

HH-946T4LV-6C1L
user manual
用户手册

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I.Specification 规格, 详述

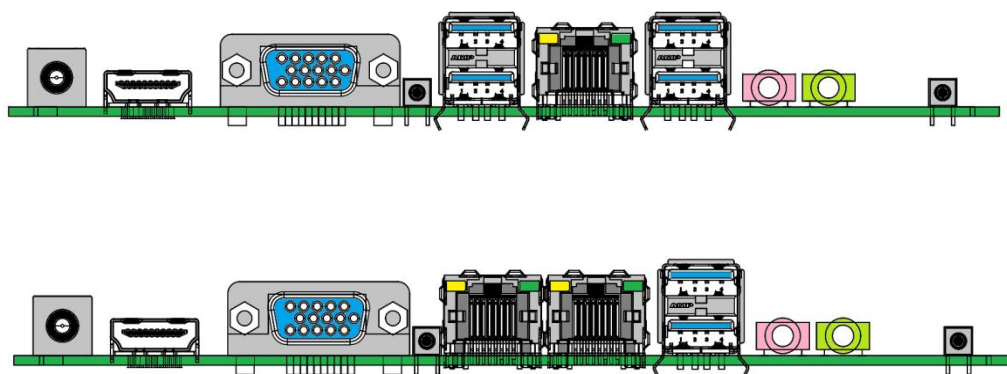
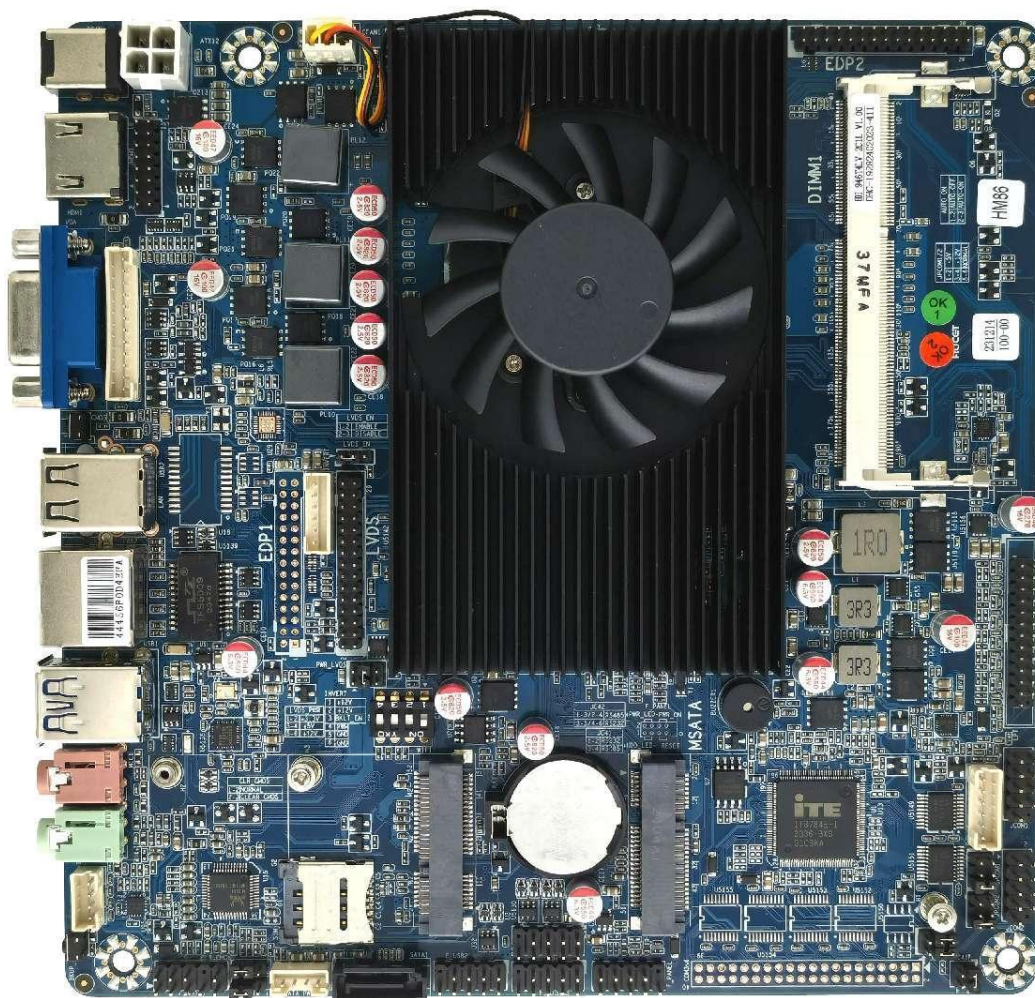
Model 型号	HH-946T4LV-6C1L
CPU	Intel® Core™ 4thr FCPGA946 I3/I5/I7 Processor 支持Intel 4代笔记本CPU(FCPGA946接口)
Memory 内存	1 * DDR3 1333/1600MHz, UP to 8GB 1 * DDR3 1333/1600MHz, 最高支持8GB (安装1条8GB内存)
Display 显示	1 * EDP2 : max resolution up to 1920*1200 1 * EDP2 : 最大分辨率1920*1200 1 * LVDS/EDP1 (either-or) : max resolution up to 1920*1200 1 * LVDS/EDP1 (二选一) : 最大分辨率1920*1200 1 * HDMI: max resolution up to 4096*2304@24Hz 1 * HDMI: 最大分辨率4096*2304@24Hz (Can do LVDS+EDP2+HDMI+VGA) (Can do EDP1+EDP2+HDMI+VGA)
Storage 存储	1 * M_SATA 1 * SATA3.0 Port
Ethernet 网络	1 * Realtek RTL8111H (10/100/1000Mbps) Optional dual network ports 1 * Realtek RTL8111H (10/100/1000Mbps) 可选双网口
Audio 声音	1 * Realtek ALC897
USB	2 * USB3.0 8 * USB2.0 Optional dual network ports 2 * USB3.0 6 * USB2.0 选择双网口则 2 * USB3.0 6 * USB2.0
COM 串口	2 * COM Optional 6 * COM 2 * COM 可选择 6 * COM
Expansion Slot 扩展接口	1 * mini-PCIe (4G/BT)
I/O Connectors I/O端口接口	1 * DC 1 * HDMI 1 * VGA 2 * USB2.0 Optional network ports/可选择网口 1 * LAN 2 * USB3.0 1 * Mic 1 * Line out
Headers 内置接口	2 * COM Headers Optional/可选择 6 * COM 6 * USB2.0 1 * AUTO_ON 1 * LVDS(Optional/可选择 EDP1) 2 * JPCOM Electrify/带电 1 * EDP2 2 * FAN 1 * 3W Amplifier/功放接口 (喇叭接口) 1 * LPT(OUT OF LPT Connector/连接器外置) 1 * PWR_LVDS 1 * F_PANEL 1 * JSATA_PWR 1 * JC2 1 * CLR_CMOS 1 * AUTO_ON
System 系统	WIN10/64 Bit WIN11/64 Bit LINUX
Temperature 温度	Storage: 0~75°C Operation: 0~60°C (non-condensing) 储藏: 0~75°C 运行: 0~60°C (非冷凝)
BIOS	AMI BIOS
DC Power DC 供电	DC 12V5A-12V10A
Factor 尺寸	Mini-ITX (170mm*170mm)

1. Common CPU List常用CPU列表

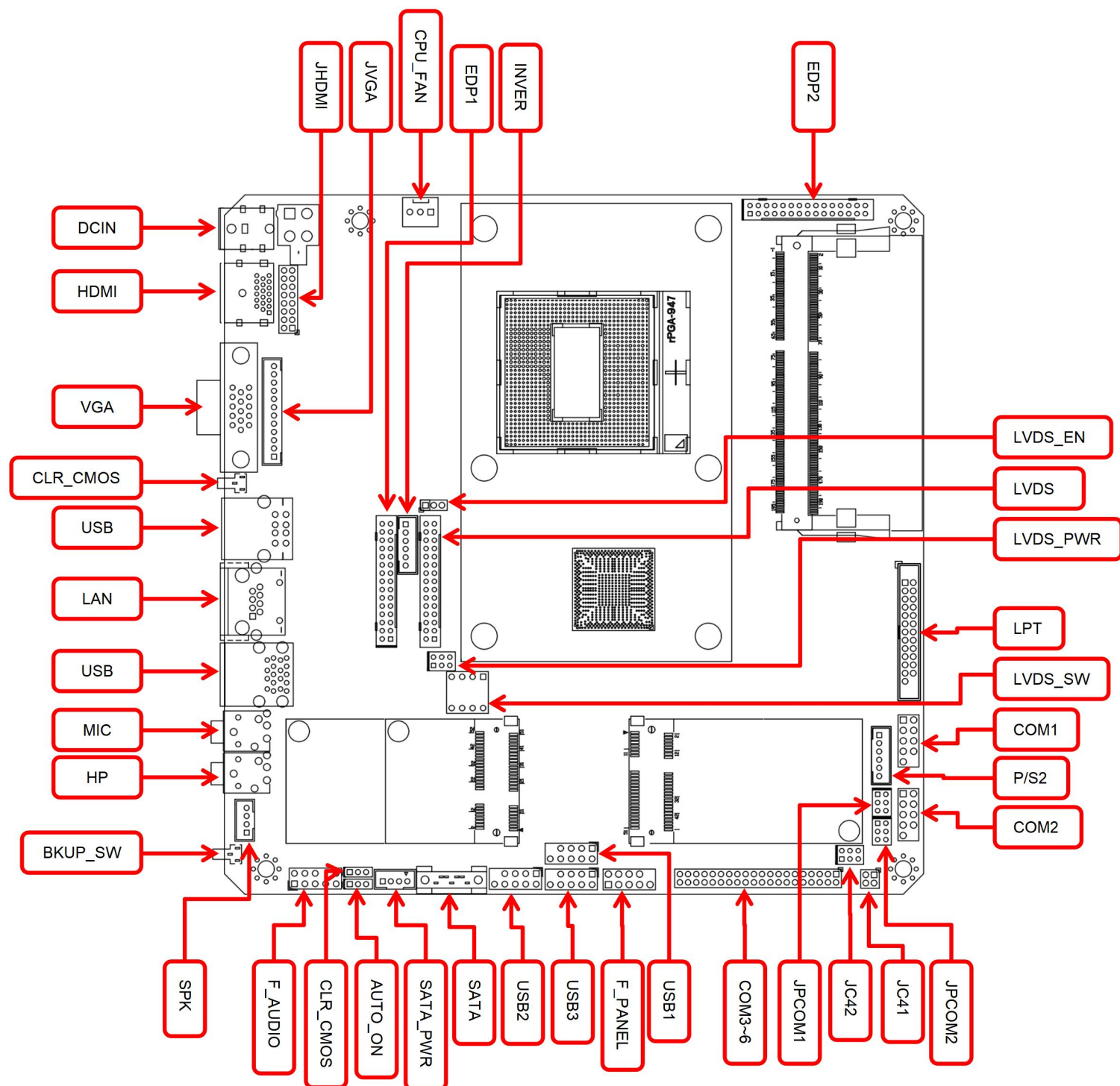
CPU model CPU型号	Core thread 核心&线程	base frequency 基础频率	Max Turbo 最大睿频	Cache 缓存	integrated graphics 集成显卡	Encapsulation 封装	TDP
Inte®Core™ i3-4000M	2 Core & 4 thread	2.40 GHZ		3 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W
Inte®Core™ i3-4100M	2 Core & 4 thread	2.50 GHZ		3 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W
Inte®Core™ i5-4200M	2 Core & 4 thread	2.50 GHZ	3.10 GHZ	3 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W
Inte®Core™ i5-4210M	2 Core & 4 thread	2.60 GHZ	3.20 GHZ	3 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W
Inte®Core™ i5-4300M	2 Core & 4 thread	2.60 GHZ	3.30 GHZ	3 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W
Inte®Core™ i5-4310M	2 Core & 4 thread	2.70 GHZ	3.40 GHZ	3 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W
Inte®Core™ i7-4600M	2 Core & 4 thread	2.90 GHZ	3.60 GHZ	4 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W
Inte®Core™ i7-4610M	2 Core & 4 thread	3.00 GHZ	3.70 GHZ	4 MB Intel® Smart Cache	Inte® graphics 4600	FCPGA946	37 W

II. Jumpers / Headers and Connectors 跳线头和连接器

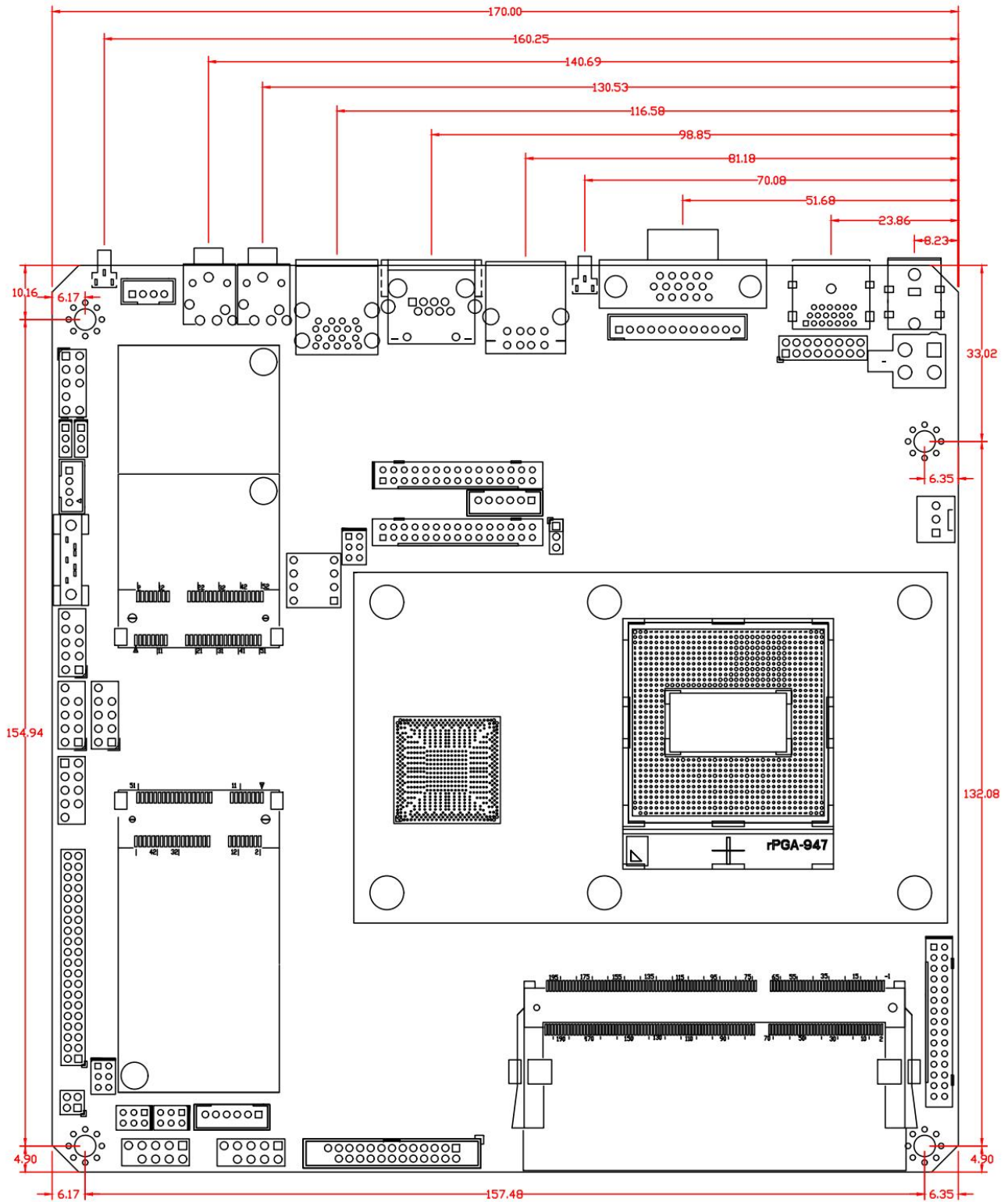
1. Photo of appearance 外观图片



2. Interface schematic diagram 接口示意图



3. Interface Dimension Drawing 接口尺寸图



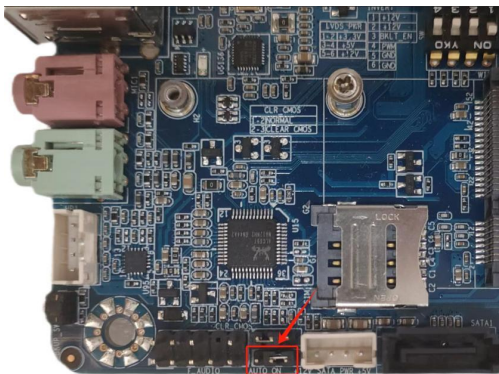
III.Function Settings 功能设置

一.Power-on setup 通电开机设置

1. Hardware incoming call auto-start 硬件来电自启。

1.1 AUTO_ON Pin header jumper cap shifted to the right (2, 3pin)。

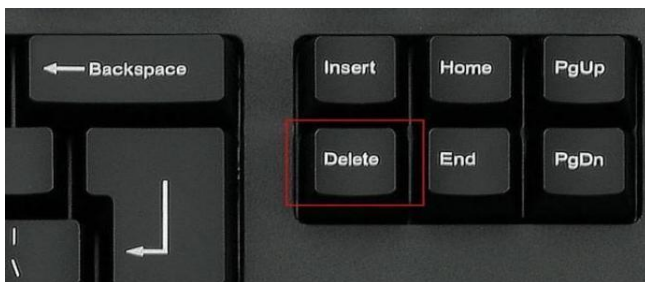
AUTO_ON 排针跳帽跳至右边 (2, 3pin)



2. Software auto-start upon incoming call 软件来电自启。

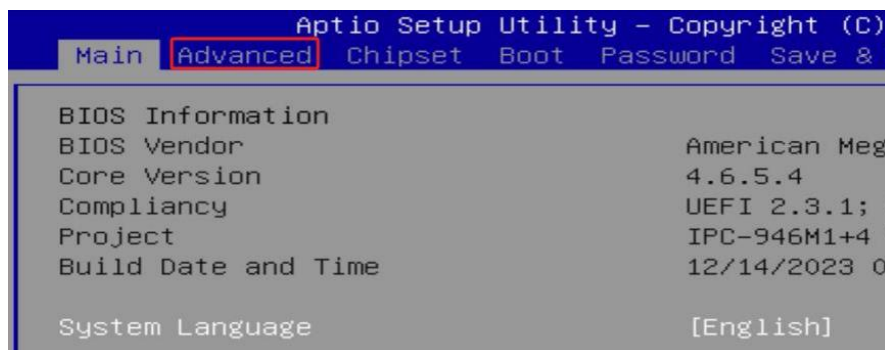
2.1 Press the (Delete) key on the keyboard during startup to enter BIOS settings.

开机按键盘 (Delete) 键进入 BIOS 设置。



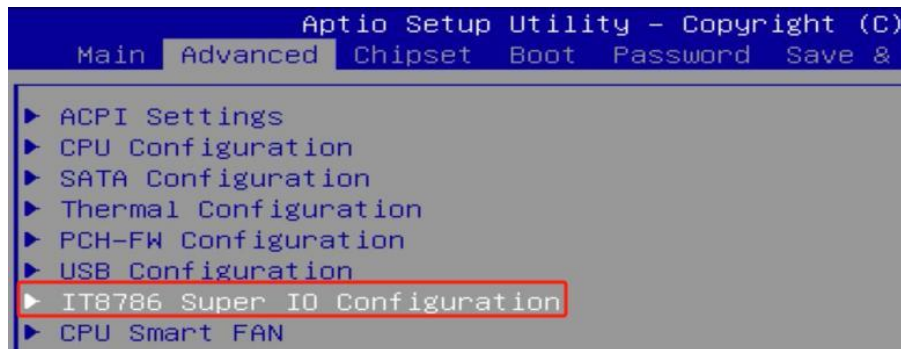
2.2 Enter this page and use the left and right arrow keys on the keyboard to move right to the Advanced option.

进入这个页面，利用键盘的左右键，往右移动到 Advanced 选项。



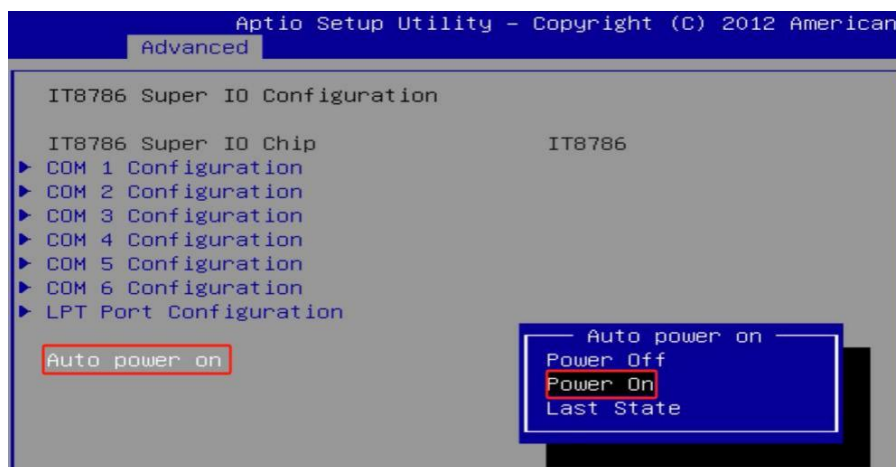
2.3 Navigate to this page, use the up and down arrow keys on the keyboard to move down to the IT8786 Super IO Configuration option, and press Enter.

到这个页面，利用键盘的上下键往下移动到 IT8786 Super IO Configuration 选项，按回车键。



2.4 Use the keyboard's up and down arrow keys to navigate to the "Restore AC Power Loss By IO" option, select "Power On." Press Enter.

利用键盘上下键移至 Restore AC Power Loss By IO 选项,选 Power On。按回车。



2.5 Press F10 to save, select Yes, and it will take effect after automatic restart.

按 F10 保存, 选择 Yes, 自动重启后生效。



2.6 Automatic restart after powering on, then shut down and disconnect the power supply. Reconnecting the power will enable power-on startup.

自动重启开机后关机断开电源, 再插上电源就可实现来电启动。

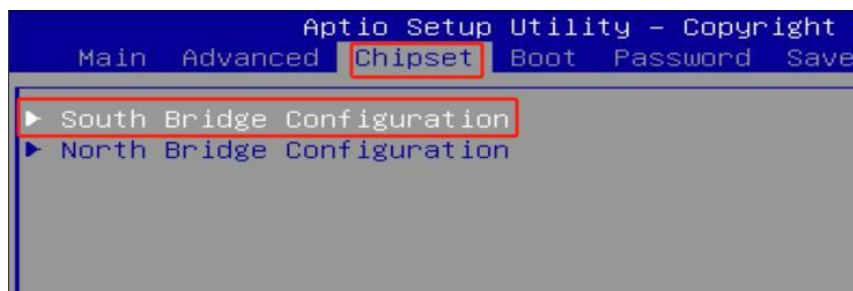
二. Timed startup 定时开机

1. Press the (Delete) key to enter the BIOS setup page, use the left and right arrow keys to move right to Chipset.

Move to the South Bridge Configuration option and press the Enter key.

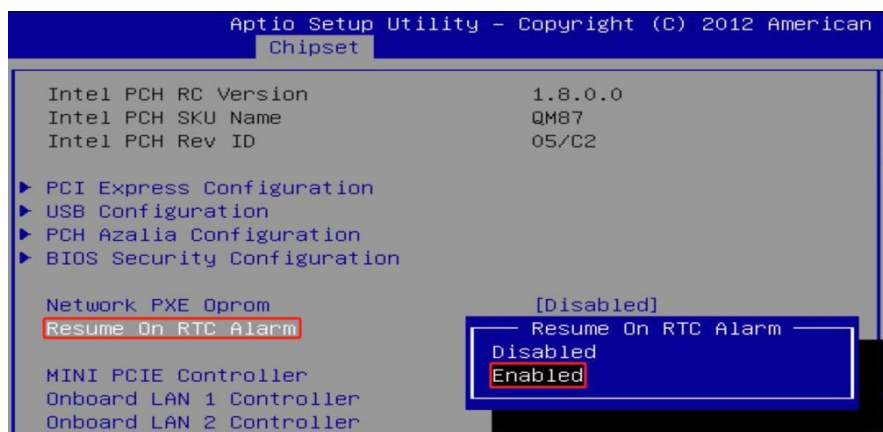
按键盘 (Delete) 进入 BIOS 设置页面, 利用键盘的左右键往右移动到 Chipset。

移至 South Bridge Configuration 选项, 按回车键。



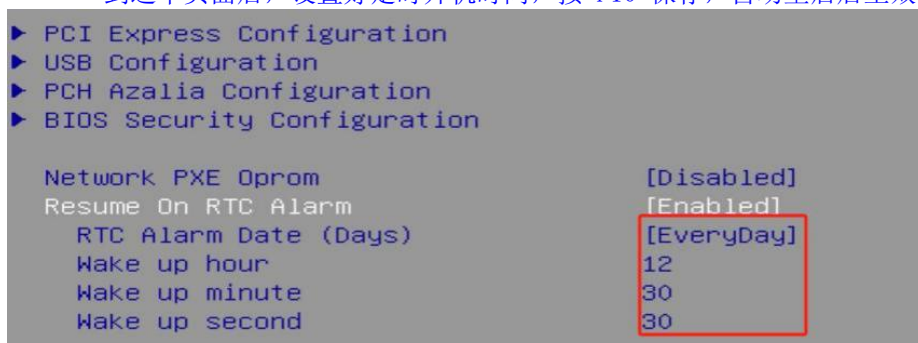
2. Enter the page, use the up and down arrow keys on the keyboard to select Resume On RTC Alarm, and press Enter to choose Enabled.

进入页面, 利用键盘上下键选择 Resume On RTC Alarm , 按回车键选择 Enabled。



3. After reaching this page, set the scheduled startup time, press F10 to save, and it will take effect after automatic restart.

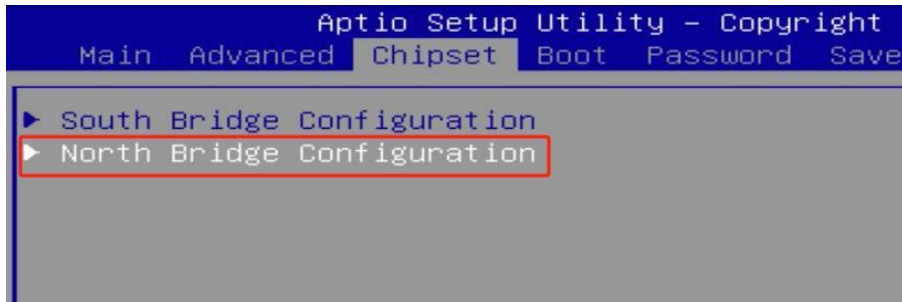
到这个页面后, 设置好定时开机时间, 按 F10 保存, 自动重启后生效。



三. LVDS display settings LVDS 显示设置

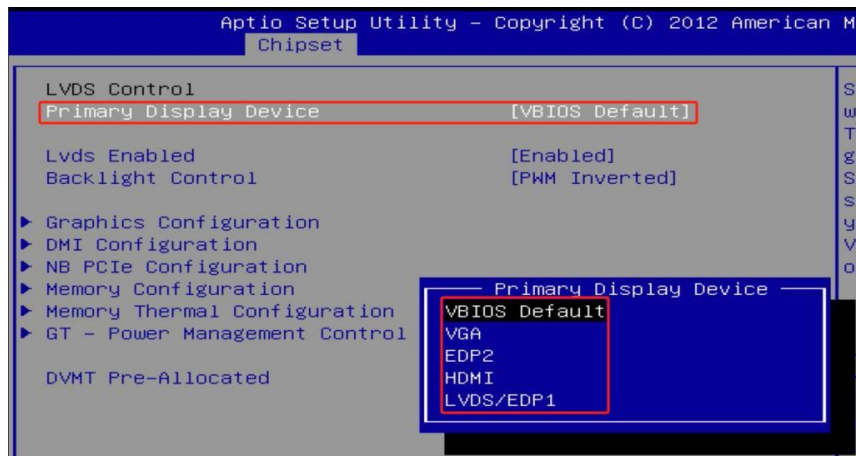
1、Press the Delete key on the keyboard to enter the BIOS setup page, use the keyboard → key to move to the Chipset option. Select the North Bridge Configuration option, then press Enter to access the settings page.

按键盘 Delete 键进 BIOS 设置页面，使用键盘→键移动到 Chipset 选项。选择 North Bridge Configuration 选项，按回车进入设置页面。



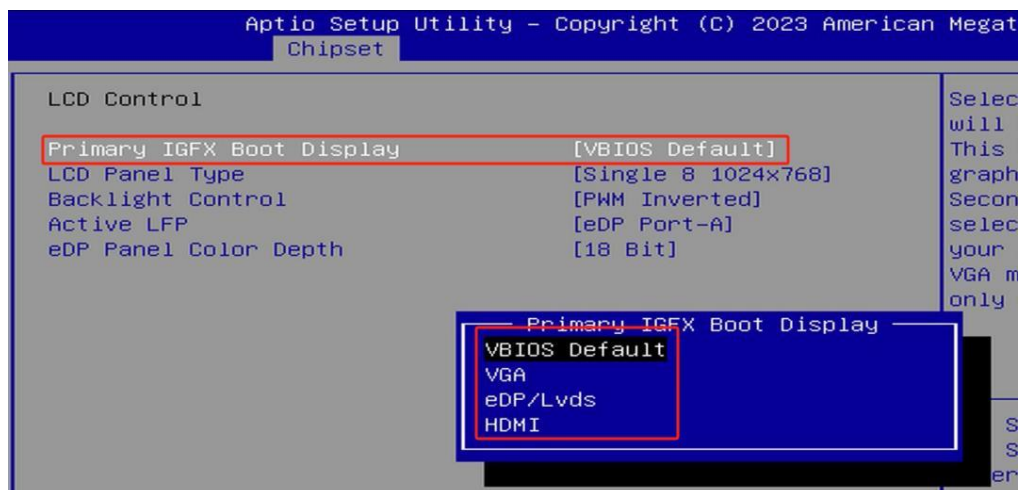
2、Primary Display Device Default VBIOS Default. If only VGA or HDMI display is connected, it must be set as the preferred option accordingly.

Primary Display Device 默认 VBIOS Default，如只接 VGA 或 HDMI 显示须相应设置为首选。



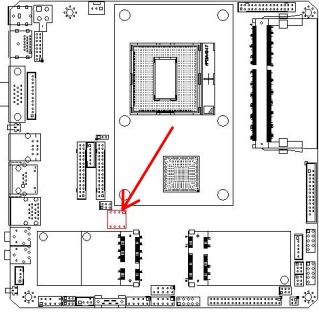
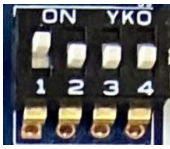
3、Primary IGFX Boot Display defaults to VBIOS Default. If only VGA or HDMI display is connected, it must be correspondingly set as the preferred option.

Primary IGFX Boot Display 默认 VBIOS Default，如只接 VGA 或 HDMI 显示须相应设置为首选。



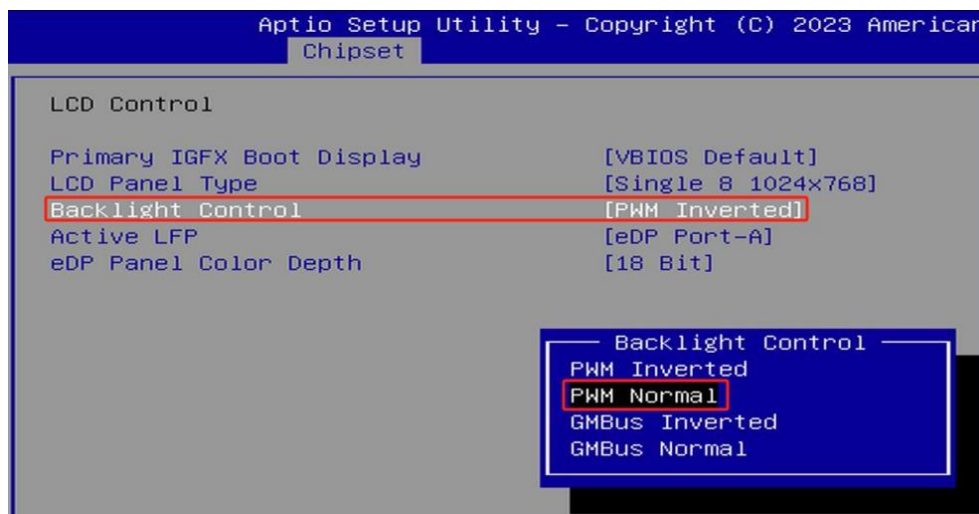
4、LVDS screen bit setting: On this motherboard, LVDS resolution conversion is achieved by adjusting the LVDS screen bit toggle switch.

LVDS 屏分位设置：此主板上通过调整 LVDS 屏分位拨动开关，实现 LVDS 分辨率转换。

Diagram 示图	setup 设置				Function 功能
	1	2	3	4	Resolution 分辨率
 	UP 上	UP 上	UP 上	UP 上	S6 800*600
	down 下	UP 上	UP 上	UP 上	S6 1024*768
	UP 上	down 下	UP 上	UP 上	S8 1024*768
	down 下	down 下	UP 上	UP 上	S6 1280*768
	UP 上	UP 上	down 下	UP 上	S6 1280*800
	down 下	UP 上	down 下	UP 上	D8 1280*800
	UP 上	down 下	down 下	UP 上	D8 1280*1024
	down 下	down 下	down 下	UP 上	S6 1366*768
	UP 上	UP 上	UP 上	down 下	S8 1366*768
	down 下	UP 上	UP 上	down 下	D8 1440*900
	UP 上	down 下	UP 上	down 下	D8 1440*1050
	down 下	down 下	UP 上	down 下	D8 1600*900
	UP 上	UP 上	down 下	down 下	D8 1680*1050
	down 下	UP 上	down 下	down 下	D8 1600*1200
	UP 上	down 下	down 下	down 下	D8 1920*1080
	down 下	down 下	down 下	down 下	D6 1920*1080

4、Backlight Control (ADJ) Brightness Regulation / Level Inversion (Default PWM Inverted Low Level).

Backlight Control (ADJ) 亮度调节/高低电平反转（默认 PWM Inverted 低电平）。



5、After completing all settings in the BIOS, you must press F10 to save them. The settings will take effect after the system automatically reboots.

BIOS 内所有设置完成后，都须按 F10 保存，自动重启后设置生效。

6、LVDS screen cable power supply voltage (3.3V, 5V, 12V), INVERT backlight pin definition.
LVDS 屏线供电电压 (3.3V, 5V, 12V), INVERT 背光 pin 脚定义。

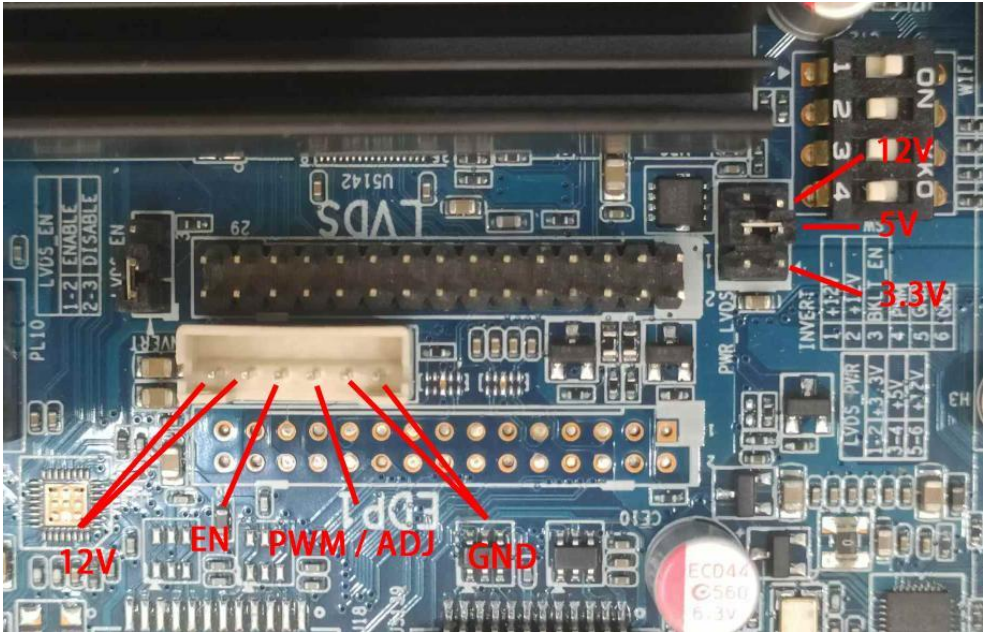
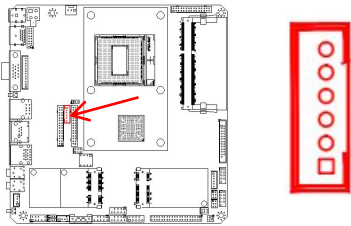


Diagram 示图	definition 定义	
	1 : +12V	2 : +12V
	3 : BL_EN	4 : BL_ADJ
	5 : GND	6 : GND

III. Definition of Jumpers /Headers and Connectors跳线/排针与连接器的定义

In the following diagram, the square pin is the first pin, and the opposite pin is the second pin; odd-numbered pins are on one side, and even-numbered pins are on the other side;

以下示意图中方孔针为第一脚，对向孔针为第二脚；单数脚一边，双数脚一边；

The first line frame near the foot is generally thicker or

has a surrounding frame, arrows, etc.

第一脚边的线框一般比较粗或是有套框、箭头等。

2 4 6 8 10



1 3 5 7 9

1. JPCOM1/2 (串口电压设置) (PH=2.00MM)

Diagram 示意图	setup 设置	Function 功能
	1-2	COM1/2_PIN9 = +5V
	3-4	COM1/2_PIN9 = +12V
	5-6	COM1/2_PIN9 = RI# (默认)

2. JCOM1/2 (串口插针) (PH=2.54MM)

Diagram 示意图	definition 定义	
	1 : DCD#	2 : RXD
	3 : TXD	4 : DTR#
	5 : GND	6 : DSR#
	7 : RTS#	8 : CTS#
	9 : COM_PIN9	

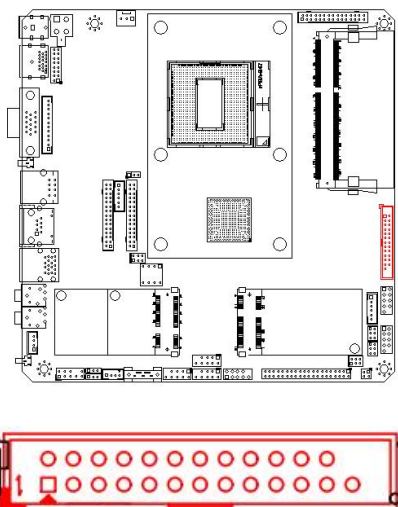
3. JC41 (设置485) (PH=2.00MM)

Diagram 示意图	setup 设置	Function 功能
	1-2	COM2 = RS232 (默认)
	3-4	COM2 = RS485

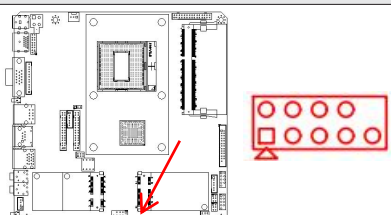
4. JC42 (设置485) (PH=2.00MM)

Diagram 示意图	setup 设置	Function 功能
	1-3 2-4	COM2_P2 = RS485- COM2_P3 = RS485+
	3-5 4-6	COM2_P2 = RS232_RX (默认) COM2_P3 = RS232_TX (默认)

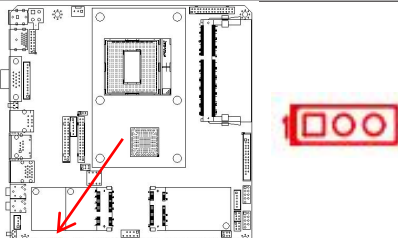
5. LPT (打印口插针) (PH=2.00MM)

Diagram 示图	definition 定义	
	1 : STROBE#	2 : AUTOFEED#
	3 : DATA0	4 : ERROR#
	5 : DATA1	6 : INIT#
	7 : DATA2	8 : SLCTIN#
	9 : DATA3	10 : GND
	11 : DATA4	12 : GND
	13 : DATA5	14 : GND
	15 : DATA6	16 : GND
	17 : DATA7	18 : GND
	19 : ACKNLG#	20 : GND
	21 : BUSY	22 : GND
	23 : PE	24 : GND
	25 : SLCT	

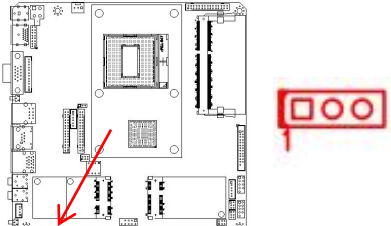
6. F_PANEL (开关及指示灯) (PH=2.54MM)

Diagram 示图	definition 定义	
	1 : HDD_LED+	2 : PWR_LED+
	3 : HDD_LED-	4 : GND
	5 : GND	6 : PWR_SW
	7 : RESET	8 : GND
	9 : GND	

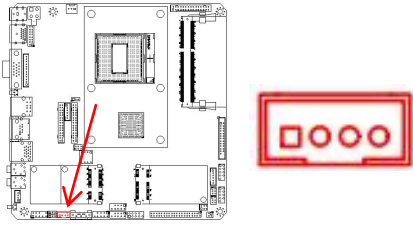
7. CLR_CMOS (清CMOS) (PH=2.00MM)

Diagram 示图	setup 设置	Function 功能
	1-2	Normal (默认)
	2-3	Clear CMOS

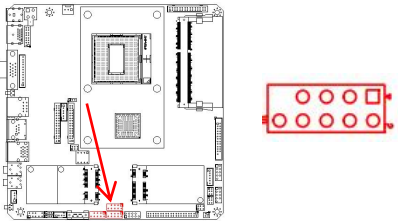
8. AUTO-ON (上电开机) (PH=2.00MM)

Diagram 示图	setup 设置	Function 功能
	1-2	AUTO-OFF (默认)
	2-3	AUTO-ON

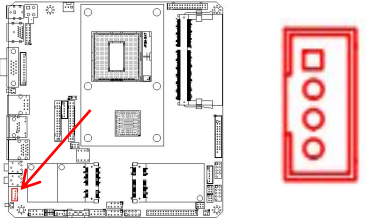
9. SATA_PWR (2.5硬盘供电) (PH=2.00MM)

Diagram 示图	definition 定义	
	1 : +12V	2 : GND
	3 : GND	4 : +5V

10. F_USB1/2/3 (USB插针) (PH2.54)

Diagram 示图	definition 定义	
	1 : +5V	2 : +5V
	3 : USB1-	4 : USB2-
	5 : USB1+	6 : USB2+
	7 : GND	8 : GND
		10 : GND

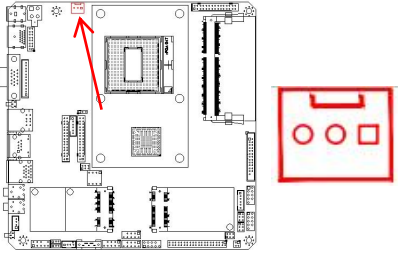
11. SPEAKER (喇叭接口) (PH=2.00MM)

Diagram 示图	definition 定义	
	1 : R+	2 : R-
	3 : L-	4 : L+

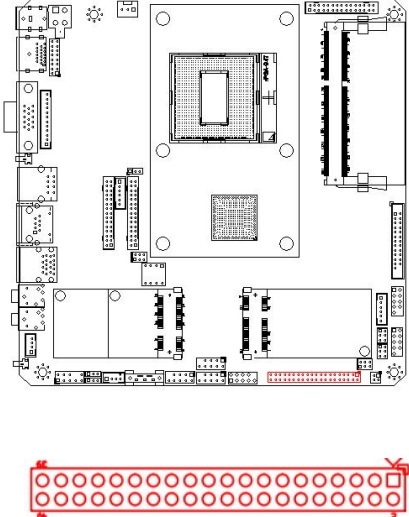
12. FAN (风扇接口) (PH=2.54MM)

CPU_fan supports intelligent fan (temperature control) function.

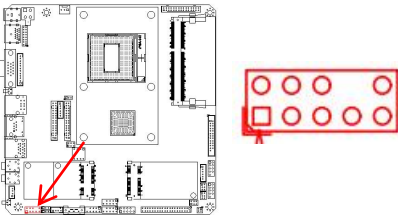
CPU_风扇支持智能风扇(温控)功能。

Diagram 示图	definition 定义	
	1 : GND	2 : +12V
	3 : SPEED	

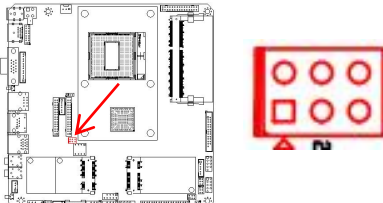
13.COM3-6 (PH2.00MM)

Diagram 示图	definition 定义	
	1 : DCD#	2 : RXD
	3 : TXD	4 : DTR#
	5 : GND	6 : DSR#
	7 : RTS#	8 : CTS#
	9 : COM_PIN9	
	11: DCD#	12: RXD
	13: TXD	14: DTR#
	15: GND	16: DSR#
	17: RTS#	18: CTS#
	19: COM_PIN9	
	21: DCD#	22: RXD
	23: TXD	24: DTR#
	25: GND	26: DSR#
	27: RTS#	28: CTS#
	29: COM_PIN9	
	31: DCD#	32: RXD
	33: TXD	34: DTR#
	35: GND	36: DSR#
	37: RTS#	38: CTS#
	39: COM_PIN9	

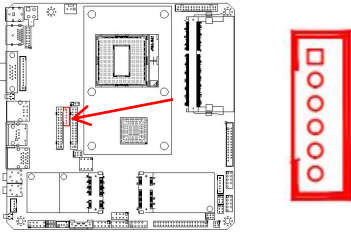
14.F_AUDIO (前置音频插针) (PH=2.54MM)

Diagram 示图	definition 定义	
	1 : MIC_IN_L	2 : GND
	3 : MIC_IN_R	4 : +3.3V
	5 : AUD_OUT_R	6 : MIC_IN_DET
	7 : GND	
	7 : AUD_OUT_L	10 : AUD_OUT_DET

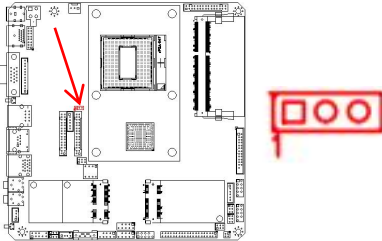
15.PWR_LVDS (LVDS电压设置) (PH=2.00MM)

Diagram 示图	setup 设置	Function 功能
	1-2	LVDS_VDD = +3.3V (默认)
	3-4	LVDS_VDD = +5V
	5-6	LVDS_VDD = +12V

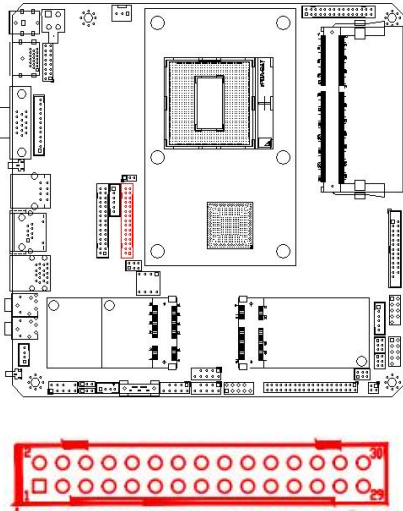
16. INVERT（LVDS背光供电及控制）（PH=2.00MM）

Diagram 示图	definition 定义	
	1 : +12V	2 : +12V
	3 : BL_EN	4 : BL_ADJ
	5 : GND	6 : GND

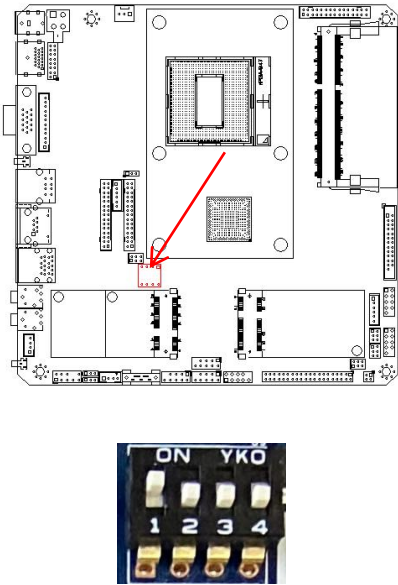
17. LVDS_EN（LVDS开关）（PH=2.00MM）

Diagram 示图	setup 设置	Function 功能
	1-2	LVDS-ON（默认）
	2-3	LVDS-OFF

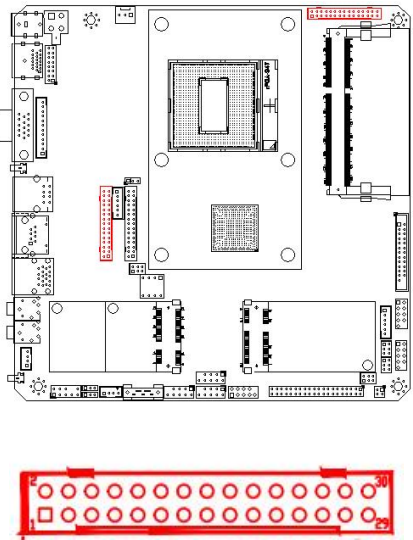
18. LVDS（LVDS信号）（PH=2.00MM）

Diagram 示图	definition 定义	
	1 : LVDS_VDD	2 : LVDS_VDD
	3 : LVDS_VDD	4 : GND
	5 : GND	6 : GND
	7 : A_DATA_0-	8 : A_DATA_0+
	9 : A_DATA_1-	10: A_DATA_1+
	11: A_DATA_2-	12: A_DATA_2+
	13: GND	14: GND
	15: A_CLK-	16: A_CLK+
	17: A_DATA_3-	18: A_DATA_3+
	19: B_DATA_0-	20: B_DATA_0+
	21: B_DATA_1-	22: B_DATA_1+
	23: B_DATA_2-	24: B_DATA_2+
	25: GND	26: GND
	27: B_CLK-	28: B_CLK+
	29: B_DATA_3-	30: B_DATA_3+

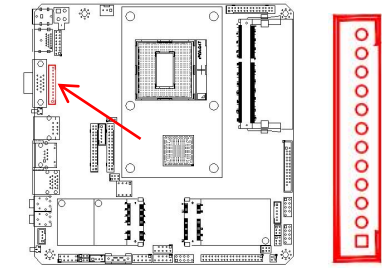
19. LVDS_SW (LVDS拨码开关设置)

Diagram 示图	setup 设置				Function 功能
	1	2	3	4	Resolution 分辨率
	UP 上	UP 上	UP 上	UP 上	S6 800*600
	down 下	UP 上	UP 上	UP 上	S6 1024*768
	UP 上	down 下	UP 上	UP 上	S8 1024*768
	down 下	down 下	UP 上	UP 上	S6 1280*768
	UP 上	UP 上	down 下	UP 上	S6 1280*800
	down 下	UP 上	down 下	UP 上	D8 1280*800
	UP 上	down 下	down 下	UP 上	D8 1280*1024
	down 下	down 下	down 下	UP 上	S6 1366*768
	UP 上	UP 上	UP 上	down 下	S8 1366*768
	down 下	UP 上	UP 上	down 下	D8 1440*900
	UP 上	down 下	UP 上	down 下	D8 1440*1050
	down 下	down 下	UP 上	down 下	D8 1600*900
	UP 上	UP 上	down 下	down 下	D8 1680*1050
	down 下	UP 上	down 下	down 下	D8 1600*1200
	UP 上	down 下	down 下	down 下	D8 1920*1080
	down 下	down 下	down 下	down 下	D6 1920*1080

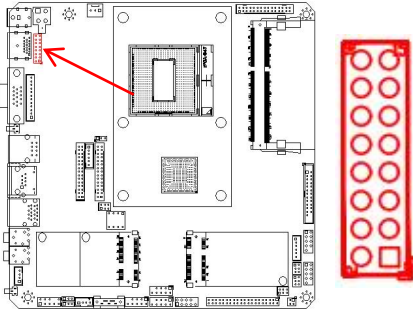
20. EDP1/2 (EDP信号) (PH=2.00MM)

Diagram 示图	definition 定义	
	1 : EDP_VDD	2 : EDP_VDD
	3 : GND	4 : GND
	5 : EDP_0+	6 : EDP_0-
	7 : GND	8 : GND
	9 : EDP_1+	10: EDP_1-
	11: GND	12: GND
	13: EDP_2+	14: EDP_2-
	15: GND	16: GND
	17: EDP_3+	18: EDP_3-
	19: GND	20: GND
	21: EDP_AUX+	22: EDP_AUX-
	23: GND	24: EDP_HPD
	25: BKLT_CTL	26: BKLT_EN
	27: GND	28: GND
	29: +12V	30: +12V

21. VGA_H（内置VGA插针）（PH=2.00MM）

Diagram 示图	definition 定义	
	1 : GND	2 : VSYNC
	3 : HSYNC	4 : GND
	5 : GND	6 : GND
	7 : GREEN	8 : GND
	9 : BLUE	10: GND
	11: DDC DATA	12: DDC CLK

22. HDMI_H（内置HDMI插针）（PH=2.00MM）

Diagram 示图	definition 定义	
	1 : HDMI_2P	2 : HDMI_1P
	3 : HDMI_2N	4 : HDMI_1N
	5 : GND	6 : GND
	7 : HDMI_0P	8 : HDMI_CLK_P
	9 : HDMI_0N	10: HDMI_CLK_N
	11: GND	12: HDMI_+5V
	13: HDMI_SCL	14: HDMI_+5V
	15: HDMI_SDA	16: HDMI_HPD

Common Fault Analysis and Resolution

Common faults	check
The device does not power on after being connected to electricity	1. Please confirm whether the power cable is properly connected. 2. Please confirm whether the power supply meets the power requirements of the motherboard. 3. Try reseating the memory module 4. Try replacing the memory module 5. Attempt to clear the motherboard CMOS according to the motherboard manual 6. Please confirm whether there is an external card, and whether it functions normally after removing the external card.
After booting up, the VGA does not display	1. Check if the monitor is turned on 2. Check whether the power cord is properly connected to the monitor and system unit 3. Check whether the monitor cable is properly connected to the system unit and the monitor 4. Check whether the display brightness control is set to a dark state. You can increase the brightness through the brightness control. For more information, refer to the monitor's operating instructions 5. When the monitor is in "power-saving" mode, simply press any key on the keyboard
BIOS settings cannot be saved	1. Please confirm whether the CMOS battery voltage is below 2.8V. If it is, please replace the battery with a new one and reset the settings for saving 2. The BIOS settings are incorrect. According to the key prompt (DEL) displayed on the boot screen, adjust the time and date in the BIOS
Prompt: Unable to find bootable device	1. Please confirm whether the hard disk power cable and data cable are properly connected 2. Please confirm whether the hard disk has any physical damage 3. Please confirm whether the operating system is installed properly on the hard disk
Blue screen or system crash during system entry	1. Please confirm whether the memory module and external card are loose 2. Try removing the newly installed hardware, uninstalling the driver or software 3. Try replacing the memory 4. Try to enter BIOS to change the hard disk mode
Slow entry into the operating system	1. Try using third-party software to check for bad sectors on the hard drive 2. Please confirm if there is too little remaining space in the partition where the system is located 3. Please confirm if the CPU cooling fan is rotating normally
System automatic restart	1. Please confirm if the CPU cooling fan is rotating normally 2. Please confirm if the reset button on the industrial control computer was accidentally triggered 3. Please use antivirus software to confirm if the system is infected with viruses 4. Please confirm if the memory module and external card are loose 5. Please confirm if the load capacity of the power supply used is sufficient, and try replacing the power supply 6. Try replacing the memory
Unable to detect USB device	1. Please confirm if the USB device requires separate power supply 2. Please confirm if there is any poor contact on the USB interface 3. Please confirm if the USB controller in the BIOS Set is turned on
LVDS dot screen does not display	1. Connect VGA and power on to BIOS to confirm if the LVDS switch is turned on and if the resolution is adjusted to the corresponding requirements 2. Please confirm if LVDS-PWR is adjusted to the corresponding working voltage 3. Please confirm if the backlight power supply ON/OFF pins are plugged in correctly and if there is voltage present 4. Please confirm if the screen cable is plugged in correctly 5. Please confirm if the screen itself can work properly
LVDS dot screen color mosaic/ghosting	1. Please try booting up and entering the BIOS settings screen to set the corresponding bit count or resolution (18 bit or 24 bit) 2. Please confirm if the screen cable is damaged 3. Please confirm if the screen itself can work properly 4. Please try changing the wire sequence of the screen cable 5. Please try replacing the memory
EDP dot screen color flower screen does not display	1. Please confirm if the motherboard is OK 2. Please confirm if the screen cable definition is correct 3. For dual EDP motherboards and single EDP connections, please connect EDP 1 4. Please confirm if the EDP_PWR jump cap has working voltage

常见故障分析与解决

常见故障	检查点
通电之后不开机	1. 请确认电源连接线是否连接正常 2. 请确认所用电源是否满足主板的供电要求 3. 尝试重新插拔内存条 4. 尝试更换内存条 5. 尝试根据主板说明书清除主板CMOS 6. 请确认是否有外接卡, 去除外接卡后是否正常
开机后VGA不显示	1 查看显示器是否有打开 2 检查电源线是否正确地连接到显示器和系统单元 3 检查显示器电缆是否正确地连接到系统单元和显示器 4 查看显示屏亮度控件是否设置为黑暗状态, 可通过亮度控件提高亮度. 有关详细信息, 可参考显示器操作说明 5 显示器处于“节电”模式, 按键盘上的任意键即可
BIOS 设置不能保存	1. 请确认CMOS电池电压是否低于2.8V, 如低于2.8V, 请更换新电池, 重新设置保存 2. BIOS设置不正确, 根据开机画面提示的按键 (DEL), 在 BIOS 中调整时间和日期
提示无法找到可引导设备	1. 请确认硬盘电源线、数据线是否连接正常 2. 请确认硬盘是否有物理损坏 3. 请确认硬盘中是否安装操作系统
进入系统过程中蓝屏或死机	1. 请确认内存条及外接卡是否松动 2. 尝试去掉新安装的硬件, 卸载驱动或软件 3. 尝试更换内存 4. 尝试进BIOS更改硬盘模式
进入操作系统缓慢	1. 尝试使用第三方软件检查硬盘是否有坏道 2. 请确认系统所在分区剩余空间是否过少 3. 请确认 CPU 散热风扇是否正常转动
系统自动重启	1. 请确认 CPU 散热风扇是否正常转动 2. 请确认是否误触发工控机复位按钮 3. 请使用杀毒软件确认系统是否感染病毒 4. 请确认内存条及外接卡是否松动 5. 请确认所用电源带载能力是否足够, 可尝试更换电源 6. 尝试更换内存
无法检测到USB设备	1. 请确认 USB 设备是否需要单独供电 2. 请确认 USB 接口是否存在接触不良 3. 请确认 BIOS Set上 中 USB 控制器是否打开
LVDS点屏不显示	1. 接VGA开机进BIOS确认LVDS开关是否打开, 分辨率是否调成对应需求 2. 请确认LVDS_PWR是否调至对应工作电压 3. 请确认背光供电ON/OFF针脚是否插对, 有无电压 4. 请确认屏线是否插对 5. 请确认屏本身是否可以正常工作
LVDS点屏彩色花屏/重影	1. 请尝试开机进BIOS设置屏对应位数或者分辨率 (18bit或24bit) 2. 请确认屏线是否有损坏 3. 请确认屏本身是否可以正常工作 4. 请尝试对换屏线的线序 5. 请尝试更换内存
EDP点屏彩色花屏不显示	1. 请确认主板是否OK 2. 请确认屏线定义是否对的 3. 双EDP主板单接EDP请接EDP1. 4. 请确认EDP_PWR跳帽是否有工作电压