S19J Pro Maintenance Guide

Table of Content

I. Preparation requirements for maintenance platform/tools/equipment:

1. Platform requirements:

Electrostatic skin maintenance workbench (workbench grounded), anti-static wristband and grounding.

2. Equipment requirements:

Constant temperature soldering iron (350 degrees -380 degrees), pointed soldering iron tip for soldering small patches such as chip resistors and capacitors; heat gun, BGA rework station for chip/BGA disassembly and soldering; multimeter, building-up soldering steel needle and sleeve with heat shrinkable tube for easy measurement (Fluke is recommended); oscilloscope (Agilent is recommended), network cable (requirements: Internet connection, stable network)

3. Test tool requirements:

APW12 power supply (AP12_12V-15V_V1.2 and power adapter cable. Make it by yourself: use thick copper wire for the positive and negative poles of the power supply to connect the power supply and the hash board. It is recommended to use 4AWG copper wire with a length of less than 60cm (only for PT1 and maintenance testing) for power supply of the hash board; using the test jig of the V2.2010 control board (test jig material number ZJ0001000001), the positive and negative poles of the power supply of the test jig need to be installed with discharge resistors. It is recommended to use 20 ohms, 100W or more cement resistors.

4. Maintenance auxiliary materials/tools requirements:

Solder paste column M705, flux, PCB washing water and anhydrous alcohol; PCB washing water is used to clean up flux residue after repair; thermally conductive gel (specification: Fujipoly SPG-30B) is used to apply on the surface of chip after repair ; Ball-planting steel mesh, tin-absorbing wire, and tin balls (the ball diameter is recommended to be 0.4mm); when replacing a new chip, it is necessary to tin the chip pins and then solder them to hash board, and the large heat sink shall be installed after the chip surface is evenly coated with thermally conductive gel.

1) Code scanning gun (purchase link: https://item.jd.com/11829261868.html)

2)Port adapter board RS232/TTL adapter board 3.3V

(Purchase link: https://detail.tmall.com/item.htm?spm=a230r.1.14.6.751533f7AP9fR8&id=583960428696)

3)Self-made short-circuit probe (use the pins to wire and solder, and require heat the shrinkable sleeve to prevent short-circuit between the probe and the small heat sink)

5. Common maintenance spare material requirements:

0402 resistance (0R, 51R, 10K, 4.7K,); 0402 capacitor (0.1uf, 1uf)

II. Maintenance requirements:

1. Pay attention to the operation method when replacing a chip. After replacing any accessories, the PCB board shall be free of obvious deformation. Check the replacement parts and the surrounding parts for open circuit and short circuit problems.

2. Maintenance personnel shall possess certain electronic knowledge, more than one year of maintenance experiences, and be proficient in BGA/QFN/LGA packaging and soldering technology.

3. After maintenance, the hash board must be tested more than two times and shall be OK before passing!

4. Check whether the tool and test jig can work normally, and determine the software parameters of the maintenance station test software and the version of test jig.

5. In the test of repairing and replacing the chip, it is necessary to test chip first, and then do functional test after pass. The functional test must ensure that the small heat sink is soldered well and the large heat sink is installed in place (each thermal adhesive must be applied evenly and then the large heat sink is installed), and the cooling fan is at full speed. When using the chassis to dissipate heat, two hash boards should be placed at the same time to form an air duct. The single-sided test of production should also ensure that an air duct is formed (important)

6.4 Auxiliary fans to dissipate heat when measuring signals, and keep the fans at full speed.

7. When the hash board is powered on, the negative copper wire of power supply must be connected first, then the positive copper wire of the power supply must be connected, and finally the signal cable must be inserted. When disassembling, the order of installation shall be reversed. First, remove the signal cable, then remove the positive copper wire of power supply, and finally remove the negative copper wire of the power supply. In case of failing to follow this order, it is very easy to cause damage to U1 and U2 (the whole chip cannot be found). Before testing the pattern, the repaired hash board must be cooled down before testing, otherwise it will result in testing PNG.

8. When replacing a new chip, print pins and solder paste to ensure that the chip is pre-tinned and then soldered to the PCBA for maintenance.

9. The fixtures on the maintenance side are all tested in Test_Mode mode and in the scan code mode. After the test is passed, the production side will be streamlined from the first test station, and the normal installation will be aged (installed according to the same level). The test configuration file can be obtained from TE.

III. Test jig setup and precautions

The matching fixture of test jig should meet the heat dissipation of the hash board and facilitate the measurement of signals.

1.Part number: ZJ0001000001 test jig.

2. For the first time, use the 19JPRO series test jig SD card to flash the program to update the FPGA control board of test jig, unzip it and copy to the SD card, then insert the card into card slot; power on for about 1 minute and wait for the control board indicator light to double flash 3 times. After that, the update is completed; (if it is not updated, it may cause a certain chip to be reported as bad during the test)

Zynq7007_sd_recover_nand_only_for_zhiju-0xB031

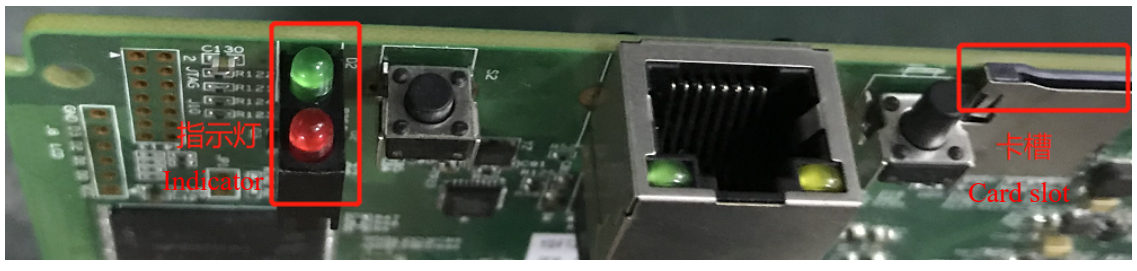


Figure 3-1

3. Make test SD card according to requirements. Single-sided heat sink inspection chip can be directly decompressed and compressed to prepare the SD card; special attention: sometimes the original package of the software configuration file Config file is not necessarily PT1, so it's necessary to confirm whether it is the configuration file of PT1.When PT1 is tested, do not plug in the network cable but only plug in the code scanner.

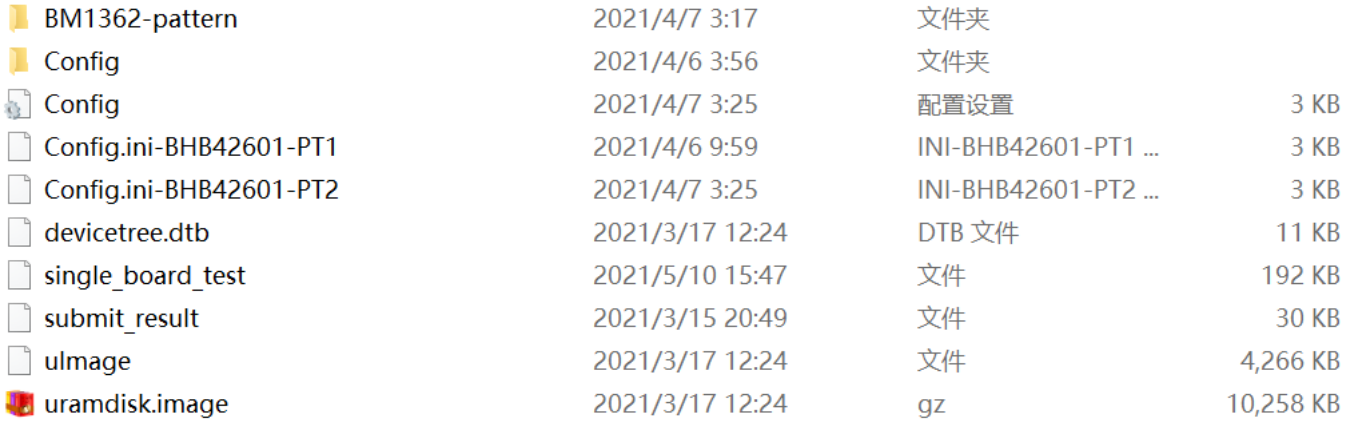


Figure 3-2

4. Prepare the test SD card according to requirements. The double-sided heat sink 8 times pattern test needs to prepare the SD card, as shown in the figure below; when the PT2 test does not need to insert code scanning gun, only the network cable can be inserted.

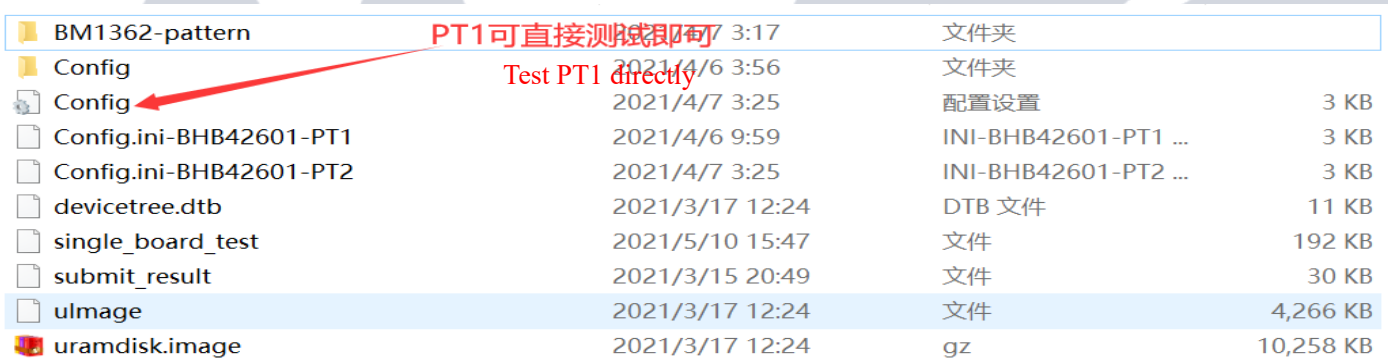


Figure 3-3

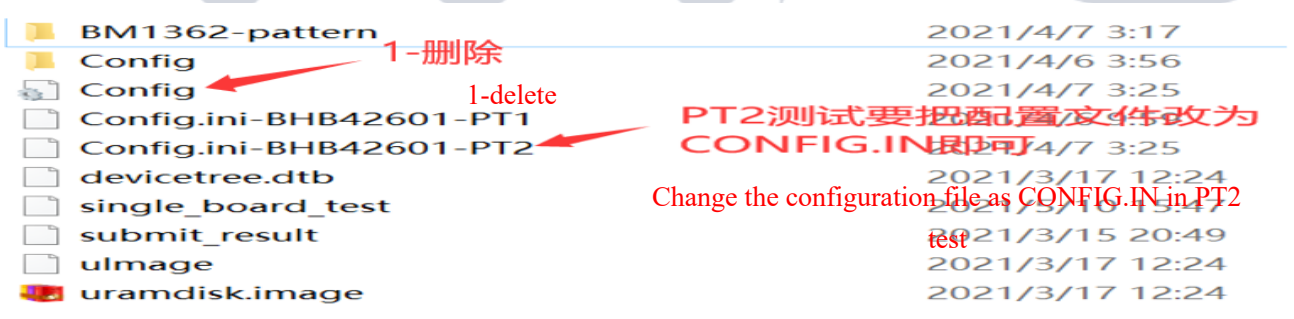


Figure 3-4

IV. Principle overview

1. S19JPRO hash board working structure

The hash board consists of 126 BM1362 chips, which are divided into 42 groups (domains), and each group consists of 3 ICs; the operating voltage of BM1362 chips used in the S19JPro hash board is 0.32V; group 42, 41, 40, 39, 38, 37, 36 (7 groups in total) are powered by the 20V output from the boost circuit U238 to the LDOs (U223 U231 U237 U236 U234 U133 U59), so that the LDOs in these 7 domains output 1.2V and 0.8V;the 35th group LDO is powered by VDD 15V to LDO of the 35th, so that it outputs 1.2V and 0.8V, and the voltage of each domain is reduced by 0.32V. As shown in Figure 4-1;

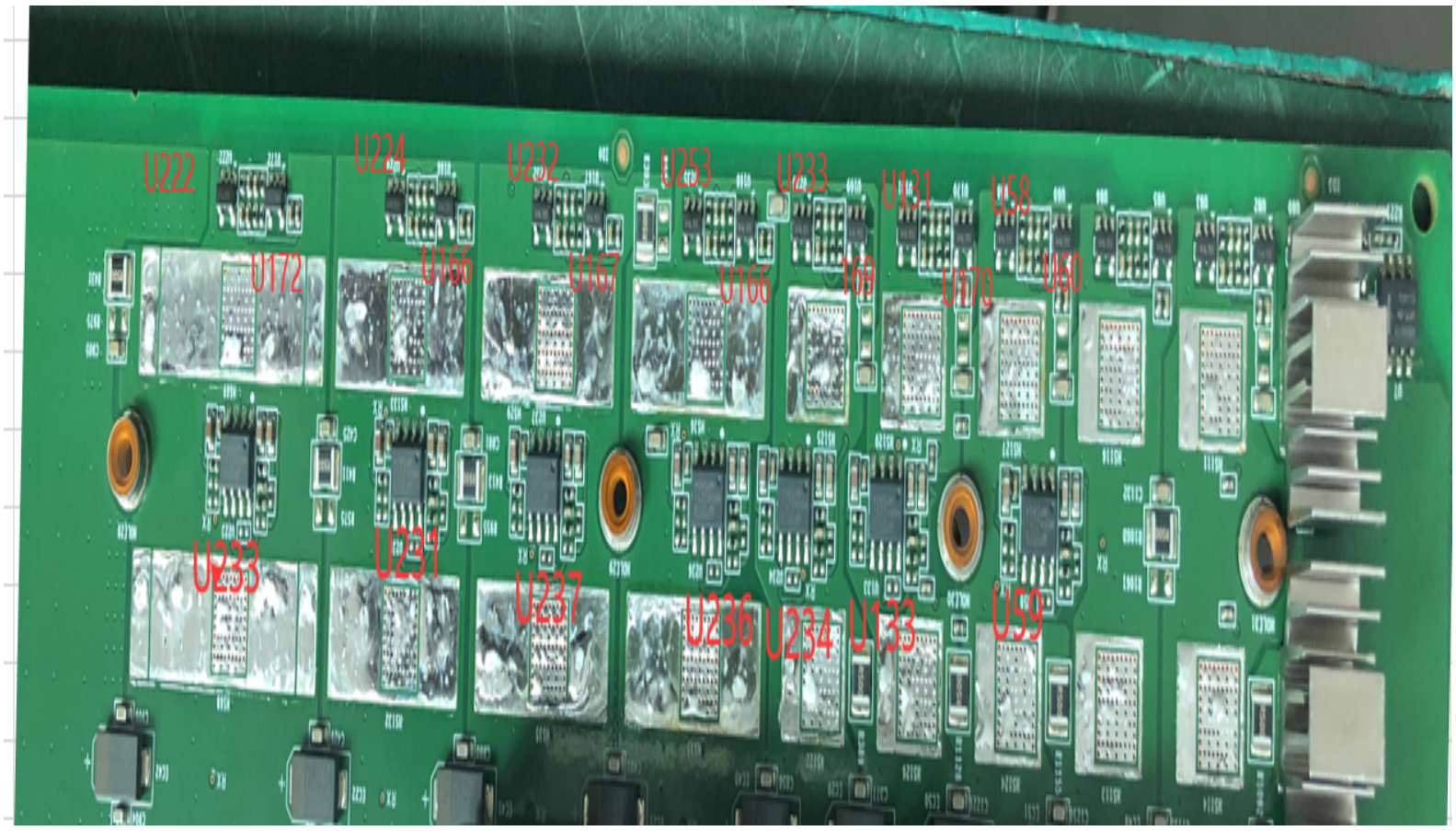


Figure 4-1

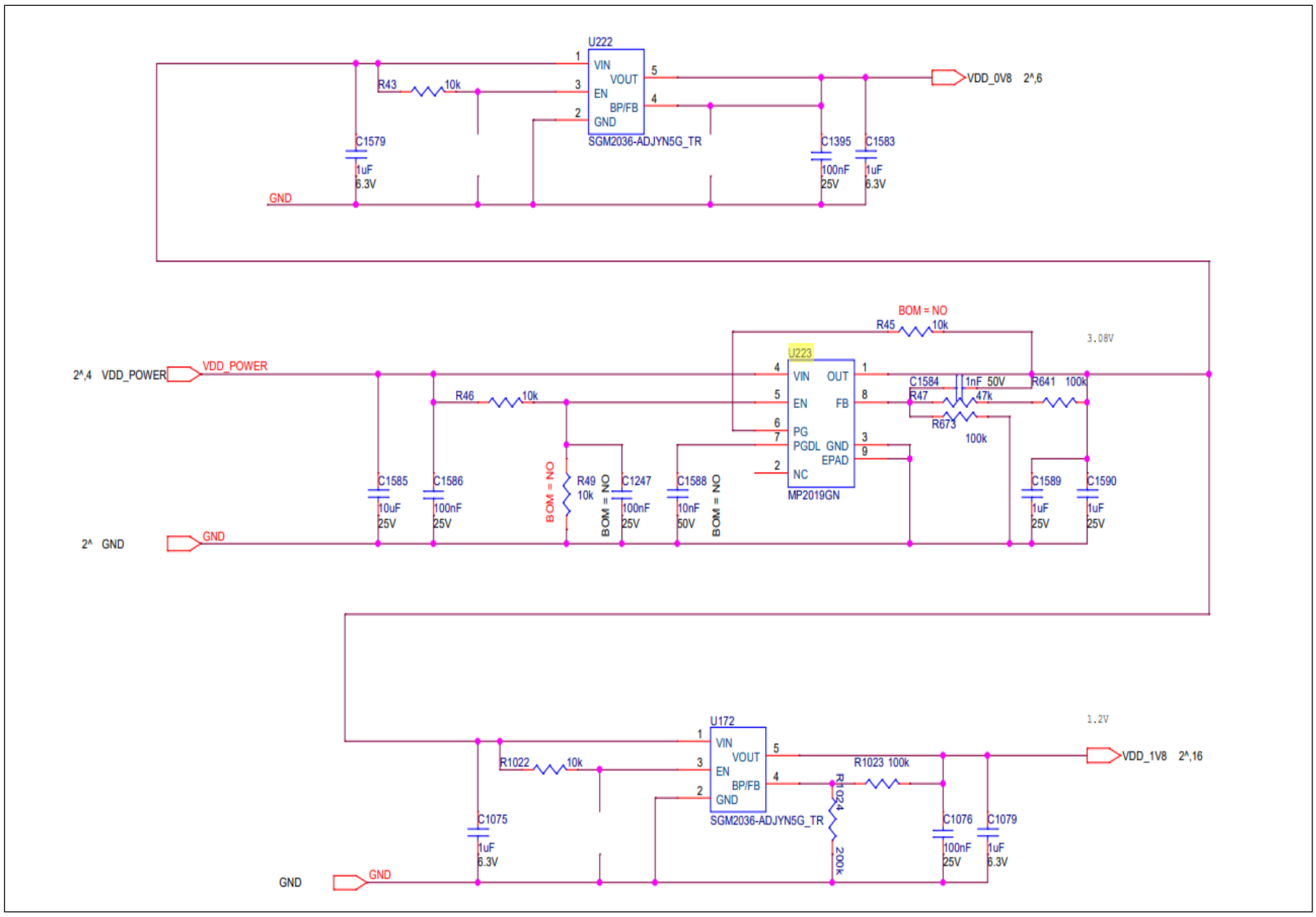


Figure 4-2

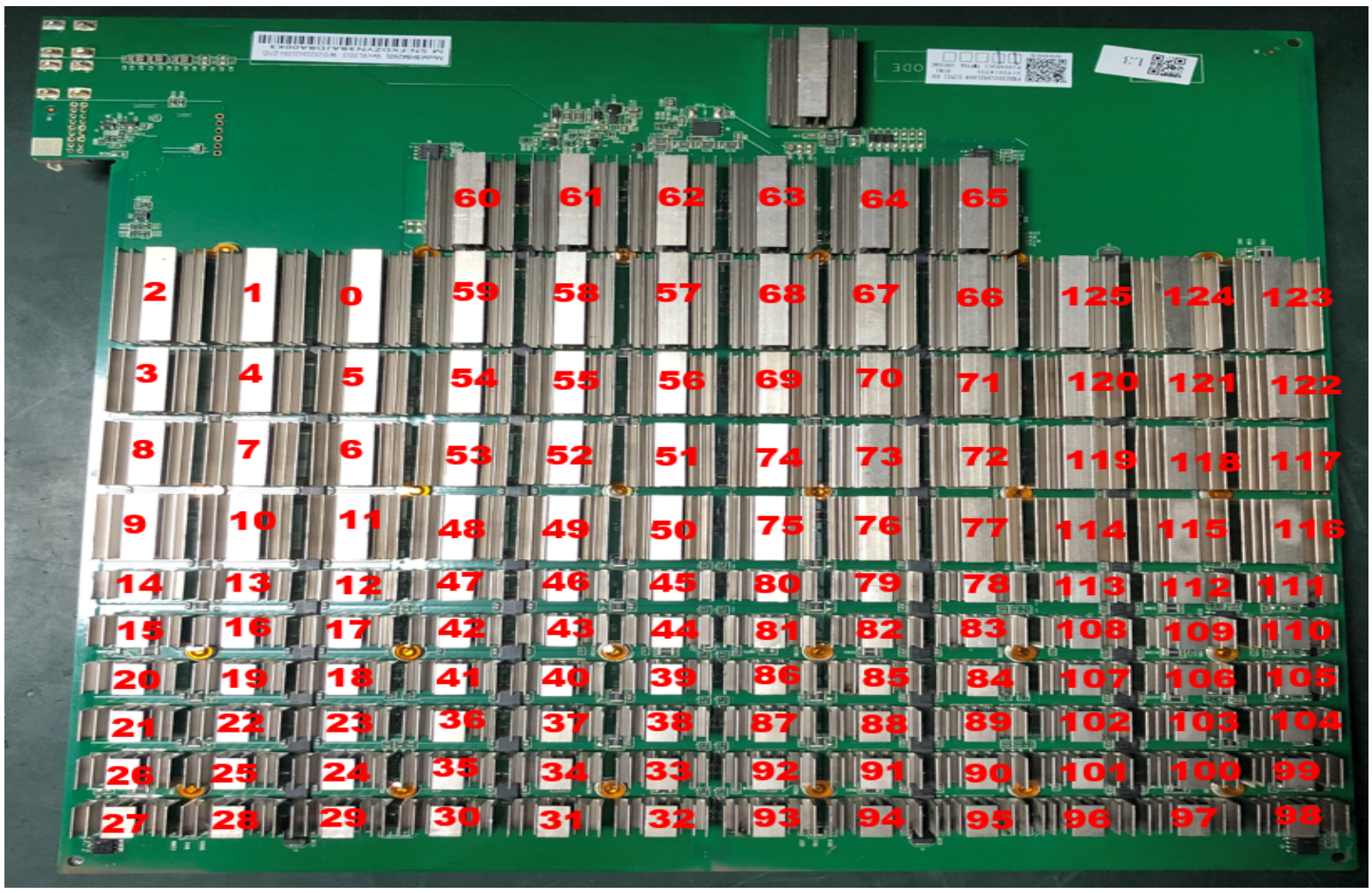


Figure 4-3

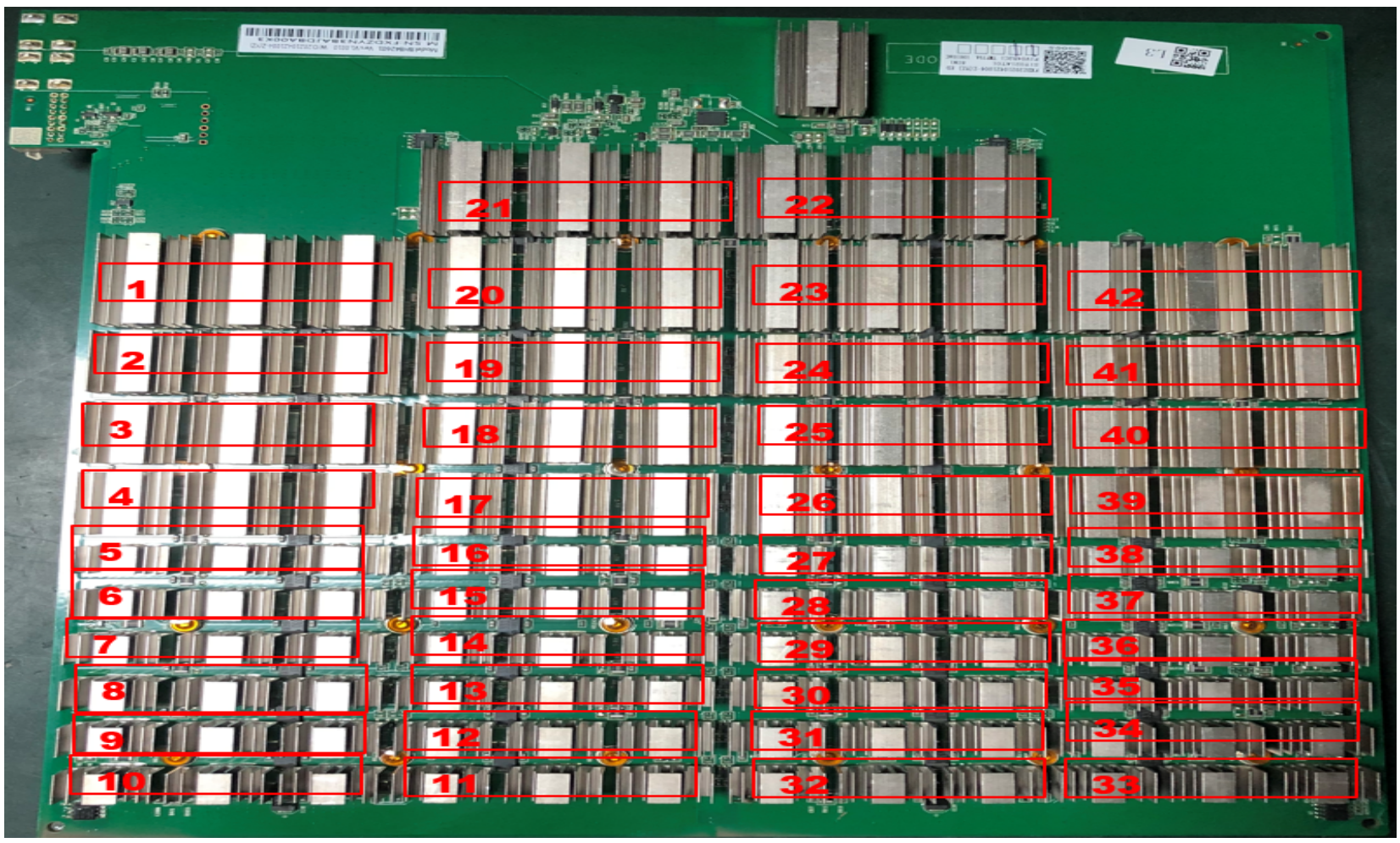
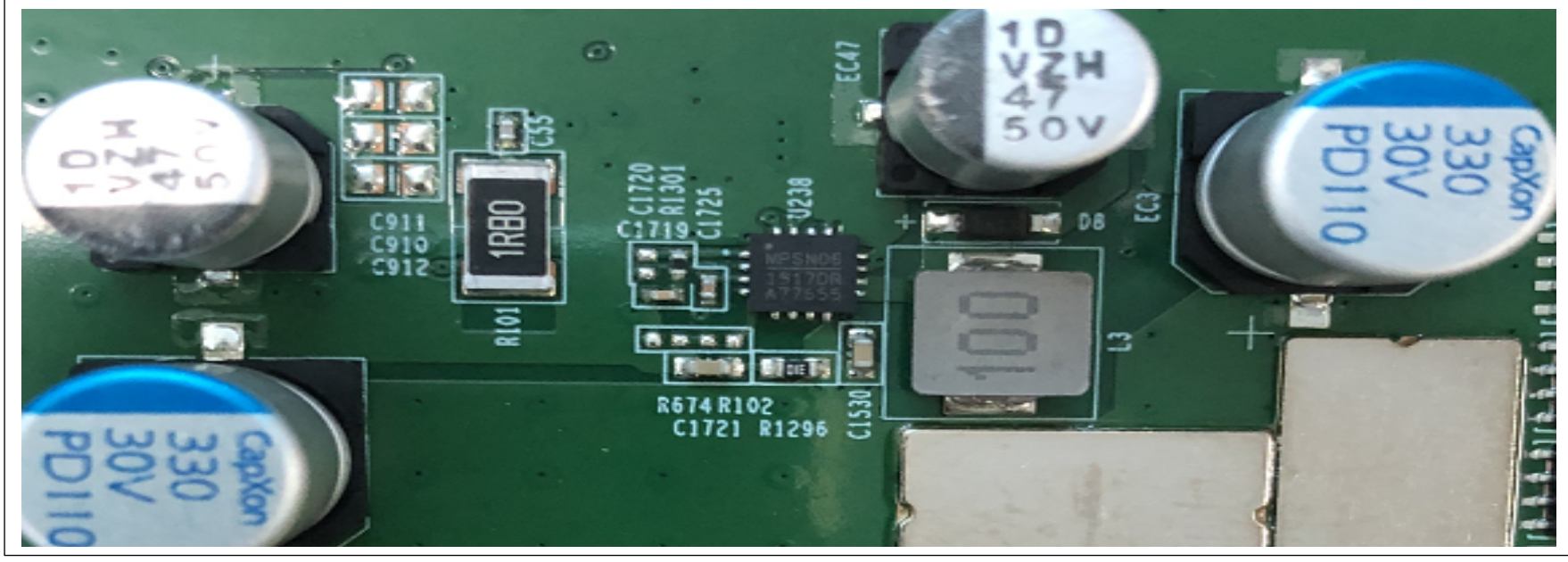


Figure 4-4

2. S19J Pro hash board boosted circuit:

The boost is powered by power supply from 15V to 20V, as shown in Figure 4-5.



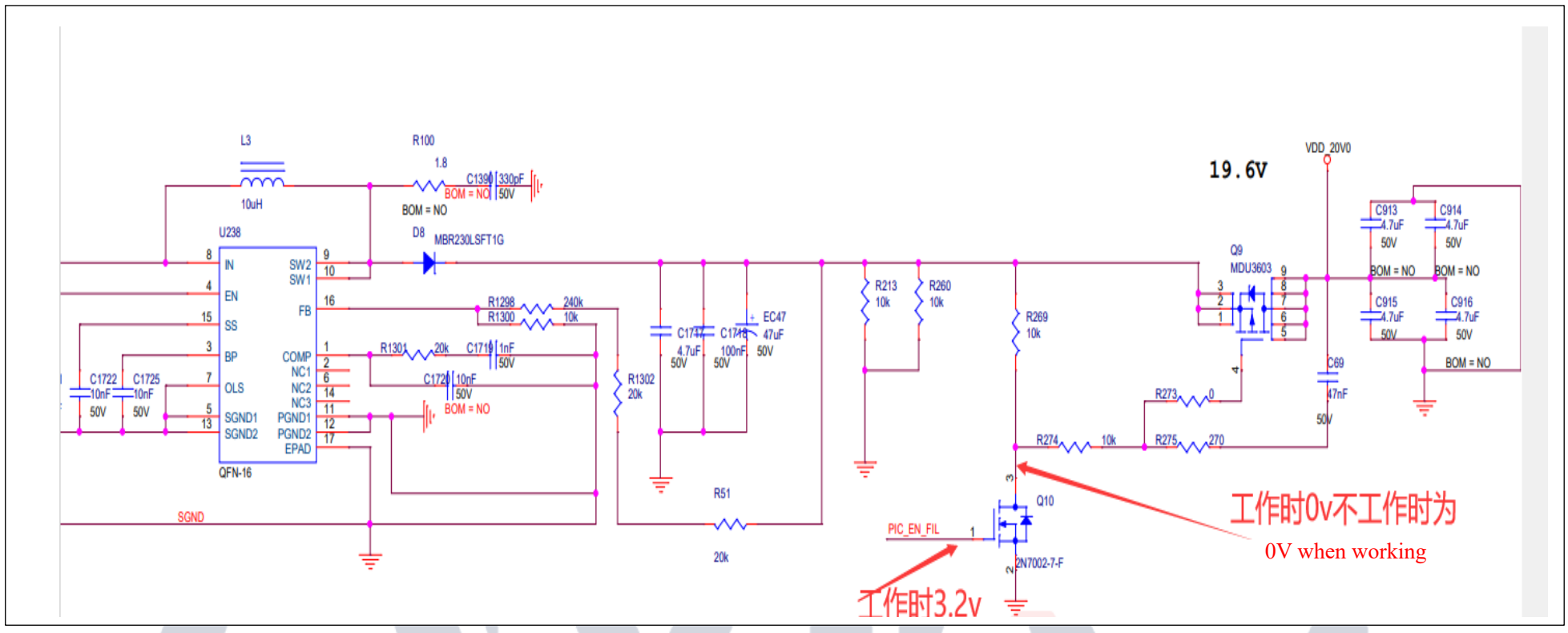


Figure 4-5

3. S19JPro chip signal direction:

1. CLK (XIN) signal flow is generated by Y1 25M crystal oscillator and transmitted from chip No. 01 to chip No. 126; the voltage is about 0.5V-0.6V;

2. The RST and CI signals flow from IO port 3 pin (3.3V) into the level conversion IC U1-U3-U4 after conversion, and then from chip 01 to chip 126 transmission; when the IO line is not inserted, the voltage is 0V, the voltage during operation is 1.2V;

3. The RX (RI, RO) signal flows from chip 126 to chip 01, and returns to the signal cable terminal through U1 to the 8th pin to return to the control board; the voltage is 0.3V when the IO signal is not inserted, and the voltage is 1.2V during operation ;

4. The signal flow direction of BO (BI, BO) is from chip 01 to 126; the multimeter measures it as 0V;

4. Overall structure:

The whole machine is mainly composed of 3 hash boards, 1 control board, APW12 power supply, and 4 cooling fans, as shown in Figure 4-6.

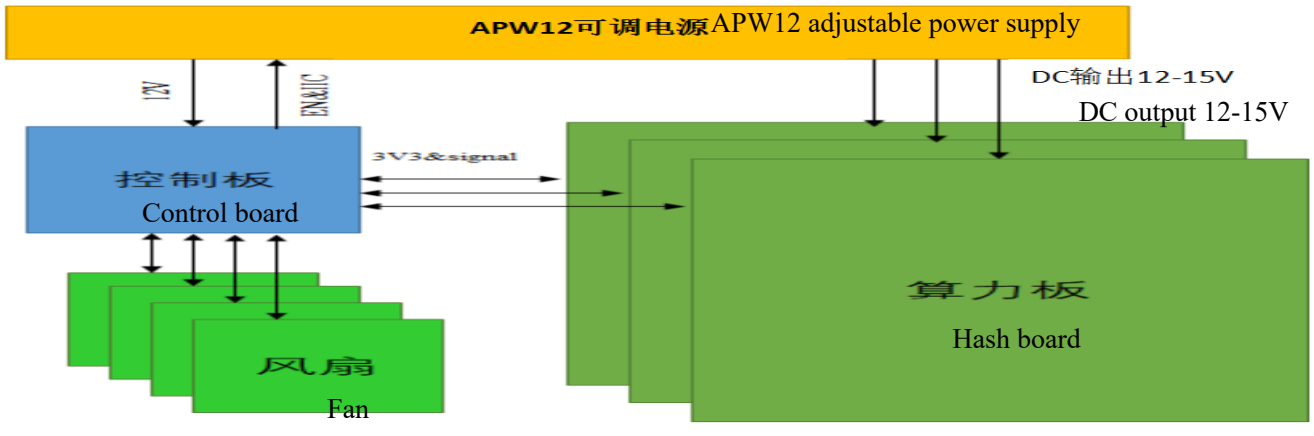


Figure 4-6

V. Common Malfunctions of Hash board and Troubleshooting Steps

1. Phenomenon: Single-board test detects that the chip is 0 (PT1/PT2 mode)

Step 1: check the output of the power supply. Please check the part of the voltage circled in Figure 5-1.

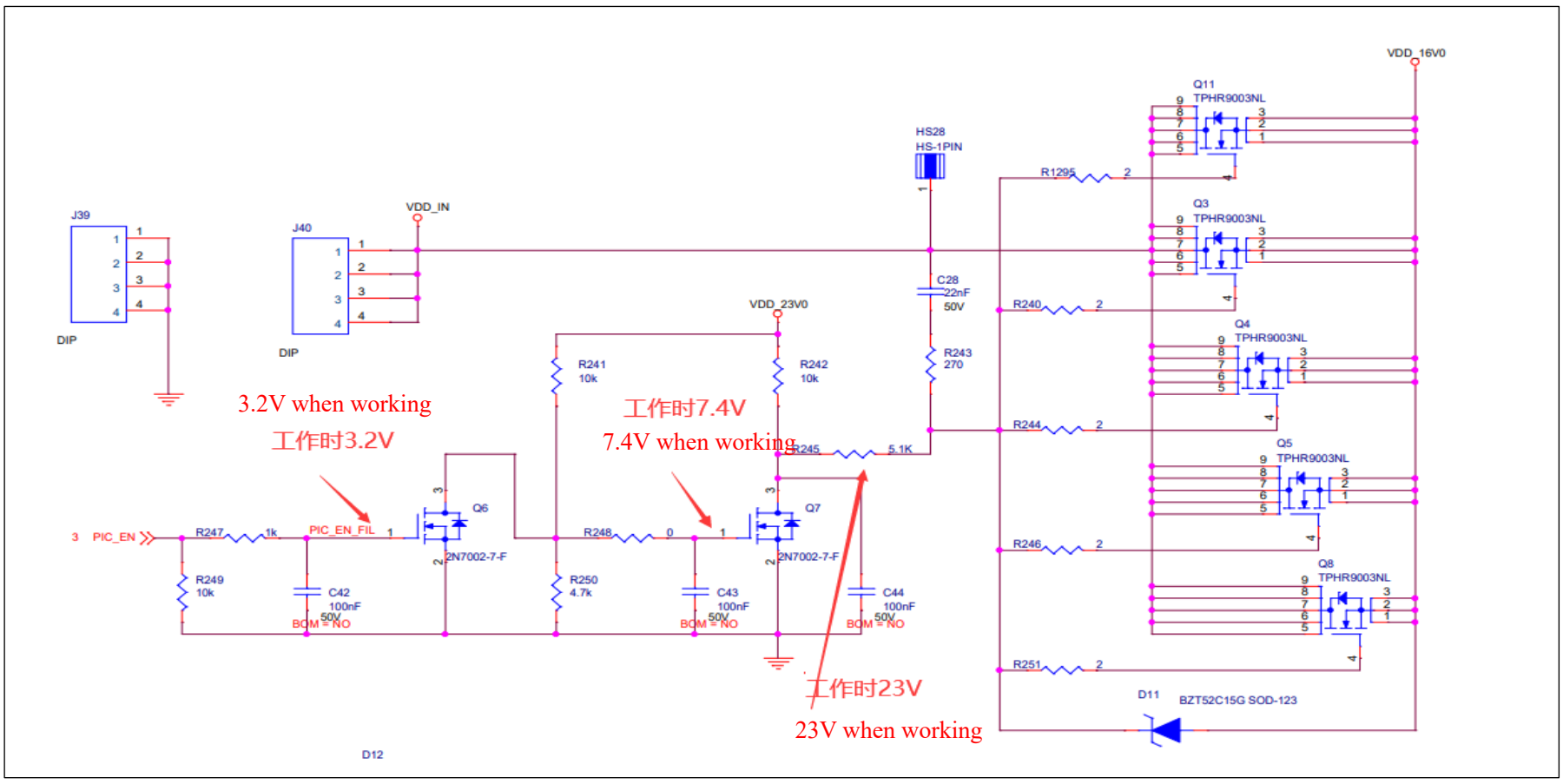


Figure 5-1

Step 2: check the voltage domain voltage output

The voltage of each voltage domain is about 0.32V, and the 15V power supply generally has the domain voltage. Priority is given to measuring the output of the power supply terminal of the hash board, and checking whether the MOS is short-circuited (measure the resistance between pins 1, 4, and 8). If 15V is powered but there is no domain voltage, continue to check.

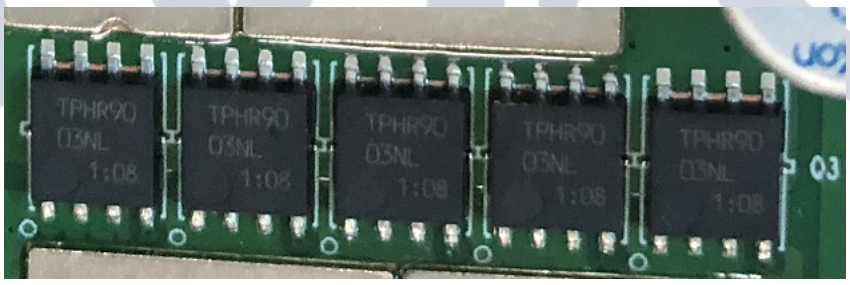


Figure 5-2

Step 3: check the PIC circuit

Measure whether pin 11 of U6 has output, check the voltage is about 3.2V. If there is, please continue to troubleshoot the problem, if there is no 3.3V, please check that the connection between the test jig cable and the hash board is OK, and re-program the PIC.

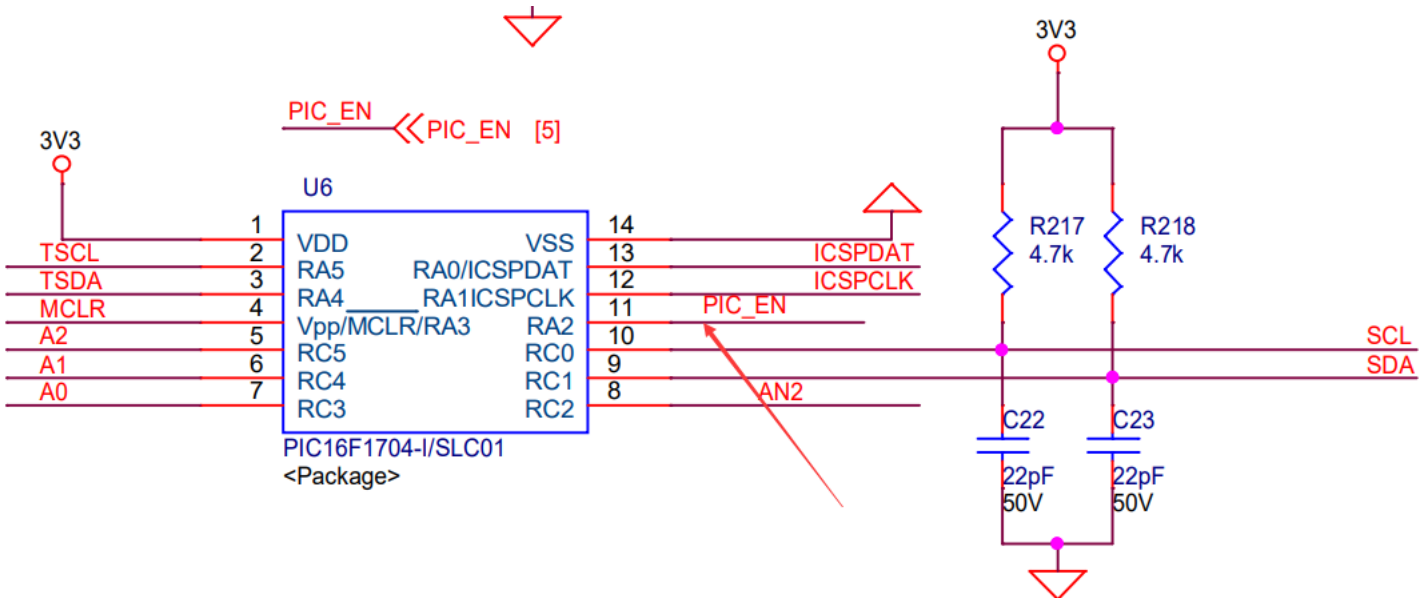


Figure 5-3

PIC programming steps:

1. Program the PIC program of hash board.

Program: 20200101-PIC1704-BM1398-V89.hex

Download the programming tool: PICkit3, pin 1 of the PICkit3 cable corresponds to pin 1 of J3 on the PCB board, and needs to be connected to pins 1, 2, 3, 4, 5, and 6.

Figure 5-6

2. Programming software:

Open MPLAB IPE, select device: PIC16F1704, click power to select the power supply method, then click operate. Step one:select file to find the .HEX file to be programmed; step two: click connect to connect normally; step three: click the program button, click verify after completion, and when it prompts the verification completed, it indicates that the programming is successful.

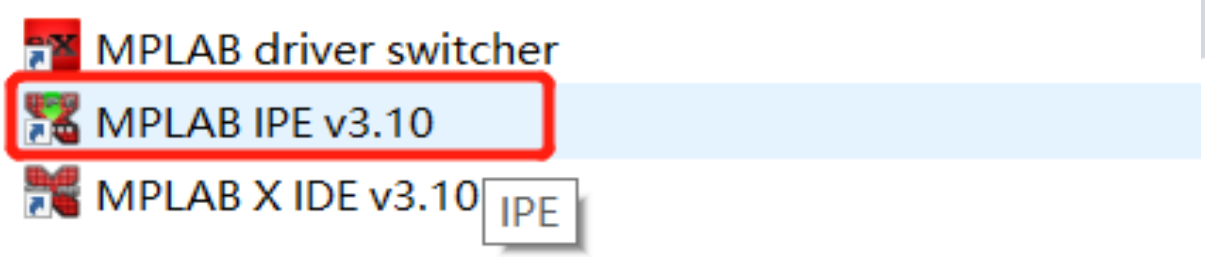


Figure 5-7

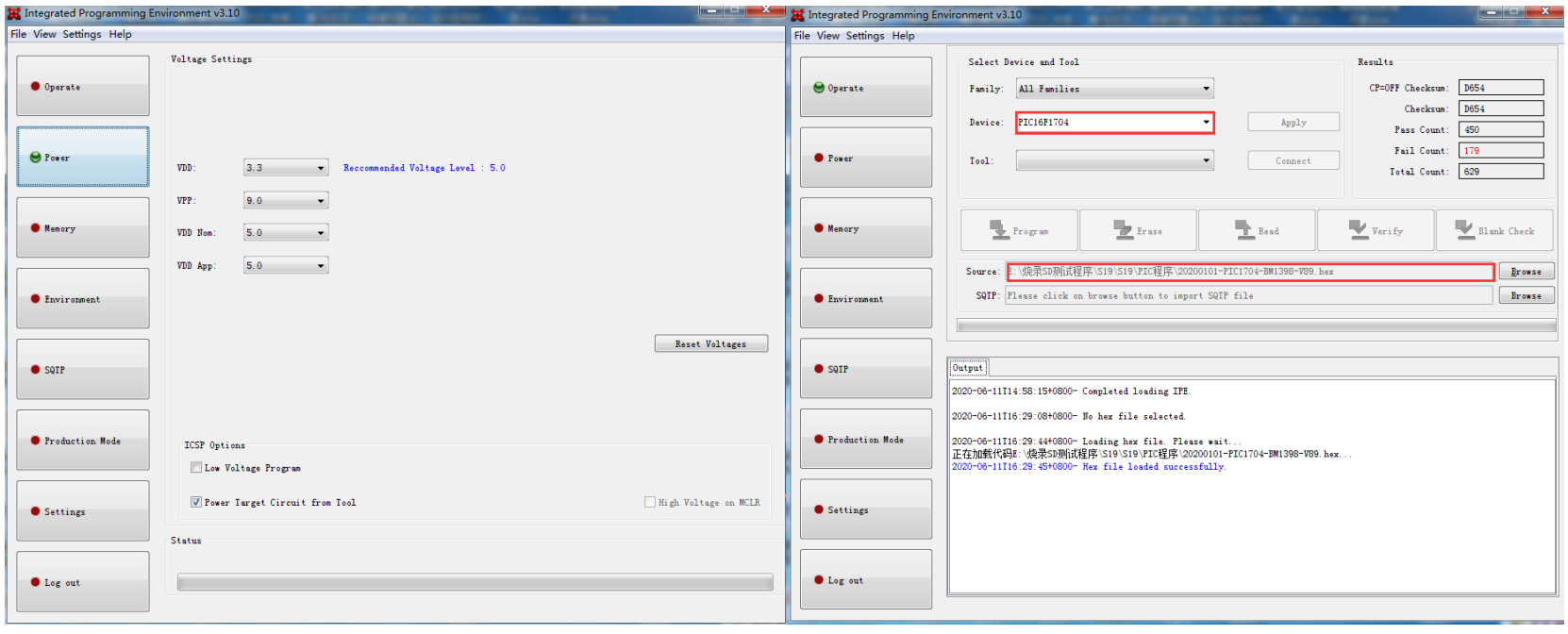


Figure 5-8

Step 4: check the boost circuit output

Measure voltage of C915 in Figure 5-9 up to 20V.

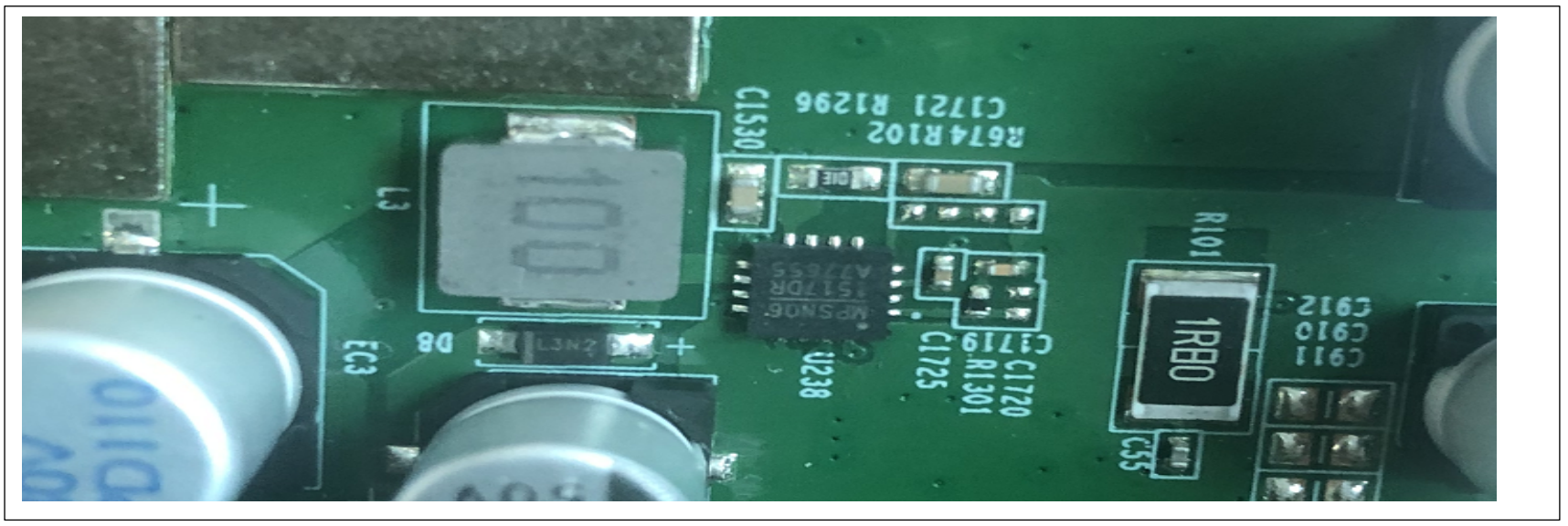


Figure 5-9

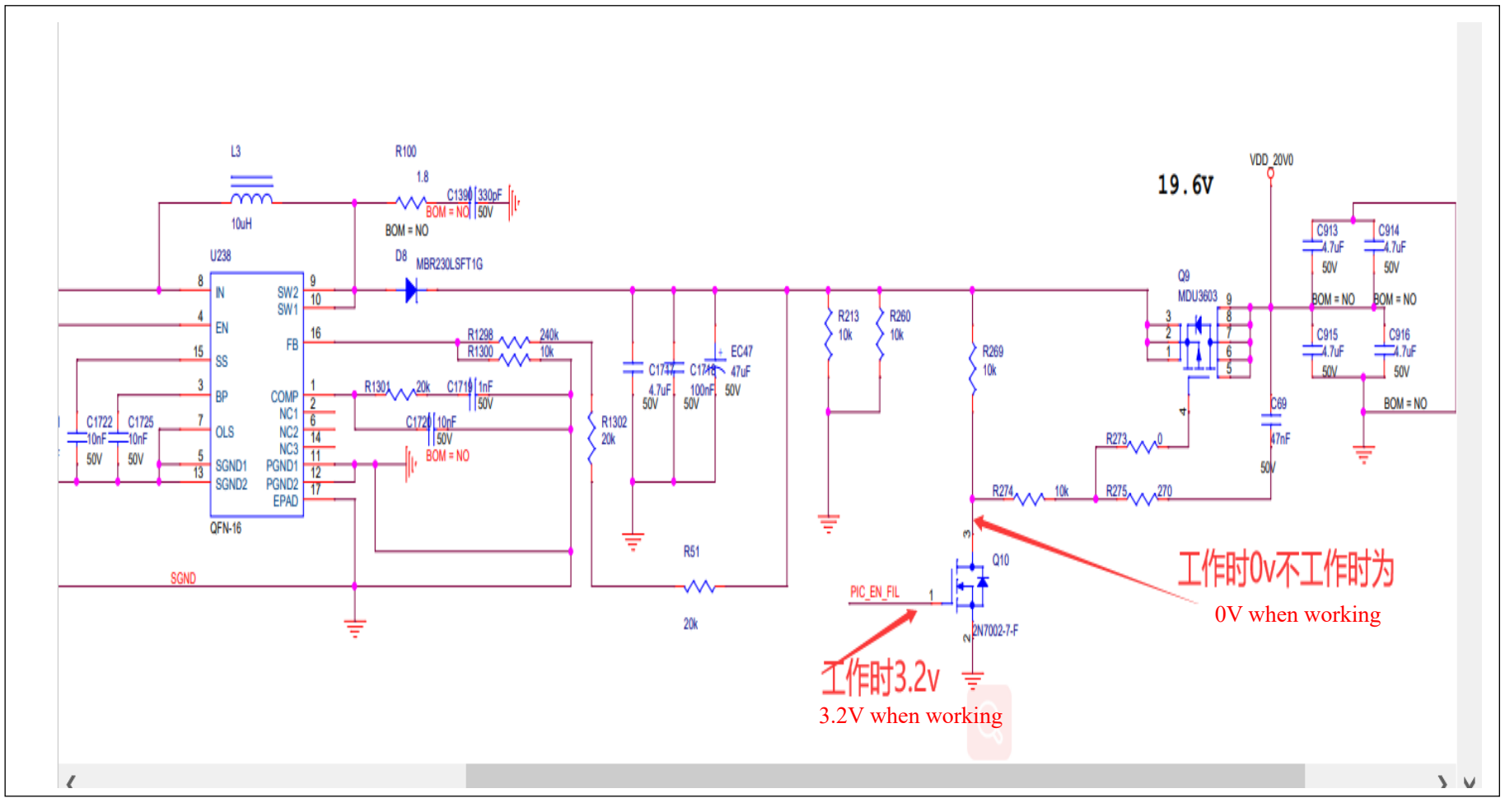
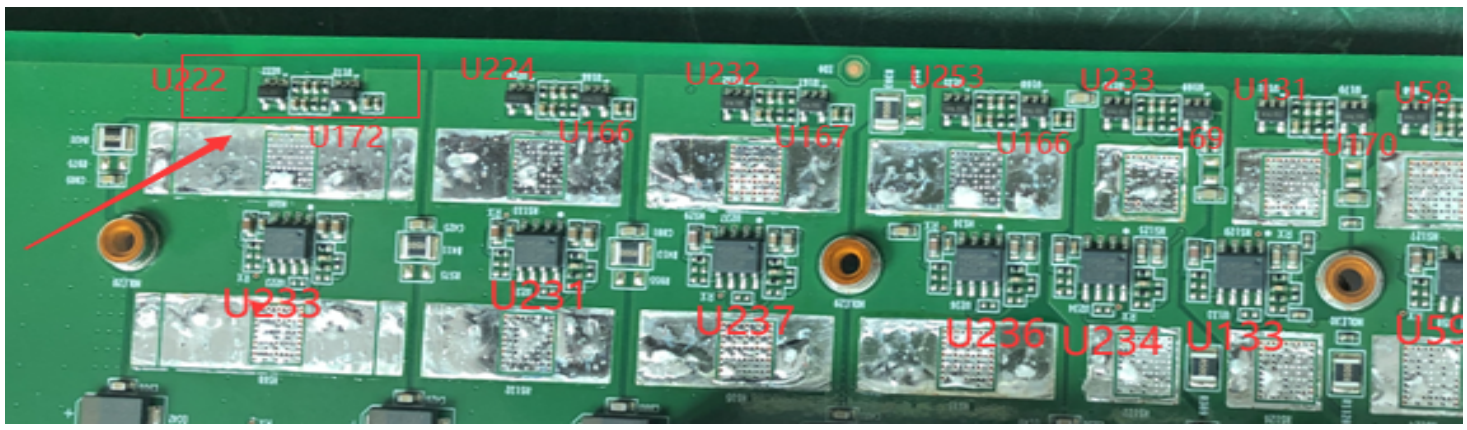


Figure 5-10

Step 5: check each group of LDO 1.2V or PLL 0.8V output



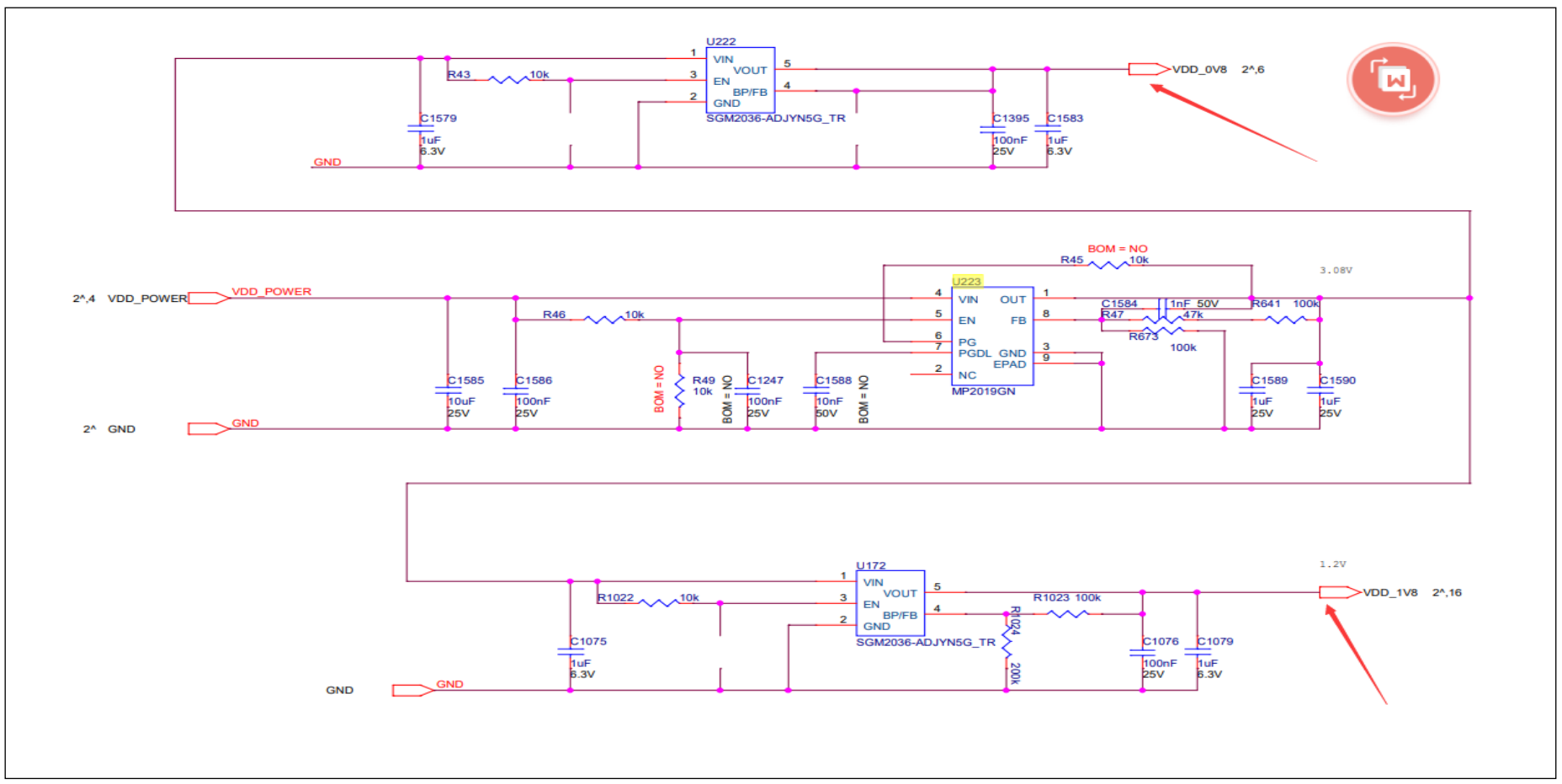


Figure 5-11

Step 6: Check the chip signal output (CLK/CI/RI/BO/RST)

Refer to the voltage value range described by signal direction. If the measurement encounters a large deviation of the voltage value, it can be compared with the measurement value of the adjacent group.

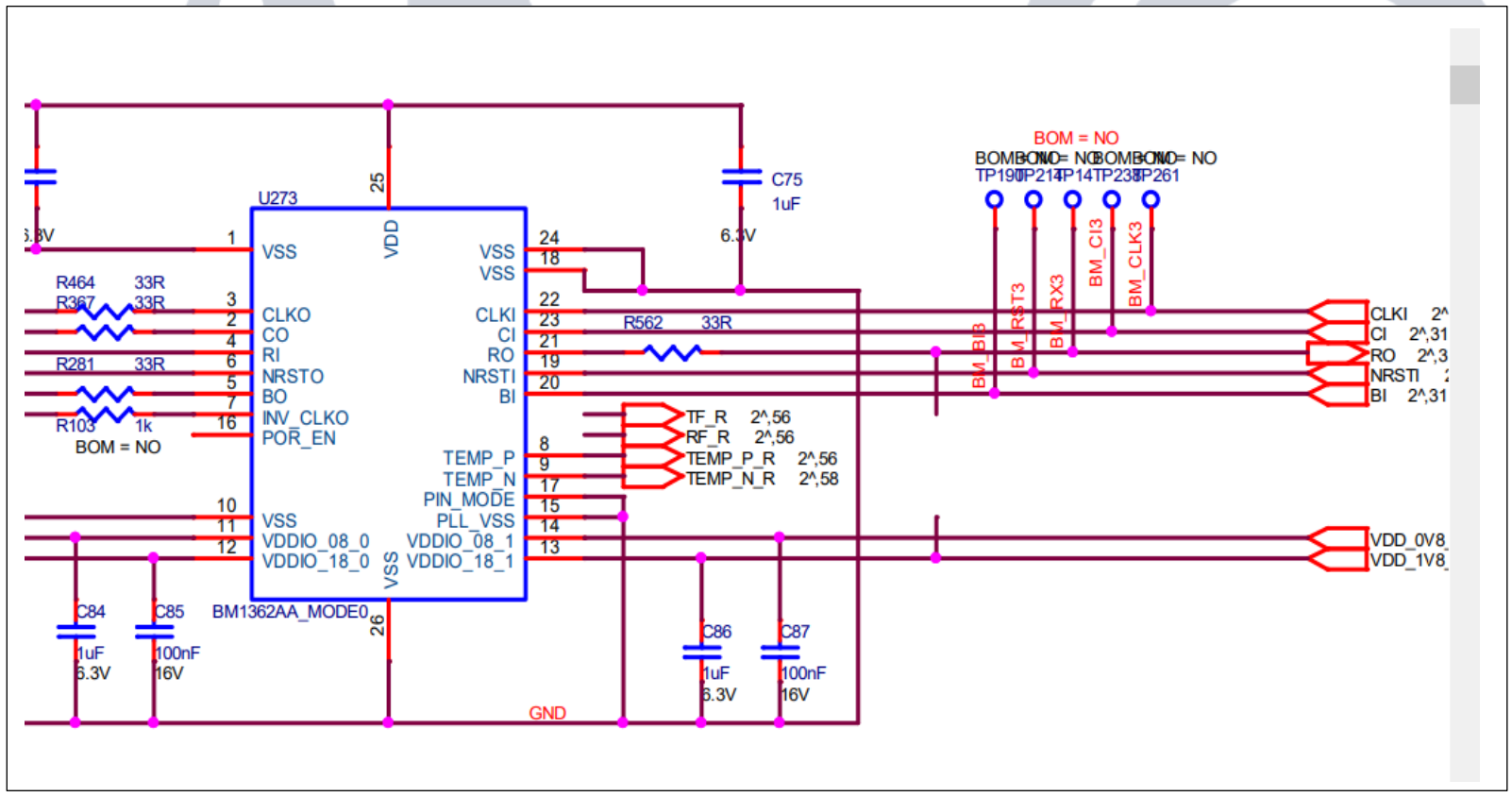


Figure 5-12

3. Phenomenon: single-board test detects incomplete chip (PT1/PT2 mode)

a) When the liquid crystal displays ASIC NG: (0), first measure the total voltage of measurement domain and check normal boost circuit 20V, then use a short-circuit probe to short-circuit the RO test point and the 1V8 test point between the first and the second chip. Then run the Chip Detection program. Checking the serial port log, if 0 chips are still found at this time, it will be one of the following situations:

a-1) Use a multimeter to measure whether the voltages of the 1V2 and 0V8 test points are 1.2V and 0.8V. If not, it may be that the 1.2V and 0.8V LDO circuits in this domain are abnormal, or two ASIC chips in this domain are not soldered well, and in most cases, it is caused by the short circuit of 0.8V and 1.2V chip filter capacitors (measure the resistance value of the chip filter capacitors related to the front and back of PCBA)

a-2) Detect whether the circuits of U1 and U2 are abnormal, such as resistance soldering, etc.

a-3) Check whether the first chip has pins that are not soldered well (it was found during maintenance that the pins were tinned from the side, but when the chip was removed, it was found that the pins were not tinned at all)

b) If one chip can be found in step a), it indicates that the first chip and the previous circuit are all good. The subsequent chips are checked in a similar way. For example, short-circuit the 1V2 test point and the RO test point between the 38th and 39th chips, if the log finds 38

chips, the first 38 chips are no problem; if 0 chips are still found, check whether the 1V2 first is normal. If it is normal, there is a problem with the chips after 38. Continue to dichotomize until you find the faulty chip. Suppose there is a problem with the Nth chip, then when the 1V2 and RO between the N-1th and Nth chips are short-circuited, N-1 chips can be found, but when short circuit the 1V2 and RO between the Nth and N+1th chips, the entire chip cannot be found.

c) When the LCD displays ASIC 125: (reports 125), it means that the hash board can detect 126 chips at 115200 baud rate, but only 125 chips are found at 12M baud rate, and one chip is at 12M baud rate was not found;

Maintenance method: Use the dichotomy method, short-circuit the 1V2 test point and the RO test point between the 38th and 39th through the short-circuit probe. If the log finds 38 chips, the first 38 chips are normal; if the log reports 46 chips after short circuiting 47 chips, it indicates that the 47th chip cannot be detected, and there is no problem with the appearance inspection. Generally, it's enough to replace the 47th chip;

d) When the liquid crystal displays ASIC NG: (fixed to report a certain chip), there are two cases as follows:

d-1) First case: (usually the value of chip will not change each time the test is reported), in this case, the maintenance method can be carried out according to the normal measurement of the signal voltage.

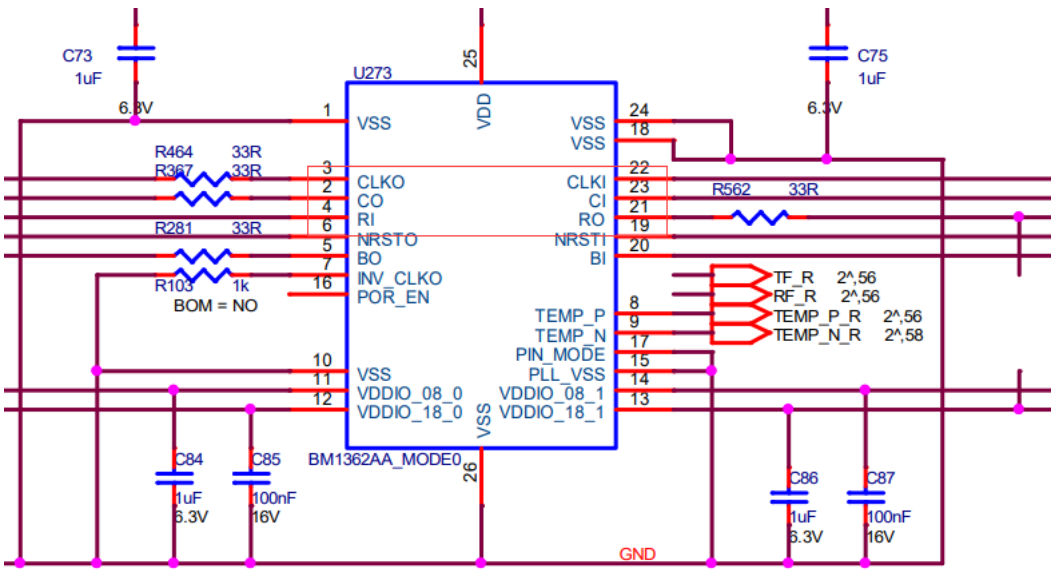


Figure 5-16

d-2) Second case; the test time is almost twice as long as the good board (sometimes the X value will change every time, and sometimes X=0); at this time, the log usually shows the following information (the red numbers are not 13 at certain, depending on which socket the cable is connected to); during the test, it is assumed that the domain voltage of all domains in front of abnormal position is almost less than 0.3V, and the domain voltage of the latter domain is almost all higher than 0.32V. This is because the chip is not soldered properly, usually 1.2V, 0.8V, or because RXT and CLK are not soldered properly. It is recommended to directly measure the domain voltage to locate the domain where the problem is. The 1V8 and RO short circuit method used in section a) can also locate abnormal position;

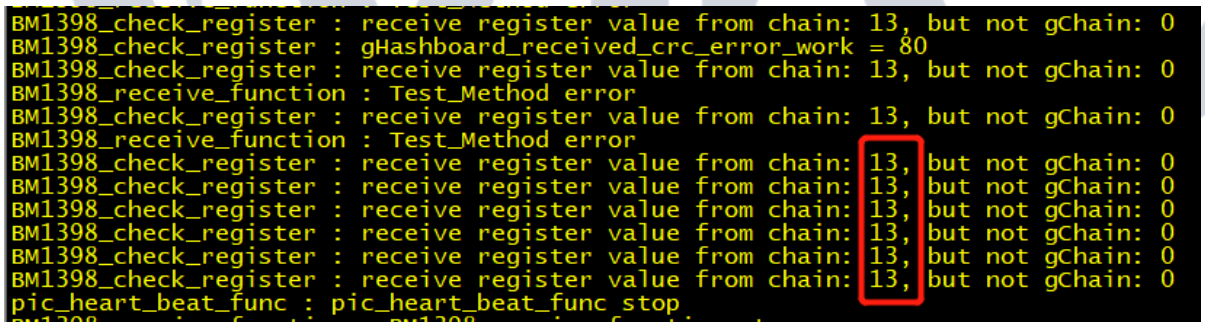


Figure 5-17

d-3) Most of current production and maintenance findings are micro-short circuits between signals (0-hundreds of ohms), which are caused by small resistance of the chip pins. First, use a hot air gun to solder to check if it is OK;

4. Phenomenon: Single board Pattern NG, that is, the reply nonce data is incomplete (PT2 mode)

Pattern NG is caused by difference between the characteristics of the chip and other chips. At present, it is found that the chip is damaged, so it is only necessary to replace the chip. According to the log information, the replacement rule is as follows:

If the appearance of the chip is not damaged, replace the chip with the lowest recovery rate in each domain. The following picture shows one of the test logs. From the log, it can be seen that the recovery rate of the four chips of asic[36][37][43][75] is low. Chips 36 and 37 are in the same domain, so replace the one with the lowest nonce. At the same time, replace chips 43 and 75.

PS: Special attention should be paid to the numbers of domain and asic starting from 0

```
Voltage domain [27] :      asic[054] = 4956,      asic[055] = 4937,      : domain nonce number :   9893
Voltage domain [28] :      asic[056] = 4959,      asic[057] = 4944,      : domain nonce number :   9903
Voltage domain [29] :      asic[058] = 4955,      asic[059] = 4964,      : domain nonce number :   9919
Voltage domain [30] :      asic[060] = 4936,      asic[061] = 4952,      : domain nonce number :   9888
Voltage domain [31] :      asic[062] = 4960,      asic[063] = 4952,      : domain nonce number :   9912
Voltage domain [32] :      asic[064] = 4961,      asic[065] = 4953,      : domain nonce number :   9914
Voltage domain [33] :      asic[066] = 4957,      asic[067] = 4951,      : domain nonce number :   9908
Voltage domain [34] :      asic[068] = 4963,      asic[069] = 4951,      : domain nonce number :   9914
Voltage domain [35] :      asic[070] = 4935,      asic[071] = 4978,      : domain nonce number :   9913
Voltage domain [36] :      asic[072] = 4955,      asic[073] = 4956,      : domain nonce number :   9911
Voltage domain [37] :      asic[074] = 4955,  !!! asic[075] = 3706,      : domain nonce number :   8661

-------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------
get_result : bad asic list:
asic[036]      asic[037]      asic[043]      asic[075]
-------------------------------------------------------------------------------------------------------
get_result : valid nonce number = 370919,      lost nonce number = 7865
get_result : nonce_rate = 97.923619 %
get_result : PATTERN NG
```

Figure 5-18

5. Phenomenon: the chip test is passed, and the PT2 function test serial port does not stop running (long-distance running)

Maintenance method: During PT2 test, check the serial port print log. When the serial port starts running in long term, use a short-circuit probe to short-circuit RO&1.8V, and start short-circuiting from the first chip. If the serial port stops long-distance running after short-circuiting, it indicates that the first chip is OK. According to this method, find the chip whose long-distance fault remains after a chip is short-circuited, usually caused by a chip failure, and it can be replaced;

```
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_software_pattern_check_nonce : receive nonce from chain: 8, but not gChain: 2
BTC_software_pattern_check_nonce : receive 2368th pattern from Aisc: 42, big_core 85, small_core 3, but the most pattern number is: 8
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_software_pattern_check_nonce : receive nonce from chain: 8, but not gChain: 2
BTC_software_pattern_check_nonce : receive nonce from chain: 4, but not gChain: 2
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_software_pattern_check_nonce : receive nonce from chain: 12, but not gChain: 2
BTC_check_register : BTC_check_register: reg_value_buf buffer is full!
BTC_software_pattern_check_nonce : receive nonce from chain: 10, but not gChain: 2
BTC_software_pattern_check_nonce : receive nonce from chain: 3, but not gChain: 2
BTC_software_pattern_check_nonce : receive nonce from chain: 14, but not gChain: 2
BTC_software_pattern_check_nonce : receive nonce from chain: 12, but not gChain: 2
BTC_software_pattern_check_nonce : receive nonce from chain: 7, but not gChain: 2
BTC_software_pattern_check_nonce : receive nonce from chain: 6, but not gChain: 2
```

Requirements for the PT2 test environment: The temperature of PT2 test environment should be 20 degrees and 30 degrees. When the ambient temperature exceeds 35 degrees, the software will stop testing.

PT2 test power supply requirements: When the PT2 test jig power supply is under a load of 1500 watts (in the case of testing a board), the actual output voltage cannot be lower than the 0.03V set in the configuration file. (For example, the configuration file requires trial production of 15V, then the output voltage of the power supply cannot be lower than 14.97V when the load is 1500 watts)

VI. Abnormal control board

1. Not running

1)Check whether the voltage of several voltage output points is normal. If 3.3V is short circuited, disconnect U8 first, thenif it is still short circuit, unplug the CPU to check. For other abnormal voltages, generally replace corresponding converter IC.

2) If the voltage is normal, please check the soldering condition of DDR/CPU

3) Try to update the flash program with SD card;

If the machine with the control board card recovery needs to start normally, the following two steps are required:

a) After the card is recovered successfully, green LED indicator is always on, and the power is turned off and restarted;

b) Wait for 30s after powering on again (time course of opening OTP)

c) OTP (One Time Programable) is a memory type of MCU, which means one-time programmable: after the program is programmed into the IC, it cannot be changed or cleared again;

Notes:

(1) Sudden power failure during OTP opening process or time of less than 30s will cause the control board to fail to start OTP function, and the control board to fail to start (not connected to the Internet). After replacing the U1 (control board main control IC FBGA), U1 can no longer be used on 19 series;

(2) U1 cannot be used on other series of models if the control board with OTP function is turned on;

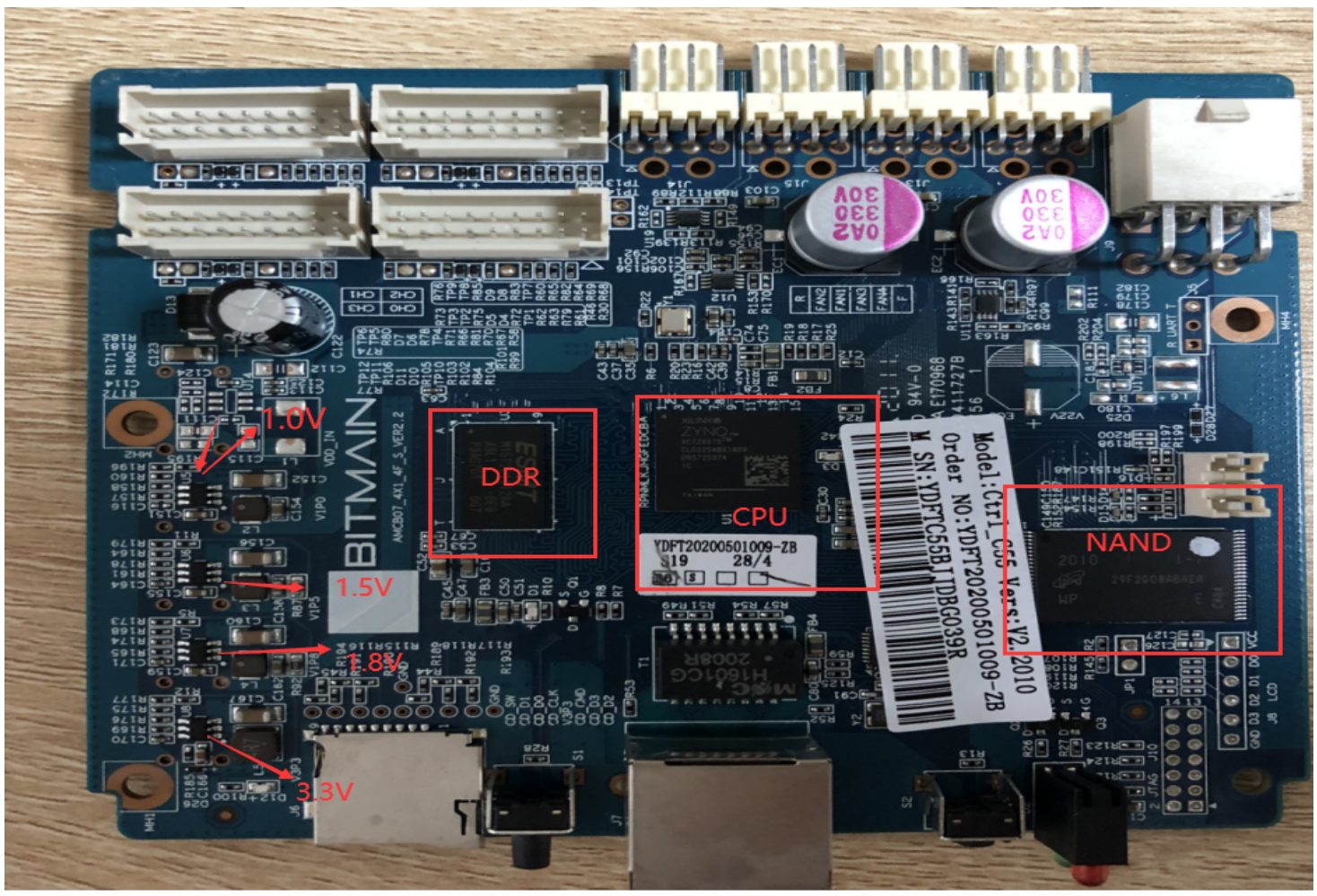


Figure 6-1

2. IP14 not found

There is a high probability that the IP cannot be found due to abnormal operation. Refer to point 1 for troubleshooting.

Check the appearance and soldering condition of the network port, network transformer T1, and CPU.

3. Unable to upgrade

Check the appearance and soldering condition of the network port, network transformer T1, and CPU.

4. Failed to read has board or less chain

A. Check the cable connection status.

B.Check the parts of the control board corresponding to the chain.

C. Check the wave soldering quality of the plug-in pins and the resistance around the plug-in interface.

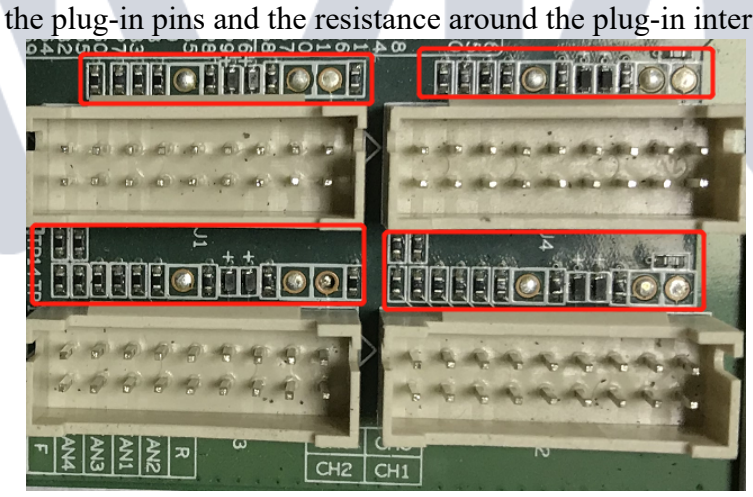


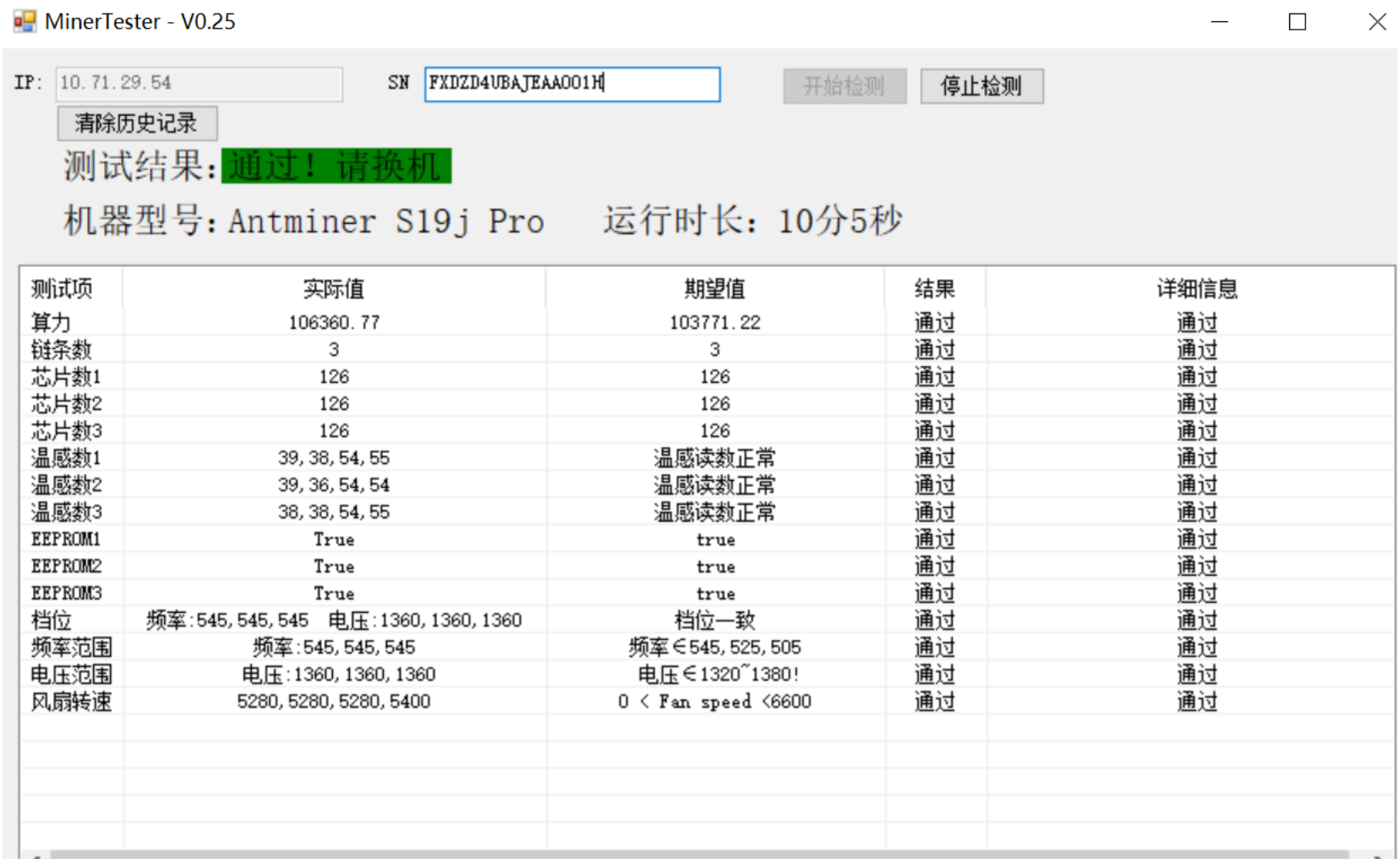
Figure 6-2

VII. Whole machine failure

1. Preliminary test of the whole machine

Referring to the test process file, the general problems are assembly process problems and control board process problems.

Common phenomenon: Failed to detect IP, abnormal number of fans detected, abnormalchain detected. If there is an abnormality, the maintenance should be carried out according to the monitoring interface and test shall be carried outaccording to LOG prompts. The maintenance methods of the initial test and the aging test of the whole machine are the same.



测试项	实际值	期望值	结果	详细信息
算力	106360.77	103771.22	通过	通过
链条数	3	3	通过	通过
芯片数1	126	126	通过	通过
芯片数2	126	126	通过	通过
芯片数3	126	126	通过	通过
温感数1	39, 38, 54, 55	温感读数正常	通过	通过
温感数2	39, 36, 54, 54	温感读数正常	通过	通过
温感数3	38, 38, 54, 55	温感读数正常	通过	通过
EEPROM1	True	true	通过	通过
EEPROM2	True	true	通过	通过
EEPROM3	True	true	通过	通过
档位	频率:545, 545, 545 电压:1360, 1360, 1360	档位一致	通过	通过
频率范围	频率:545, 545, 545	频率∈545, 525, 505	通过	通过
电压范围	电压:1360, 1360, 1360	电压∈1320~1380!	通过	通过
风扇转速	5280, 5280, 5280, 5400	0 < Fan speed <6600	通过	通过

Figure 6-3

2. Aging test: During the aging test, maintenance should be carried out according to the monitored interface test, for example;
1) Fan display is abnormal - check whether the fan works normally, whether the connection with control board is normal, and whether the control board is abnormal.
2) Missing chain: Less chain means that 1 of the 3 boards is missing. In most cases, it's because a problem with the link between the hash board and the control board. Check the cable to confirm if there is an open circuit. If the connection is OK, test the single board for PT2 to check if it can be tested. If it passes the test, it can basically be determined that it is because of an issue of the control board. If the test fails, use the maintenance method of PT2 maintenance.
3) Abnormal temperature: Generally, it's due to the temperature is high. The maximum PCB temperature set by our monitoring system cannot exceed 90 degrees. If it exceeds 90 degrees, the machine will alarm and cannot work normally. Generally, the ambient temperature is too high, and the fan works abnormally. It may also cause abnormal temperature.
4) Not all chips can be found (it can be turned on, but the hashrate is 2/3 or 1/3 of the normal value), the number of chips is not enough: if the number of chips is not enough, refer to PT2 test and maintenance
5) After running for a period of time, there is no hashrate, and the connection of the mining pool is interrupted, check the network;

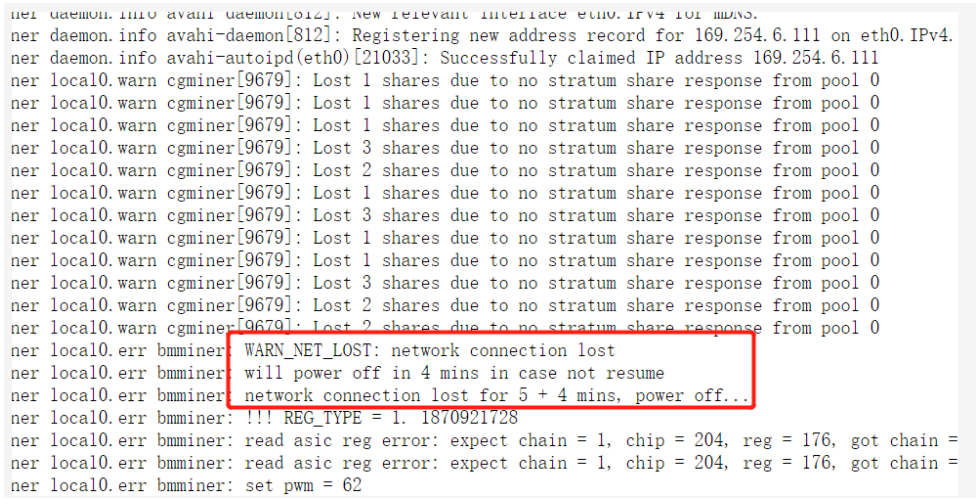


Figure 6-5

6) The aging test state of normal good machine;

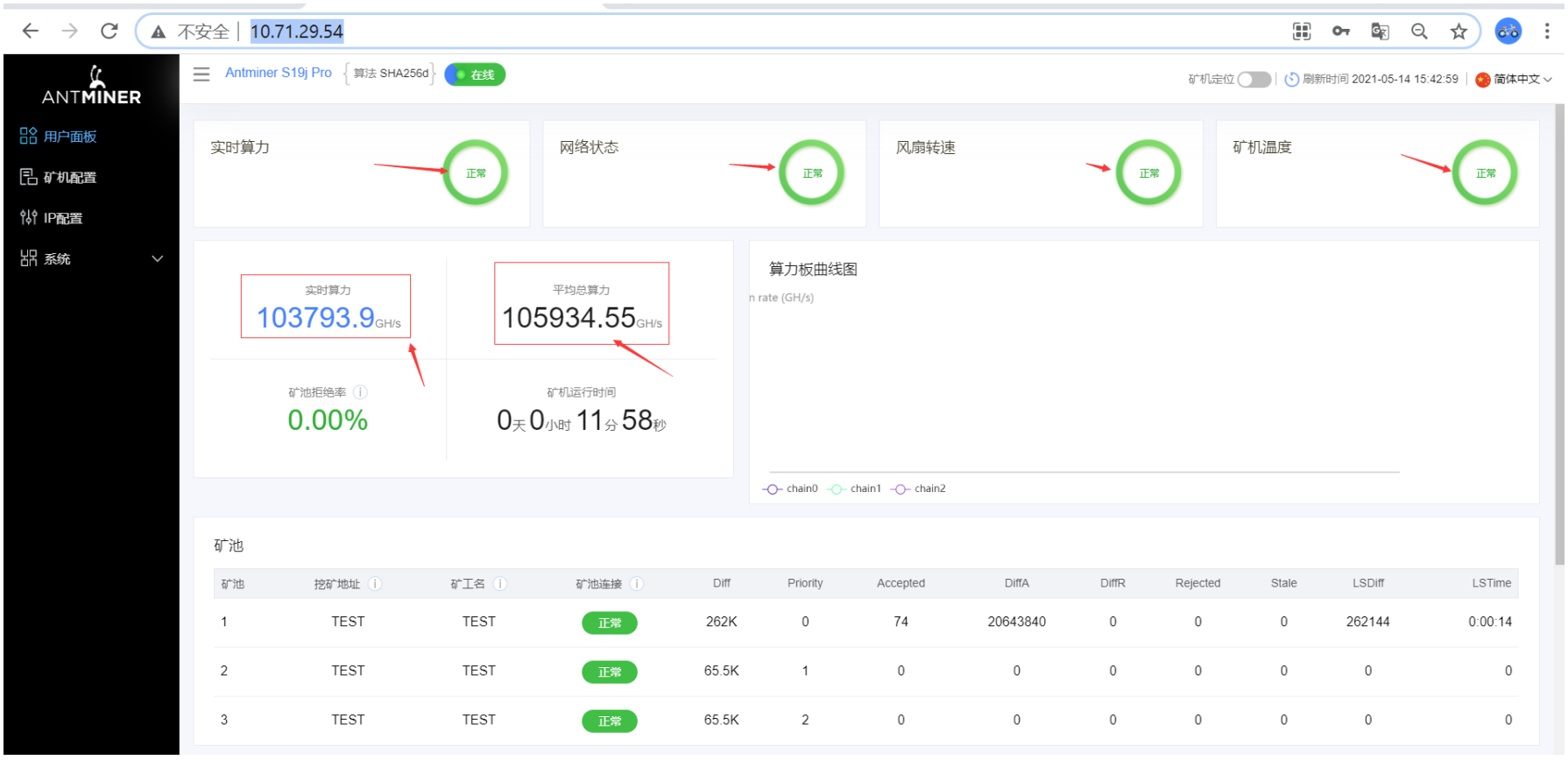


Figure 6-6

Figure 6-7

7. If the single board test is passed, assemble it into a whole machine for testing. One board with low hashrate: As shown in the figure below, the first board has no hashrate after running for about 3 minutes. The specific analysis method is as follows: 1- First perform single-board PT2 test to check if the board is OK. If the test chips are incomplete, then repair the single board. If the normal gear is OK after the test, then separate the board and use the test jig to transport it into the master chip program of DeBug for mining, and adjust the fan speed to 95%. The voltage and frequency are adjusted to the working voltage and frequency of the whole machine. Make the machine run and check if the machine loses its hashrate. If the machine still loses hashrate, reduce the frequency to 200M and remain other conditions unchanged. Let the machine run to see if it will lose hashrate and whether the hash board will display X; if it still displays X and loses hashrate, then remove the heat sink of the hash board for mining, and wait for thehashrate to drop. Measure whether the domain voltage is normal. Generally, the domain voltage will be abnormal in the problematic domain. When measuring the RI signal, check where the RI signal is broken. If the RI signal is missing, basically the chip is short-circuited or damaged due to continuous soldering.

VIII. Other matters needing attention

Maintenance flow chart

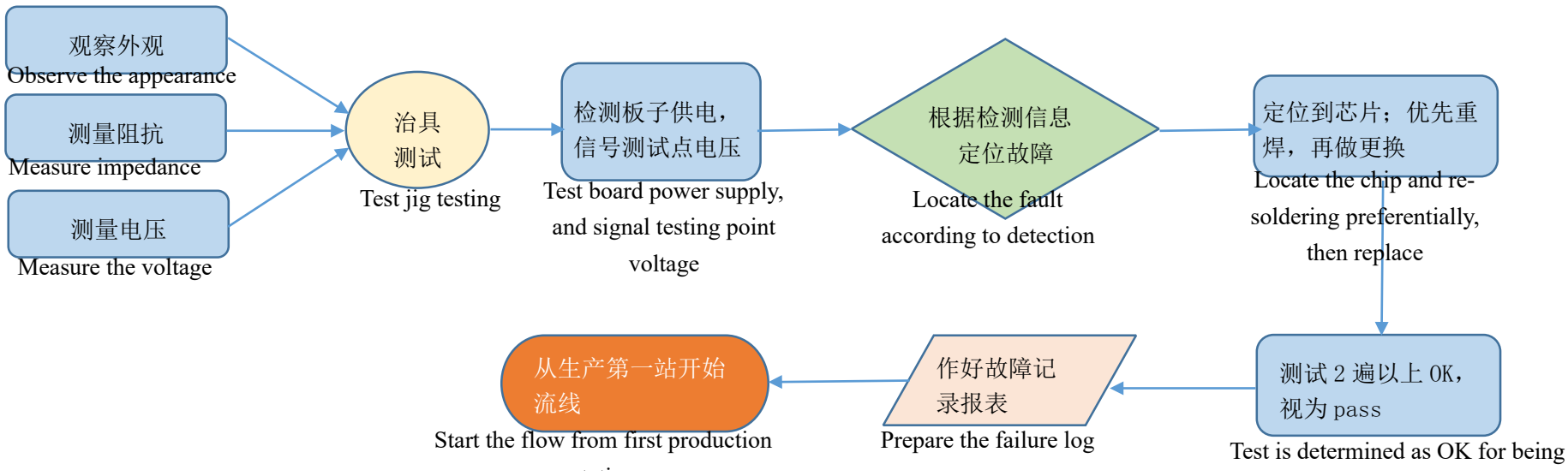


Figure 8-1 Maintenance flow chart

- Routine inspection: First, visually inspect the hash board to be repaired to observe whether there is any PCB deformation or scorching. If there is any, it must be dealt with first; Check whether there are obvious burn marks of parts, parts impact offset or missing parts, etc. Second, after visual inspection is OK, test the impedance of each voltage domain to detect whether there is a short circuit or an open circuit. If any abnormality is found, it must be dealt with first. Then, check whether the voltage of each domain is about 0.32V.
- After the routine inspection is OK (generally the short-circuit inspection of routine inspection is necessary to avoid burning the chip or other materials due to short circuit when the power is turned on), the chip inspection can be carried out with a test jig, and positioning can be determined according to the test results of test jig.
- According to the display results detected by test jig, start from the vicinity of the faulty chip, and detect the chip test points (CO/NRST/RO/XIN/BI) and voltages such as VDD0V8 and VDD1V2.
- According to the signal flow, the RX signal is transmitted in reverse direction (chip 126 to chip 1), among which several signals CLK CO BO RST are transmitted in the forward direction (1-126), and the abnormal fault point is found through the power supply sequence.
- When locating the faulty chip, the chip needs to be re-soldered. The method is to add flux (disposable flux recommended) around the chip, and heat the solder joints of the chip pins to a dissolved state to promote the chip pins and the pads to re-run in, then collect tin, so as to achieve the effect of re-tinning. If the fault is still the same after re-soldering, the chip shall be replaced directly.
- After repairing the hash board, when testing the test jig, the test must be passed for more than two times to judge the product as a good product. For the first time, after replacing the parts, wait for the hash board to cool down, use the test fixture jig to test. After passing the test, put it aside before cooling. For the second time, wait a few minutes for the hash board to cool down completely before testing.