temperature range	Optional lens					
	FOV	HFOV	VFOV	F.NO	EFL/mm	WP
-40 ~ +85℃	/	196	154	2	1.51	IP67
-20 ~ +70℃	/	122	90	2.2	1	IP67
-40 ~ 85℃	H30X	30	24	1.6	10.96	M12
	H60FA	60	46	1.6	5.8	IP67
	H100F1A	100	78	1.6	3.55	IP67
	H120UA	118	92	2	3	IP67
	H190XA	196	154	2	1.51	IP67
-40 ~ 85℃	H30X	30	17	1.6	10.96	IP67
	H60FA	60	32	1.6	5.8	IP67
	H100F1A	100	53	1.6	3.55	IP67
	H120UA	118	62	2	3.04	IP67
	H190XA	196	112	2	1.51	IP67
-40 ~ 85℃	H30YA	30	17	1.6	15.3	IP67
	H60SA	64	33	1.8	7.87	IP67
	H120YA	120	66	1.6	4.01	IP67
-10 ~ 85℃	/	Depth: 90 Color: 86	Depth: 65 Color: 55	/	/	IP5X
-10℃~50℃@15fps -10℃~45℃@30/60fps	/	Depth: 90° ± 3° @2m Infrared: 91° ± 3° Color: 94° ± 3°	Depth: 65° ± 3° @2m Infrared: 65° ± 3° Color: 68° ± 3°	/	/	IP67
-10℃~50℃@15fps -10℃~45℃@30/60fps	/	Depth: 90° ± 3° @2m Infrared: 91° ± 3° Color: 94° ± 3°	Depth: 65° ± 3° @2m Infrared: 65° ± 3° Color: 68° ± 3°	/	/	IP65



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