PCI+LPC 2 Digit Dual Sides Display Diagnostic Card

MP2C V6

User Guide v1.0

(Please take note of the product updates without further notice)

Automatic LPC Compatible King diagnostic Card

The invention of this LPC Automatic diagnostic card is a complete technical breakthrough to allow over hundreds of new addon converters. If using the jumper design, the diagnostic card cannot hold all the different types of the jumpers.

One card for all, no limitation to which brand of motherboards to work with.

Quick facts:

1 Regardless of the motherboard brands and models to be tested.

No risk of causing shorts / damages to the motherboards by connecting the bundle of the jumper pins or converter connector in a wrong way to the motherboards.

2. LPC connection fail safe design.

When the LPC pins on motherboards are over 12 or even 30 pins in total, no need to align the pin 1 on the LPC diagnostic card to the motherboard LPC port pin1; That's ok to connect the LPC diagnostic card to the motherboard LPC pins the other way around. Either way, won't short the motherboards.

Worry free and safe to install to the motherboard in the different way.

3. no need to collect a bundle of the different converters or connectors in advanced. That is difficult to pick up the correct one among all the other converters for use; also easy to lost the

converters as well.

4. one card is all we needed.
Bonus saving life time upgrade support and first time annual free upgrade support for certain rare type motherboards that need the special converters to work.
No need to keep purchasing the additional diagnostic cards or adding more converter boards time after time.

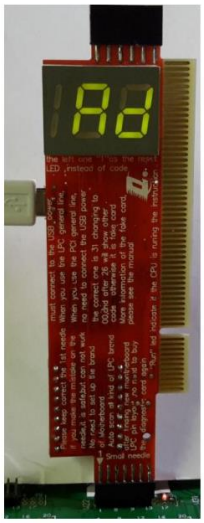
5. RUN LED indicates the working status of the CPU processor.

6. Precise diagnosis results, codes 31 won't show as code 00 anymore, the diagnosis process continue after the code 26.

7. Mobile and smart phone Apps support. User interactive multimedia enriched pictures and text descriptions guide users how to use easily.
Available in English and Chinese language

Dual side Digital display units

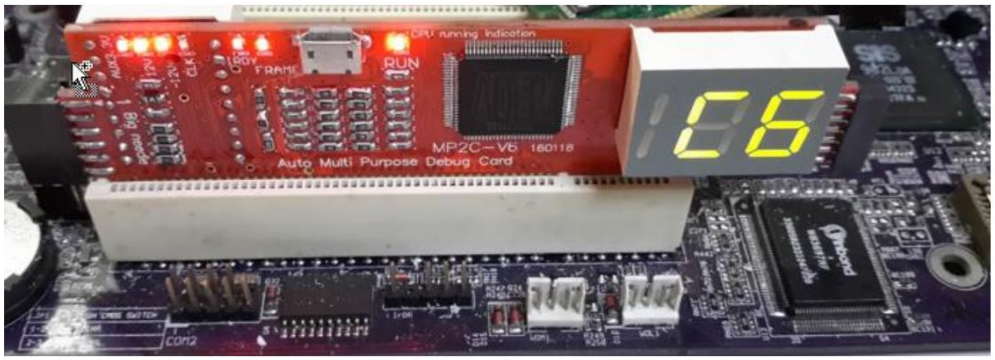
The ergonomic design of the double side digital displays helps the viewing of the diagnostic codes much more easily and conveniently. Viewing of the diagnostic codes will not be hindered by the other components on the motherboard.



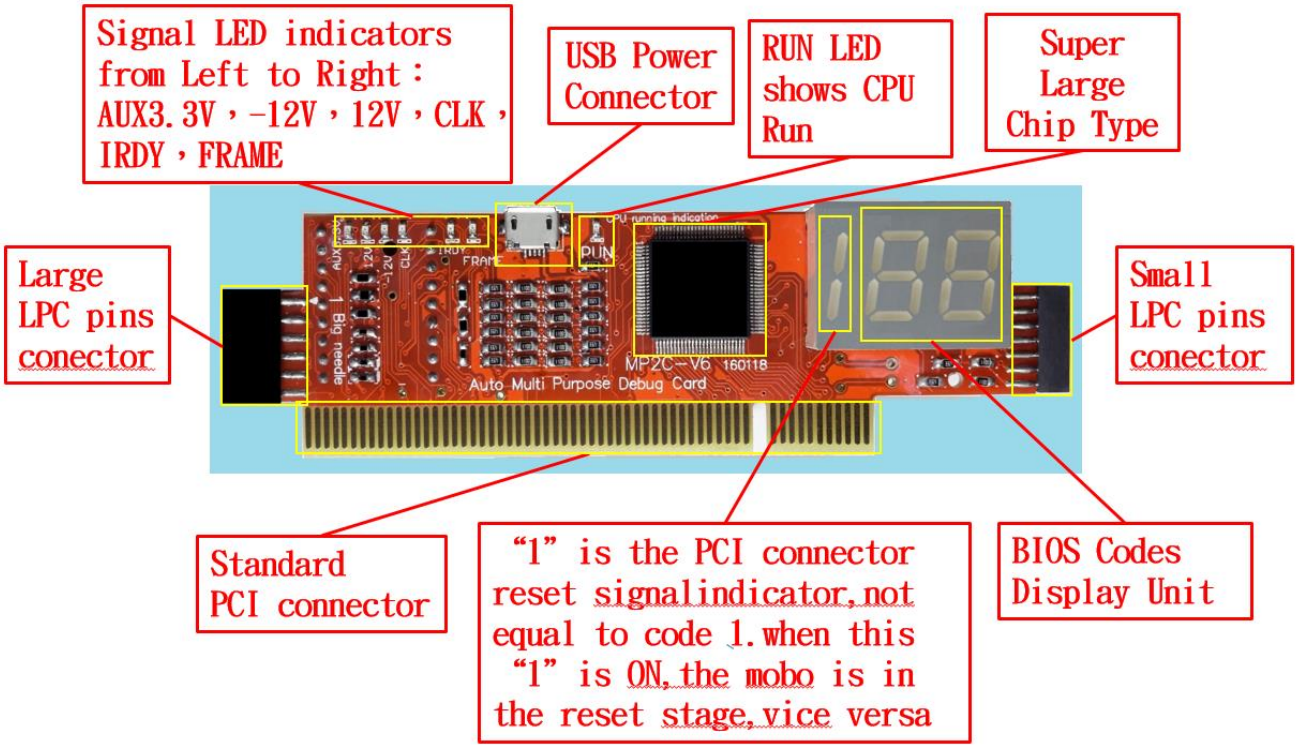
This shows the LPC diagnostic card installing on the 2.0 small pin gap LPC connector

This shows using the large LPC connector on the other side of the diagnostic card to install on the motherboard that comes with the 2.54 large pin gap LPC connector. The dual side codes display design help to show the diagnstic codes clearly.

Regardless of using the standard PCI bus or LPC interface connectionm, both sides of the digital codes display units will show the diagnostic codes.



MP2C V6 Structural Diagram



LPC fully Automatic features:

"Fully Automatic" here means that the diagnostic card is capable of automatically scan and recognize the different LPC pins layouts on the different motherboards.

The advantages:

1. no need to use any converter card or jumper settings to connect the diagnostic card to the motherboard
    a. Compatible with the earlier known and the new latest types LPC connectors. In the case that the LPC connector on the motherboard is new to the diagnostic card, we need not to

purchase the other new diagnostic card or looking for the new converter adapter for the LPC to work, just need to upgrade the current diagnostic card.

b. There will not be further damage to the motherboard at all for connecting the LPC converter or adapter in the wrong way.

c. No need to prepare a complete set of the different converter cards in advance or having hassle of missing some converters from the complete set when needed to do the diagnosis.

2 no need to know the motherboard brand name or the motherboard model numbers in advanced, just stay focus in testing the motherboard directly,

Plug to USB port to get the power to the diagnostic card first

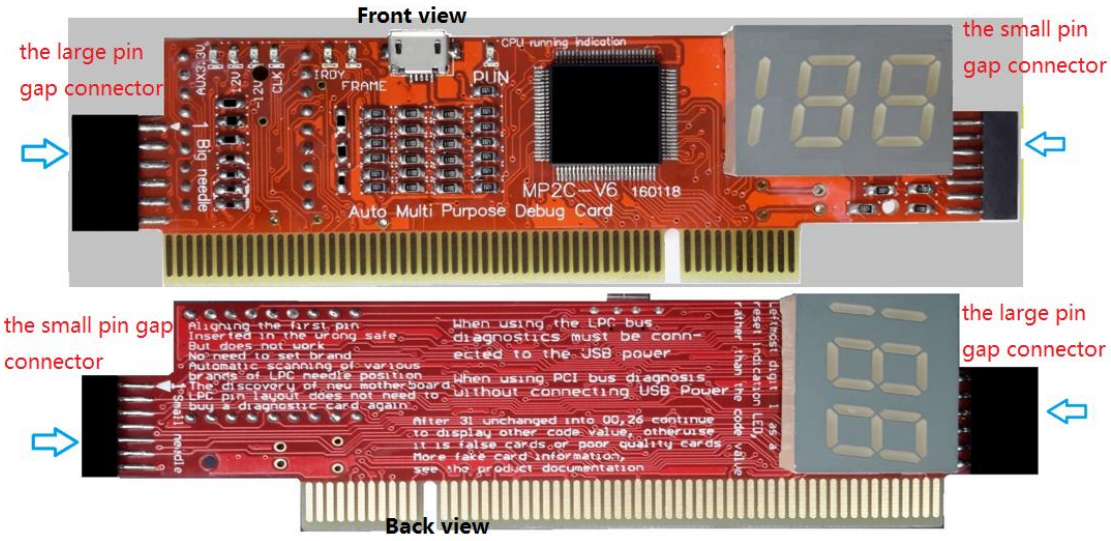
Before putting the diagnostic card to use, the card needs the electrical power in advanced.
We can get the power to the diagnostic card by connecting to the computer USB connector.
Ok to use the mobile phone charging USB cable. Or order as needed.

LPC large and small pin layout connectors

- Both large and small LPC pins connectors come with the Pin 1. This indicates the first pin of the LPC connector
- When using the LPC connector to diagnose the computer, align the pin1 from the tester LPC connector to the motherboard LPC port pin1.

This is truth for all different brands of the motherboards.

- The failsafe LPC connection. If the LPC pins on the motherboard are more than the 12 pins or more, just install the tester LPC connector to the motherboard LPC ports regardless which pin to align with. Try the different connection combinations until the codes are running on the

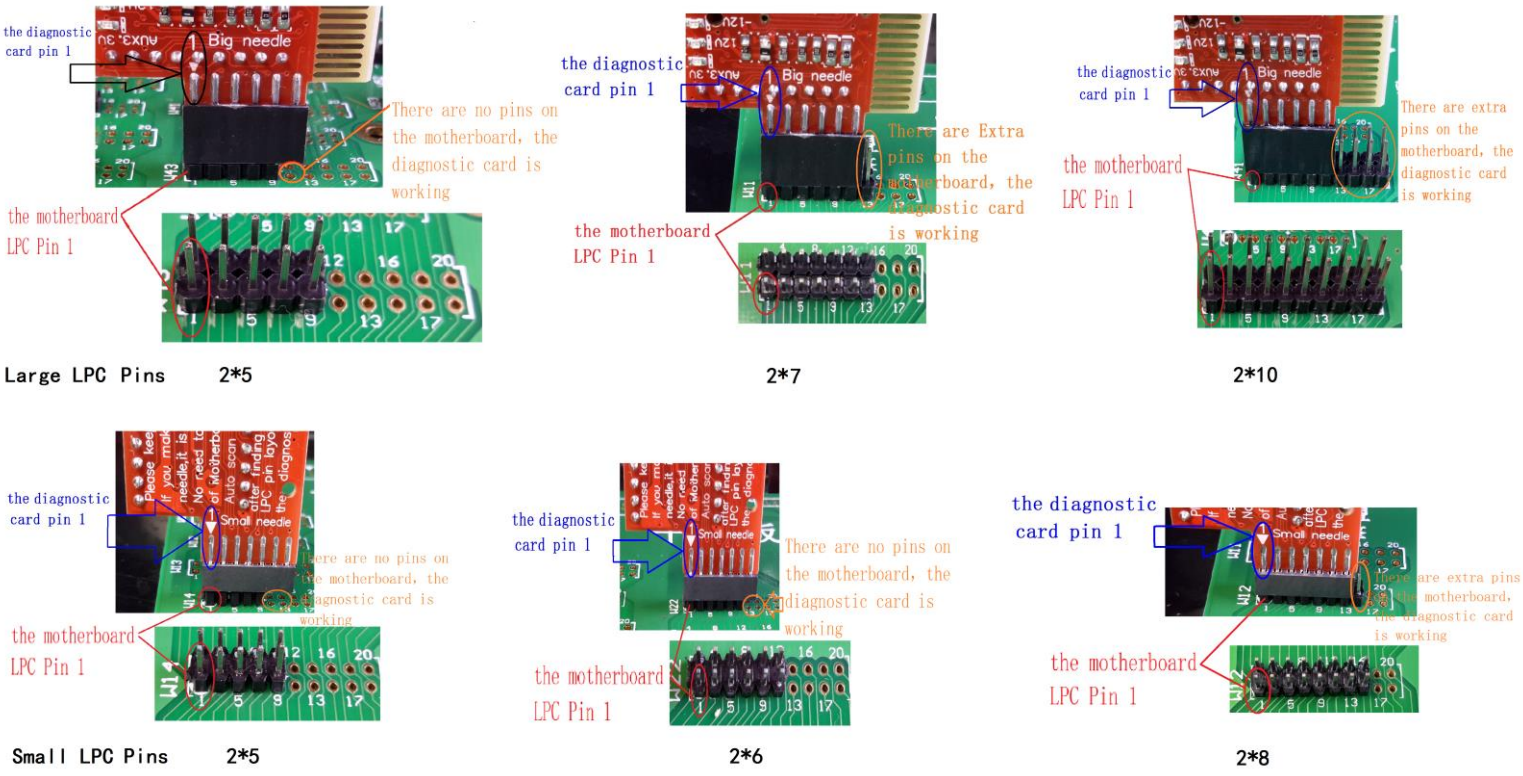


tester unit.

- If cannot get the codes, please contact the support for assistance and the tester upgrade.

<u>The following methods of installing the LPC diagnostic card to the motherboards LPC ports are all correct:</u>

Regardless of the pin layouts on the motherboard, most of time, the LPC pins will not 100% use all pins on the motherboard or sometimes just use

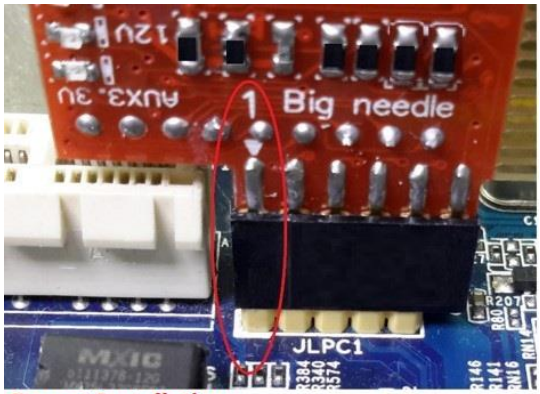


some pins on the motherboard.

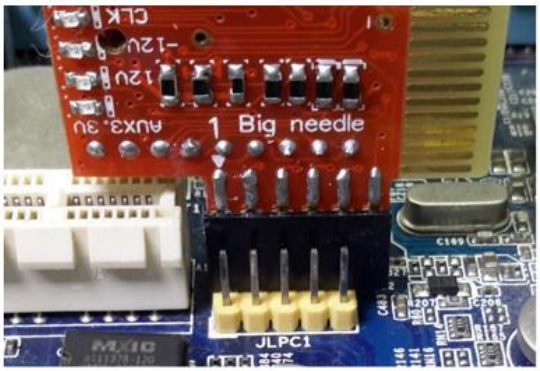
Graphic demonstration : installing the LPC test card to the motherboard LPC ports:

- Align the 1st pin of the LPC tester (pin1 marked with a small White Down arrow) to the motherboard LPC port 1st pin (mostly marked with the small number 1 as well)

- If install the LPC connector to the wrong LPC pins on the motherboard, the test card will not work, and will not damage the motherboard. Try again till get the codes to run on the tester unit

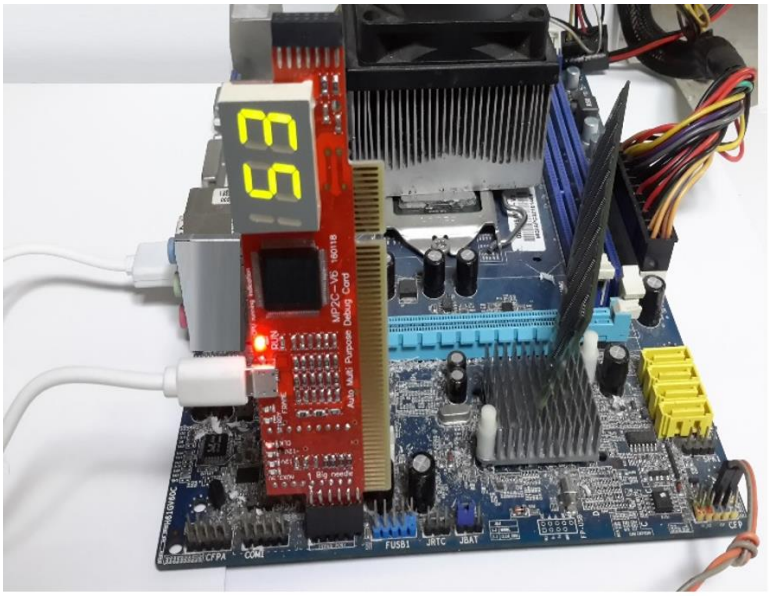


Correct Installation Align pin 1 with arrow sign on the card to the motherboard LPC Pin 1

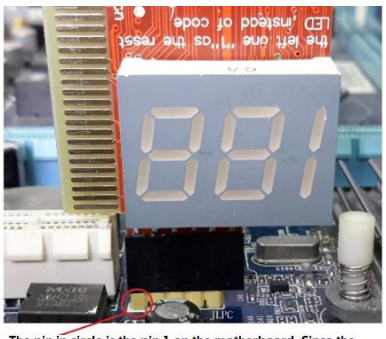


The other row of the pins is mismatched, both rows of pins must match and connect.

The Gamen motherboard without RAM module showing the diagnostic codes “53”.



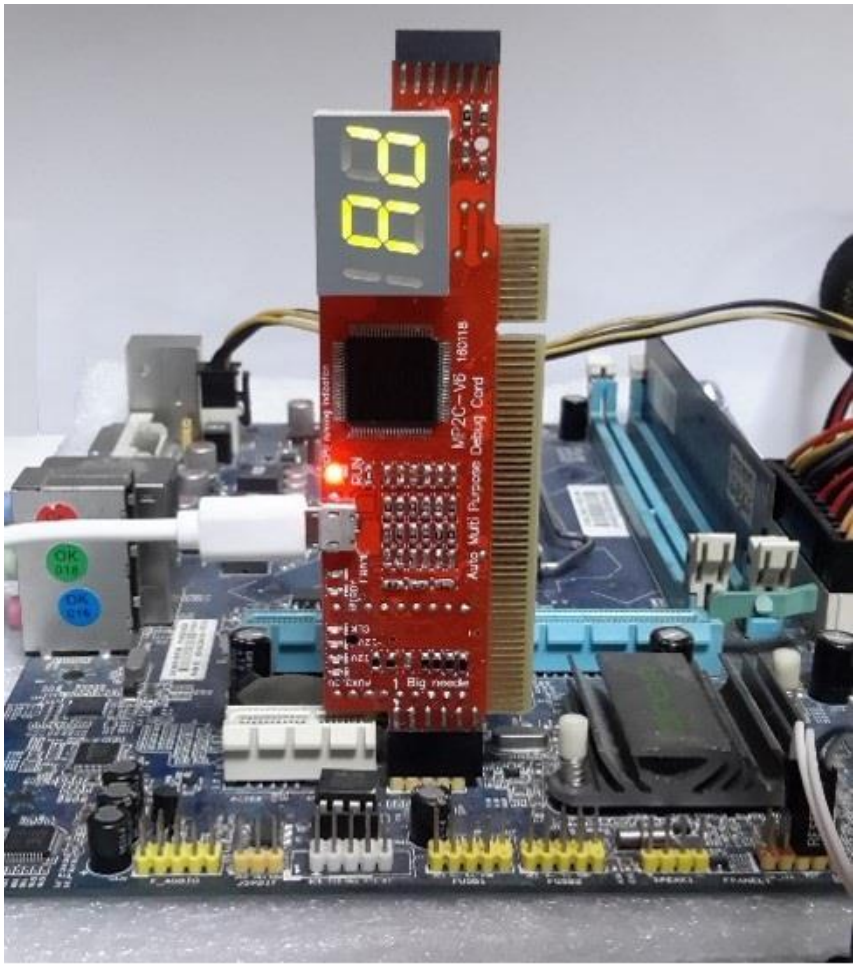
Correct



The pin in circle is the pin 1 on the motherboard. Since the diagnostic card pin 1 is not aligning with this motherboard LPC pin1, the diagnostic card is not working. But will not cause damage to the motherboard.

Wrong

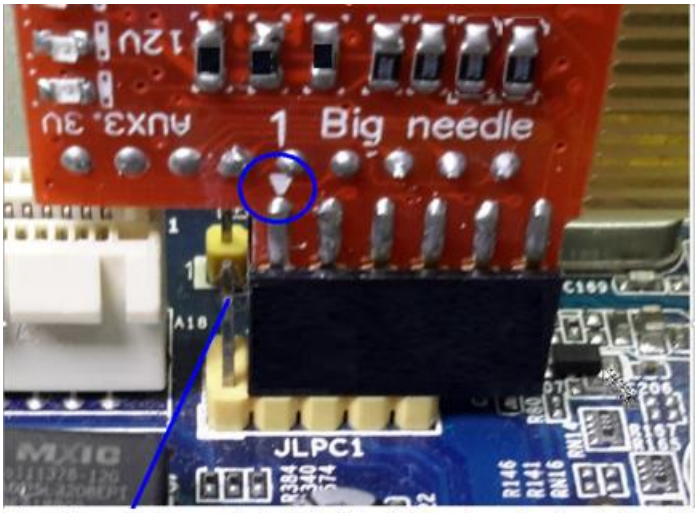
Onda motherboard passes the diagnosis and showing ok Code “Ad”



Correct

The following LPC pin1 and motherboard pin1 are not aligned.

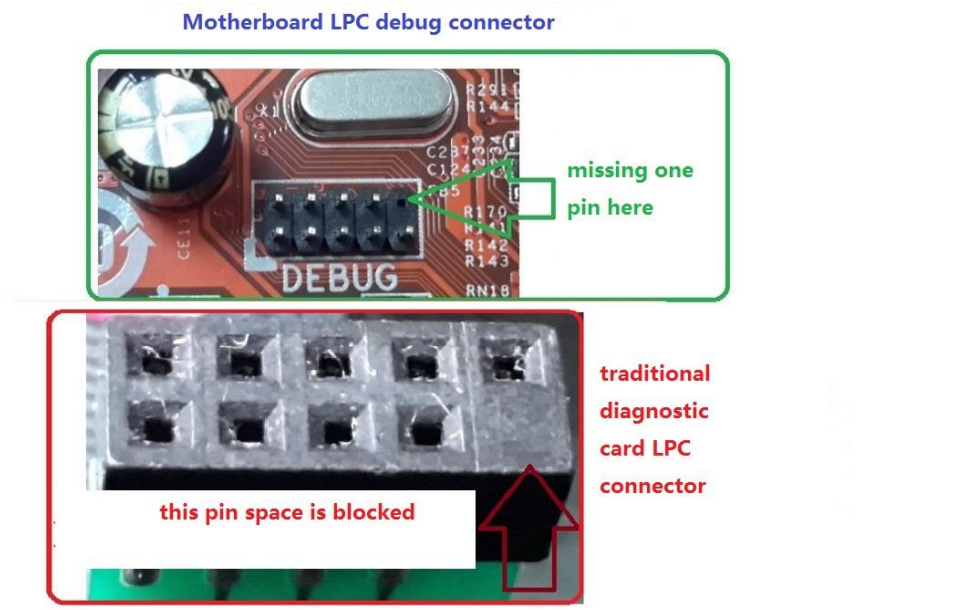
Should align the small white arrow on the LPC diagnostic card to the motherboard Pin1 pins.



The diagnostic card pin1 (with white triangle sign) should be aligned and connect to the pin 1 on the motherboard LPC port.

Wrong

When there is a missing pin (the breaker pin that helps to installing the LPC device to the motherboard correctly) on the motherboard LPC ports, just treat that pin is there and install the LPC diagnostic card to the motherboard.



This blocked pin design does not allow the LPC connector to be installed in different way to the motherboard LPC connector, must match exactly the pins position. But motherboard LPC pins layout are not all the same, so we leave this pin unblocked on our cards.

Since different motherboard LPC ports layout are different with the breaker pins at the different positions, our diagnostic cards breaker pin connectors are designed to work with full pins scenario. So will not bent any pins on the motherboards.

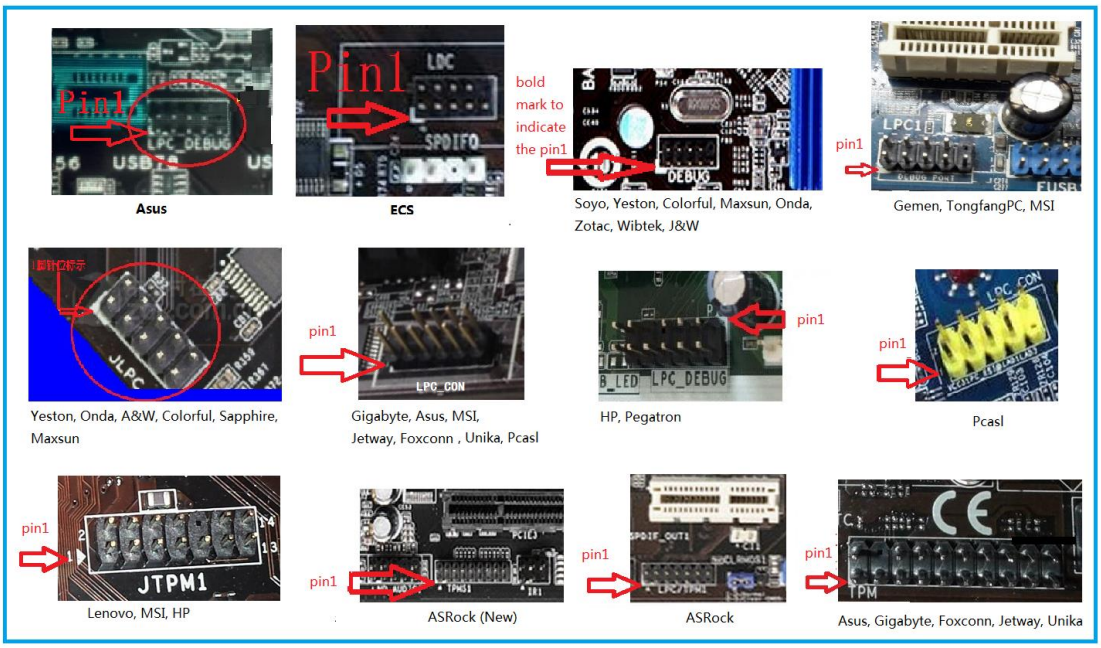
How to identify the LPC ports on the different motherboards Part 1/2

Here are some examples:

Please take note that the LPC ports on the different series of the motherboard in the same brand may have different layouts or orientations; please connect the diagnostic units to the motherboards accordingly.

The followings are the known LPC connectors.

Attn: same brand motherboards LPC pins layout could be different



How to identify the LPC ports on the different motherboards Part 2/2

1. At the time this user guide is binding, we have found the other 3 new LPC connectors on the market. We keep constant checking on the new LPC connection types on the markets, tester will work mostly with the LPC pins, in the case there is new LPC connection type not support by the diagnostic cards, please contact customer supports for the free upgrade on the tester unit (first year free).
2. Tester will not damage the motherboards if install the tester LPC connectors in the wrong orientation or at the different pins settings to the motherboard LPC ports. Try locate the pin1 first, if cannot, just try

again at any combination settings until the codes are running on the diagnostic card unit. If still cannot get the codes, please contact support for assistance.

Upgrade info

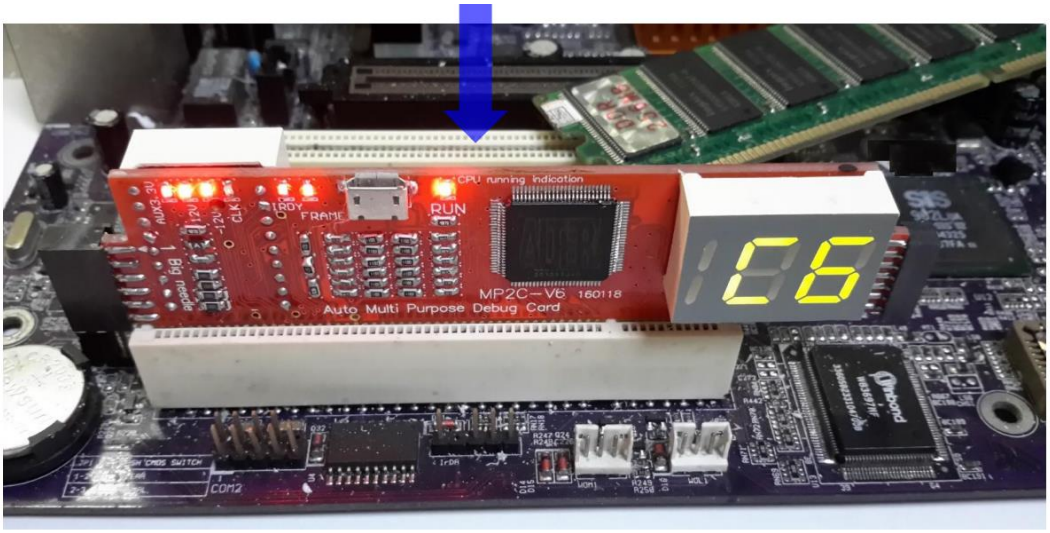
When the motherboard has the LPC, Debug, TPM connectors that are not getting the codes to the LPC tester, please contact support for the upgrade, again, 1st year free, lifetime bonus savings on the upgrade.

Qiguan reserves the final rights on the upgrade

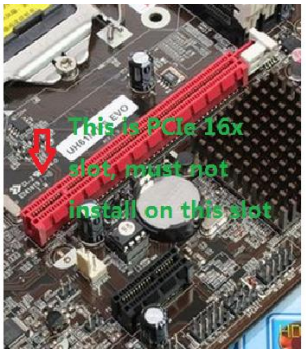
Precaution when using PCI connectors

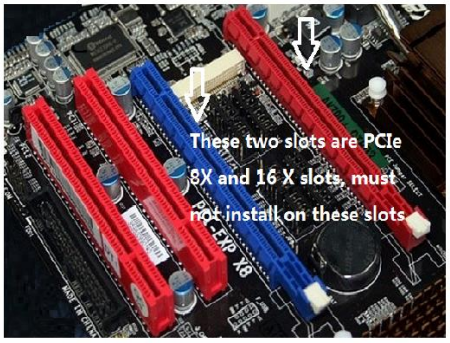
- Install the diagnostic card to the computer standard PCI slot
- When using the PCI connection, please do not connect the USB for power again. But connecting the USB as well will not damage the computer.
- DO NOT install the diagnostic card PCI connector to the other non PCI connector; this will damage the tester and/or motherboard.

Please take note that the standard PCI slot is the white connector in the following picture:



Examples of Non PCI connectors :





LED lights quick reference:

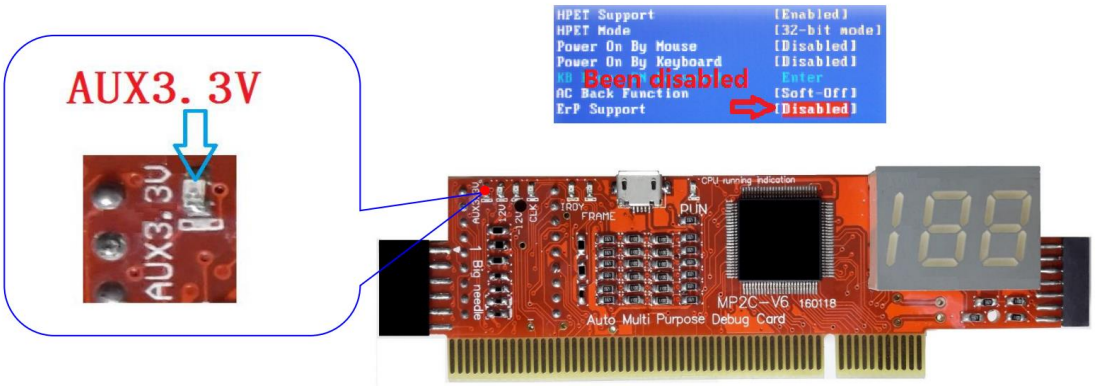
LED indicators

LED Name	Signal sources	Descriptions
AUX3.3.V	power	Found on the standard PCI bus. Power On the empty motherboard this LED should steady On. some motherboards PCI bus does not have this voltage, so this LED will not turn ON. LPC bus does not have this voltage as well, so this signal remains OFF on LPC
+12V	power	When diagnostic card is using the PCI slot, this LED turns steady ON when the motherboard is powered on. Otherwise, there is not such voltage or the motherboard is shorted. LPC does not have this voltage so will; remain OFF on LPC
-12V	power	When diagnostic card is using the PCI slot, this LED turns steady ON when the motherboard is powered on. Otherwise, there is not such voltage or the motherboard is shorted. LPC does not have this voltage so will; remain OFF on LPC
CLK	Main Bus Clock	Only lit when there is clock signal, some motherboards will turn this LED off when finish booting. Sometimes, this LED may flash too fast, hard to see, looks like OFF but ok
IRDY	Major devices ready	For PCI bus only, only lit when there is IRDY signal. LPC does not have this signal, this LED remains OFF on LPC
FRAME	Frame Period	Only lit when there is recycle frame signal, this LED flash fast, sometimes hard to see.
RST	RESET	This LED lit for 1s when using the tester on PCI bus or pressing the computer Reset button. If steady ON, the motherboard reset circuit faulty or the reset pins on motherboard connected to the other; wrong accelerated switches. MP2C-V6 card the digit "1" is the indicator for the Reset signal. When the digit 1 is flashing, the motherboard is resetting, if not, there is no reset process on the motherboard. When using LPC connection, this RST signal was sent from the motherboard to the tester unit. The tester does not rely on motherboard RST signal, it can check on its own, so just focus on the running digital codes on tester. Should not conclude faulty RST when LPC not showing this RST signal.
RUN	CPU	Shows CPU been running and worked. This LED will remain ON even the CPU is paused or quitted from the work queue now. To check on this LED, take the CPU off the motherboard, power on and check again, if this LED turns ON again, this LED is faulty.

AUX3.3V LED

- When installing the diagnostic card into the PCI slot, ATX power supply is connected to the main, this AUX3.3V LED will lit before the PC is power ON or after power OFF.
- When powering ON the computer, this AUX3.3V LED is dim, check the Bios to see if the power saving mode is enabled.

- LPC connector does not come with this LED signal, so this LED will remain OFF on LPC interface.



RUN LED

- The RUN LED relies on very few components on the motherboard to work. Its faulty rate is extremely low. Even installing the diagnostic card to the faulty PCI slot or when all other signal LEDs are OFF, this RUN LED probably can still work and turns ON to indicate that the motherboard used to run. So we can use this feature to help diagnose the following problems :

1. **the diagnostic card is faulty**
2. **the diagnostic card is incompatible with the motherboard being tested.**
3. **the diagnostic card been installed to the faulty PCI slot or to the other motherboard connectors that cannot run the diagnostic process.**
4. **the diagnostic card is having the poor contact with the PCI slot**

due to the following reasons: a. not probably installed to the motherboard; b. the diagnostic card pins are getting dirty to provide the good contacts. C. metal pins are getting rusty.

5. **motherboard is dead**
6. **motherboard is executing the other command unrelated to the diagnostic process**

As soon as the CPU processor has run, this RUN LED will light, even though the CPU stopped working after the initial CPU works.

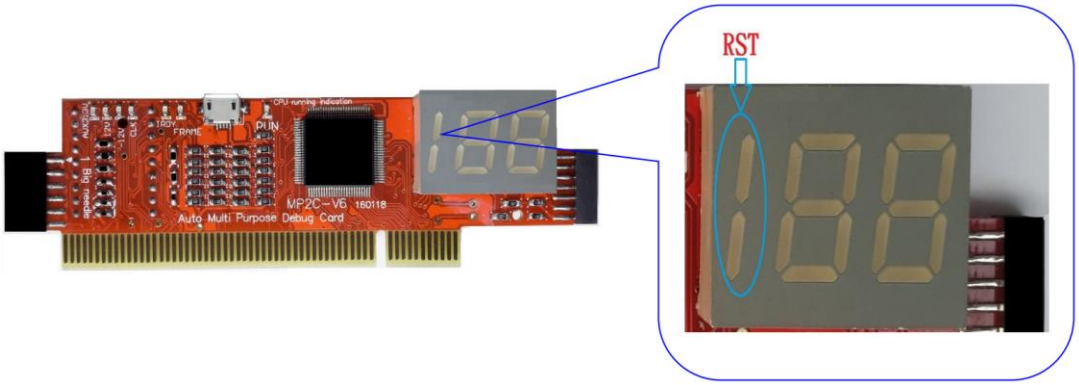
How to check this RUN LED: take the CPU off the motherboard, power on to see if this LED is ON or OFF, if ON, this LED signal is faulty.

RESET Signal LED

- When using the PCI slot, this RESET Signal LED will indicate the reset activity on the PCI slot. Power on the computer or pressing the Reset button on the computer, this RST LED will flash half to one second quickly, this is the correct activity.

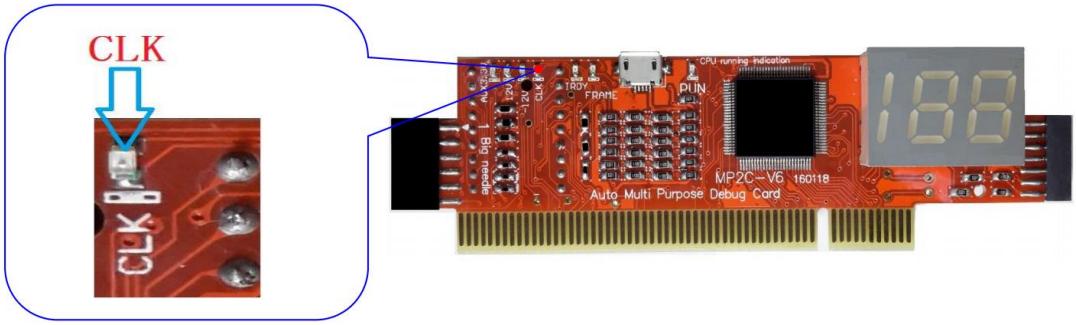
If this RST LED remains ON steady, the RST pins on the motherboard could have wrongly connected to the motherboard acceleration switch or the reset circuitry on the motherboard is faulty.

- When using the LPC connector, Reset signal is the signal send from the motherboard to the LPC diagnostic card. MP2C-V6 does not rely on the Reset signal, it can reset itself. Just need to check on the digital diagnostic codes. Even there is no RST LED signal on using the LPC interface, we cannot conclude that the motherboard is having the faulty reset circuitry.



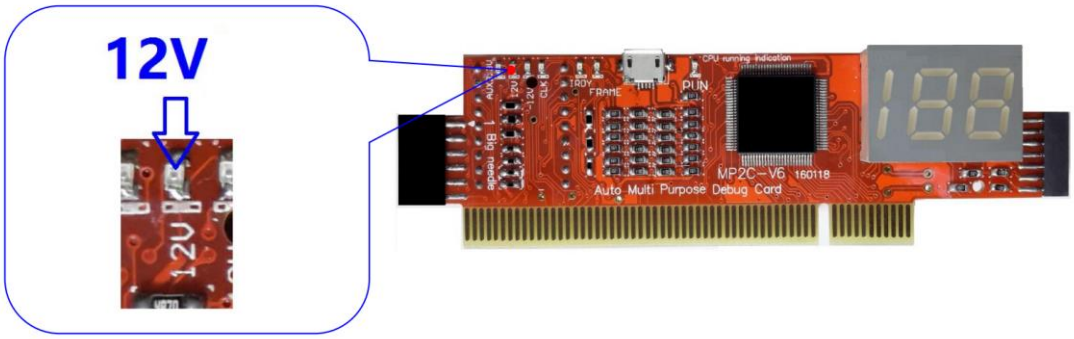
Clock Main Bus Clock Signal LED

1. as shown in the following picture, the CLK represents the Clock signal of 33MHZ or 66MHZ.
2. This CLK LED lit when there is clock signal pulse. Some motherboard turns this LED off after the computer boot up.
3. Sometimes, this LED flash fast enough to be detected, this is normal clock LED activity.



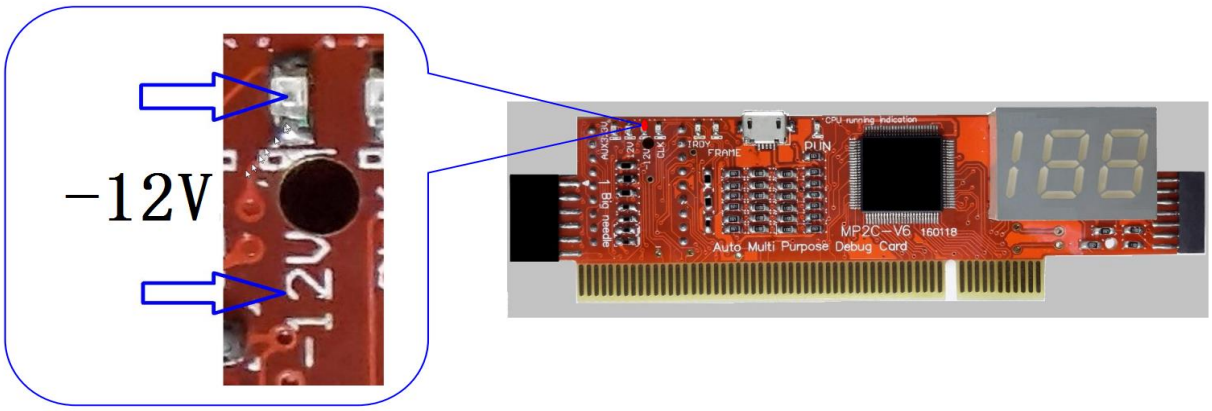
12V Signal LED

- When using the PCI slot, this LED will indicate the PCI slot 12V voltage. Empty motherboard with powers ON, this 12V LED should remains ON steady, otherwise, the 12V voltage is faulty.
- When using the LPC alone, there is no 12V voltage on the LPC bus, so this LED will be OFF on LPC interface.



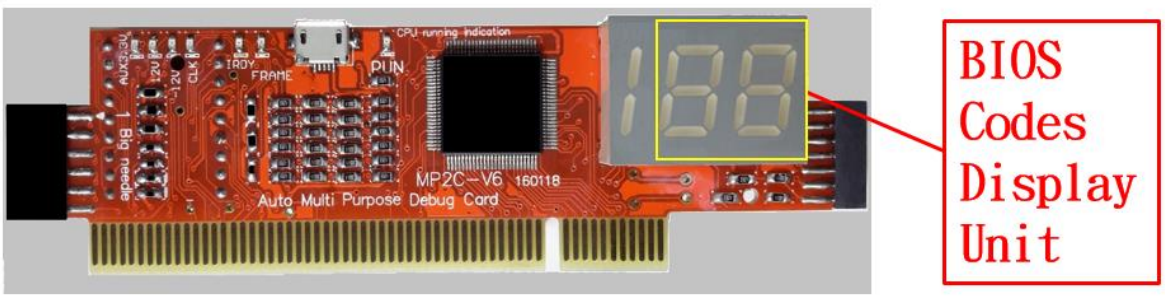
-12V Signal LED

- When using the PCI slot, this LED will indicate the PCI slot -12V voltage. Empty motherboard with powers ON, this -12V LED should remains ON steady, otherwise, the -12V voltage is faulty.
- When using the LPC alone, there is no -12V voltage on the LPC bus, so this LED will be OFF on LPC interface.



Bios codes and features introduction

- Bios codes consist of 2 digital codes and are defined differently by the different Bios manufacturers.
- When using the diagnostic card on the PCI / LPC connectors, diagnostic card will show the Bios codes for the corresponding bus connectors. Not all motherboards have the Bios codes.
- When installing the diagnostic card to the above buses and showing the Bios codes "NO", this means that there is no Bios codes can be retrieved from the current bus (PCI / LPC) connector.



Bios diagnostic features:

1. After the Diagnostic card shows a series of the codes, Bios codes stopped at the “FF”, “00” or “Ad”, this indicates that the motherboard passed self diagnosis. If powering on the motherboard, the Bios codes show “No” instantly and no code changing, this indicates that the motherboard does not work. Please see the section “How to interpret the diagnostic codes “NO”” for more details.
2. Some motherboards have the known issues, but the diagnostic codes show no error, this could be the reason that the error reporting feature been set to disable in the Bios. So there will not be error codes for non critical errors and the diagnostic card will keep going to show the final OK codes such as code “FF” or code “00”.

Solution: change the Bios setting and configuration to report all errors. Must power off and power on the computer again after save and exit this Bios setting change.

After this Bios setting change, even this is non critical error, the diagnostic card can pickup the error codes. Users can then proceed to the troubleshooting and repair process next.

3. Due to the reason that there are different new types of motherboards and models as well as the new Bios codes update periodically, Bios POST codes tables cannot assure the 100% accuracy and complete. Thus, the Bios codes in this manual can only be used as reference.

Computer manufacturers and the Bios designers should have the most up-to-date Bios codes descriptions.

4. Same motherboard different PCI slots, only certain specific PCI slot gets the complete diagnostic codes. Eg. Dell810 desktop PC, only the PCI slot close to the CPU gets the complete diagnostic codes and let the diagnostic card to run through the diagnostic process till the final code “FF” or “00”. Comparing to the other PCI slot on the same machines, the other PCI slots only get the codes to the code 38 and won’t proceed any further. Suggested to try the different PCI slots for the diagnosis.
5. When using the LPC diagnosis, suggested to try reseating the diagnostic card LPC connector to the motherboard LPC port a couple more times to ensure the good contacts. Also using the diagnostic card on the known good motherboard slots and gets the different codes, the diagnostic card is working.

How to lookup the Diagnostic codes description:

Visit the Bios manufacturer to check on the Bios codes descriptions.

Also check on our Qiguan latest update Bios codes tables and/or the Qiguan mobile phone app for the codes lookup.

Smart phone app, Available in Android (complete and Free), Apple App (pending and near the completion).

Use the email on the smart phone to receive the APK app download.

Mobile phone end user App features

- No need to use small booklet paper manual. Multimedia for user interaction, much easier to use than the traditional LCD screen diagnostic card that does not allow the user interaction and comes with limitation on the display of the diagnostic contents.
- After installation, no need network connection; allow checking of the diagnostic codes description and hardware repair solution anytime anywhere.
- Whenever there is update available, the app will show the popup reminder.

Smart phone user interface

The Advantages of using the USB for power

1. common USB ports supply 5V standard voltage, easy to use
2. Not rely on the motherboard LPC 3.3v power supply. Capable of testing the motherboard even when the LPC is having the power failure.
3. avoid the common rectifying voltage adding the extra power consumption burden to the motherboard LPC bus and thus causing the inaccurate test results
4. Avoid the common rectifying activity reduce the LPC connector voltage and thus cause the wrong diagnosis.

   Even using the low voltage 1.8V chips, still cannot compare to the original standard voltage supply
5. Prevent the overloaded common rectifying circuitry from stopping and burnt down the protection feature on the LPC bus.So far, no any other

LPC diagnostic cards can actually prevent themselves from the burnt down.

6. reduce the diagnostic card failure rate by reducing the amount of rectifying diodes on the diagnostic card, more components on the same diagnostic card increases the diagnostic failure rate, especially the power components high voltage diodes and triodes.the damage most of time is the short-circuit or explosions. This is more hazardous than the open circuit problem.

Our engineers used the traditional method during the early stage design and done the experiment:

Used the SchottkyBarrierDiode(SBD) Common Rectification method to gain the power voltage supply, the result was totally a lost.

That is difficult to list all the nice features on the Qiguan LPC diagnostic card, but after more and more uses, we can find how useful and superior the Qiguan diagnostic cards are.

Diagnostic code "no"

Bios codes "no" indicates that the diagnostic card does not receive the Bios code, also same as the initialization code.

How to deal with the Bios code “no” when using the PCI interface?

1. the diagnostic card is having the poor connection with the motherboard PCI slot, the diagnostic card shows “ no “

suggested action 1. use a paper rubber to clean the diagnostic card pins.

Suggested action 2. the PCI slot contact lead could have oxidized, getting rusty, and other situations such as broken pins, bent pins … etc. We may try reseat the diagnostic card a few times on the PCI slot or use the other PCI slot. If there is poor connection between the diagnostic card and the PCI slot, we may get the diagnostic card not showing digital codes display, showing the wrong codes, LED lights not lit, Qiguan diagnosis codes report the normal computer working signals as none.

2. CPU is not working, codes shows “no” and the RUN Led never lit.

Suggested action: check if motherboard is running, check CPU if that is

faulty; check if CPU jumper or CPU settings are correct; also check if power supply is supplying the proper voltages and if the motherboard CMOs battery is getting corroded.

3. on some motherboards, missing RAM module, incompatible RAM or the RAM that failed to pass the tests will also show the codes “no”. Suggest using the paper rubber to clean the RAM pins and clean the RAM slot and redo the test again. Then check if there are other new codes on the diagnostic card.
4. Faulty Bios on the motherboard

Suggested to reflash the latest Bios and test again.

5. Computer boots up ok but still showing “no”

Double check and make sure there is no poor connection and all the connections are ok. If still the same Bios code “no”, the testing slot is not getting the Bios signal.

Suggested to use the other connector (PCI/LPC) to test again. Or use the diagnostic card on the other motherboard. As soon as there are different codes showing on the other test slot or other motherboard, the diagnostic card is working

6. Qiguan diagnosis codes (only applies to the diagnostic cards that come with the 4digtit Qiguan diagnosis codes display) that explained why there is no Bios codes.

Suggested to follow the Qiguan diagnosis codes to troubleshoot the computer and repair the faulty parts first.

How to deal with the code "1no" when using the PCI interface

- When "1" shows up, the motherboard is resetting. If not, the motherboard is not in the process of resetting itself.
- "1" is the reset signal indicator not the diagnostic code.
- When powering ON or pressing the Reset button on computer, the digit "1" should flash once quickly to indicate a working reset circuitry. If this digit keeps steady ON, the motherboard reset pins could have connected wrongly to the motherboard accelerated switch or the motherboard reset circuitry is faulty. The diagnostic code will show "no" when this RST LED is steady ON.
- On LPC interface, the Reset signal is from the diagnostic card itself, not solely indicating the motherboard reset signal, will not display the code "1no"|.

Suggested action: check on the motherboard reset pins and repair the reset circuitry if needed, then proceed to the next diagnosis.

What to do when the LPC diagnosis showing codes "no"?

1. First check on the motherboard LPC port to make sure come with the following markings with LPC pins:

LPC-DEBUG, LPC, DEBUG, LPC1, DEBUG PORT, JLPC, LPC_CON, LPC-DEBUG, LPC/TPM1, JTPM1, TPMS1, TPM etc.

2. next is to find the pin1 on the motherboard LPC port
3. make sure above 2 conditions are met, then select the large or small LPC connectors on the diagnostic card and install the card to the motherboard LPC port with the pin1 aligned.
4. check if the diagnostic card is connected to the USB when installing to the motherboard LPC port
5. if all above steps are done correctly and the diagnostic card still showing code “no”, motherboard LPC connector pins could have been oxidized, try reseat the diagnostic card on the LPC port a few more times(Attn: remove the USB to the diagnostic card and remove the power source to the motherboard when reseating the card on the LPC port). This can prevent the poor connections from causing the wrong diagnostic result.
6. CPU is not working, codes showing “no” and the RUN Led is OFF. First, check on the CPU if that is getting the power and is running by touching the CPU to feel if it is warming up after powered ON.
7. on some motherboards, missing RAM modules, incompatible RAM or the RAM that failed to pass the tests will also show the codes “no”. Suggest using the paper rubber to clean the RAM pins

and clean the RAM slot, reinstall the RAM, then redo the test again. Check if there are new diagnostic codes displaying on the diagnostic card.

8. Motherboard Bios faulty, try reflash the Bios and do the diagnosis again. If not familiar with Bios update reflash, please skip this step.
9. Computer boots up normally but still showing the code “no”.

Suggest to double check there is no poor connection on testing connectors and all the connections are ok. If still the same Bios code “no”, the testing slot is not getting the Bios signal.

Suggested to use the other connectors (PCI / LPC) to test again. Or use the diagnostic card on the other motherboard. As soon as there are different codes showing on the other test slot or other motherboard, the diagnostic card is working

10. Qiguan diagnosis codes (only applies to the diagnostic cards that comes with the 4digit Qiguan diagnosis digital display) that explained why there is no Bios codes. Suggested to follow the Qiguan diagnosis codes to troubleshoot the computer and repair the faulty parts first.

Different LPC conversion modes comparisons

Different LPC Conversion Modes Comparison（1）				
Manufacturers	Other LPC interface diagnostic card		Qiguan LPC Diagnostic card	
Features:	mode1: independent conversion	mode2: use of jumpers on an integrated card	mode3 star shapes converters for multiLPC conversion(Classified Converter Integration and diverse circuitry conversion)	mode4: auto scan
Descriptions	Purely independent mode of conversion. 1. Advantage: no interference during conversion. 2.Disadvantage: many converters to use. 3. Need to keep adding different converters later on. Increasing costs of acquiring and easy to lost. 4.Difficult in the LPC safety design. 5.Hard to operate, tend to causing errors and enlarge the error rate. Not worth to own.	Extremely focus mode of conversion. 1.Advantage: only need few converters to work. 2.disadvantage: lower accuracy due to the interference 3.Cannot catch up with the needs of adding new converters. 4.Difficult in the LPC safety design. 5.Fair performance on the Diagnostic results, not ideal. 6.Hard to operate, tend to causing errors and enlarge the error rate. Not upgradable.	Integrate both advantages from mode 1 and mode 2 1.Not duplicating the disadvantages. 2.Minimize the no. of converters to use and no electronic interference. 3.High diagnostic accuracy, complete diagnostic results. 4.Supplemental Smart phone Applications, easy to work with, fully guarded.	complete technological breakthrough. 1.no converter needed, no electronic interference, high diagnosis accuracy. 2.One card for all motherboards, just like the standard PCI diagnostic card does., 3.Easiest to use, best compatibility, high level safety and reliable 4.Upgradable
Accuracy	1.good accuracy on the conversion mode. 2.Still depends on the card quality and design.	1.A lot of jumpers to use on the diagnostic card. 2.Concentrated Circuitries easy to cause interference. 3.Prone to miss and get the wrong diagnostic codes. 4.When the no of jumpers causing higher work load than the motherboard LPC port can afford, there will not be diagnostic codes executing, the interference will at the same time causing the inaccurate diagnostic result obtain from the PCI and PCIe ports.	Classified and grouped designs help to eliminate the interference and thus getting the accurate diagnostic test results. The 6digit cards get the best results.	1.no need conversion; 2.no interference, high accuracy, no missing or wrong diagnostic codes.
Compatibility	Cannot get the diagnostic codes when the motherboard does not have the same converter.	Cannot get the diagnostic codes when the motherboard does not have the same converter. Even though the converters on the diagnostic board stated supporting motherboard brands or models, due to the concentrated conversion mode causing a lot of interference, and weakened the LPC port workloads capacity, easy to get the missing codes or wrong diagnostic codes.	When need to test the new motherboards with the newer connectors, the diagnostic card can be upgraded to the newer chipset. Or simply purchase the addon converter to work with.	One diagnostic card for all, the best compatibility. Auto scan no wrong connection, the most secured method.

Different LPC Conversion Modes Comparison（2）

Manufac-turers	Other LPC interface diagnostic card		Qiguan LPC Diagnostic card	
Features:	mode1: independent conversion	mode2: use of jumpers on an integrated card	mode3 star shapes converters for multiLPC conversion(Classified Converter Integration and diverse circuitry conversion)	mode4: auto scan
Safety of operation	Basic electronic knowledge: wrong connection on the unprotect designed electronic converters will cause the "burn and smokes". the best scenarios is just the freeze or abnormal halt on the operation.	Basic electronic knowledge: wrong connection on the unprotect designed electronic converters will cause the "burn and smokes". the best scenarios is just the freeze or abnormal halt on the operation.	LPC connectors are fully protected. Mistakenly connection or installation will only cause the halt on the diagnostic card, will not cause any damage to the motherboard. Safe to use.	No need to check on the motherboard brand name or model number before the test. Auto scan no wrong connection, the most secured method.
Operating difficulty	step1：need to ensure the motherboard brand and model step2：need to study the motherboard menu to find out the specific connector to use. This will be very difficult since each converter supports many brand motherboards, one brand motherboard also come with many different LPC layouts the limitation of the no. of the converters cannot fully meet the different motherboard diagnostic needs. very easy to install wrong. Step3: to select the correct converter among many converters step4：connect the selected converter to the motherboard step5：align the pin1 on the motherboard LPC ports or align the breaker pins. easy to connect the converter wrongly to the motherboard, unconfident of use causing worry of the "burn and smoke" from the motherboard. Finally give up on the diagnostic process.	step1: need to ensure the motherboard brand and model step2：need to study the motherboard menu to find out the specific connector to use. This will be very difficult since each converter supports many brand motherboards, one brand motherboard also come with many different LPC layouts the limitation of the no. of the converters cannot fully meet the different motherboard diagnostic needs. very easy to install wrong. Step3：to select the correct converter among many converters step4：connect the selected converter to the motherboard step5：align the pin1 on the motherboard LPC ports or align the breaker pins. step6：align the pin1 on the motherboard to connect the converter to. easy to install wrong and have to take precaution of causing the "smoke", thus have to give up on the diagnosis.	No need to study the motherboard manual. Each converter comes with the marking to help indicate which motherboard brand to test. LPC complete protection design, ok to test using different connection settings until the codes are running.	No need to check on the motherboard brand name or model number before the test. Just as easy as using the standard PCI diagnostic card, works on all motherboards, no worry of causing damage to the motherboard.
Upgradability	non upgradeable, either buy the newer cards or adding the converter types.	non upgradeable, and also hard to invent much other new converters for the newer motherboards. this is because the LPC on the motherboard comes with a certain workload capability. More added on converter will exceed the workload the halt the diagnosis.	Only need to keep adding more new converters	in the case gets no diagnostic codes on the motherboards that supposed to have the codes running, contact the supports to upgrade the card.
stocking easiness	converters are all very small size, hard to find, max no. of converters to keep, easy to lose, hard for storage.	number of the converters is much fewer than the one in mode1, about the same to the one in mode3. but the converters and jumpers are the smallest to keep and hard to find.	Classified and concentrated, the converters are larger size, easy to find.	No need converter and jumpers, nothing to lose.

2 bit BIOS CODE
For MP2C V6/KQCPET6-H/KQMET6/KQSW4

UEFI BIOS POST CODE

Code	Explanation		
92	PCI Bus initialization is started.	A3	Activated all currently connected IDE devices.
93	PCI Bus hot plug initialization.	A4	SCSI initialization is started.
94	PCI Bus enumeration for detecting how many resources are requested.	A5	Issue reset during SCSI initialization process.
95	Check PCI device requested resources.	A6	Detect and install all currently connected SCSI devices.
96	Assign PCI device resources.	A7	Activated all currently connected SCSI devices.
97	Console Output devices connect (ex. Monitor is lighted).	A8	Verify password if needed.
98	Console input devices connect (ex. PS2/USB keyboard/mouse are activated).	A9	BIOS Setup is started.
99	Super IO initialization.	AA	Reserved.
9A	USB initialization is started.	Ab	Wait user command in BIOS Setup.
9b	Issue reset during USB initialization process.	AC	Reserved.
9C	Detect and install all currently connected USB devices.	Ad	Issue Ready To Boot event for OS Boot.
9d	Activated all currently connected USB devices.	AE	Boot to Legacy OS.
9E~9F	Reserved.	AF	Exit Boot Services.
A0	IDE initialization is started.	B0	Runtime AP installation begins.
A1	Issue reset during IDE initialization process.	B1	Runtime AP installation ends.
A2	Detect and install all currently connected IDE devices.	B2	Legacy Option ROM initialization.
		B3	System reset if needed.

EFI BIOS POST CODE

General Power	
code	Meaning
10	PEI Core is started.
11	Pre-memory CPU initialization is started.
12~14	Reserved.
15	Pre-memory North-Bridge initialization is started.
16~18	Reserved.
19	Pre-memory South-Bridge initialization is started.
1A~2A	Reserved.
2b~2F	Memory initialization.
31	Memory installed.
32~36	CPU PEI initialization.
37~3A	IOH PEI initialization.
3b~3E	PCH PEI initialization.
3F~4F	Reserved.
60	DXE Core is started.
61	NVRAM initialization.
62	Installation of the PCH runtime services.
63~67	CPU DXE initialization is started.
68	PCI host bridge initialization is started.
69	IOH DXE initialization.
6A	IOH SMM initialization.
6b~6F	Reserved.
70	PCH DXE initialization.
71	PCH SMM initialization.
72	PCH devices initialization.
73~77	PCH DXE initialization (PCH module specific).
78	ACPI Core initialization.
79	CSM initialization is started.
7A~7F	Reserved for AMI use.
80~8F	Reserved for OEM use (OEM DXE initialization codes).
90	Phase transfer to BDS (Boot Device Selection) from DXE.
91	Issue event to connect drivers.
92	PCI Bus initialization is started.
93	PCI Bus hot plug initialization.
94	PCI Bus enumeration for detecting how many resources are requested.
95	Check PCI device requested resources.
96	Assign PCI device resources.
97	Console Output devices connect (ex. Monitor is lighted).
98	Console input devices connect (ex. PS2/USB keyboard/mouse are activated).
99	Super IO initialization.
9A	USB initialization is started.
9b	Issue reset during USB initialization process.
9C	Detect and install all currently connected USB devices.
9d	Activated all currently connected USB devices.
9E~9F	Reserved.
A0	IDE initialization is started.
A1	Issue reset during IDE initialization process.
A2	Detect and install all currently connected IDE devices.
A3	Activated all currently connected IDE devices.
A4	SCSI initialization is started.
A5	Issue reset during SCSI initialization process.
A6	Detect and install all currently connected SCSI devices.
A7	Activated all currently connected SCSI devices.
A8	Verify password if needed.
A9	BIOS Setup is started.
AA	Reserved.
Ab	Wait user command in BIOS Setup.
AC	Reserved.
Ad	Issue Ready To Boot event for OS Boot.
AE	Boot to Legacy OS.
AF	Exit Boot Services.
B0	Runtime AP installation begins.
B1	Runtime AP installation ends.
B2	Legacy Option ROM initialization.
B3	System reset if needed.
B4	USB device hot plug-in.
B5	PCI device hot plug.
B6	Clean-up of NVRAM.
B7	Reconfigure NVRAM settings.
B8~BF	Reserved.
C0~CF	Reserved.

EFI BIOS POST Code

S3 wake	
CODE	Meaning
E0	S3 Resume is stared (called from DXE IPL).
E1	Fill boot script data for S3 resume.
E2	Initializes VGA for S3 resume.
E3	OS S3 wake vector call.

recovery	
代码	Meaning
F0	Recovery mode will be triggered due to invaild firmware volume detection.
F1	Recovery mode will be triggered by user decision.
F2	Recovery is started.
F3	Recovery firmware image is found.
F4	Recovery firmware image is loaded.
F5~F7	Reserved for future AMI progress codes.

ERROR	
代码	meaning
50~55	Memory initialization error occurs.
56	Invalid CPU type or speed.
57	CPU mismatch.
58	CPU self test failed or possible CPU cache error.
59	CPU micro-code is not found or micro-code update is failed.
5A	Internal CPU error.
5b	Reset PPI is failed.
5C~5F	Reserved.
D0	CPU initialization error.
D1	IOH initialization error.
D2	PCH initialization error.
D3	Some of the Architectural Protocols are not available.
D4	PCI resource allocation error. Out of Resources.
D5	No Space for Legacy Option ROM initialization.
D6	No Console Output Devices are found.
D7	No Console Input Devices are found.
D8	It is an invaild password.
D9~DA	Can't load Boot Option.
Db	Flash update is failed.
DC	Reset protocol is failed.
DE~DF	Reserved.
E8	S3 resume is failed.
E9	S3 Resume PPI is not found.
EA	S3 Resume Boot Script is invaild.
EB	S3 OS Wake call is failed.
EC~EF	Reserved.
F8	Recovery PPI is invaild.
F9	Recovery capsule is not found.
FA	Invalid recovery capsule.
Fb~FF	Reserved.

AWARD BIOS POST CODE

CODE	meaning	Explanation
C0	Turn off chipset cache	Close OEM manufacturers to design the Cache Controller CPU status (1 FLAGS) test
1	Microprocessor Test 1	Test CPU following states:. Carry, zero, sign, overflow BIOS setting each state and tested.
2	Microprocessor Test 2	Read / write / verify all of the CPU cache, SS, SP, and BP buffer containing 00 FF and the data type do this test.
3	Initialization Chipset	Close NMI, PIE, AIE, UEI, SQWV. Close video, parity checking, DMA. Reset point arithmetic (math coprpcessor). Clear has paging cache, CMOS shutdown octet initialization Timer 0, 1, 2, including
4	Memory Test	RAM test can be normal Refreshed, ensure Refresh memory function can work.
5	Initialize keyboard and clear the screen	Initialization Keyboard controller and clear screen.(IOR*. IOW*. RESET . Clock SA2)
6	Reserved	Reserved
7	Test CMOS interface and battery status	Test CMOS interface and battery status Detecting whether the battery in good condition.
bE	Chipset default value is initialized	The chipset buffer to boot (Power On) default so easy to enter the boot state.
C1	Memory presence test	OEM specific, test the size of on-board memory

AWARD BIOS POST CODE

CODE	meaning	Explanation
0A	Set up interrupt vector table	nitialize first 120 interrupt vectors. The interrupt address 00h to 1Fh address set to be consistent with the INT-TBL.
0b	Test CMOS RAM checksum	CMOS RAM checksum test, if an error or insert key is pressed, the preset load.
0C	Initialization keyboard	Detects the presence of Keyboard in KBC port and Set NUM _LOCK Status
0d	Initialize video interface	Detect CPU clock, read CMOS location 14h to find the type of video in use, detect and initialize video adapter
0E	Test video memory	Write sign-on message to screen, setup shadow RAM
0F	Test DMA controller 0	BIOS checksum test, keyboard detect and initialization.
10	Test DMA controller 1	
11	Test DMA page registers	Test DMA page registers
12~13	Reserved	
14	Test timer counter 2	Test 8254 timer counter 2
15	Test 8259-1 mask bits	Test 8259-1 mask interrupts is normal..
16	Test 8259-2 mask bits	Test 8259-2 mask interrupts is normal..
17	Test stuck 8259 interrupt bits	Test stuck 8259 interrupt bits; Test stuck key.
18	Test 8259 interrupt functionality	Interrupt and checks the interrupt operation is normal.

AWARD BIOS POST CODE

CODE	meaning	Explanation
POST DEBUG CODE （practical AWARD 6.0version）		
C0		Turn off chipset cache
C1		Memory presence test; OEM specific, test the size of on-board memory
C3		memory self-check
C5		Early shadow; OEM specific, early shadow enable for fast boot； memory self-check
08		Test special keyboard controller for Winbond 977 series S uper I/O chips; Enable keyboard interface
29		Initialization Graphics
2d		Display system information
52		Test all memory (clear all extended memory to 0)
FF		Boot loader (INT 19h)
7		

PHOENIX BIOS POST CODE

Code	Meaning	Instructions
POST DEBUG CODE （PHOENIX BIOS 6.0）		
06		Initialize system hardware
08		Initialize chipset
16		BIOS ROM checksum
28		Test for memory(Autosize DRAM)
29		Initialize POST Memory Manager
2A		Clear 512 KB base RAM
4A		Initialize all video adapters in system
50		Display CPU type and speed
F6		Clear Huge Segment
F7		POST done - prepare to boot operating system

AWARD BIOS POST CODE

CODE	meaning	Explanation
1B~1E	Reserved	
1F	Set EISA mode	Set EISA mode; If the EISA memory checksum is good then EISA is initi alized. If it's not good then ISA tests and clear EISA mode flag
20	Enable slot 0	Enable slot 0(System Board).
21~2F	Enable slots 1-15	Initialization slots 1 to 15.
30	Test base and ex tended memory	Size base and extended memory; Size the base memory from 256K to 640K and the extended memory above 1MB
31	Test base and ex tended memory	Test the base memory from 256K to 640K and the extended memory above 1MB using various bit patterns注意: EISA mode does not perform this test, under ISA mode you can press the ESC key to skip this test.
32	Test EISA extend ed memory	If EISA mode set, then tested on a memory Slots Note: This test mode will be omitted under the ISA, EISA mode, press the ESC key to skip this test.
33~3b	Reserved	
3C	Setup enabled	
3d	Initialization and install the mouse	Initialize and install mouse if present.

AMI BIOS POST CODE

Code	Meaning	Instructions
BOOT BLOCK DEBUG CODE		
Before d0		Save power-on CPUID value in scratch CMOS.
d0	Power CPU and chipset initialization	Go to flat mode with 4GB limit and GA20 enabled. Verify the bootblock checksum. Early chipset initialization is done. Early super I/O initialization is done including RTC and keyboard controller. NMI is disabled.
d1	Power-SIO initialization	Early chipset initialization is done. Early super I/O initialization is done including RTC and keyboard controller. NMI is disabled. Including RTC and keyboard controller, serial, parallel, floppy controller initialization.
d2	Early super I/O and chipset initialization	Open the cache, examine BootBlock checksum; open RTC; SIO initialization of Hareware Monitor, north and south bridge and OEM north and south bridge.
d3	Early BootBlock initialization	If memory sizing module not executed, start memory refresh and do memory sizing in Bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
d4	Test memory	Test base 512KB memory. Adjust policies and cache first 8MB. Set stack.
		Bootblock code is copied from ROM to lower system

AMI BIOS POST CODE

Code	Meaning	Explanation
		为INT13, INT0E, INT1E设置默认的处理方式。 ???
E9		Set up floppy controller and data. Attempt to read from floppy.
EA		Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM.
EB		Disable ATAPI hardware. Jump back to checkpoint E9.
EF		Read error occurred on media. Jump back to checkpoint EB.
F0		Search for pre-defined recovery “AMIBOOT. ROM” file name in root directory.
F1		Recovery file not found “AMIBOOT. ROM”
F2		Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file.
F3		Start reading the recovery file cluster by cluster.
F5		Disable L1 cache.
FA		Check the validity of the recovery file configuration to the current configuration of the flash part.
Fb		Make flash write enabled through chipset and OEM specific method. Detect proper flash part. Verify

AMI BIOS POST CODE

Code	meaning	Explanation
Fd		Program the flash part.
FF		The flash has been updated successfully. Make flash write disabled.
POST DEBUG CODE （Practical AMI 8.0）		
03	Start Post	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	CMOS initialization	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.

AMI BIOS POST CODE

Code	meaning	Explanation
2E	Initializes all the output devices.	
31	Allocate memory for ADM module and uncompress it	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module	Initializes the silent boot module. Set the window for displaying text information.
37	Display BIOS Information	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Mid-POST device initialization.	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
39	Initializes DMAC-1 & DMAC-2.	
3A	RTC detection	Initialize RTC date/time.
3b	Detection of system memory	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.。
3C	Mid POST initialization of chipset registers.	Initialization SATA, HAD and BGA OEM POST mid-initialized.

AMI BIOS POST CODE

Code	Meaning	Instructions
8d	Build ACPI tables (if ACPI is supported)	Build ACPI tables (if ACPI is supported)
8E	Configuring Peripherals	Program the peripheral parameters. Enable/Disable NMI as selected
90	Initialization Late SMI	Late POST initialization of system management interrupt.
A0	Check boot password if installed.	If the user has set a password before, you will be prompted to enter the password authentication information.
A1	Clean-up work needed before booting to OS.	Make sure that all the preparatory work before into the OS has been done to restore Runtime status and interrupt vectors.
A2	准备Runtime Image。	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.	
A7	Displays the system configuration	Displays the system configuration screen if enabled.Initialize the CPU's before boot, which includes the

Qiguan 2-bit Open Code

Motherboard brands and models	The code flash	Meaning
Gigabyte H61-DS2	C1	No memory detected or memory self-test is not passed
Gigabyte H61-DS2	d3	No memory detected or memory self-test is not passed
Supermicro X9DAi	82	No memory detected or memory self-test is not passed
Biostar H81MDV5	84	No memory detected or memory self-test is not passed
Foxconn H61	84	No memory detected or memory self-test is not passed
DELL MIH81R	84	No memory detected or memory self-test is not passed
DELL MIH81R	dF	By detecting

insyde Debug code

BOOT-LOADER		POST		POST	
POST CODE	DESCRIPTION	POST CODE	DESCRIPTION	POST CODE	DESCRIPTION
00H	Boot started	19H	Checksum the ROM	33H	Test keyboard command byte
01H	initialize chipset	1AH	Reset PICs	34H	TEST,blank and count all RAM
02H	initialize chipset	1BH	initialize video adapter(s)	35H	Safely entered protectedmode(2)
03H	Test RAM	1CH	Initialize video(6845Regs)	36H	Completely RAM test
04H	into RAM	1DH	Initialize color adapter	37H	protected mode(2)
05H	Execution in RAM	1EH	Initialize monochrome adapter	38H	Update keyboard contro-ller output port
06H	Check override option	1FH	Test 823 A page registers	39H	Setup cache controller
07H	Shadow system BIO	20H	Keyboard controller self test	3AH	Test if 18.2Hz periodicworking
08H	Checksum systemBIOS ROM	21H	Rest keyboard controller	3BH	Test for RTC ticking
09H	Proceed withnormal boot	22H	Check if CMOS RAM valid	3CH	Initialize hardware interrupt vectors
0AH	Proceed withcrisis boot	23H	Test battery fail &CMOS X-SUM	3DH	Search and init the mouse
0FH	No memory/fatalerror	24H	Test the DMA controllers	3EH	Update Numloxk status
CCH	Proceed with crisis ROM	25H	Initialize 8237A controller	3FH	OEM init COM and LPTports
99H	Resume SMRAM not found	26H	Initialize interruptvectors	40H	Configure the COM andLPT ports
		27H	RAM quick sizing(page test)	41H	Initialize the floppies
POST		28H	Safely entered protected mode	42H	Initialize the hard disk
POST CODE	DESCRIPTION	29H	Completely RAM test	43H	Initialize option ROMs
10H	Signals that RESEtoccurred	2AH	Successful exit from protectedmode	44H	OEM's init of power management
11H	Turn off FASTA20for POST	2BH	Setup shadow	45H	Update NumLock status
12H	Signal power onreset	2CH	Going to initialize video	46H	Test for coprocessorinstalled
13H	Initialize the chipset	2DH	Search for monochrome adapter	47H	OEM functions before boot
14H	Search for ISAbusVGA adapter	2EH	Search for color adapter	48H	Dispatch to OS boot
15H	Reset counter/time 1	2FH	Sign-on messages displayed	49H	Jump into bootstrap code
16H	User registerconfiguration through CMOS	30H	OEM init of keyboard controller	50H	ACPI initial
17H	Size system memory	31H	Test if keyboard present	51H	Check if S2D partition exist
18H	Dispatch to RAMtest	32H	Test keyboard interrupt	52H	USB hub controller initial

insyde Debug code

PCI BIOS		PNP BIOS	
POST CODE	DESCRIPTION	POST CODE	EDESCRIPTION
D0H	Check ROM signature, 1.x video	A1H	Check R/W status for runtime dataarea
D1H	Enable RAM area in registers	A2H	Check R/W status for NVRAM dataarea
D2H	Copy ROM to RAM in registers	A3H	Resolve svstem nodes by CMOSsettings
D3H	Update seqment range attribute	A4H	Init. Var.to PNP BIOS runtime dataarea
D4H	Configure memory registers	A5H	Hook INT 15h
D5H	Configure I/O registers	A6H	Setup $PnP install ch-eck in F0000 seq.
D6H	Configure IRQ assignments	A7H	PNP last minute hooks for OEMs
D7H	Turn on PCI device	A8H	Protect RT data area &NVRAMbuffer
D8H	2.x video r/w segment	A9H	Return from PNP init-ial procedure
D9H	OEM defined, ROM init		
DAH	Disable add-in ROM card decode	SMI HANDLER	
DBH	PCI return(config and no video)	POST COD	EDESCRIPTION
DCH	PCI video->Enable RAM area in reg	C0H	SMI entry marker
DDH	PCI Video-Copy ROM to RAM in reg	C1H	SMI exit marker
DEH	PCI Video-Update seg. Range attr.	C2H	APMSMI entry
DFH	PCI Video-Configure memory reg.	C3H	APMSMI exit
E0H	PCI Video-Configure I/O reg.	C4H	SWSMI function execution
E1H	PCI Video-Configure IRQ	C5H	HWSMI function execution
E2H	PCI Video-Turn on PCI device		
E3H	PCI Video-2.x video r/w segment		
E4H	PCI Video-OEM defined,ROM init		
E5H	PCI Video-Dis.addin ROM carddecode		
E6H	PCI Video-PCI return (no video)		
E7H	Look for PCI bridge device		
E8H	Search IDE controllers on the PCI bus		
E9H	Start of CardBus configuration		