

笔记本三合一诊断卡

(VIP版)

使用说明书

NOTEBOOK MINI PCI / MINI PCI-E /

LPC COMBO-DEBUG-CARD

(VIP VERSION)

USER'S GUIDE

Mini PCI/Mini PCI-E/LPC 三合一诊断卡(VIP 版)

笔记本三合一诊断卡(VIP 版)使用说明

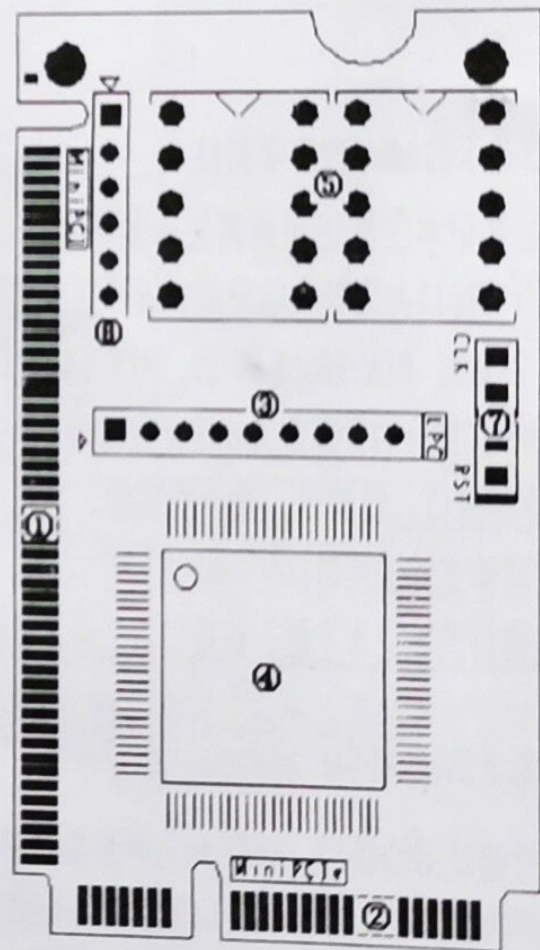
该笔记本诊断卡采用四层 PCB 设计, 信号稳定性好。此外诊断卡采用了高质量的钽电容来提供优质的电源供应。这使得VIP版的诊断卡更适合于在恶劣环境下长期工作。该VIP版笔记本诊断卡是三合一版诊断卡的升级版本, 支持Mini PCI, Mini PCI-E, LPC总线接口。该诊断卡使用方便, 稳定性好, 是笔记本电脑维修的理想工具。

- ◆ 一: 系统主要组成部分及用法
- ◆ 二: 诊断卡的Mini PCI接口
- ◆ 三: 诊断卡的Mini PCI-E接口
- ◆ 四: 诊断卡的LPC接口
- ◆ 五: 诊断卡的显示接口
- ◆ 六: 诊断卡的部分错误代码解释
- ◆ 七: 问题和答案

➤ 一: 系统主要组成部分

- 1) Mini PCI 接口: 用于连接该诊断卡到笔记本主板的Mini PCI插槽
- 2) Mini PCI-E 接口: 用于连接该诊断卡到笔记本主板的Mini PCI-E插槽

- 3) LPC 接口: 用于连接该诊断卡到笔记本主板的LPC接口
- 4) 专用的主芯片: 用于处理Mini PCI, MiniPCI-E, LPC的信号
- 5) 两个七段数码管: 用于显示诊断结果
- 6) 测试接口: 该接口仅被用于在该卡出厂前的检测, 用户请不要连接该接口。
- 7) 显示接口: 显示 CLK 和 RST 的状态。



➤ 二：诊断卡的Mini PCI接口

Mini PCI 是被笔记本主板普遍使用的接口，它的功能类型于 PCI 总线。Mini PCI总线共有 124 个管脚，该诊断卡通过使用其中的 101个管脚实现了所需的功能。当该诊断卡被安装到笔记本的 Mini PCI插槽上的时候，该诊断卡的长度会短于主板 Mini PCI 插槽的长度。这给使用该诊断卡带来了方便。

➤ 三：诊断卡的Mini PCI-E接口

Mini PCI-E是笔记本主板正在逐渐使用的新型接口。比较于Mini PCI接口，Mini PCI-E接口占用更少的空间。该诊断卡使用Mini PCI-E接口的下列管脚：PIN-8, PIN-10, PIN-12, PIN-14, PIN-16, PIN-17, PIN-19。当前，由于这部分的管脚定义标准正在形成，所以并非目前所有笔记本主板都支持该接口。经测试，最近的联想，惠普，东芝，华硕，TCL 等笔记本主板能够支持该接口。

对于少数不支持该接口的笔记本主板，该接口将无法正常使用。

➤ 四：诊断卡的LPC接口：

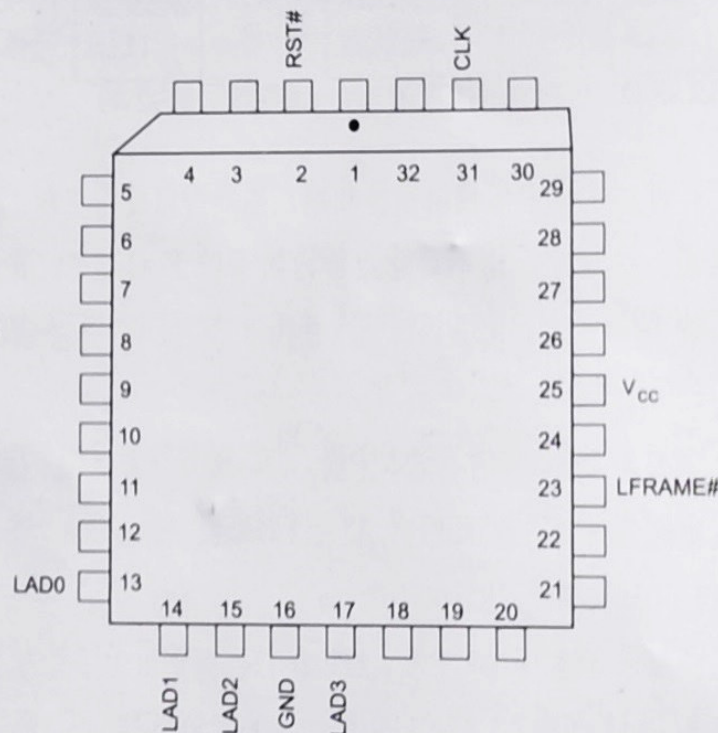
LPC 是主板普遍使用的接口。诊断卡上对该接口的定义是：从左到右，依次是：PIN1-LFRAME#，PIN2-LAD3，PIN3-LAD2，PIN4-LAD1，

PIN5-LAD0，PIN6-GND，PIN7-LRESET#，PIN8-LCLK，PIN9-3.3V。

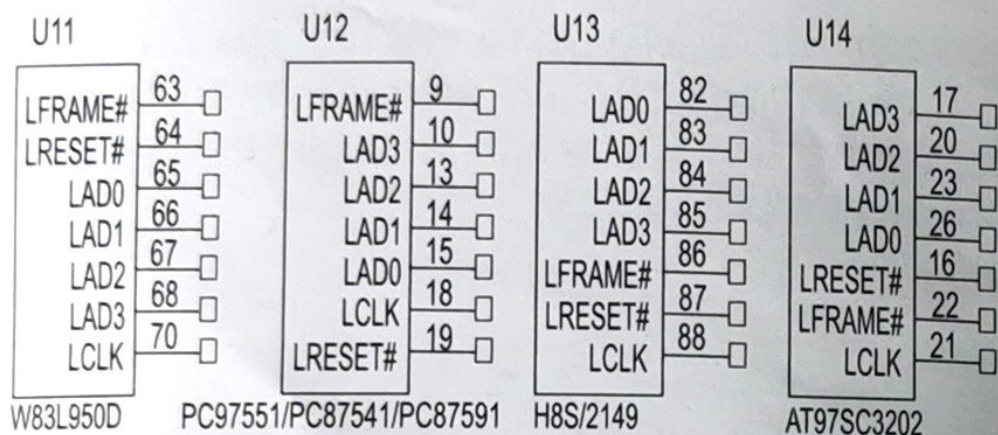
主板上通常没有跟该接口相对应的插槽，所以用户需要通过飞线来连接该接口到主板上。如果主板上PLCC32的BIOS，用户可以通过飞线连接该诊断卡到主板的 LPC接口 BIOS 上。

LPC BIOS 的管脚定义是：

PIN2-RST#，
PIN14-LAD1，
PIN16-GND，
PIN23-LFRAME#，
PIN13-LAD0，
PIN15-LAD2，
PIN17-LAD3，
PIN25-VCC，



除了 LPC BIOS，用户也可以连接该诊断卡到常用的笔记本主板 LPC 接口芯片上，比如常见的 PC97551，PC87541，PC87591，H8S/2149，W83L950D，TCPA 等。下面是部分芯片的LPC 管脚定义。更多信息请参考该芯片的数据手册。



注：上图中未列出电源和地。用户可以使用主板上的任意 GND 和 3.3V 电源。（注意：请不要连接该诊断卡的 PIN1-3.3V 或者 PIN10-3.3V 到非 3.3V 的电源上。因为该诊断卡使用 3.3V 供电，不正确的电源连接会永久损坏该诊断卡。）

对于 IBM X60 的笔记本主板，LPC 接口已被保留于序号为 U39 的插槽上。其定义为：A2-→LRESET#，A3-→LFRAME#，A5-→LCLK，A9-→LAD3，A10-→LAD2，A11-→LAD1，A12-→LAD0

对于 IBM T6 R6 主板，LPC 接口已被保留于序号为 J26 的插针上。其定义为：A1-→LCLK，A3-→LFRAME#，B2-→LRESET#，B7-→LAD3，A7-→LAD2，B6-→LAD1，A6-→LAD0

五：诊断卡的显示接口

诊断卡的显示接口包括诊断代码显示，总线类型显示，和时钟(CLK)，复位(RST)信号状态显示。

1) 诊断代码显示：使用两个七段数码管，左边的数字为高位，右边的数字为低位。当主板出错时，通过显示的诊断代码就可以知道出错点。

2) 总线类型显示：两个数码管右下角中的两个圆点分别被用于显示所使用的总线接口。当使用 Mini-PCI-e 和 LPC 接口时，右边的数码管右下角圆点会被点亮；当使用 Mini-PCI 接口时，左边的数码管右下角圆点会被点亮。

3) 时钟和复位信号显示：当主板处于复位状态时，复位指示灯亮起，CLK 指示灯熄灭。

六：诊断卡的部分代码解释

当主板 BIOS 在运行的时候，会通过该诊断卡输出一系列的代码。当主板出现故障时，诊断卡会显示对应于故障的代码。下面列出部分重点代码：

AWARD BIOS，当诊断卡所显示的数字停留在下列代码时的解释如下：

代码	解释	注释
C0	关闭 Cache	
01	处理器测试	
07	CMOS 测试	
C1	内存大小测试	
0A	设置中断表	
0C	初始化键盘	
0D	初始化显卡	
1A	显示 CPU 频率	
3C	CMOS 设定	
42	初始化硬盘	
52	检测扩展 ROM	
FF	引导系统	

AMI BIOS, 当诊断卡所显示的数字停留在下列代码时的解释如下:

代码	解释	注释
00	自检出错	
01	处理器测试出错	
0D, 0F	CMOS 自检出错	
1A 至 22	内存自检出错	
3A	显卡出错	
FF	顺利完成自检	

➤ 七: 问题和解答

问: 复位(RST)信号指示灯熄灭, CLK信号指示灯不闪烁, 诊断卡显示代码“00”。

答: 通常, 这种情况表明诊断卡没有收到时钟信号, 所以无法工作。可能的情况是主板不支持诊断卡的 Mini PCI-e 接口。请采用 LPC接口或者 Mini PCI 接口进行测试。

问: 复位(RST)信号指示灯熄灭, CLK信号指示灯闪烁, 诊断卡显示代码“00”。

答: 这种情况表明复位信号和时钟信号正常, 请检查总线指示灯。如果右边数码管右下角圆点被点亮, 表明诊断卡工作在 Mini PCI-e总线或者 LPC 总线状态。如果左边数码管右下角圆点被点亮, 表明诊断卡工作在 Mini PCI总线状态

Mini PCI / Mini PCI-E / LPC Combo-Debug-Card VIP version Notebook Combo-Debug-Card (VIP Version) User Guide

This notebook Combo-Debug-Card uses 4-layers PCB design to provide a very stable signal quality. Also, it uses Tantalum capacitance to provide good power supply. So this VIP version Debug card is more suitable to be used in poor environment. This VIP version is the upgraded version of the Combo-Debug-Card, and it supports three bus interfaces: MINI PCI, Mini PCI-E and LPC. This product is easy to use, and is designed with good stability. It is your ideal tool for notebook repair.

- ◆ 1. Combo-Debug-Card structure and usage
- ◆ 2. The Mini-PCI interface in the Combo-Debug-Card
- ◆ 3. The Mini PCI-E interface in the Combo-Debug-Card
- ◆ 4. The LPC interface in the Combo-Debug-Card
- ◆ 5. The LED-Display in the Combo-Debug-Card
- ◆ 6. Part of Error-Code explanation
- ◆ 7. Q/A

► 1. Combo-Debug-Card structure and usage

① Mini PCIinterface:

This is used to connect this Combo Debug Card to notebook` s Mini-PCI slot.

② Mini PCI-e interface:

This is used to connect this Combo Debug Card to notebook` s Mini-PCI-e slot.

③ LPC interface:

This is used to connect this Combo Debug Card to notebook's Mini-PCI slot.

④ ASIC:

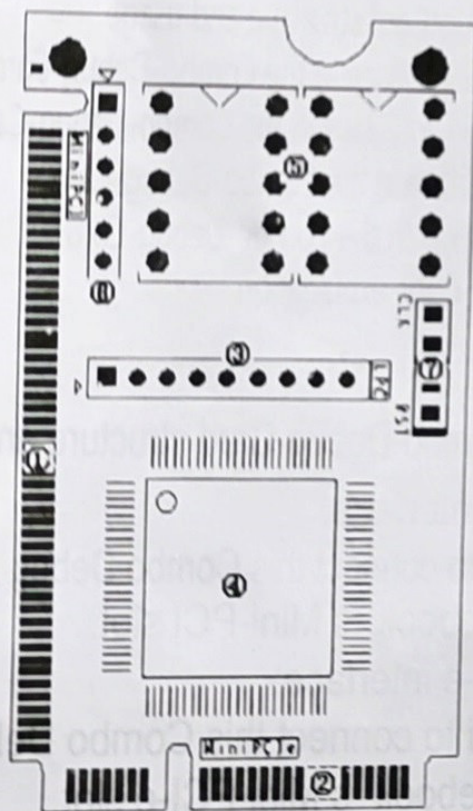
⑤ Two 7-segment LED s:

This is used to display the Error-code:

⑥ Tes port:

This port is reserved, and end-user should not use this port,

⑦ Indicator: This is for showing the status of CLK and RST signal.



► 2. The Mini-PCI interface in the Combo-Debug-Card

Mini PCI is a general interface, which is used in notebook. It includes 124 pins. This Combo-Debug-Card doesn't fully use those pins, and only 101 pins are used. When installing this Combo-Debug-Card to your notebook main-board, you will find the Combo-Debug-Card is shorter than the notebook Mini-PCI slot. This is correct, and it serves better for you to plug or unplug this Combo-Debug-Card.

► 3. The Mini-PCI-e interface in the Combo-Debug-Card

Mini-PCI-e is used as a trend in the new notebooks. Comparing to Mini-PCI, Mini-PCI-e occupies less space. This Combo-Debug-Card doesn't use all of the Mini-PCI-e bus pins. And only the below pins are used: PIN-8, PIN-10, PIN-12, PIN-14, PIN-16, PIN-17, and PIN-19. In the Mini-PCI-e spec, those pins are reserved, and it is not standard, so some of Notebook manufacturers define it as a LPC debug-port. And more and more notebook manufacturers are using this standard, such as IBM, Toshiba, HP, ASUS, TCL and etc... This Combo-Debug-Card can only work in the notebooks, which are with the LPC debug-port definition. For the notebooks, which don't support this LPC debug-port definition, this Combo-debug-card PCI-E interface will not work.

Note: Please be aware that Mini-PCI-e is supported with limitation, and it can works in most of notebooks, but not all.

► 4. The LPC interface in the Combo-Debug-Card

For the user, whose notebooks don't support the Mini-PCI interface and the Mini-PCI-e interface, you can use the third port: LPC interface. LPC interface exists in all notebook main-boards. In the Combo-Debug-Card, from left to right, the LPC definition is:

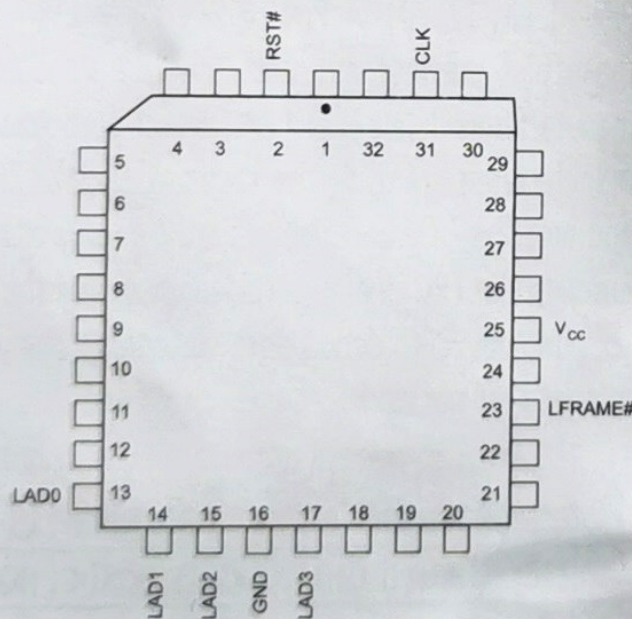
PIN1-LFRAME#, PIN2-LAD3, PIN3-LAD2, PIN4-LAD1, PIN5-LAD0, PIN6-GND, PIN7-LRESET#, PIN8-LCLK, PIN9-3.3V

Usually, the notebook boards haven't LPC connectors or slots. And the users will need to connect this LPC port to the notebook by using wires. Below is some description for how to connect the Combo-Debug-Card to your notebook through this LPC interface.

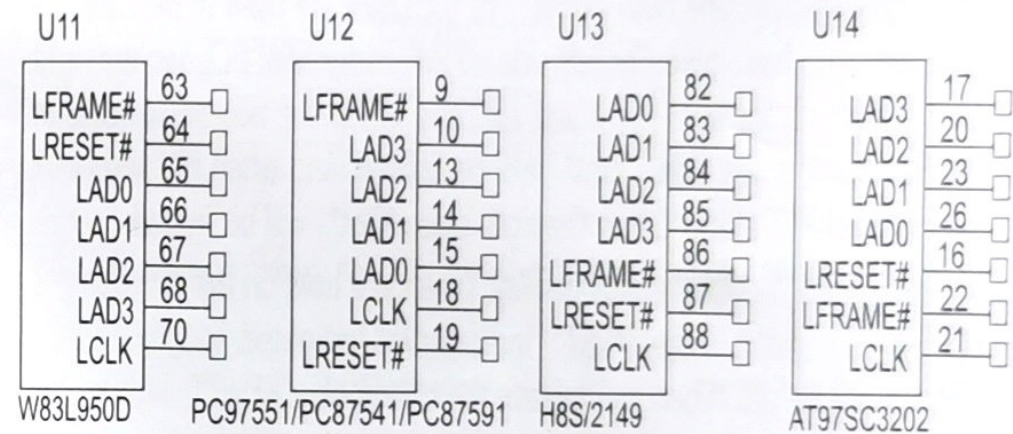
- ◊ If your notebooks use LPC VBIOS, you can connect the Combo-Debug-Card to your notebook's VBIOS bus.

>> LPC VBIOS

PIN2-RST#,
PIN14-LAD1,
PIN16-GND,
PIN23-LFRAME#,
PIN31-CLK
PIN13-LAD0,
PIN15-LAD2,
PIN17-LAD3,
PIN25-VCC,



- ◊ You can connect this Combo-Debug-Card to any LPC bus. Some LPC interface chips are listed as below. You can connect the Combo-Debug-Card to the corresponding pins. For more information, please refer those chips' datasheets.



Note: This Combo-Debug-Card uses 3.3V as power supply, and you can use any 3V3 and GND signals in your notebook main-board. Please be aware that connecting the Combo-Debug-Card to a non-3.3V power may damage this Combo-Debug-Card.

- ◊ For IBM X 60 notebooks, the LPC interfaces are located in the U39 slot of the main-board. The Pin definitions are as below: A2->LRESET# A3->LFRAME# A5->LCLK A9->LAD3 A10->LAD2 A11->LAD1 A12->LAD0

- ◊ For IBM T6 R6 notebooks, the LPC interfaces are located in the J26 slot of the main-board. The Pin definitions are as below: A1->LCLK, A3->LFRAME# B2->LRESET# B7->LAD3 A7->LAD2 B6->LAD1 A6->LAD0

► 5. The LED-Display in the Combo-Debug-Card

The Display includes Error-Code display, Bus-Type display, and "CLK" , " RST" signal status display.

- 1) Error-Code display: It is composed with two 7-segment LED s.
- 2) Bus-Type display: The two "Dots" of the LED s are used to indicate the notebook bus type. The left side "Dot" is for Mini-PCI, and the right side "Dot" is for Mini-PCI-e and LPC bus. When the notebook works in Mini-PCI bus, the left side "Dot" will be lighted. And when the notebook works in Mini-PCI-e or LPC bus, the right side "Dot" will be lighted.
- 3) "CLK" , " RST" signal status display: When you hold on the notebook' s "RESET" button, the "RST" indicator will be lighted, and the "CLK" indicator will be off. When you release the notebook "RESET" button, the "RST" indicator will be off, and the "CLK" indicator will be twinkled.

► 6. Part of Error-Code explanation

When the notebooks are running, this Combo-Debug-Card will show the corresponding debug code. If there is a problem in the notebook, you can judge the problem by the debug code. Below is the explanation for some main error codes.

◇ AWARD BIOS:

The explanation when the Combo-Debug-Card shows the below debug codes.

Code	Explanation	Note
C0	Close cache	
01	Processor test	
07	CMOS test	
C1	Memory size test	
0A	Set the interrupt table	
0C	Initiate the keyboard	
0D	Initiate the Graphic card	
1A	Show CPU frequency	
3C	CMOS setting	
42	Initiate hardware	
52	Test the extended ROM	
FF	Boot	

◇ AMI BIOS:

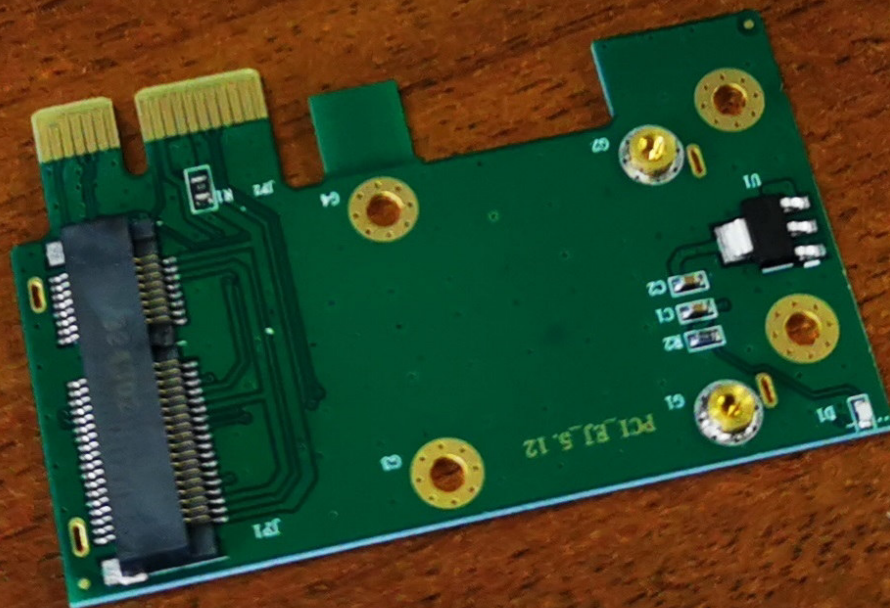
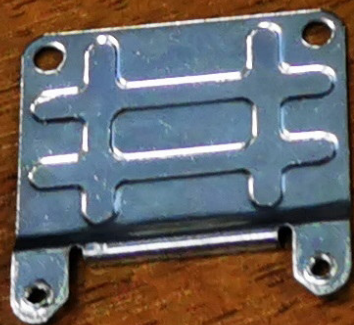
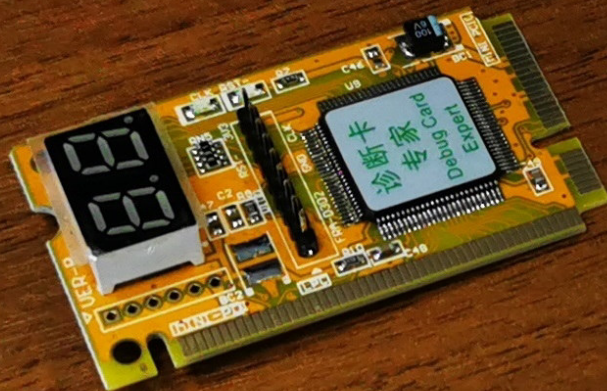
The explanation when the Combo-Debug-Card shows the below debug codes.

Code	Explanation	Note
00	Error in self test	
01	Error in processor test	
0D, 0F	Error in CMOS test	
1A ~ 22	Error in Memory test	
3A	Error in graphic card	
FF	Pass the self test	

► 7 Q/A

Question: "RST" indicator is off, but "CLK" indicator is NOT twinkled.
 Answer: This symptom shows there is no CLK signal for debug card so that the "CLK" indicator isn' t twinkled. Usually, it may mean the motherboard can NOT support this Mini-PCI-e interface. Please use Mini-PCI or LPC interface to test it.

Question: "RST" indicator is off, and "CLK" indicator is twinkled. But it shows "00"
 Answer: In this case, please check the Bus-Type display to check if the Bus-Type display is corresponding to the bus type.



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