



WhatsMiner Immersion Cooling

Miner

Repair Manual

V1.0



Shenzhen MicroBT Electronics Technology Co., Ltd..

Forward

About this Document

This Document introduces repair methods for immersion cooling miners. All pictures and other information are merely for illustrative purposes.

Symbol instruction

Symbol	Instruction
	Provides additional information to supplement the text.
	Alerts to potential dangers that may cause harm if neglected.

Revision history

Version	Revision Content	Release Time
V1.0	First release	20250822

Legal information

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1. Repair Environment Setup and Tooling Requirements

The following content briefly introduces information related to environmental setup and tool requirements.

1.1 Test Program

You need to use Mobxterm for testing. If you do not have this program, please contact our after-sales personnel.

1.2 Test Command

The following content introduces test commands.

Hashboard test:	ft-readchipid
Power on:	echo 1 > /sys/class/gpio/gpio356/value
cable plug to CB port (0&1)	
RST set 1.8v:	echo 1 > /sys/class/gpio/gpio197/value
RST set 0v:	echo 0 > /sys/class/gpio/gpio197/value
cable plug to CB port (2&3)	
RST set 1.8v:	echo 1 > /sys/class/gpio/gpio202/value
RST set 0v:	echo 0 > /sys/class/gpio/gpio202/value

1.3 Test Fixture CB

The test fixture CB (Control Board, abbreviated as “CB”) is an immersion cooling miner CB (CB4/CB5/CB6).

1.4 Test Cable

The test cable is an immersion cooling miner original cable.

1.5 Fixture CB Connection

The following figure shows a connection method of a fixture CB.

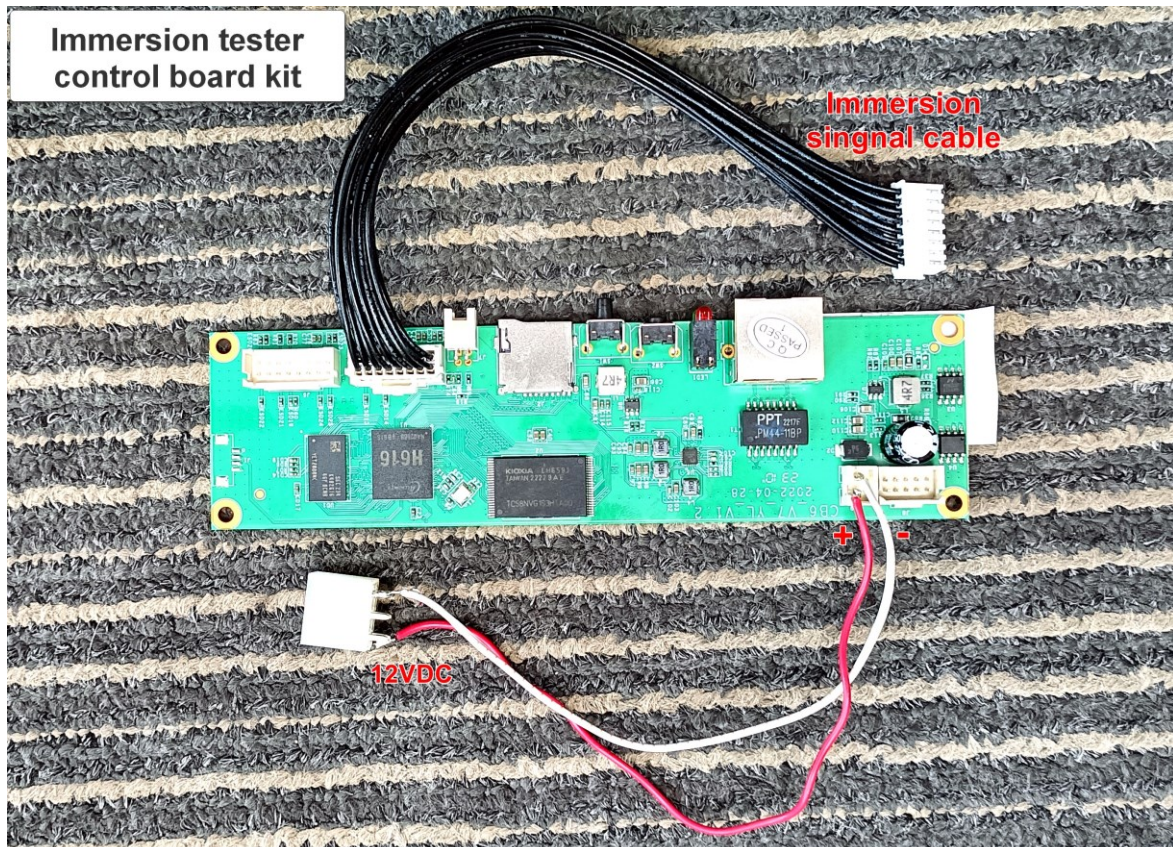


Figure 1-1

1.6 Power Supply Requirements

The test setup requires independent power sources for its components, with the following specifications:

- **Hashboard**
 - Voltage: 25 VDC
 - Current: 15 A
- **Test Control Board (CB)**
 - Voltage: 12 VDC
 - Current: 2 A

1.7 Tools and Accessories

The following tools are required to perform the test and potential rework procedures:

- **Soldering/Rework:** Hot air rework station
- **Measurement Instruments:** Multimeter, and Oscilloscope
- **Hand Tools & Consumables:** Tweezers, Solder Paste, and Solder Flux

2. Introduction to Circuit Principle

2.1 Hashboard Circuit Principle

The following shows a diagram of power supply for series-connected chip domains on a hashboard.

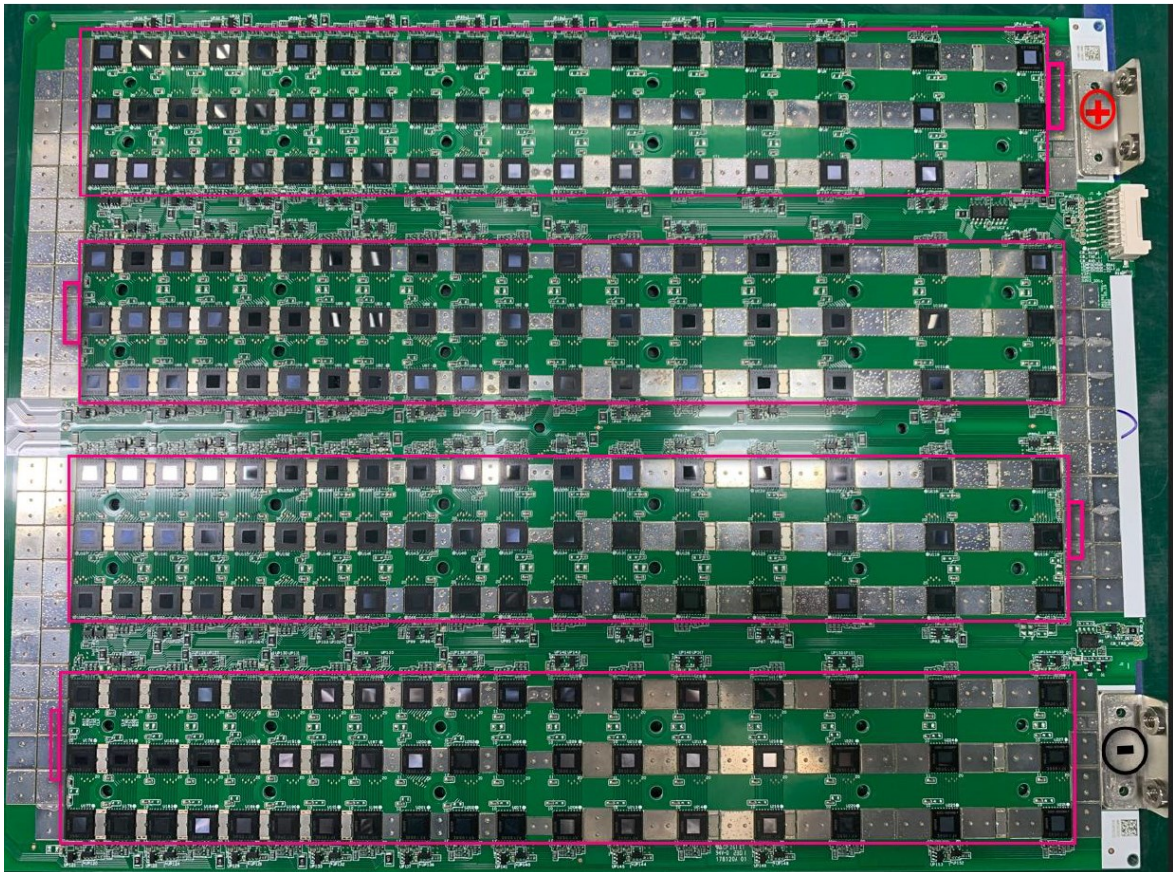


Figure 2-1

Single Flow: A hashboard contains SM0 and SM1.

On SM0: Signals RST, RXD, and CLK are transmitted from U1 to U108; and TXD is transmitted from U108 to U1, and then returned to a control board via UP3.

On SM1: Signals RST and CLK (both from SM0' s U108) and RXD (from a control board via UP2) are transmitted from U109 to U216; TXD is transmitted from U216 back to U109, and

then sent back to the control board via UP2.

RST and CLK are public signals, transmitted from the start to the end across the whole board; and RXD and TXD are private signals belonging to SM0 or SM1, independent of each other.

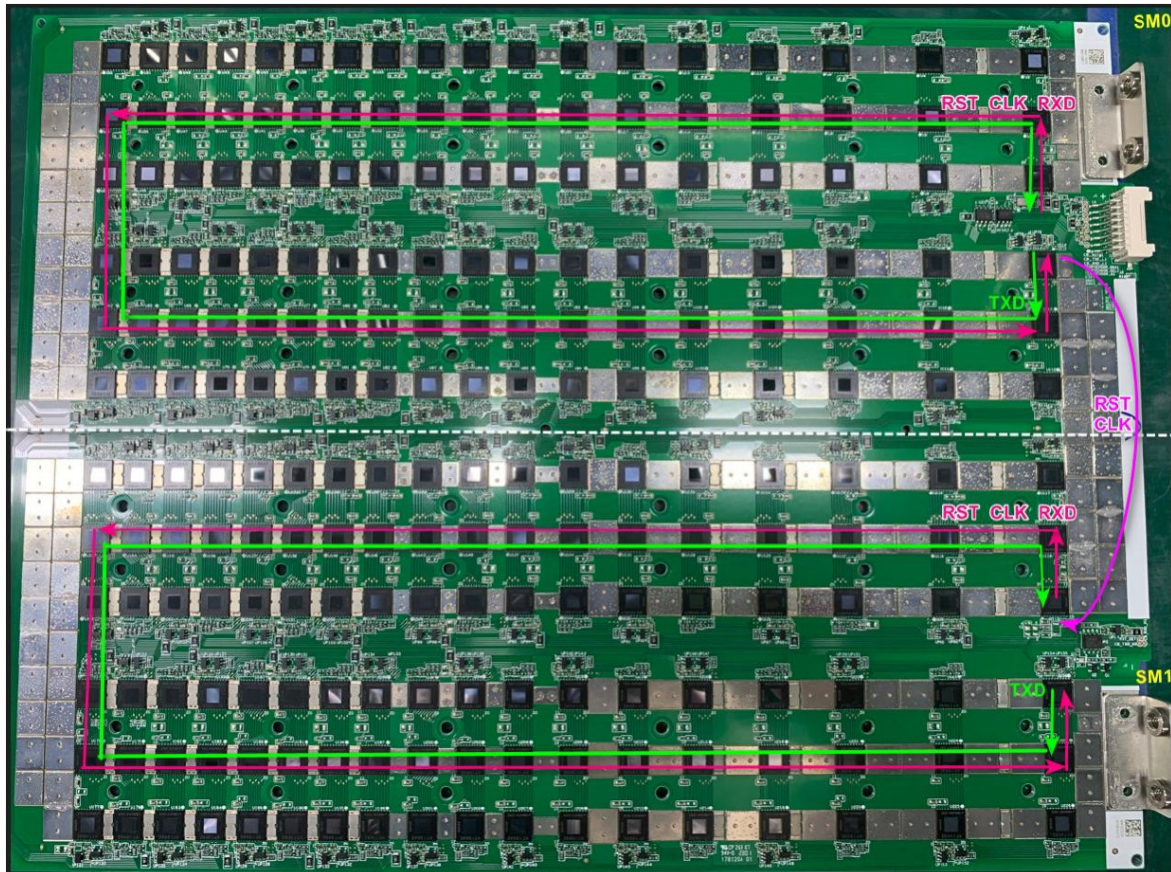


Figure 2-2

2.2 SM0 I/O Port Signal Routing Diagram

The first 9 groups of LDOs of SM0 have their input power supply coming from a control board via an I/O port.

An initial status is low voltage with no input. When test is executed, the control board inputs 3.3V to the first 9 groups of LDOs, and the voltage changes to high voltage.

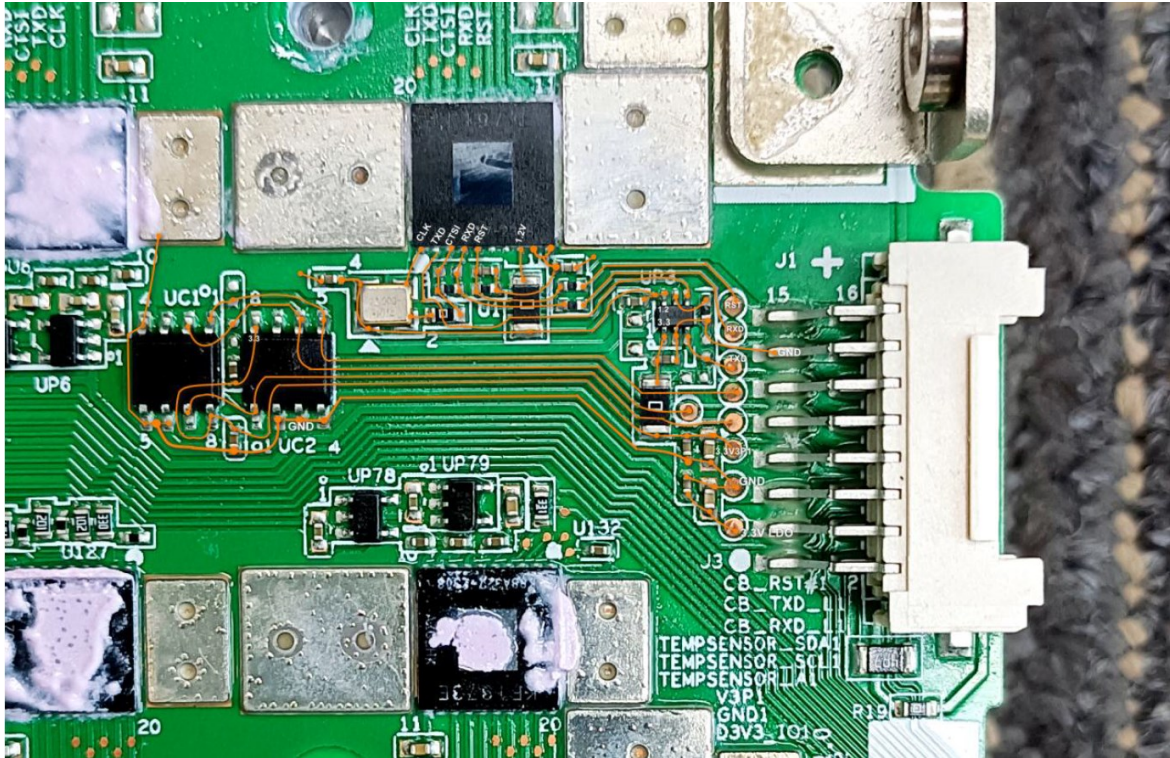


Figure 2-3

2.3 SM1 I/O Port Signal Routing Diagram

Both RXD and TXD go through a UP2 chip for voltage conversion, and enter and exit a control board via an I/O port.

The output voltage of pin 5 of UP1 is 2.5V, which is sent to pin 1 of UP2.

RST and CLK come from the last chip of SM0.

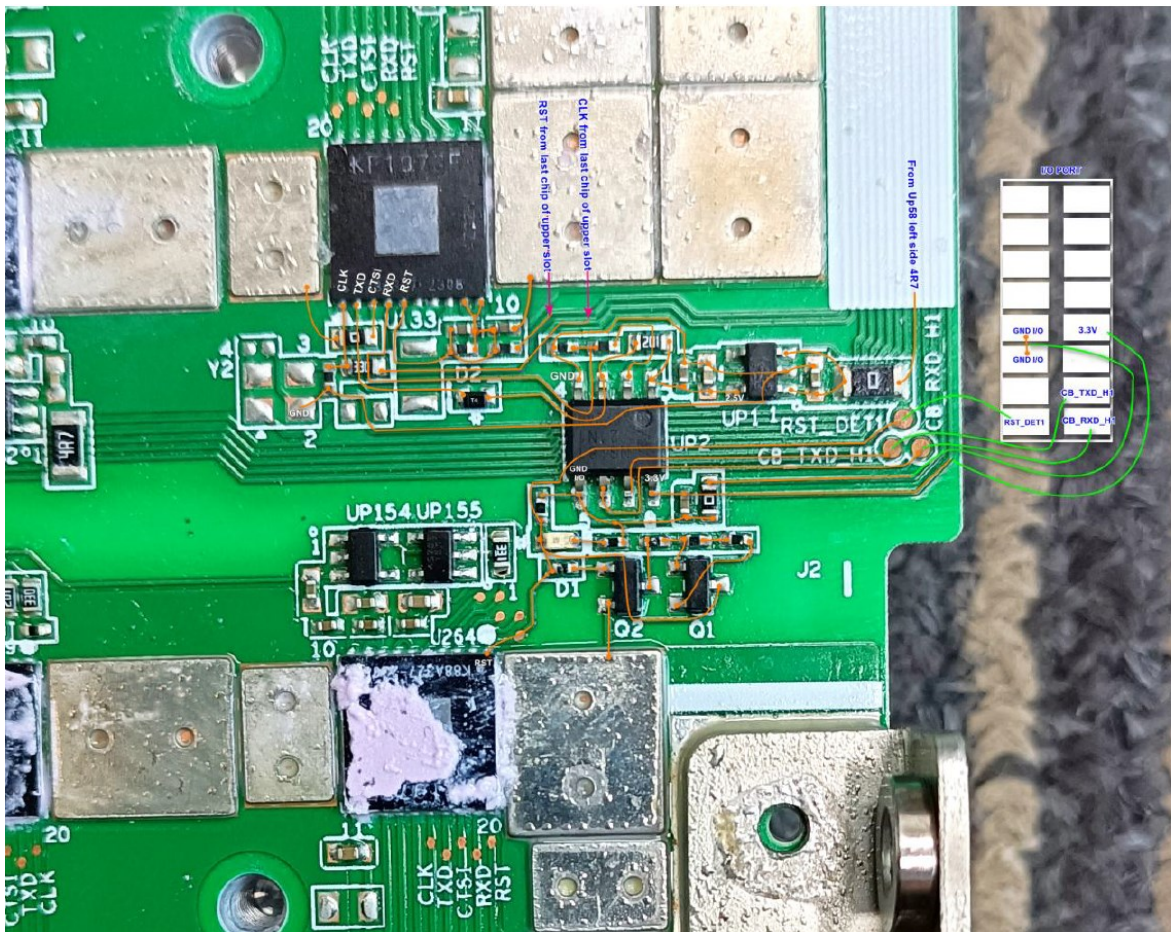


Figure 2-4

2.4 Others

The repair method of other circuits is basically the same as M3X series air cooling hashboard. Please refer to the repair manual of the air cooling miner.

3. Test Safety Notice

Given that the power supply utilizes a 3-phase AC input, to ensure personal safety:

The power connections for the test fixture control board and hashboard power supply must use a three-pin plug (with an earth pin) for reliable grounding.

If measuring signals with an oscilloscope, the oscilloscope must use a two-pin plug (without an earth pin).

Refer to the following figure for details.

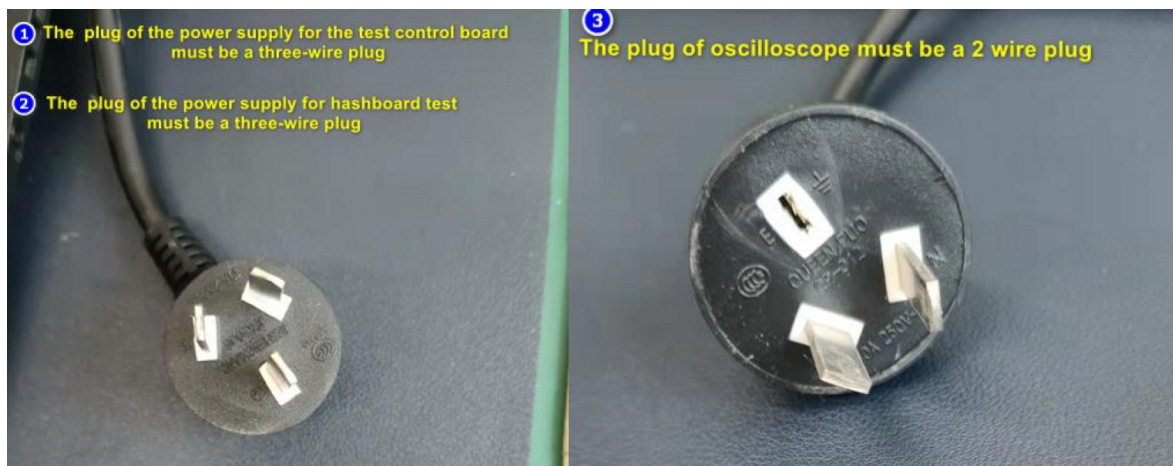


Figure 3-1



Danger: Failure to do so as said above may expose the hashboard to a 110 V AC electric shock hazard.

4. Soldering Requirements

For chip soldering, follow these steps to ensure proper assembly.

Step 1 Preheat the entire board evenly.

This prepares the board for localized heating and minimizes thermal stress.

Step 2 Clean any oil-contaminated areas that need replacement before soldering to ensure a reliable weld.

Step 3 After the above operation, focus heat only on the area where the chip replacement is needed.

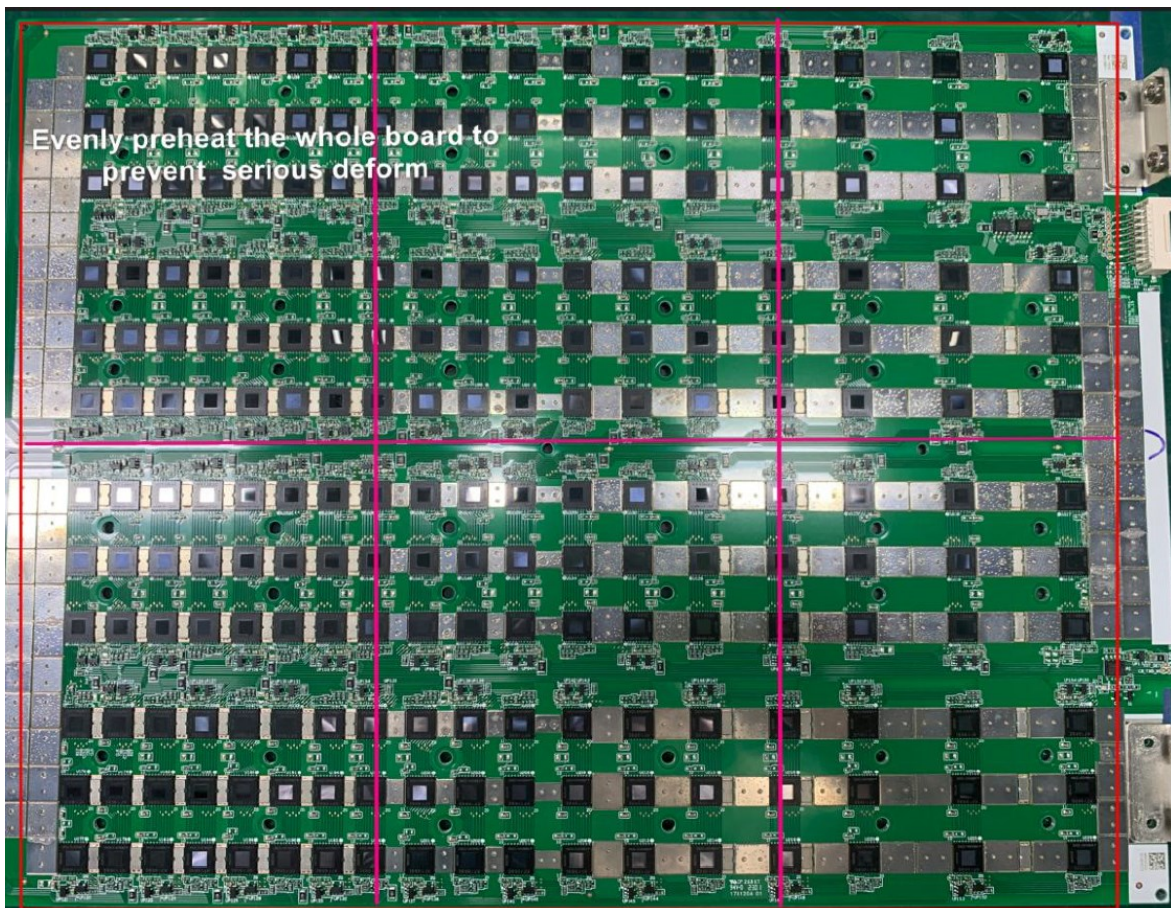


Figure 4-1



Note: If preheating is skipped, thermal deformation may occur. This can cause the following issues:

- Damage to other chips on the board due to uneven heat exposure.
- Pad detachment (the metal pads connecting components to the board may separate from the substrate).
- Complete board failure (rendering the board scrap).

5. Assembly Attention

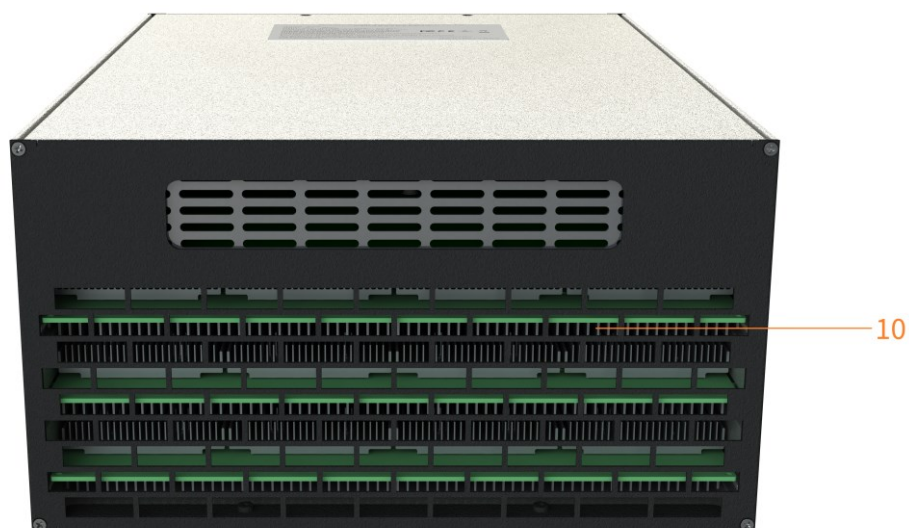
When installing a hashboard onto a cooling plate surface, ensure all screws are tightened evenly and none are missed. This avoids localized poor heat dissipation.

6. Immersion Cooling Miner Overview



- 1. Power supply interface
- 2. Outlet
- 3. Handle
- 4. Control board housing
- 5. Indicator lights
- 6. TF card slot
- 7. IP Found button
- 8. Reset button
- 9. Ethernet interface

Figure 6-1



- 10. Inlet

Figure 6-2



Figure 6-3

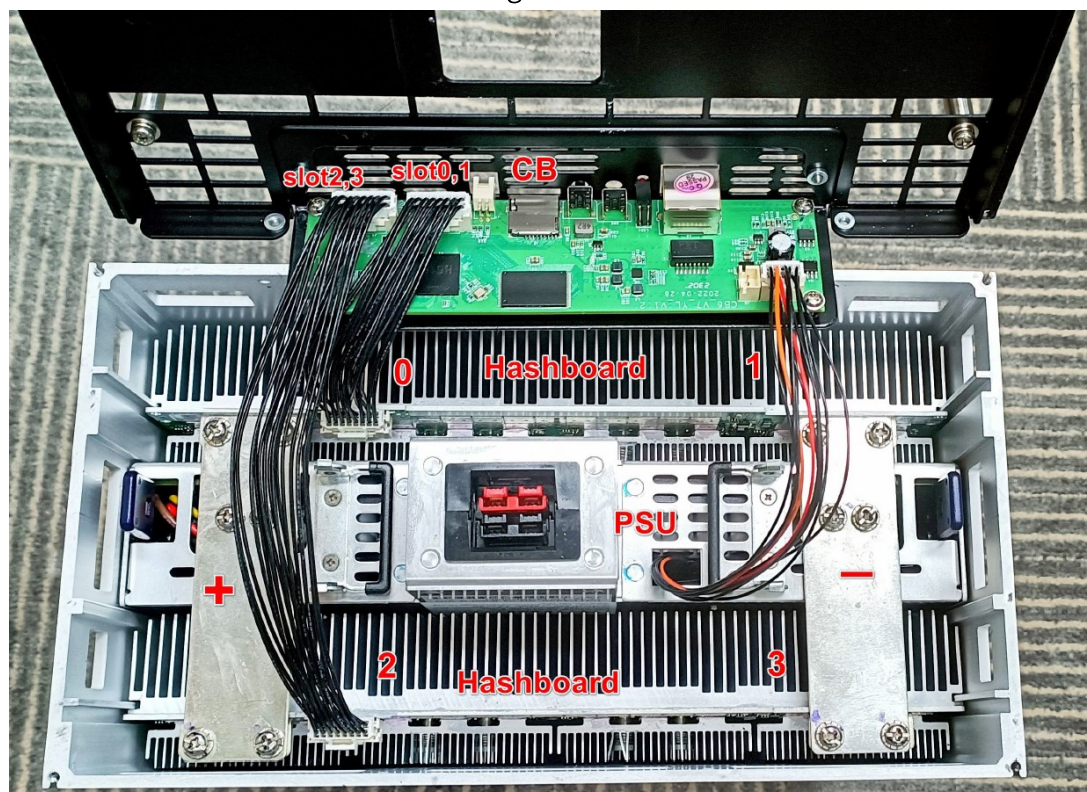


Figure 6-4