

EC3-1820V2NA

3.5 寸主板带 VGA/HDMI/LVDS
/2LAN/4COM




3.5-inch Motherboard with VGA
/HDMI/LVDS/2LAN/4COM

Version: C02

法律资讯

警告提示

为了您的人身安全以及避免财产损失，必须注意本手册中的提示。人身安全的提示用一个警告三角表示，仅与财产损失有关的提示不带警告三角。警告提示根据危险等级由高到低如下表示。


 危险
表示如果不采取相应的小心措施，将会导致死亡或者严重的人身伤害。
 警告
表示如果不采取相应的小心措施，可能导致死亡或者严重的人身伤害。
 小心
带有警告三角，表示如果不采取相应的小心措施，可能导致轻微的人身伤害。
注意
表示如果不注意相应的提示，可能会出现不希望的结果或状态。

合格的专业人员

本文件所属的产品/系统只允许由符合各项工作要求的合格人员进行操作。其操作必须遵照各自附带的文件说明，特别是其中的安全及警告提示。由于具备相关培训及经验，合格人员可以察觉本产品/系统的风险，并避免可能的危险。

EVOC产品

请注意下列说明：

 警告
EVOC产品只允许用于目录和相关技术文件中规定的使用情况。如果要使用其他公司的产品和组件，必须得到EVOC推荐和允许。正确的运输、储存、组装、装配、安装、调试、操作和维护是产品安全、正常运行的前提。必须保证允许的环境条件。必须注意相关文件中的提示。



免责声明

本公司保留对此手册更改的权利，产品后续相关变更时，恕不另行通知。对于任何因安装、使用不当、超规格使用而导致的直接、间接、有意或无意的损坏及隐患概不负责。

订购产品前，请向经销商详细了解产品性能是否符合您的需求。

EVOC是研祥智能科技股份有限公司的注册商标。本手册所涉及到的其他商标，其所有权为相应的产品厂家所拥有。

研祥智能科技股份有限公司©2019，版权所有，违者必究。未经许可，不得以机械、电子或其它任何方式进行复制。

保修条款：

产品保修期两年。用户如另有要求，以双方签署的合同为准。

欲获更多信息请访问：

研祥网站：<http://www.evoc.com>

研祥技术支持邮箱：support@evoc.com（国际）、support@evoc.cn（国内）

免费客服热线： 4008809666

文档说明

本文档适用范围

本文档适用于EVOC EC3-1820V2NA型号。

约定

在本文档中，术语“本板”或“产品”有时特指EVOC EC3-1820V2NA产品。

说明

安全相关注意事项

为避免财产损失以及出于个人安全方面的原因，请注意本入门指南中关于安全方面的信息。文中使用警告三角来指示这些安全信息，警告三角的出现取决于潜在危险的程度。

历史

本说明书发布版本：

版本	时间
B00	2015.4
C00	2015.7
C01	2015.7
C02	2019.9



安全须知

ESD 指令

可以通过下面的标签来识别含有静电敏感设备 (ESD, electrostatic sensitive devices) 的模块:



在操作含有 ESD 的模块时, 请严格遵守下面提到的准则:

- 在操作含有 ESD 的模块之前, 请务必导去身体上的静电 (例如, 通过触摸接地物体)。
- 所有设备和工具必须不能带有静电。
- 在安装或卸下含有 ESD 的模块之前, 请务必拔出电源插头并卸下电池。
- 只能通过其边缘来操作装配有 ESD 的模块。
- 请勿触摸含有 ESD 的模块上的任何连接器针脚或导体。

目 录

1.产品介绍	1
1.1 概述	1
1.2 机械尺寸、重量与环境	1
1.3 典型功耗	1
1.4 电源选型参考功耗	2
1.5 微处理器	4
1.6 芯片组	4
1.7 系统内存	4
1.8 显示功能	4
1.9 网络功能	4
1.10 音频功能	4
1.11 电源特性	4
1.12 Watchdog功能	5
1.13 操作系统	5
1.14 I/O接口	5
2.安装说明	7
2.1 产品外形尺寸图	7
2.2 接口位置示意图	8
2.3 记录板卡的标识数据	9
2.4 架构图	9
2.5 跳线设置	10
2.6 串口	11
2.7 LCD背光控制接口	12
2.8 显示接口	12

2.9 USB接口	15
2.10 网络接口	16
2.11 音频接口	17
2.12 鼠标键盘接口	17
2.13 SATA接口	17
2.14 GPIO接口	18
2.15 风扇接口	18
2.16 电源接口	19
2.17 状态指示控制接口	19
2.18 SIM接口	20
2.19 Mini-PCIe接口	20
2.20 mSATA接口	22
2.21 SATA硬盘热插拔	23
3. BIOS功能介绍	25
3.1 BIOS 信息提示界面	25
3.2 BIOS基本功能设置	26
3.3 x86 平台下BIOS所要管理的系统资源	34
4. 驱动程序安装说明	39
5. 附录	40
5.1 GPIO编程指引	40
5.2 WDT看门狗编程指引	42
5.3 LVDS背光控制编程指引	44
5.4 常见故障分析与解决	45
5.5 缩略语	46

1. 产品介绍

1.1 概述

EC3-1820V2NA 是一款基于 Intel®新一代凌动 Bay Trail SoC 平台的 3.5 寸主板，CPU 选用 Future Intel® Celeron® processor for Intelligent Systems (Based on 22nm Intel® Silvermont microarchitecture)，主频为 4 核 1.91GHz、2 核 1.33GHz 和 4 核 2.00GHz，图形核心整合 INTEL 第七代图形引擎、两条显示管线，支持 DX11 及 3D 输出。

EC3-1820V2NA 拥有丰富的接口类型，可广泛应用于军工、自动化、电力等领域。

1.2 机械尺寸、重量与环境

- 外形尺寸：146.1mm（长）×101.6mm（宽）×24.7mm（高）
- 净重：0.29Kg
- 工作环境：
 - 温度：0℃~60℃；可扩展温度：-40℃~85℃（J1900 不支持温度扩展）
 - 湿度：5%~95%（非凝结状态）
- 贮存环境：
 - 温度：-40℃~85℃
 - 湿度：5%~95%（非凝结状态）

1.3 典型功耗

典型功耗是基于以下配置闲置状态的数值。

配置1

CPU：板载Atom E3845 1.91GHZ 四核

内存：板载4G

操作系统：Win7 32bit

硬盘：Sandisk SSD SATA3.0 128GB

➤ +12V@0.62A; +5%/-3%

配置2

CPU：板载Atom E3825 1.33GHZ 双核

内存：板载4G

操作系统：Win7 32bit

硬盘：Sandisk SSD SATA3.0 128GB

➤ +12V@0.61A; +5%/-3%

配置3

CPU：板载Celeron J1900 2.00GHZ 四核

内存：板载4G

操作系统：Win7 32bit

硬盘：Sandisk SSD SATA3.0 128GB

➤ +12V@ 0.95A; +5%/-3%

1.4 电源选型参考功耗

参考功耗基于以下环境的数值，扩展卡及其它外加设备功耗在电源选型时需按规格要求增加。

配置 1

- 2 • EC3-1820V2NA

CPU: 板载 Atom E3845 1.91GHZ 四核

内存: 板载 4G

硬盘: Sandisk SSD SATA3.0 128GB

操作系统: Windows7 32bit

运行软件: TAT 4.7

➤ +12V@1.84A; +5%/-3%

配置 2

CPU: 板载 Atom E3825 1.33GHZ 双核

内存: 板载 4G

硬盘: Sandisk SSD SATA3.0 128GB

操作系统: Windows 7 32bit

运行软件: TAT 4.7

➤ +12V@1.38A; +5%/-3%

配置3

CPU: 板载Celeron J1900 2.00GHZ 四核

内存: 板载4G

操作系统: Win7 32bit

硬盘: Sandisk SSD SATA3.0 128GB

➤ +12V@ 1.53A; +5%/-3%

1.5 微处理器

板载Bay Trail-I SoC CPU, E3825 CPU主频为1.33GHz, 为2核CPU; E3845 CPU主频为1.91GHz, 为4核CPU; J1900 CPU主频为2.00GHz, 为4核CPU。

1.6 芯片组

单芯片处理器, 芯片组集成在CPU里面。

1.7 系统内存

板载4G DDR3L内存颗粒, 支持1333MT/s。

1.8 显示功能

- 支持VGA、HDMI和LVDS显示; LVDS不支持热插拔功能;
- VGA+LVDS为异步输出;
- VGA支持分辨率到2560×1600@60Hz; LVDS最高支持UXGA(1920×1080)。

1.9 网络功能

提供2个10/100/1000Mbps网络接口, 其中LAN1为标准RJ45接口, 支持网络唤醒功能; LAN2采用2×7 2.0mm插针输出。

1.10 音频功能

采用HDA标准, 支持MIC-IN/LINE-IN/LINE-OUT。

1.11 电源特性

+12V单电源供电, 2×2供电接口。

1.12 Watchdog功能

- 支持 255 级，可编程按分或秒；
- 支持看门狗超时中断或复位系统。

1.13 操作系统

支持操作系统：Windows8.1、Windows8、windows7、Linux。

1.14 I/O接口

- 提供 4 个串口，其中 COM1 和 COM2 支持 RS-232/RS-422/RS-485 模式，通过 BIOS 设置工作模式，COM3 和 COM4 仅支持 RS-232 模式；不支持 Modem 唤醒功能；
- 提供 1 个 SATA 接口和一个 mSATA (J2 可选) 接口；
备注：建议使用以下 SATA 3.0 硬盘：
固态硬盘 Crucial 6Gb/s SATA3.0 2.5 128GB M4
机械硬盘 Seagate 6Gb/s SATA3.0 500GB ST500DM002
机械硬盘 Seagate 6Gb/s SATA3.0 3000GB
机械硬盘 WD 6Gb/s SATA3.0 4000GB
- 提供 5 个 USB2.0 接口和 1 个 USB3.0 接口；
备注：USB3.0 接口默认关闭，没有安装 Intel USB3.0 驱动之前只能当 USB2.0 接口使用，且开启 USB3.0 功能后没有安装 USB3.0 驱动之前在 Windows7 系统所有 USB 接口（包括其他 USB2.0 接口）都不能使用，Windows8/8.1 会自动加载驱动不需要安装驱动，下面为在 Windows7 系统启用 USB3.0 步骤：
 - 1、将主板 BIOS 设置为默认值，然后安装 Windows7，将附件驱动光盘放入 USB 光驱，进入驱动光盘将 Driver 目录下文件夹 USB3.0 拷贝到桌面；
 - 2、重启电脑，按 F2 进入 BIOS，选择“Advanced”-“EHCI Controller”设置为“Disabled”，将“XHCI Controller”设置为“Enabled”，按“F10”保存退出；

3、重启后进入 Windows7 系统，用 PS2 鼠标双击桌面 USB3.0 文件夹，双击“Setup.exe”进行安装 USB3.0 驱动，安装完成后所有 USB 都能正常使用，此时 USB3.0 接口已达到 USB3.0 标准。

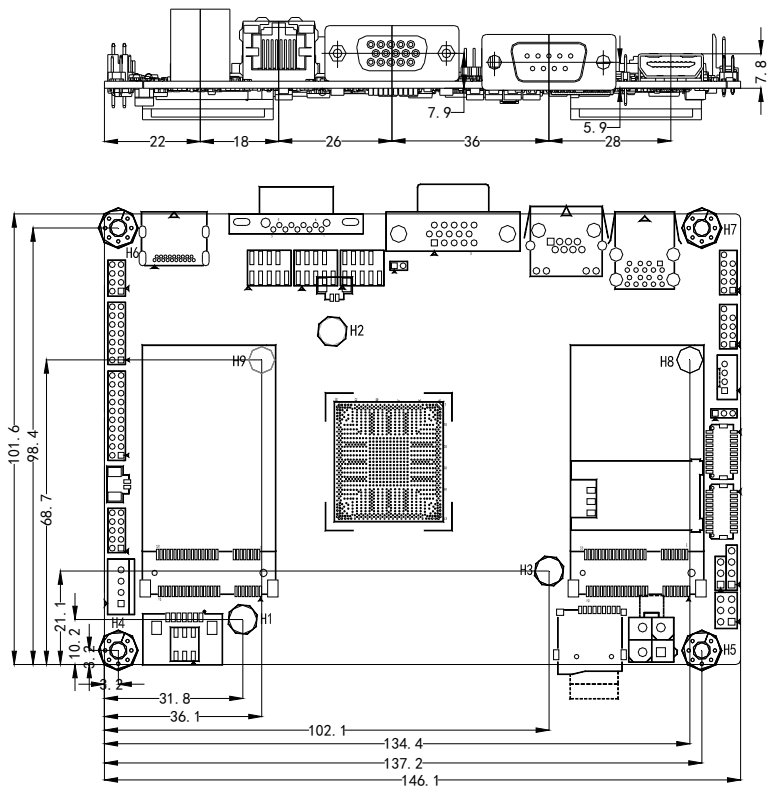
- 提供 1 个 PS/2 键盘/鼠标接口；
- 提供 1 个 16 路数字 I/O 接口；
- 提供 2 个 Mini PCIE 接口 (MPCIE1 和 J2, J2 可选)，支持 WiFi；其中 MPCIE1 还支持 3G 模块；
- 提供 1 个 Micro SD 卡接口，J1900 的主板不支持 Micro SD 卡接口；
- 提供 1 个 HDMI 接口和 1 个 VGA 接口；
- 提供 2 个千兆网络接口。

提示：如何识别报警声

- 1、长鸣声为系统内存出错。
- 2、短“嘀”一声为开机声。

2. 安装说明

2.1 产品外形尺寸图

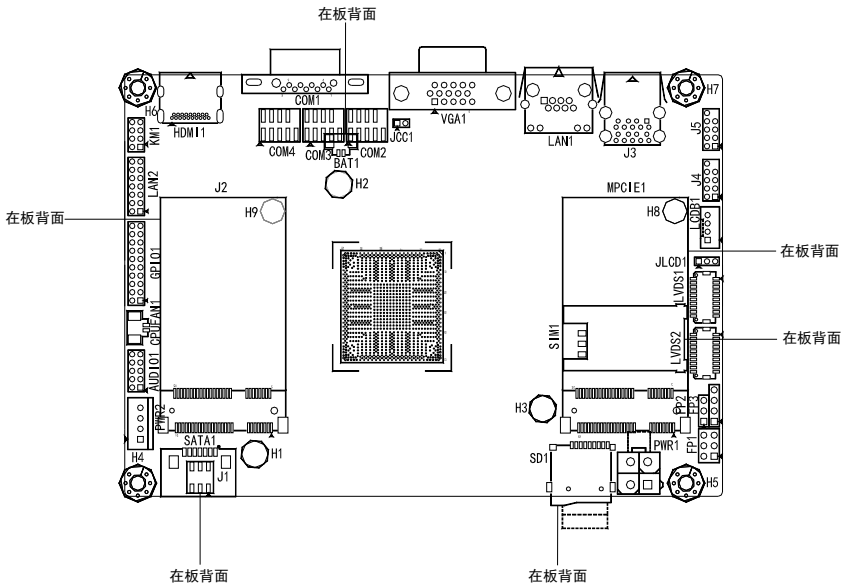


单位: mm

警告!

请务必选择合适的螺钉和使用正确的安装方法（包括板卡定位、CPU、散热器等安装），否则可能损坏板。此板推荐 H4~H7 使用 M3×6 GB9074.4-88 螺钉。

2.2 接口位置示意图



2.3 记录板卡的标识数据

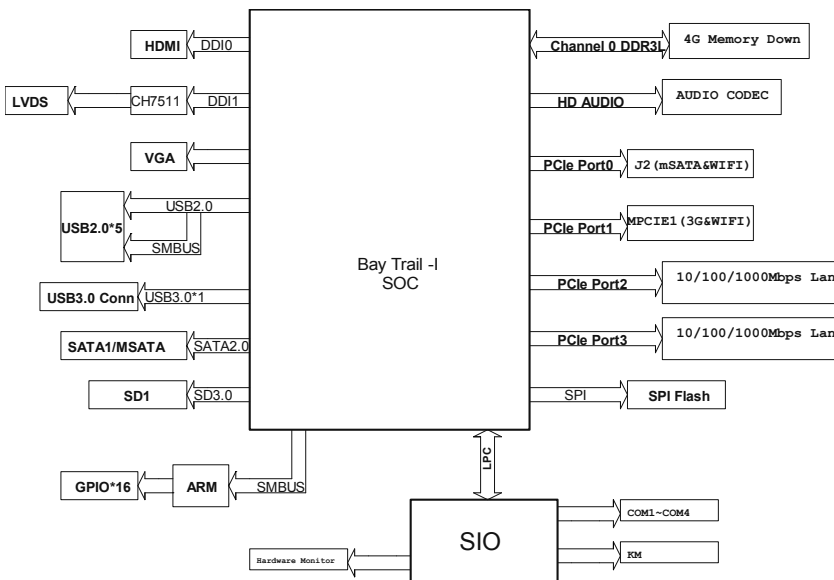
注意

在维修时或失窃后，可凭借这些唯一的编号来识别板卡，请不要撕毁。

序列号：位于板卡上（如下图所示）



2.4 架构图




提示：如何识别跳线、接口第一脚

- 1、观察插头、插座旁边的文字标记，通常用“1”或加粗的线条或三角符号表示。
- 2、看看背面的焊盘，通常方型焊盘为第一脚。

2.5 跳线设置

1. JCC1：CMOS内容清除/保持设置（脚距：2.0mm）

CMOS由板上钮扣电池供电。清CMOS会导致永久性消除以前系统配置并将其设为原始（工厂设置）系统设置。其步骤：(1)关闭计算机，断开电源；(2)瞬间短接JCC1插针；(3)开计算机；(4)启动时按屏幕提示按键进入BIOS设置，重新加载最优缺省值；(5)保存并退出设置。设置方式如下：

 <p>JCC1</p>	设置	功能
	1-2 开路	正常工作状态 (Default)
	1-2 短路	清除 CMOS 内容，所有 BIOS 设置恢复成出厂值

2. JLCD1：LCD工作电压选择（脚距：2.0mm）

不同的 LCD 屏电压可能不同，本板提供了 3.3V 和 5V 两种电压选择，当所选择的 LCD 电压与所使用的 LCD 屏的工作电压一致时，LCD 屏才能正常显示。设置方式如下：

 <p>JLCD1</p>	设置	功能
	1-2 短路	+3.3V(Default)
	2-3 短路	+5V

2.6 串口

- 1、 本板卡提供两个可支持RS-232/RS-485/RS-422模式的串口，其中COM1为DB9输出，COM2为2×5Pin的插针输出（脚距：2.0mm），管脚定义如下。

管脚	信号名称		
	RS-232	RS-422	RS-485
1	DCD#	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	NC
4	DTR#	RXD-	NC
5	GND	GND	GND
6	DSR#	NC	NC
7	RTS#	NC	NC
8	CTS#	NC	NC
9	RI#	NC	NC


注：COM1 和 COM2 的串口模式需要通过 BIOS 设置进行切换，设置路径是 BIOS 中 Advanced\Com1&Com2 Mode Selection，BIOS 默认为 RS-232 模式，用户可根据需要选择 RS-422 或 RS-485 模式。

- 2、 本主板提供2个2×5Pin的插针串口（脚距：2.0mm），管脚定义如下：

管脚	信号名称	管脚	信号名称
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	NA

2.7 LCD背光控制接口

本板提供1个1×4Pin 的wafer LCD背光控制接口（脚距：2.0mm），管脚定义如下：

 <p>LCDB1</p>	管脚	信号名称
	1	VCC_LCDBKLT
	2	LCD_BKLTCTL
	3	LCD_BKLTEN
	4	GND

注：VCC_LCDBKLT---+12V 背光电源（电流限制在 1A 以下）；

LCD_BKLTCTL---背光控制（该信号由 CPU 直接输出，为 PWM 信号，电压幅值 0V—3.3V，占空比在 0%~100%之间）；

LCD_BKLTEN ---背光使能，高有效（此板该信号由 CPU 直接输出，CMOS 输出，电压幅值为 0V-3.3V）。

2.8 显示接口

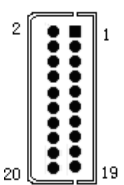
1、 本主板提供1个标准DB15 VGA接口，管脚定义如下：

 <p>VGA1</p>	管脚	信号名称	管脚	信号名称
	1	Red	2	Green
	3	Blue	4	NC
	5	GND	6	GND
	7	GND	8	GND
	9	NC	10	GND
	11	NC	12	DDCDATA
	13	HSYNC	14	VSYNC
	15	DDCCLK		

注：由于Intel GMA驱动限制，在安装完显卡驱动后重启进入系统，CRT可能会成为扩展模式或者CRT不显示（此时CRT为副显），此时可通过Ctrl+Alt+F1热键进行切换，将CRT转换为主显示。

2、LVDS接口

本板提供1个双通道24bit的LVDS接口（LVDS1、LVDS2；脚距：1.0mm），使用单通道的18位/24位的LVDS屏时，LVDS数据线要接在LVDS1位置。双通道24位LVDS管脚定义如下：

 LVDS1	管脚	信号名称	管脚	信号名称
		1	LVDSO_D0+	2
	3	GND	4	GND
	5	LVDSO_D1+	6	LVDSO_D1-
	7	GND	8	GND
	9	LVDSO_D2+	10	LVDSO_D2-
	11	GND	12	GND
	13	LVDSO_CLK+	14	LVDSO_CLK-
	15	GND	16	GND
	17	LVDSO_D3+	18	LVDSO_D3-
	19	VDD	20	VDD



管脚	信号名称	管脚	信号名称
1	LVDSSE_D0+	2	LVDSSE_D0-
3	GND	4	GND
5	LVDSSE_D1+	6	LVDSSE_D1-
7	GND	8	GND
9	LVDSSE_D2+	10	LVDSSE_D2-
11	GND	12	GND
13	LVDSSE_CLK+	14	LVDSSE_CLK-
15	GND	16	GND
17	LVDSSE_D3+	18	LVDSSE_D3-
19	VDD	20	VDD

注：LVDS0x表示双扫描PANEL的奇数行，LVDSEx表示双扫描PANEL的偶数行。本板用到LVDS插座型号为DF20G-20DP-1V，建议使用对应端子的型号DF20A-20DF-1C。

3、HDMI接口



管脚	信号名称	管脚	信号名称
1	TMDS Data2+	2	TMDS Data2
3	TMDS Data2-	4	TMDS Data1+
5	TMDS Data1 Shield	6	TMDS Data1-
7	TMDS Data0+	8	TMDS Data0
9	TMDS Data0-	10	TMDS Clock+
11	TMDS Clock Shield	12	TMDS Clock-
13	CEC	14	Reserved (NC on device)
15	SCL	16	SDA
17	DDC/CEC Ground	18	+5V
19	Hot Plug Detect		

2.9 USB接口

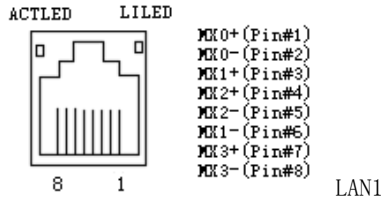
本板提供1个双层标准USB接口（J3，J3上层接口仅支持USB2.0设备，下层接口支持USB2.0和USB3.0设备）和2个二合一的2×5Pin的USB插针接口（J4，J5脚距：2.0mm），共可支持5个USB2.0设备和1个USB3.0设备。

 <p>J3</p>	管脚	信号名称
	1	+5V_USB
	2	USB_Data-
	3	USB_Data+
	4	GND
	5	USB_SSRX-
	6	USB_SSRX+
	7	GND
	8	USB_SSTX-
	9	USB_SSTX+
	10	+5V_USB
	11	USB_Data-
	12	USB_Data+
	13	GND

 <p>J4、J5</p>	管脚	信号名称	管脚	信号名称
	1	+5V_USB	2	+5V_USB
	3	USB1_Data-	4	USB2_Data-
	5	USB1_Data+	6	USB2_Data+
	7	GND	8	GND
9	NA	10	GND	

2.10 网络接口

本板提供2个10/100/1000Mbps网络接口，1个是RJ45连接器LAN1，另1个是2×7的插针接口（LAN2脚距：2.0mm）。



ACTLED (单色: 绿色灯)	网络活动 指示状态	LAN1	
		LILED (双色: 橙绿双色)	网络速度指 示状态
		绿色	1000Mbps
闪烁	有数据传输	橙色	100Mbps
灭	无数据传输	灭	10Mbps

注：千兆网卡不管有/无Link信号，左边的ACTLED灯表示的是有无数据传输，有数据传输时，左边的绿色灯应为“闪烁”状态，只连接网络未收发数据时，绿色灯应为“熄灭”状态，有广播包时，ACTLED灯“闪烁”属于正常。

 LAN2	管脚	信号名称	管脚	信号名称
	1	MX0+	2	MX0-
	3	MX1+	4	MX1-
	5	MX2+	6	MX2-
	7	MX3+	8	MX3-
	9	GND	10	GND
	11	LINK1000-	12	LINK100-
	13	ACT_LED+	14	ACT_LED-

2.11 音频接口

本板提供1个2×5Pin的音频接口（脚距：2.0mm）。

 AUDIO1	管脚	信号名称	管脚	信号名称
	1	LOUT_R	2	LOUT_L
	3	GND_AUDIO	4	GND_AUDIO
	5	LIN_R	6	LIN_L
	7	GND_AUDIO	8	GND_AUDIO
	9	MIC_L	10	MIC_R

2.12 鼠标键盘接口

本板提供1个2×4Pin的PS/2键鼠接口（脚距：2.0mm）。

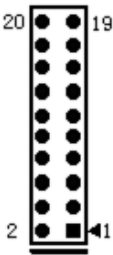
 KM1	管脚	信号名称	管脚	信号名称
	1	KB_DATA	2	MS_DATA
	3	KB_CLK	4	MS_CLK
	5	GND	6	GND
7	+5V	8	+5V	

2.13 SATA接口

本主板提供1个单层SATA接口，定义如下。

 SATA1	管脚	信号名称	管脚	信号名称
	1	GND	5	SATA_RX-
	2	SATA_TX+	6	SATA_RX+
	3	SATA_TX-	7	GND
4	GND			

2.14 GPIO 接口

 <p>GPIO1 (脚距: 2.0mm)</p>	管脚	信号名称	管脚	信号名称
	1	GPI01	2	GPI09
	3	GPI02	4	GPI010
	5	GPI03	6	GPI011
	7	GPI04	8	GPI012
	9	GPI05	10	GPI013
	11	GPI06	12	GPI014
	13	GPI07	14	GPI015
	15	GPI08	16	GPI016
	17	+5V	18	+5V
19	GND	20	GND	

注：出厂Default值为连接器的第1、3、5、7、9、11、13、15脚为GPIO输入，第2、4、6、8、10、12、14、16脚为GPIO输出，出厂默认状态为高电平，输入输出信号的电压范围为0-5V。

2.15 风扇接口

本主板提供 1 个 1×2Pin 的 CPU 风扇接口（CPUFAN1，脚距：1.25mm）。使用风扇插座时要注意以下三点：

- 风扇电流不大于 500 毫安（12 伏特）。
- 请确认风扇接线和本插座的接线是否相符。插座凹槽正对我们，从左往右第一脚为地，第二脚为 12V 电源脚；请注意匹配装配。
- 将风扇气流调整成能将热量排出的方向。

 CPUFAN1	管脚	信号名称
	1	GND
	2	+12V

注：FAN_I0：风扇转速脉冲输出，FAN_PWM：风扇转速PWM控制。


2.16 电源接口

1、电源接口，单12V电源接口（脚距：4.2mm）

 PWR1	管脚	信号名称
	1	GND
	2	GND
	3	+12V
4	+12V	

2、SATA电源转接接口

wafer 1×4P电源插座（白色，脚距：2.54mm）

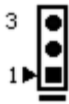
 PWR2	管脚	信号名称
	1	+12V
	2	GND
	3	GND
4	+5V	

2.17 状态指示控制接口


1、电源开关及硬盘指示灯接口（脚距：2.54mm）

 FP1	管脚	信号名称	管脚	信号名称
	1	PWRBTN#	2	GND
	3	GND	4	RESET#
	5	HDD_LED-	6	HDD_LED+

2、电源指示灯接口（脚距：2.54mm）

 <p>FP2</p>	管脚	信号名称
	1	PWR_LED+
	2	NC
	3	GND

3、扬声器输出接口（脚距：2.54mm）

 <p>FP3</p>	管脚	信号名称
	1	BUZ-
	2	NC
	3	GND
	4	BUZ+

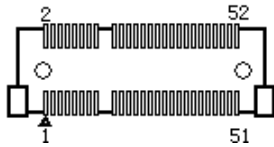
2.18 SIM接口

SIM1接口定义如下：

 <p>SIM1（在板背面）</p>	管脚	信号名称	管脚	信号名称
	1	VCC	2	RESET
	3	CLK	4	GND
	5	VPP	6	IO

2.19 Mini-PCIE接口

本板提供 2 个 Mini-PCIE 接口，MPCIE1 和 J2（可选）插槽，可支持 WiFi 的无线网卡；另外 MPCIE1 还支持 3G 模块，配合 SIM 卡插槽，可实现无线通讯。

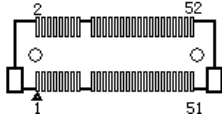


MPCIE1 (在板背面)

管脚	信号名称	管脚	信号名称
1	WAKE#	2	+3.3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	REFCLK-	12	NC
13	REFCLK+	14	NC
15	GND	16	NC
17	Reserved	18	GND
19	Reserved	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3V
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	Reserved	46	NC
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3VSB

2.20 mSATA接口

本板提供 1 个 mSATA 接口 J2(可选)；该插槽支持采用 Mini PCIE 接口的 SSD 存储盘，接口定义如下。



管脚	信号名称	管脚	信号名称
1	NC	2	+3.3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	Reserved	18	GND
19	Reserved	20	NC
21	GND	22	PERST#
23	SATA_RX+	24	+3.3V
25	SATA_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	NC
31	SATA_TX-	32	NC
33	SATA_TX+	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	Reserved	46	NC
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3VSB

2.21 SATA硬盘热插拔

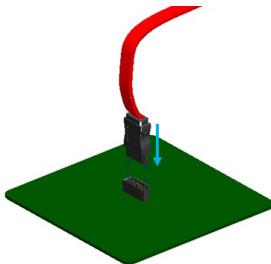
SATA 硬盘热插拔需注意：

- (1) 硬盘必须支持：SATA2.0 接口以上，并且采用 15 芯 SATA 硬盘电源接口；
- (2) SATA 硬盘仅工作在 AHCI 模式下且打开热插插选项时支持热插拔功能；
- (3) 芯片组驱动程序支持 SATA 硬盘的热插拔；
- (4) 不能对操作系统所在的 SATA 硬盘进行带电热插拔。

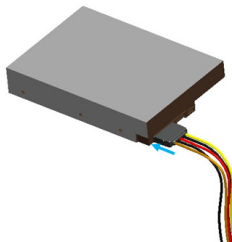
注：请按照如下步骤进行 SATA 硬盘热插拔，否则，操作不当会导致硬盘损坏和数据丢失。

热插入SATA硬盘步骤：

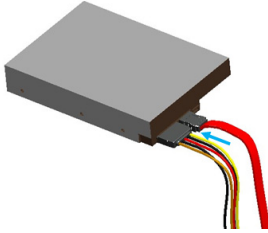
步骤1：将SATA数据线接到主板上的SATA接口；



步骤2：将SATA电源线15-针脚接口（黑色）一端接到SATA硬盘；



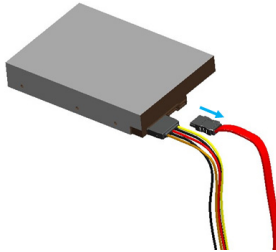
步骤3：将SATA数据线接到SATA硬盘。



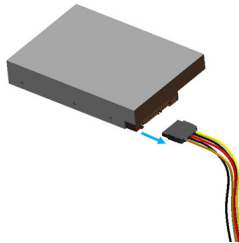
热拔出SATA硬盘步骤:

步骤 1: 从设备管理器中卸载该硬盘;

步骤 2: 从 SATA 硬盘一侧拔去 SATA 数据线;



步骤 3: 从 SATA 硬盘一侧拔去 SATA 15-针脚电源线接口（黑色）。



3. BIOS功能介绍

3.1 BIOS 信息提示界面

每当系统接通电源，正常开机后，便可看见进入BIOS设置程序提示的信息。此时，按下提示信息所指定的按键（通常为<F2>键或键）即可进入BIOS Setup设置界面。

```
EVOC Intelligent Technology
*****
*                EC3-1820V2NA                *
*                =====                    *
*                EVOC IPC Embedded 2015        *
*****
BIOS Version: N9189001 (X64) B00
Build Time: 04/13/2015
CPU: Intel(R) Atom(TM) CPU E3845 @ 1.91GHz
Memory: 4096 MB DDR3 Onboard

Press <F2> or <Del> to BIOS Setup, Press <F7> to Boot Menu.
```

BIOS信息提示界面如上图所示，包括公司及产品相关信息。BIOS版本和编译时间，CPU型号和内存容量等信息。

通过BIOS Setup设置程序修改相关设置（除了日期、时间）都保存在系统的闪存存储器中，即使掉电或拔掉主板电池，其内容也不会丢失；在因误操作无法进入Setup界面时，如需恢复出厂设置，请短接JCC1执行清除CMOS内容的操作。

注意！ BIOS的设置直接影响到电脑的性能，设置错误的参数将造成电脑的损坏，甚至不能开机，请使用BIOS内置缺省值来恢复系统正常运行。

由于本公司不断研发更新BIOS，其设置界面也会略有不同，以下的画面供您参考，有可能跟您目前所使用的BIOS设置程序不完全相同。

3.2 BIOS基本功能设置

当SETUP程序启动之后，您可以看到Phoenix SecureCore Technology Setup

主画面如下：

◆ Main

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
System Date [01/23/2015]			Item Specific Help	
System Time [11:54:08]			View or set System Date	
▶ System Information				
▶ Boot Features				
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit				

● System Date

选择此选项，用< + > / <->来设置目前的日期。以月/日/年的格式来表示。

各项目合理的范围是：Month/月(1-12)，Date/日(01-31)，Year/年(最大至2099)，Week/星期(Mon. ~ Sun.)。

● System Time

选择此选项，用< + > / <->来设置目前的时间。以时/分/秒的格式来表示。

各项目合理的范围是：Hour/时(00-23)，Minute/分(00-59)，Second/秒(00-59)。

➤ System Information

选择此子菜单，按< Enter > 进入，可以查看系统信息，如板卡名称，BIOS版本，CPU型号，内存大小等信息，详细参考下图所示。

Phoenix SecureCore Technology Setup	
Main	
System Information	
Embedded Board	EC3-1820V2NA
BIOS Version	N9189001 (X64) B00
Build Time	06/08/2015
Processor Type	Intel(R) Atom(TM) CPU E3845 @ 1.91GHz
Processor Speed	1.923 GHz
L2 Cache RAM	2048 KB
Total Memory	4096 MB (DDR3 Onboard)
System Memory Speed	1333 MHz
Lan1 MAC Address	00-90-B5-B7-00-13
Lan2 MAC Address	00-90-B5-B7-00-14
F1 Help ↑ ↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ← → Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

➤ **Boot Features**

选择此子菜单，按 < Enter > 进入，可以进行引导功能设置等选项。

Phoenix SecureCore Technology Setup	
Main	
Boot Features	Item Specific Help
NumLock: [On]	Selects Power-on state for NumLock.
Timeout [0]	
CSM Support [Yes]	
Quick Boot [Disabled]	
BIOS Level USB [Enabled]	
UEFI Boot [Enabled]	
Legacy Boot [Enabled]	
Boot in Legacy Video Mode [Disabled]	
Boot Priority [UEFI First]	
F1 Help ↑ ↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ← → Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

- **NumLock**

键盘NumLock状态设置，用于选择开机时NumLock的状态

- **Timeout**

开机过程中等待时间设置，当主板接大容量存储设备时建议增加等待时间。

- **CSM Support**

传统BIOS模块支持控制开关。

- **Quick Boot**

快速开机选项开关，当开启时系统将省略开机提示信息。

- **BIOS Level USB**

BIOS Legacy支持控制开关，当关闭时BIOS阶段及DOS系统无法使用USB设备。

- **UEFI Boot**

UEFI 引导支持开关。

- **Legacy Boot**

传统引导方式支持开关。

- **Boot in Legacy Video Mode**

引导时使用传统显示模式，以兼容个别系统或软件。

- **Boot Priority**

引导方式优先级设置开关，用于调整UEFI和Legacy引导方式的先后顺序。

◆ **Advanced**

Phoenix SecureCore Technology Setup	
Main	Advanced
Setup Warning: Setting items on this screen to incorrect values may cause system to malfunction! ▶ Hardware Monitor OS Selection [Windows7/Linux] IGD Boot Type [Auto] LCD Panel Type [Auto] LCD Backlight Value [100%] COM1 Port [Enable] COM1 Mode Selection [RS232] COM2 Port [Enable] COM2 Mode Selection [RS232] COM3 Port [Enable] COM4 Port [Enable] xHCI Controller [Disable] EHCI Controller [Enable] Audio Controller [Enable] SATA Controller Mode [AHCI] SD Card Support [Enable] Power State [Power On] Lan1 PXE ROM [Disable] RTC Alarm [Disable]	Item Specific Help Hardware Monitor.
F1 Help ↑ ↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ← → Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

➤ **Hardware Monitor**

选择此子菜单，按 < Enter > 进入，可以查看硬件监控相关信息。

Phoenix SecureCore Technology Setup	
Advanced	
Hardware Monitor	
SYS Temperature : CPU Temperature: CPUVCORE: VCC3.3V VCC5V VCC12V	[45 C] [45 C] [0.880 V] [3.264 V] [5.040 V] [11.711 V]
F1 Help ↑ ↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ← → Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

- **OS Selection**

操作系统选择项，包括Windows 8. x, Android, 和Windows7/Linux三个选项。

- **IGD Boot Type**

IGD引导显示设置选项，用于配置开机过程中显示输出端口，包括VGA, HDMI, LVDS, Auto 选项是按照VBIOS默认输出。

- **LCD Panel Type**

LCD 显示平板类型选择项，Auto选项是按照VBIOS默认输出分辨率，可以根据所接的LVDS屏选择对应的集成显示分辨率输出，如所支持的LVDS屏分辨率不在预备选项中，请联系EVOC客服寻求定制。

- **COM1~4 Port**

串口1至4开关控制选项，关闭后系统下默认无法使用。

- **COM1~2 Mode Selection**

串口1~2 模式选择项，用于配置COM1, 2的工作模式，由RS-232, RS-485, RS-422。

- **xHCI Controller / EHCI Controller**

此两项用于选择USB控制器模式，选项xHCI Controller与EHCI Controller不能同时设置成Enable。

- **SATA Controller Mode**

集成SATA控制器工作模式选项，有AHCI, IDE 被选项。

- **SD Card Support**

SD卡支持开关选项

- **Power State**

用于选择系统上电行为， Power On, 系统上电即开机, Power Off, 系统上电后，需要Power Button动作或通过其他方式唤醒系统。

- **Lan1 PXE ROM**

用于设置lan1网口，控制disable和enable。

- **RTC Alarm**

用于设置定时启动，如果enable后会显示唤醒时间设置栏，设置时间小时、分钟、秒，该时间到达后上电唤醒系统。

◆ **Security**

Phoenix SecureCore Technology Setup					
Main	Advanced		Security	Boot	Exit
			[Disabled]		Item Specific Help
▶	Secure Boot Configuration				
	Supervisor Password is:		Cleared		Set or clear the Supervisor account's password.
	User Password is:		Cleared		
	Set Supervisor Password		[Enter]		
	Supervisor Hint String		[]		
	Set User Password		[Enter]		
	User Hint String		[]		
	Min. Password length		[1]		
	Authenticate User on Boot		[Disabled]		
	HDD Password Select				
	No HDD detected				
F1 Help ↑ ↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ← → Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit					

- **Secure Boot Activation**

安全引导激活选项，该选项需设置 Supervisor Password 才能使用，该选项一经设置 Enable，无法关闭。

- **Secure Boot Configuration**

安全引导相关设置子菜单。该子菜单需设置 Supervisor Password 才能使用

- **Supervisor/User Password is:**

此两项分别用于显示超级用户和普通用户的密码状态，当没有密码时显示 Cleared，如有设置密码显示 Set。

- **Set Supervisor/User Password**

此两项分别用于设置超级用户和普通用户的密码，按< Enter > 进入设置。

- **Supervisor/User Hint String**

此两项分别用于设置超级用户和普通用户的提示信息，直接输入即可。

- **Min. Password length**

最小密码长度设置项。

- **Authenticate User on Boot**

验证用户开机选项，当Enable此项，每次开机需要输入用户密码。当Disable时，进入Setup时需要输入用户密码，该项需要设置Supervisor Password才能使用。

- **HDD Password Select**

用于选择硬盘密码权限，有 User Only/User+Master被选项。该选项只有接硬盘时才显示。

- **HDD Security Status**

用于显示硬盘安全信息状态列表，如没有侦测到硬盘，会显示No HDD Detected，如有侦测到硬盘会显示对应的 HDD Password State 状态，和 Set HDD User Password 选项，用于查看硬盘密码状态和设置硬盘密码功能。

◆ **Boot**

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Priority Order 1. ATAPI CD: 2. ATA HDD0: WDC WD5000LPVT-08G33T1 3. ATA HDD1: 4. USB HDD: SanDisk U3 Cruzer Micro 5. USB CD: 6. USB FDD: 7. SD Card: 8. Internal Shell				Item Specific Help Keys used to view or configure devices: ^ and v arrows Select a device. '+' and '-' move the device up or down. 'Shift + l' enables or disables a device. 'Del' deletes an unprotected device.
F1 Help ↑ ↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ← → Select Menu Enter Select ► Sub-Menu F10 Save and Exit				

➤ **Boot Priority Order**

此项用于配置系统引导的优先次序，编号越大优先级越低。其中，1优先级最高，对应类型的“:”后面有信息，说明系统有该类型设备存在，可以用于引导。Internal Shell属于系统内建的EFI Shell环境，用于维护系统。用方向键↑↓选择设备；用“+”/“-”键向上和向下移动设备已调整优先顺序；用“Shift + l”组合键使能或关闭对应设备；“Del”删除未保护设备。

◆ **Exit**

Phoenix SecureCore Technology Setup					
Main	Advanced	Security	Boot	Exit	
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Load Optimized Defaults Discard Changes Save Changes				Item Specific Help Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.	
F1 Help ↑ ↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ← → Select Menu Enter Select ► Sub-Menu F10 Save and Exit					

- **Exit Saving Changes**
退出并保存变更。
- **Exit Discarding Changes**
退出并放弃之前变更。
- **Load Setup Defaults**
加载出厂默认设置。
- **Load Optimized Defaults**
加载性能优化设置。
- **Discard Changes**
放弃变更。
- **Save Changes**
保存变更。

3.3 x86 平台下BIOS所要管理的系统资源

这里的系统资源我们定义三种：I/O端口地址，IRQ中断号和Memory地址。

◆ IO端口地址

X86的I/O地址线只设计16条，从0~0FFFFh，I/O地址空间总共有64K，在传统的ISA接口，只使用到前面的1024个（0000~03FFh），0400h以上的端口为PCI接口与EISA接口所使用。每一外围设备都会占用一段I/O地址空间。下表给出了X86平台大致上所要用到的I/O接口列表。

地 址	设备描述
0000-006F	PCI bus
0020-0021	Programmable interrupt controller
0024-0025	Programmable interrupt controller
0028-0029	Programmable interrupt controller
002C-002D	Programmable interrupt controller
002E-002F	Motherboard resources
0030-0031	Programmable interrupt controller
0034-0035	Programmable interrupt controller
0038-0039	Programmable interrupt controller
003C-003D	Programmable interrupt controller
0040-0043	System timer
004E-004F	Motherboard resources
0050-0053	System timer
0060-0060	PS/2 标准键盘
0061-0061	Motherboard resources
0063-0063	Motherboard resources
0064-0064	PS/2 标准键盘
0065-0065	Motherboard resources
0067-0067	Motherboard resources
0070-0070	Motherboard resources
0070-0077	System CMOS/real time clock
0078-0CF7	PCI bus
0080-008F	Motherboard resources
0092-0092	Motherboard resources
00A0-00A1	Programmable interrupt controller
00A4-00A5	Programmable interrupt controller

00A8-00A9	Programmable interrupt controller
00AC-00AD	Programmable interrupt controller
00B0-00B1	Programmable interrupt controller
00B2-00B3	Motherboard resources
00B4-00B5	Programmable interrupt controller
00B8-00B9	Programmable interrupt controller
00BC-00BD	Programmable interrupt controller
02E8-02EF	通信端口 (COM4)
02F8-02FF	通信端口 (COM2)
03B0-03BB	标准 VGA 图形适配器
03C0-03DF	标准 VGA 图形适配器
03E8-03EF	通信端口 (COM3)
03F8-03FF	通信端口 (COM1)
0400-047F	Motherboard resources
04D0-04D1	Programmable interrupt controller
0500-05FE	Motherboard resources
0600-061F	Motherboard resources
0680-069F	Motherboard resources
0D00-FFFF	PCI bus
1000-1FFF	PCI standard PCI-to-PCI bridge
2000-2FFF	PCI standard PCI-to-PCI bridge
3000-301F	SM 总线控制器
3020-303F	标准 AHCI 1.0 串行 ATA 控制器
3040-3047	标准 AHCI 1.0 串行 ATA 控制器
3048-304F	标准 AHCI 1.0 串行 ATA 控制器
3050-3057	标准 VGA 图形适配器
3058-305B	标准 AHCI 1.0 串行 ATA 控制器
305C-305F	标准 AHCI 1.0 串行 ATA 控制器

◆ IRQ中断分配表

系统共有15个中断源，有些已被系统设备独占。只有未被独占的中断才可分配给其它设备使用。ISA设备要求独占使用中断；只有即插即用ISA设备才可由UEFI或操作系统分配中断。而多个PCI设备可共享同一中断，并由UEFI或操作系统分配。下表给出了X86平台部分设备的中断分配情况，但没有给出PCI设备所占用的中断资源。

中断号	设备描述
IRQ0	System timer
IRQ1	PS/2 标准键盘
IRQ2	保留
IRQ3	通讯端口 (COM2)
IRQ4	通讯端口 (COM1)
IRQ5	保留
IRQ6	保留
IRQ7	保留
IRQ8	High precision event timer
IRQ9	保留
IRQ10	通讯端口 (COM3)
IRQ11	通讯端口 (COM4)
IRQ12	PS/2 兼容鼠标
IRQ13	保留
IRQ14	保留
IRQ15	保留

◆ APIC

高级可编程中断控制器。在现代P4以上级别的主板中，大都支持APIC，可以提供多于16个中断源，如IRQ16—IRQ23，部分主板如支持PCI-X的主板可以有高达28个中断源。但要启用该功能必须相应的操作系统支持。

◆ Memory地址

地 址	设备描述
000A0000-000BFFFF	PCI bus
000A0000-000BFFFF	标准 VGA 图形适配器
000C0000-000DFFFF	PCI bus
000E0000-000FFFFFF	PCI bus
80000000-8FFFFFFF	标准 VGA 图形适配器
80000000-908FFFFE	PCI bus
90000000-903FFFFFF	标准 VGA 图形适配器
90400000-9047FFFF	以太网控制器
90400000-904FFFFFF	PCI standard PCI-to-PCI bridge
90480000-90483FFF	以太网控制器
90500000-9057FFFF	以太网控制器
90500000-905FFFFFF	PCI standard PCI-to-PCI bridge
90580000-90583FFF	以太网控制器
90600000-906FFFFFF	PCI 加密/解密控制器
90700000-907FFFFFF	PCI 加密/解密控制器
90800000-90803FFF	High Definition Audio 控制器
90804000-90804FFF	SDA Standard Compliant SD Host Controller
90805000-90805FFF	SDA Standard Compliant SD Host Controller
90806000-90806FFF	SDA Standard Compliant SD Host Controller
90807000-90807FFF	SDA Standard Compliant SD Host Controller
90808000-908087FF	标准 ACHI 1.0 串行 ATA 控制器
90808800-90808BFF	Standard Enhanced PCI to USB Host Controller
90808C00-90808C1F	SM 总线控制器
E0000000-EFFFFFFF	Motherboard resources
E00000D0-E00000DB	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor MBI Device - 33BD
FED00000-FED003FF	High precision event timer
FED01000-FED01FFF	Motherboard resources
FED03000-FED03FFF	Motherboard resources
FED04000-FED04FFF	Motherboard resources
FED08000-FED08FFF	Motherboard resources
FED0C000-FED0FFFF	Motherboard resources
FED1C000-FED1CFFF	Motherboard resources
FEE00000-FEEFFFFFF	Motherboard resources
FEF00000-FEFFFFFF	Motherboard resources
FF000000-FFFFFFFF	Intel(R) 82802 Firmware Hub Device

4. 驱动程序安装说明

本产品的驱动程序可依据配套光盘内容安装，在此不做介绍。

5. 附录

5.1 GPIO编程指引

本板GPIO功能使用的是通过连接在SMBUS上的ARM芯片，芯片选用的是为 NUVOTON M054LDN，由M054LDN控制GPIO输入输出。

在OS层，基于SMBUS通信与M054LDN建立连接控制，用户可以设置GPIO输出电平，读取GPIO输入电平。

M054LDN 与主板通过 SMBUS 通信，本产品设计主板为主设备，M054LDN 为从设备。SMBUS 通信编程，用户可参考 ICH7 等相关文档规范。操作 SMBUS 底层接口函数已实现，用户可以调用提供好的 API 来实现自己的相应需求。

以下是接口函数介绍，详细程序见光盘。

```
(1)、SMBWriteByteEx(UCHAR ucSlaveAddress,  
                    UCHAR ucCommand,  
                    UCHAR ucData,  
                    BOOLEAN bPecCheck  
                    );
```

功能描述：向SMBUS上写一字节（UCHAR）数据

参数： ucSlaveAddress——从设备地址

ucCommand——写操作命令

ucData——数据

bPecCheck——false:不校验，true:校验

返回值：

非0 --- 函数执行失败

0 --- 函数执行成功

```
(2)、SMBReadByteEx(UCHAR ucSlaveAddress,
                    UCHAR ucCommand,
                    PUCHAR pData,
                    BOOLEAN bPecCheck
                    );
```

功能描述：向 SMBUS 上读一字节（UCHAR）数据

参数： ucSlaveAddress——从设备地址
ucCommand——读操作命令
pData——返回数据
bPecCheck——false:不校验，true:校验

返回值：

非 0 --- 函数执行失败
0 --- 函数执行成功

以上两API接口函数，也是根据SMBUS寄存器等协议规范进行编写的，用户按照SMBUS规范和我们规定的相关协议命令，即可建立与M054LDN的正常通信。

本产品现规定M054LDN从设备地址为0x75，目前GPIO通信协议命令如下，

```
typedef enum
```

```
{
```

```
SMBUS_POST_INFO = 0,
```

```
    SMBUS_INITGPIO = 0x01, //init gpio
```

```
    SMBUS_DEINITGPIO = 0x02, //deinit gpio
```

```
    SMBUS_GETARMINFO = 0x03, //get arm version
```

```
    SMBUS_SETGPOHIGH=0x06, //set one gpo output high
```

```
    SMBUS_SETGPOLOW=0x07, //set one gpo output low
```



```

SMBUS_GETGPILEVEL=0x08, //get one gpi input level
SMBUS_SETALLGPOLEVEL=0x0A, //set ALL gpo output LEVEL(0/1)
SMBUS_GETALLGPILEVEL=0x0B, //Get all gpi input LEVEL(0/1)
SMBUS_GPIOEND=0x5A
} SMBUS_GPIO_CMD;

```

函数参数值如下表：

地址	命令	参数	校验
slaveAddress	command	parameter	false

parameter 表示 GPO/GPI 索引值，为 1-8。

则向 M054LDN 发送信息，调用 SMBWriteByteEx 函数即可以控制 GPO 的输出电平；由于 M054LDN 为从设备，GPI 输入电平需主机主动读取，需先执行写函数 SMBWriteByteEx，再执行读函数 SMBReadByteEx，即可获取 GPI 的输入电平信息。

5.2 WDT看门狗编程指引

看门狗由 Super I/O NCT6106D 实现控制的。用户操作 WATCHDOG TIMER 寄存器，即可实现控制看门狗。

操作看门狗底层接口函数已实现，用户可以调用提供好的 API 来实现自己的相应需求。

以下是接口函数介绍，详细程序见光盘。

(1)、WDT_Start(UINT8 time, UINT8 count_mode);

功能描述：启动看门狗

参数： time——看门狗时间，范围 1-255 之间

count_mode——0:计时单位秒，1:计时单位分

返回值:

BPI_STATUS_INVALID_PARAMETER --- 函数执行失败

BPI_STATUS_SUCCESSFUL --- 函数执行成功

(2)、WDT_Feed(UINT8 time);

功能描述: 喂狗

参数: time——看门狗时间, 范围 1-255 之间

返回值: 无

(3)、WDT_Stop();

功能描述: 关闭看门狗

参数: 无

返回值: 无

(4)、Get_WDT_Current_Timeout_Value();

功能描述: 获取当前看门狗超时时间

参数: 无

返回值:

timeout --- 超时时间

以上为看门狗操作接口函数, 调用 WDT_Start, 配置看门狗并启动看门狗; 调用 WDT_Feed, 进行喂狗操作; 调用 WDT_Stop, 为关闭看门狗; 调用 Get_WDT_Current_Timeout_Value, 为获取此刻看门狗超时计时时间。

用户使用时, 调用我们的库文件 DLL 或静态文件 LIB, 相应的宏和命令, 用户包含我们的头文件即可。

5.3 LVDS背光控制编程指引

LVDS 背光控制由 ICH 实现控制的。用户操作 PWM 寄存器,即可实现控制 LVDS 屏背光亮度。

操作 LVDS 屏底层接口函数已实现,用户可以调用提供好的 API 来实现自己的相应需求。

以下是接口函数介绍,详细程序见光盘。

(1)、BPI_STATUS Set_SIO_LVDS_BL(UINT8 PWM_Value);

功能描述: 设置背光控制参数值

参数: PWM_Value—— 背光参数值, 范围 1-255 之间

返回值:

BPI_STATUS_INVALID_PARAMETER --- 函数执行失败

BPI_STATUS_SUCCESSFUL --- 函数执行成功

(2)、BPI_STATUS Get_SIO_LVDS_BL(UINT8 *PWM_Value);

功能描述: 获取背光控制参数值

参数: *PWM_Value—— 返回背光参数值, 范围 1-255 之间

返回值:

BPI_STATUS_INVALID_PARAMETER --- 函数执行失败

BPI_STATUS_SUCCESSFUL --- 函数执行成功

以上为 LVDS 背光控制操作接口函数, 背光控制寄存器 BIOS 已默认初始化, 用户只需调用 Set_SIO_LVDS_BL, 进行设置背光参数操作; 调用 Get_SIO_LVDS_BL, 可以读取背光参数; 背光参数设置范围为 0-255, 0 为黑屏, 255 为最亮。

用户使用时, 调用我们的库文件 DLL 或静态文件 LIB, 相应的宏和命令, 并包含我们的头文件即可。

5.4 常见故障分析与解决

常见故障	检查点
通电之后不开机	<ol style="list-style-type: none"> 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. 查看CPU是否安装到位，CPU卡扣是否扣好 4. 尝试重新插拔内存条 5. 尝试更换内存条 6. 尝试根据主板说明书清除主板CMOS 7. 请确认是否有外接卡，去除外接卡后是否正常
BIOS Setup设置不能保存	<ol style="list-style-type: none"> 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
提示无法找到可引导设备	<ol style="list-style-type: none"> 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. 请确认硬盘中是否正常安装操作系统
进入系统过程中蓝屏或死机	<ol style="list-style-type: none"> 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
进入操作系统缓慢	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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

无法检测到USB设备	<ol style="list-style-type: none"> 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 Setup 中 USB 控制器是否打开
无法检测到PCI卡	<ol style="list-style-type: none"> 1. 请确认 PCI 卡是否需要额外供电 2. 请确认 PCI 卡工作所需电压与主板 PCI 提供电压(默认 5V) 是否相符 3. 请确认更换 PCI 槽位后能否被识别
无法检测到ISA卡	<ol style="list-style-type: none"> 1. 依据 ISA 卡手册确定 ISA 卡所使用的资源已经被 BIOS 预留--大部分主板 BIOS Setup 中有针对 ISA 使用 I/O 或 memory 资源的预留选项, ISA 卡所使用的 IRQ 是否在 BIOS Setup 中被 reserved 2. ISA 卡一般在系统下无法直接识别, Windows 系统需在“控制面板”中选择“添加硬件”进行添加

5.5 缩略语

缩略语	术语	含义
AC	交流	交流
APM	高级电源管理	用于监视和降低 PC 功耗的工具
ACPI	高级配置与电源接口	
AHCI	高级主控接口/高级主机控制器接口	串行 ATA 的标准控制接口, Microsoft windows XP (高于 SP1 版本) 和 IAA 驱动程序支持该接口
APIC	高级可编程中断控制器	扩张的可编程中断控制器
ASPM	活动状态电源管理	一种对 PCIE 设备空闲节电模式控制
ATM	异步传输模式	
ASCII	美国信息交换标准代码	
API	应用程序编程接口	
ATM	异步传输模式	

AT	高级技术	AT 电源
ATX	高级技术扩展	ATX 主板结构或 ATX 电源
AWG	美国线缆规格	区分电缆直径的美国标准
BIOS	基本输入输出系统	BIOS 代码
bps	位/秒	数据传输速率的一种描述
BGA	球状矩阵排列	一种芯片封装形式
Buffer	缓冲器	
Battery	电池	
BBS	电子公告牌系统	
BMP	位图	一种图形格式
CAN	控制器局域网	一种通用的工业现场总线
CD-ROM	只读光盘	大数据存储只读光盘
CD-RW	可读写光盘	刻录光盘
CE	欧洲共同体 (CE 认证符号)	欧盟产品的统一认证标示
CF	CF 卡	
CGA	彩色图形适配器	标准监视器接口
CLK	时钟脉冲	时钟信号
CMOS	互补金属氧化物半导体	
COA	真品证书	Microsoft Windows 产品密钥
CoL	许可证书	许可证授权
COM	串行通信端口	串行接口
CP	通信处理器	通信计算机
CPU	中央处理单元	
CRT	阴极射线管	CRT 显示器
CSA	加拿大标准协会	按照本国或两国标准 (使用 UL/USA) 进行测试和认证的加拿大组织
CTS	清除发送	
CPCI	紧凑型 PCI	一种高性能工业总线接口标准
CISC	复杂指令集计算机	

CRC	循环冗余校验码	一种错误校验编码
CGI	通用网关界面	
Cache	高速缓冲存储器	
DRAM	动态随机存取存储器	
DDRAM	双数据随机存取存储器	带有高速接口的存储器芯片
DC	直流	
DCD	数据载波检测	数据载波信号检测
DMA	直接存储器存取	直接内存存取
DOS	磁盘操作系统	无图形界面的操作系统
DP	显示端口	Display Port
DQS	德国质量与环境管理体系 认证机构	
DSR	数据设置就绪	操作就绪
DTR	数据终端就绪	
DVD	数字多功能光盘	
DVI-D	数字视频接口	数字显示器接口
DVI-I	数字视频接口	具备数字和 VGA 模拟信号的显示器 接口
dB	分贝	一种纯计数单位，表示两个量的比 值大小
DCE	数据通信设备	数据通信终端设备
DOM	DOM 电子硬盘	Disk on module 的缩写
DOC	单芯片快闪磁盘	Disk on chip 的缩写
DDC	显示数据通道	显示器和主机通信总线标准
DDR	双倍数据速率	一种内存规范
Decode	指令解码	
DFP	数字平面显示器	
DHCP	动态主机设置协议	一种局域网的网络协议
DES	数据加密算法	一种对称加密算法
DIMM	双列直插式存储模块	

DMI	直接媒体接口	处理器 CPU 和 IO 控制器 (PCH, ICH) 间的数据传输通道
DNS	域名系统	因特网的一项核心服务
Dot Pitch	点距	显示屏相邻两个像素点的间距
DPMS	显示能源管理信号	VESA 组织制定的一种显示能源管理标准
DVMT	动态分配共享显存技术	用于设定显卡可使用的共享内存大小的技术
ECC	错误检查修正	
ECP	扩展的功能端口	扩展的并行端口
EGA	增强型图形适配器	PC 和监视器的接口
ESD	静电释放	
EDID	扩展显示标识数据	一种 VESA 标准数据格式
EIDE	增强型 IDE	增强形电子集成驱动器
EISA	扩展工业标准体系结构	扩展的 ISA 标准
EM64T	64 位内存扩展技术	
EN	欧洲标准	成员国的国家标准必须与 EN 标准保持一致
EEPROM	电可擦可编程只读存储器	使用 EEPROM 芯片的子模块
EPP	增强型并行端口	
ESC	退出字符	控制字符
EC	嵌入式控制器	
EMI	电磁干扰	
EMC	电磁兼容	
ES	能源之星	
ESCD	可扩展系统配置数据	
EIA	电子工业协会	
FAQ	常见问题解答	
FAT32	32 位文件分配表	

FDD	软盘驱动器	
FSB	前端总线	外部总线
FCPGA	倒装芯片针脚栅格阵列	一种芯片封装形式
FCBGA	倒装球栓栅格阵列	一种芯片封装形式
FIFO	先入先出队列	
FireWire	火线	IEEE1394 标准
Firmware	固件	固化的软件
FWH	固件中心	
FPU	浮点运算单元	
FTP	文件传输协议	
GND	接地	
GB	千兆位	
GPS	全球定位系统	
GSM	全球移动通信系统	
GUI	图形用户界面	
GMCH	图形和内存控制中心	
GPU	图形处理器	
HDD	硬盘驱动器	
HDTV	高清晰度电视	
HEX	十六进制	
HTML	超文本标记语言	用于创建 Internet 页面的脚本语言
HTTP	超文本传输协议	Internet 上的数据传输协议
HardWare	硬件	
HW Monitor	硬件监控	
Hz	赫兹	
HDMI	高清晰度多媒体接口	一种高清晰显示接口
H D A	高保真音频	
HT	超线程技术	
HS	热插拔 Hot-plug	开机状态下的设备卡带电拔插操作

I/O	输入输出	计算机的数据输入/输出
IDE	电子集成驱动器	
IGD	集成的图形设备	
IP	防护等级	
IP	Internet 通信协议	
IR	红外线	一种低速近距离的无线传输
IRDA	红外线数据协会	用于通过 IR 模块传输数据的标准
IRQ	中断请求	
ISA	工业标准体系结构	用于扩展模块的总线
IC	集成电路	
IDSL	因特网数字用户线路	
IE	微软因特网浏览器	
IEEE	电机及电子学工程师联合会	
IPC	工业控制计算机	
ISO	国际标准化组织	
IT	信息技术	
IA	英特尔架构	
ICH	输入/输出控制中心	
ID	身份标识号码	
IDF	英特尔开发者论坛	
INI File	初始化文件	
ISP	因特网服务提供商	
IPMI	智能平台管理接口	
JEDEC	固态技术协会	存储设备的标准规范制定协会
KB	键盘	
Kbps	千位每秒钟	传输速率的一种
L2 Cache	二级缓存	
LAN	局域网	局限于本地通讯的计算机网络
LCD	液晶显示器	

LED	发光二极管	
LPT	打印机端口	
LVDS	低电压差分信号	
Latency time	潜伏延迟时间	
LBA	逻辑块寻址	一种机械硬盘的块寻址模式
LFP	LCD 平板	LCD 平板显示器
MAC	介质访问控制	
MMC	微型存储卡	32×24.5mm 格式的存储卡
MPI	用于编程设备的多点接口	
MS-DOS	微软磁盘操作系统	
MTBF	平均无故障间隔时间	
MB	兆字节	
MPEG	动态影像压缩标准	一种视频的压缩标准
MTR	平均修复时间	
MBR	主引导记录	
MHz	兆赫兹	一种频率的单位
MCU	微控制单元	单片微型计算机的一种
MODEM	调制解调器	
NA	空	
NC	未连接	
NP	未安装	
NCQ	原生命令队列	自动将文件和磁盘存取重新排列，以提高性能
NMI	不可屏蔽中断	
NTFS	新技术文件系统	Windows XP、Windows Server 2008、Vista 和 Windows 7 的标准文件系统
NIC	网络接口卡	网络适配器
NB	北桥	北桥芯片
ODD	光盘驱动器	

OS	操作系统	
OSD	屏幕显示菜单	
PATA	并行 ATA	存储接口标准的一种
PC	个人电脑	个人计算机
PCI	外围设备互连	PCI 总线
PCIE	Peripheral Component Interconnect Express	一种高速串行差分全双工的总线传输规范
PCMCIA	个人计算机存储卡国际协会	
PEG	PCI EXPRESS 图形	
POST	开机自检	
PXE	预引导执行环境	用于通过网络运行没有硬盘数据 PC 的软件
PMC	PCI 夹层卡	PCI Mezzanine Card
PS2	PS2 接口设备	IBM 开发的 PS2 鼠标键盘标准接口形式
PICMG	PCI 工业计算机制造商协会	
RAID	独立磁盘冗余阵列	冗余硬盘阵列
RI	振铃输入	呼入唤醒信号
RS485	协调子层 485	设计用于多大 32 个节点的双向总线系统
RTC	实时时钟	
RTS	发送数据请求	
RXD	接收数据	
RF	射频	频率范围从 300kHz~30GHz 之间的无线发射电磁波
RSV	保留使用引脚	
RST	复位	Reset
SCSI	小型计算机系统接口	

SDK	软件开发工具包	
SSD	固态电子盘	
SV	标准电压	
SMART	自我检视, 分析和报告技术	硬盘错误诊断程序
SO-DIMM	小外形双列内存模组	笔记本内存的一种
SRAM	静态随机存取存储器	
SDRAM	同步动态随机存储器	
SVGA	超级视频图形阵列	
SW	软件	Software
S5	关机	所有硬件设备(包括电源)全部都关闭
S4	挂起到硬盘	内存信息写入硬盘, 然后所有部件停止工作
S3	挂起到内存	将运行中的数据写入内存后关闭硬盘
S1	POS (Power on Suspend)	CPU 停止工作, 其他的硬件设备仍然正常工作
S0	电脑正常工作	所有硬件设备全部处于打开或正常工作的状态
SMB	全系统管理总线	
SMD	表面安装设备	
SMI	系统管理中断	只有触发 SMI 才能进入 SMM 模式
SMM	系统管理模式	
SNR	信噪比	
SPD	串行存在探测	一个 256KB 的 EEPROM
S/PDIF	索尼/飞利浦数字接口	一种民用数字音频接口协议
SCI	系统控制中断	硬件产生的通知 OS 的 ACPI 中断事件
TFT	薄膜晶体管	LCD 平面屏幕类型
TxD	发送数据	数据传送信号
TDP	热量设计功耗	Thermal Design Power

TTL	晶体管 to 晶体管逻辑电路	
Turbo	瞬间加速自动超频技术	英特尔睿频加速技术 Turbo boost
TPM	可信平台模组	
USB	通用串行总线	
UPS	不间断电源	
UL	美国保险商实验室	UL 认证
U	服务器尺寸单位, 1U=44.45mm	
UEFI	统一的可扩展固件接口	Intel 全新固件接口标准, 采用 C 语言
VGA	视频图形阵列	满足工业标准的视频适配器
VRM	电压调整模块	
VT	虚拟化技术	通过 Internet 技术可以使用模拟封闭环境
VID	电压识别定义	
VSYNC	垂直同步	垂直同步刷新
VESA	视频电子标准协会	
VRAM	视讯随机存取存储器	
VIO	VIO 电压	PCI 总线设备上的 IO 电压
VPX	新一代高速串行总线	
WDT	看门狗	Watch dog
WLAN	无线局域网	
WOL	网络唤醒	局域网唤醒
WWW	环球信息网	万维网
WAN	广域网络	Wide Area Network
WAP	无线应用协议	
XGA	扩展图形阵列	最大分辨率支持 1024×768
XMC	XMC 夹层过渡卡	XMC Switched Mezzanine Card


Legal Information

Warnings


Please pay attention to the tips within the manual so as to avoid personal injury or property losses. The tips for personal injury are indicated in warning triangles while the tips only related to property losses have no warning triangles. The warning tips are listed as follows with the hazardous scale from severe to slight.

 Danger

If handled carelessly, death or severe human injury will occur.

 Warning
--

If handled carelessly, death or severe human injury might occur.
--

 Caution
--

Warning triangle indicates that slight human injury might occur if handled carelessly.
--

Note

Unexpected result or status might occur, if not handled according to the tips.
--

Professional Personnel

The product/system covered by the manual can only be handled by qualified and professional personnel. During operation, please follow the respective instructive manuals, especially the safety warnings. The professional personnel have been trained and possess relevant experiences; therefore, he/she could be aware of the risks of the product/system and avoid possible damages.

EVOC Product

Please pay attention to the following instructions:

 Warning
--

EVOC product can only be used according to the descriptions within the manual, including the contents and the relevant technical documents. If the products or components from other companies are required, please get the recommendation and grant from EVOC first. Proper transportation, storage, assembly, installation, debugging, operation and maintenance are prerequisite to ensure product safety and normal operation; therefore, please ensure permitted environment conditions and pay attention to the tips within the manual.



Copyright Notice

Information offered in this manual is believed to be correct at the time of printing, and is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer. In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of improper installation and/or use, or inability to use the product or documentation.

This user manual is protected by copyright. No part of this manual may be reproduced, stored in any retrieval system, or transmitted, in any form or by any means, mechanical, electronic, photocopied, recorded or otherwise, without the prior written permission from the manufacturer.

Trademarks

EVOC is a registered trademark of EVOC Intelligent Technology Co., Ltd. Other product names mentioned herein are used for identification purposes only and may be trademark and/or registered trademarks of their respective companies.

Warranty Terms:

The warranty on the product lasts for two year. If the user has additional requirements, the contract signed between the two sides shall prevail.

Please visit our website: <http://www.evoc.com> for more information, or send an email to the Technical Support Mailbox support@evoc.com (International) or support@evoc.cn (Domestic) for consultation.

Hotline: 4008809666

About this manual

Scope of the Manual


The manual is appropriate for EVOC EC3-1820V2NA.

Convention

The term “the PC” or “the Product” within the manual usually stands for EVOC EC3-1820V2NA.

Instructions

Safety instructions

To avoid property losses or individual injury, please pay attention to the safety instructions within the manual. The warnings within the manual are marked with warning triangle , whose existence is dependent upon the scale of the potential hazard.

History

Version release of this manual:

Version	Time
B00	2015.4
C00	2015.7
C01	2015.7
C02	2019.9



Safety Instructions

ESD Instructions

The following label can be used to identify the modules that contain electrostatic sensitive devices:



When operating the modules that contain electrostatic sensitive devices, please follow the instructions below:

- When operating the modules that contain electrostatic sensitive devices, make sure to release static electricity on your body (for example, by touching a grounded object).
- All the devices and tools should not contain ESD.
- Before installing or removing modules that contain ESD, make sure to pull out the power plug and remove the battery.
- When assembling modules that contain ESD, always handle them by their edge.
- Please do not touch any connector pin or conductive part on the modules that contain ESD.

Contents

1. Product Introduction	1
1.1 Overview	1
1.2 Mechanical Dimensions, Weight and Environment	1
1.3 Typical Consumption	1
1.4 Reference Power Consumption for Power Supply Model Selection	3
1.5 Micro-processor	4
1.6 Chipset	4
1.7 System Memory	4
1.8 Display Function	4
1.9 Network Function.....	4
1.10 Audio.....	5
1.11 Power Supply Feature	5
1.12 Watchdog Function.....	5
1.13 Operating Systems	5
1.14 I/O Ports	5
2. Installation Instructions	7
2.1 Product Dimensions Drawing	7
2.2 Port Location.....	8
2.3 Data to Identify the Board.....	9
2.4 Structure Diagram	9
2.5 Jumper Setting.....	10
2.6 COM Port.....	11
2.7 LCD Backlight Control Port.....	12
2.8 Display Port.....	12

2.9 USB Port	15
2.10 LAN Port.....	16
2.11 Audio Port	17
2.12 Keyboard/Mouse Port	17
2.13 SATA Interface	17
2.14 GPIO Port.....	18
2.15 Fan Connector	18
2.16 Power Connector	19
2.17 Status Indication Control Port	19
2.18 SIM Port.....	20
2.19 Mini-PCIe Slot	20
2.20 mSATA Interface	22
2.21 Hot-swap of SATA Hard Drive.....	23
3. BIOS Setup.....	25
3.1 BIOS Information Interface	25
3.2 Basic Function Setting for BIOS.....	26
3.3 System Resource Managed by BIOS under X86 Platform.....	34
4. Installing the Drivers	40
5. Appendix	41
5.1 GPIO Programming Guide.....	41
5.2 WDT Programming Guide	43
5.3 LVDS Backlight Control Programming Guide.....	45
5.4 Troubleshooting and Solutions.....	46
5.5 Abbreviations	48

1. Product Introduction

1.1 Overview

EC3-1820V2NA is a 3.5-inch motherboard based on Intel® new-generation Atom Bay Trail SoC platform. Its CPU is Future Intel® Celeron® processor for Intelligent Systems (Based on 22nm Intel® Silvermont microarchitecture), clock frequency Quad-core 1.91GHz, Dual-core 1.33GHz and Quad-core 2.00GHz. Its graphics core integrates INTEL 7th generation graphics engine, with two display tubes, supporting DX11 and 3D output.

EC3-1820V2NA has multiple types of interfaces, and can be widely used in military industry, automation, electric power, and etc.

1.2 Mechanical Dimensions, Weight and Environment

- Dimensions: 146.1mm(L) x 101.6mm(W) x 24.7mm(H)
- Net Weight: 0.29Kg
- Operating environment:
 - Temperature: 0°C ~ 60°C; Extendable temperature range: -40°C ~ 85°C
(J1900 does not support temperature expansion)
 - Humidity: 5% ~ 95% (non-condensing)
- Storage environment:
 - Temperature: -40°C ~ 85°C
 - Humidity: 5% ~ 95% (non-condensing)

1.3 Typical Consumption

The typical consumption is calculated based on the following configuration under idle status.

Configuration 1

CPU: Onboard Atom E3845 1.91GHZ Quad-core

Memory: Onboard 4G

Operating system: Win7 32bit

Hard disk drive: SanDisk SSD SATA3.0 128GB

➤ +12V@0.62A; +5%/-3%

Configuration 2

CPU: Onboard Atom E3825 1.33GHZ Dual-core

Memory: Onboard 4G

Operating system: Win7 32bit

Hard disk drive: SanDisk SSD SATA3.0 128GB

➤ +12V@0.61A; +5%/-3%

Configuration 3

CPU: Onboard Celeron J1900 2.00GHZ Quad-core

Memory: Onboard 4G

Operating system: Win7 32bit

Hard disk drive: SanDisk SSD SATA3.0 128GB

➤ +12V@ 0.95A; +5%/-3%

1.4 Reference Power Consumption for Power Supply Model Selection

The reference power consumption is based on the data collected from the following environments, expansion card and power consumption of other peripheral devices. Power consumption needs to be added according to configuration requirements for power supply model selection.

Configuration 1

CPU: Onboard Atom E3845 1.91GHZ Quad-core

Memory: Onboard 4G

HDD: SanDisk SSD SATA3.0 128GB

Operating system: Windows7 32bit

Operating software: TAT 4.7

➤ +12V@1.84A; +5%/-3%

Configuration 2

CPU: Onboard Atom E3825 1.33GHZ Dual-core

Memory: Onboard 4G

HDD: SanDisk SSD SATA3.0 128GB

Operating system: Windows 7 32bit

Operating software: TAT 4.7

➤ +12V@1.38A; +5%/-3%

Configuration 3

CPU: Onboard Celeron J1900 2.00GHZ Quad-core

Memory: Onboard 4G

HDD: SanDisk SSD SATA3.0 128GB

Operating system: Win7 32bit

Operating software: TAT 4.7

➤ +12V@ 1.53A; +5%/-3%

1.5 Micro-processor

Onboard Bay Trail-I SoC CPU, E3825 CPU with 1.33GHz clock frequency, dual-core CPU; E3845 CPU with 1.91GHz clock frequency, quad-core CPU; J1900 CPU with 2.00GHz clock frequency, quad-core CPU.

1.6 Chipset

Single-chip processor, chipset integrated in the CPU.

1.7 System Memory

Onboard 4G DDR3L memory chip, supporting 1333MT/s.

1.8 Display Function

- Supports VGA, HDMI and LVDS; LVDS does not support hot swap;
- VGA+LVDS are asynchronous output;
- VGA supports resolution up to 2560×1600@60Hz; LVDS supports up to UXGA(1920×1080).

1.9 Network Function

Provides two 10/100/1000Mbps LAN ports; LAN1 is standard RJ45 port and supports Wake-On-LAN; LAN2 uses 2×7 2.0mm pin header for output.

1.10 Audio

HDA standard, supporting MIC-IN/LINE-IN/LINE-OUT.

1.11 Power Supply Feature

+12V single power supply, 2×2 power connector.

1.12 Watchdog Function

- 255 levels, programmable by minute or second;
- Supports Watchdog timeout interrupt or system reset.

1.13 Operating Systems

Supported operating systems: Windows8.1, Windows8, Windows7, Linux.

1.14 I/O Ports

- Provides 4 COM ports. COM1 and COM2 support RS-232/RS-422/RS-485 modes, set by BIOS setup; COM3 and COM4 only support RS-232 mode; Modem wakeup function is not supported;
- 1 x SATA interface and 1 x mSATA (optional J2) interface;

Note: It is recommended to use the following SATA 3.0 hard drives:

SSD Crucial 6Gb/s SATA3.0 2.5 128GB M4

HDD Seagate 6Gb/s SATA3.0 500GB ST500DM002

HDD Seagate 6Gb/s SATA3.0 3000GB

HDD WD 6Gb/s SATA3.0 4000GB

- 5 x USB2.0 port and 1 x USB3.0 port;

Note: USB3.0 is disabled by default. Before Intel USB3.0 driver is installed, it can only be used as USB2.0 port. If USB3.0 driver is not installed after enabling USB3.0 function, all the USB ports of Windows7 system (including other USB2.0 ports) cannot be used. Windows8/8.1 will automatically load the driver.

The following steps are about enabling USB3.0 under Windows7 system:

1. Set the motherboard BIOS to default value, then install Windows7, place the enclosed driver CD into the USB optical drive, and enter into the driver CD to copy the folder USB3.0 under the Driver directory onto the desk;
2. Reboot the PC, press F2 to enter into BIOS, select “Advanced”- set “EHCI Controller” to “Disabled”, and set “XHCI Controller” to “Enabled”, press “F10” to save and exit;
3. Reboot and enter into Windows7 system, use PS2 mouse to double click USB3.0 folder on the desk, double click “Setup.exe” to install the USB3.0 driver. After the installation is finished, all the USB ports can be normally used. At this time, USB3.0 ports have reached the USB3.0 standard.

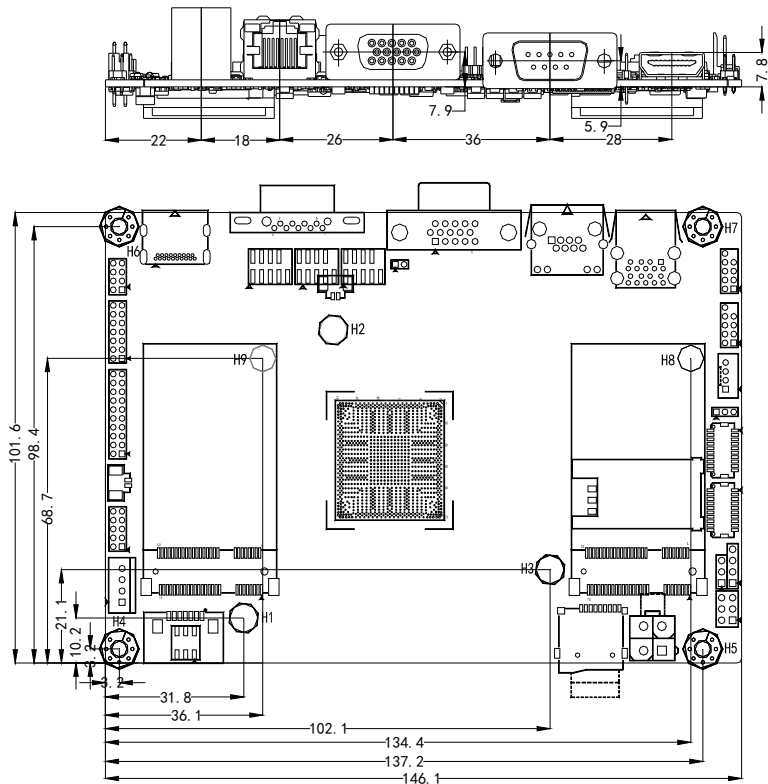
- 1 x PS/2 keyboard/mouse port;
- 1 x 16-channel digital I/O port;
- 2 x Mini PCIE slot (MPCIE1 and J2, J2 optional), supporting WiFi; MPCIE1 supports 3G module;
- 1 x Micro SD card slot, J1900 motherboard does not support Micro SD card slot;
- 1 x HDMI port and 1 x VGA port;
- 2 x 1000Mbps LAN port.

Note: How to identify alarms

1. A long beep means a system memory error;
2. A short beep means bootup.

2. Installation Instructions

2.1 Product Dimensions Drawing

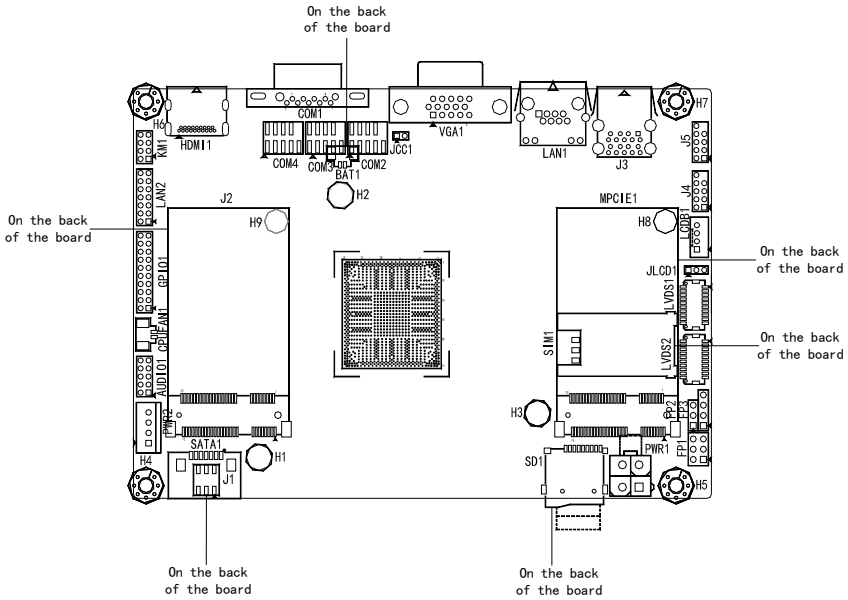


Unit: mm

Warning!

Please adopt appropriate screws and proper installation methods (including board allocation, CPU and heat sink installation); otherwise, the board may be damaged. It is recommended to use M3×6 GB9074.4-88 screws at H4 ~ H7.

2.2 Port Location

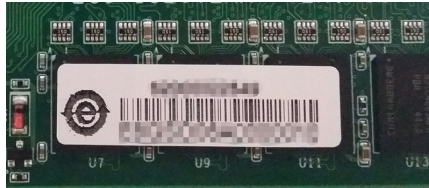


2.3 Data to Identify the Board

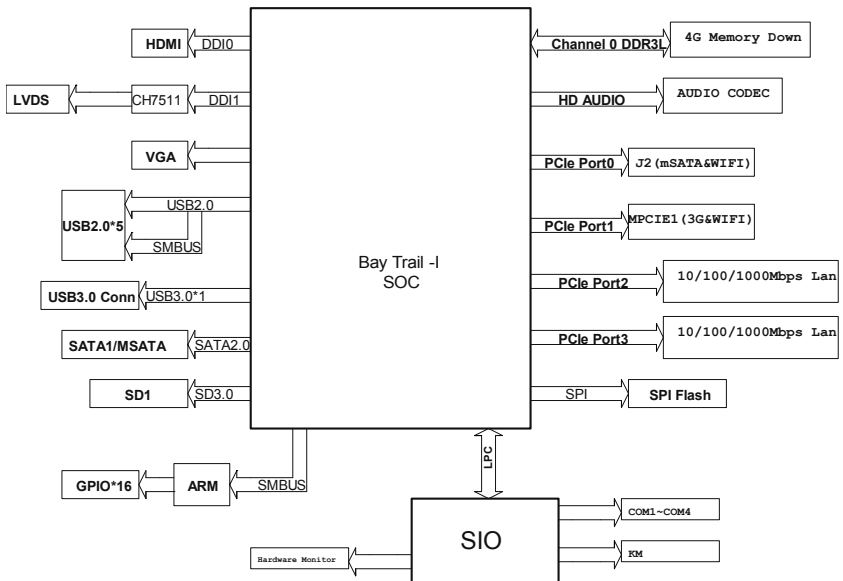
Attention

During maintenance or after the product is stolen, this code can be used to identify the PC. Please do not rip it off.

Serial No.: Located on the board (as shown below)



2.4 Structure Diagram




Tip: How to identify the first pin of the jumpers and connectors

1. Observe the letter beside the socket, the first pin is usually marked with “1” or bold lines or triangular symbols;
2. Observe the solder pad on the back: usually the square pad is the first pin.

2.5 Jumper Setting

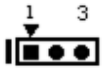
1. JCC1: Clear/Keep CMOS Setting (Pitch: 2.0mm)

CMOS is powered by the button battery on board. Clearing CMOS will restore original settings (factory default). The steps are listed as follows: (1) Turn off the computer and unplug the power cable; (2) Instantly short circuit JCC1; (3) Turn on the computer; (4) Follow the prompt on screen to enter BIOS setup when booting the computer, load optimized defaults; (5) Save and exit. Please set as follows:

 JCC1	Setup	Function
	1-2 Open	Normal (Default)
1-2 Short	Clear the contents of CMOS and all BIOS settings will restore to factory default values.	

2. JLCD1: LCD Working Voltage Selection (pitch: 2.0mm)

Different LCD screens may have different voltages. This board provides two voltage options: 3.3V and 5V. Only when the selected LCD voltage is consistent with that of LCD screen, can LCD screen give normal display. Its setup method is as follows:

 JLCD1	Setup	Function
	1-2 Open	+3.3V(Default)
2-3 Short	+5V	

2.6 COM Port

1. This board provides two COM ports which support RS-232/RS-485/RS-422 mode. The COM1 is DB9 output; COM2 is 2×5Pin pin header output (pitch: 2.0mm). Their pin definitions are as follows:

Pin	Signal Name		
	RS-232	RS-422	RS-485
1	DCD#	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	NC
4	DTR#	RXD-	NC
5	GND	GND	GND
6	DSR#	NC	NC
7	RTS#	NC	NC
8	CTS#	NC	NC
9	RI#	NC	NC


Note: The COM port mode of COM1 and COM2 needs to be switched by BIOS setup, and the setting path is Advanced\Com1&Com2 Mode Selection in the BIOS. It is RS-232 mode by default in BIOS. Users can select RS-422 or RS-485 mode.

2. This motherboard provides two 2×5Pin pin header COM ports (pitch: 2.0mm). Their pin definitions are as follows:

Pin	Signal Name	Pin	Signal Name
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	NA

2.7 LCD Backlight Control Port

This board provides one 1×4Pin wafer LCD backlight control port (pitch: 2.0mm). Its pin definition is as follows:

 LCDB1	Pin	Signal Name
	1	VCC_LCDBKLT
	2	LCD_BKLTCTL
	3	LCD_BKLTEN
	4	GND

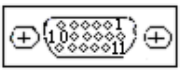
Note: VCC_LCDBKLT--+12V backlight power supply (The current is limited under 1A);

LCD_BKLTCTL--backlight control (The signal is directly output from CPU, and is PWM signal. The voltage amplitude is 0V—3.3V, and the duty ratio is within 0%~100%);

LCD_BKLTEN--backlight enable, highly effective (The signal of the board is directly output from CPU, and is CMOS output. The voltage amplitude is 0V-3.3V).

2.8 Display Port

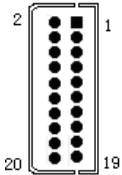
1. This motherboard provides one standard DB15 VGA port. Its pin definition is as follows:

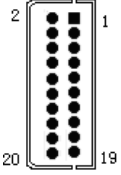
 VGA1	Pin	Signal Name	Pin	Signal Name
	1	Red	2	Green
	3	Blue	4	NC
	5	GND	6	GND
	7	GND	8	GND
	9	NC	10	GND
	11	NC	12	DDCDATA
	13	HSYNC	14	VSYNC
	15	DDCCLK		

Note: Due to the limit of Intel GMA driver, after the video card driver is installed and reboot into the system, CRT may become expansion mode, or CRT has no display (at this time, CRT is secondary display). At this time, Ctrl+Alt+F1 hot key can be used to switch the CRT to primary display.

2. LVDS Port

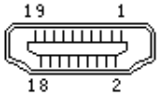
This board provides one dual-channel 24bit LVDS port (LVDS1, LVDS2; pitch: 1.0mm). When single-channel 18-bit/24-bit LVDS screen is used, LVDS data cable must be connected to LVDS1. The pin definition of dual-channel 24-bit LVDS is as follows:

	Pin	Signal Name	Pin	Signal Name
 <p>LVDS1</p>	1	LVDSO_D0+	2	LVDSO_D0-
	3	GND	4	GND
	5	LVDSO_D1+	6	LVDSO_D1-
	7	GND	8	GND
	9	LVDSO_D2+	10	LVDSO_D2-
	11	GND	12	GND
	13	LVDSO_CLK+	14	LVDSO_CLK-
	15	GND	16	GND
	17	LVDSO_D3+	18	LVDSO_D3-
	19	VDD	20	VDD

 LVDS2	Pin	Signal Name	Pin	Signal Name
	1	LVDSE_D0+	2	LVDSE_D0-
	3	GND	4	GND
	5	LVDSE_D1+	6	LVDSE_D1-
	7	GND	8	GND
	9	LVDSE_D2+	10	LVDSE_D2-
	11	GND	12	GND
	13	LVDSE_CLK	14	LVDSE_CLK-
	15	GND	16	GND
	17	LVDSE_D3+	18	LVDSE_D3-
	19	VDD	20	VDD

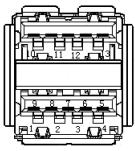
Note: LVDSOx means the odd line of dual-scan PANEL; LVDSEx means the even line of dual-scan PANEL. The LVDS socket model used by this board is DF20G-20DP-1V. It is recommended to use corresponding terminal of model DF20A-20DF-1C.

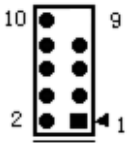
2 HDMI Port

 HDMI1	Pin	Signal Name	Pin	Signal Name
	1	TMDS Data2+	2	TMDS Data2 Shield
	3	TMDS Data2-	4	TMDS Data1+
	5	TMDS Data1	6	TMDS Data1-
	7	TMDS Data0+	8	TMDS Data0 Shield
	9	TMDS Data0-	10	TMDS Clock+
	11	TMDS Clock	12	TMDS Clock-
	13	CEC	14	Reserved (NC on device)
	15	SCL	16	SDA
	17	DDC/CEC	18	+5V
	19	Hot Plug Detect		

2.9 USB Port

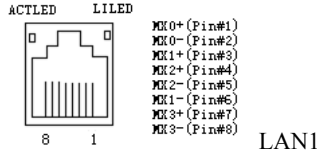
This board provides one double-layer standard USB port (J3, J3 upper-layer ports only support USB2.0 device; the lower-layer ports support both USB2.0 and USB3.0 devices) and two 2-in-1 2×5Pin USB pin header ports (J4, J5 pitch: 2.0mm). In total, five USB2.0 devices and one USB3.0 device are supported.

 <p>J3</p>	Pin	Signal Name
	1	+5V_USB
	2	USB_Data-
	3	USB_Data+
	4	GND
	5	USB_SSRX-
	6	USB_SSRX+
	7	GND
	8	USB_SSTX-
	9	USB_SSTX+
	10	+5V_USB
	11	USB_Data-
	12	USB_Data+
13	GND	

 <p>J4、J5</p>	Pin	Signal Name	Pin	Signal Name
	1	+5V_USB	2	+5V_USB
	3	USB1_Data-	4	USB2_Data-
	5	USB1_Data+	6	USB2_Data+
	7	GND	8	GND
	9	NA	10	GND

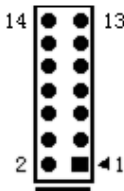
2.10 LAN Port

This board provides two 10/100/1000Mbps LAN ports. One is RJ45 connector LAN1, the other is a 2×7 pin header. (LAN2 pitch: 2.0mm)



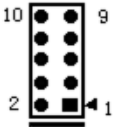
ACTLED (Single color: green)	Network activity	LILED (dual-color: orange and green)	Network speed status
		Green	1000Mbps
Flash	Data being transmitted	Orange	100Mbps
Off	No data being transmitted	Off	10Mbps

Note: no matter the Gigabit LAN card contains Link signal or not, the ACTLED on the left always indicates the data transmission status. When data is being transmitted, the green LED on the left is “flashing”; when it is connected to network with no data transmission, the green LED is “off”; when there are broadcasting packages, it is normal if the ACTLED is “flashing”.

 LAN2	Pin	Signal Name	Pin	Signal Name
	1	MX0+	2	MX0-
	3	MX1+	4	MX1-
	5	MX2+	6	MX2-
	7	MX3+	8	MX3-
	9	GND	10	GND
	11	LINK1000-	12	LINK100-
	13	ACT_LED+	14	ACT_LED-

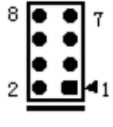
2.11 Audio Port

This board provides one 2×5Pin audio port (pitch: 2.0mm).

 <p>AUDIO1</p>	Pin	Signal Name	Pin	Signal Name
	1	LOUT_R	2	LOUT_L
	3	GND_AUDIO	4	GND_AUDIO
	5	LIN_R	6	LIN_L
	7	GND_AUDIO	8	GND_AUDIO
	9	MIC_L	10	MIC_R

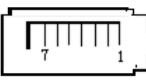
2.12 Keyboard/Mouse Port

This board provides one 2×4Pin PS/2 keyboard/mouse port (pitch: 2.0mm).

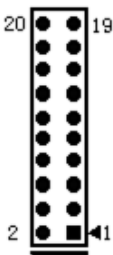
 <p>KM1</p>	Pin	Signal Name	Pin	Signal Name
	1	KB_DATA	2	MS_DATA
	3	KB_CLK	4	MS_CLK
	5	GND	6	GND
	7	+5V	8	+5V

2.13 SATA Interface

This motherboard provides one single-layer SATA interface. Its pin definition is as follows:

 <p>SATA1</p>	Pin	Signal Name	Pin	Signal Name
	1	GND	5	SATA_RX-
	2	SATA_TX+	6	SATA_RX+
	3	SATA_TX-	7	GND
	4	GND		

2.14 GPIO Port


 GPIO1 (pitch: 2.0mm)	Pin	Signal Name	Pin	Signal Name
		1	GPIO1	2
	3	GPIO2	4	GPIO10
	5	GPIO3	6	GPIO11
	7	GPIO4	8	GPIO12
	9	GPIO5	10	GPIO13
	11	GPIO6	12	GPIO14
	13	GPIO7	14	GPIO15
	15	GPIO8	16	GPIO16
	17	+5V	18	+5V
	19	GND	20	GND

Note: The factory default is that the Pin1, Pin3, Pin5, Pin7, Pin9, Pin11, Pin13 and Pin15 of the connector are GPIO input; Pin2, Pin4, Pin6, Pin8, Pin10, Pin12, Pin14 and Pin16 are GPIO output. The factory default status is high level, and the voltage range of input/output signals is 0-5V.

2.15 Fan Connector

This motherboard provides one 1×2Pin CPU fan connector (CPUFAN1, pitch: 1.25mm). Please pay attention to the following three points when using the fan connector:

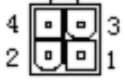
- The fan current should not be larger than 500 mA (12V).
- Please confirm that the fan cable complies with the socket cable. The socket groove facing us, the first pin from left is the ground, and the second pin is 12V power supply pin; Please note the matching when assembling the product.
- Adjust the fan's airflow to the direction of heat venting.

 CPUFAN1	Pin	Signal Name
	1	GND
	2	+12V

Note: FAN_IO: fan speed pulse output; FAN_PWM: fan speed PWM control.

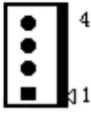
2.16 Power Connector

1. Power connector, single 12V power connector (pitch: 4.2mm)

 PWR1	Pin	Signal Name
	1	GND
	2	GND
	3	+12V
	4	+12V


2. SATA Power Connector

Wafer 1×4P power connector (white, pitch: 2.54mm)


 PWR2	Pin	Signal Name
	1	+12V
	2	GND
	3	GND
	4	+5V

2.17 Status Indication Control Port


1. Power switch and HDD LED port (pitch: 2.54mm)

 FP1	Pin	Signal Name	Pin	Signal Name
	1	PWRBTN#	2	GND
	3	GND	4	RESET#
	5	HDD_LED-	6	HDD_LED+

2. Power LED port (pitch: 2.54mm)

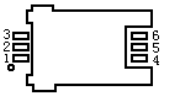
 FP2	Pin	Signal Name
	1	PWR_LED+
	2	NC
	3	GND

3. Speaker output port (pitch: 2.54mm)

 FP3	Pin	Signal Name
	1	BUZ-
	2	NC
	3	GND
	4	BUZ+

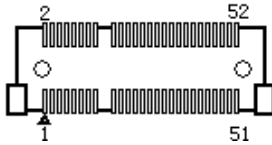
2.18 SIM Port

The pin definition of SIM1 port is as follows:

 SIM1 (on the back of the board)	Pin	Signal Name	Pin	Signal Name
	1	VCC	2	RESET
	3	CLK	4	GND
	5	VPP	6	IO

2.19 Mini-PCIe Slot

This motherboard provides two Mini-PCIe slots, MPCIE1 and J2 (optional) slots, supporting WiFi wireless network port. In addition, MPCIE1 also supports 3G module, and can realize wireless communication with SIM card slot.

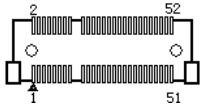


MPCIE1 (on the back of the board)

Pin	Signal Name	Pin	Signal Name
1	WAKE#	2	+3.3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	REFCLK-	12	NC
13	REFCLK+	14	NC
15	GND	16	NC
17	Reserved	18	GND
19	Reserved	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3V
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	Reserved	46	NC
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3VSB

2.20 mSATA Interface

This board provides one mSATA interface J2 (optional); The interface supports SSD storage disk using Mini PCIE slot. Its pin definition is as follows:



Pin	Signal Name	Pin	Signal Name
1	NC	2	+3.3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	Reserved	18	GND
19	Reserved	20	NC
21	GND	22	PERST#
23	SATA_RX+	24	+3.3V
25	SATA_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	NC
31	SATA_TX-	32	NC
33	SATA_TX+	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	Reserved	46	NC
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3VSB

2.21 Hot-swap of SATA Hard Drive

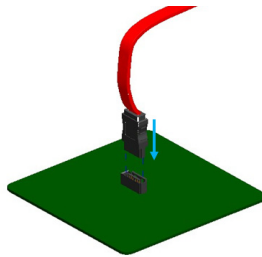
Notes for hot-swap of SATA hard drive:

1. The hard drive shall support SATA 2.0 and use 15-pin SATA hard drive power connector.
2. SATA hard drive only works under AHCI mode, and supports hot swap function when the hot swap option is enabled.
3. The driver of chipset shall support the hot-swap of SATA hard drive.
 4. Hot-swap of SATA hard drive where the operating system is located is forbidden when system is powered-on.

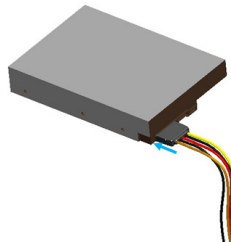
Note: Please carry out hot plugging by the following steps. Improper operation may destroy the hard drive or result in data loss.

SATA hard drive hot plug steps:

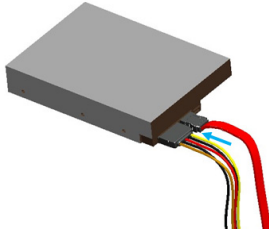
Step 1: Connect the SATA data cable to the SATA interface on the motherboard;



Step 2: Connect the 15-pin connector (black) of SATA power cable to the SATA hard drive;



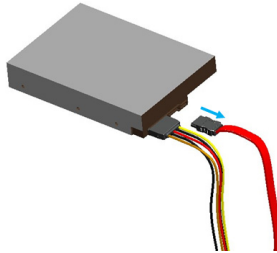
Step 3: Connect the SATA data cable to the SATA hard drive.



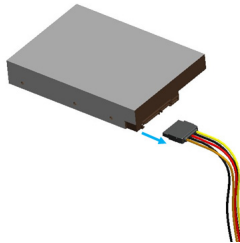
Steps for Hot unplug of SATA hard drive:

Step 1: Uninstall the hard drive in the Device Manager;

Step 2: Pull out the SATA data cable from the side of SATA hard drive;



Step 3: Pull out the 15-pin power connector (black) from the side of SATA hard drive.



3. BIOS Setup

3.1 BIOS Information Interface

Whenever the system is connected to power source, and normal boot-up is finished, the prompt information about BIOS setup program can be seen. At this time, press the specified keys (usually <F2> or) to enter into BIOS Setup interface.

```

EVOC Intelligent Technology
*****
*                EC3-1820V2NA                *
*                =====                    *
*                EVOC IPC Embedded 2015        *
*****
BIOS Version: N9189001 (X64) B00
Build Time: 04/13/2015
CPU: Intel(R) Atom(TM) CPU  E3845  @ 1.91GHz
Memory: 4096 MB DDR3 Onboard

Press <F2> or <Del> to BIOS Setup, Press <F7> to Boot Menu.

```

The BIOS information interface is shown in the above picture, including information about the company and product, such as BIOS version and compilation time, CPU model, memory capacity, and etc.

All the settings set up by BIOS (excluding data and time) are saved in the flash storage in system; the contents will not be lost even if powered down or remove the battery of the board. If users cannot enter into Setup interface due to false operation, and need to restore to factory default, please short JCC1 to execute operation to clear CMOS content.

Note! BIOS setting will affect the computer performance directly. Setting parameter improperly will cause damage to the computer; it may even be unable to power on. Please use the internal default value of BIOS to restore the system. Our company is constantly researching and updating BIOS, its setup interface may be a bit different. The figure below is for reference only; it may be different from your BIOS setting in use.

3.2 Basic Function Setting for BIOS

After starting SETUP program, the main interface of Phoenix SecureCore Technology Setup will appear:

◆ Main

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
System Date [01/23/2015] System Time [11:54:08] ▶ System Information ▶ Boot Features			Item Specific Help View or set System Date	
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit				

● System Date

Choose this option and set the current date by < + > / < - >, which is displayed in format of month/date/year. Reasonable range for each option is: Month (1-12), Date (01-31), Year (Maximum to 2099), Week (Mon. ~ Sun.).

● System Time

Choose this option and set the current time by < + > / < - >, which is displayed in format of hour/minute/second. Reasonable range for each option is: Hour (00-23), Minute (00-59), Second (00-59).

➤ System Information

Select this submenu, press < Enter >, to check system information, such as name of the board, BIOS version, CPU model, memory capacity, and etc. For details, please see the figure below:

· 26 · EC3-1820V2NA

Phoenix SecureCore Technology Setup	
Main	
System Information	
Embedded Board	EC3-1820V2NA
BIOS Version	N9189001 (X64) B00
Build Time	06/08/2015
Processor Type	Intel(R) Atom(TM) CPU E3845 @ 1.91GHz
Processor Speed	1.923 GHz
L2 Cache RAM	2048 KB
Total Memory	4096 MB (DDR3 Onboard)
System Memory Speed	1333 MHz
Lan1 MAC Address	00-90-B5-B7-00-13
Lan2 MAC Address	00-90-B5-B7-00-14
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

➤ **Boot Features**

Select this submenu, press < Enter >, to carry out boot function setup.

Phoenix SecureCore Technology Setup	
Main	
Boot Features	
	Item Specific Help
NumLock:	[On]
Timeout	[0]
CSM Support	[Yes]
Quick Boot	[Disabled]
BIOS Level USB	[Enabled]
UEFI Boot	[Enabled]
Legacy Boot	[Enabled]
Boot in Legacy Video Mode	[Disabled]
Boot Priority	[UEFI First]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

● **NumLock**

Keyboard NumLock status setup, used to select NumLock status during boot-up.

- **Timeout**

Wait time setup during boot-up. When the motherboard is connected to large-capacity storage device, it is recommended to increase wait time.

- **CSM Support**

Traditional BIOS module support control switch.

- **Quick Boot**

Switch for quick boot option. When it is enabled, they system will skip the boot-up prompt information.

- **BIOS Level USB**

BIOS Legacy support control switch. When it is disabled, USB device cannot be used in BIOS stage and DOS system.

- **UEFI Boot**

UEFI boot support switch.

- **Legacy Boot**

Switch for legacy boot.

- **Boot in Legacy Video Mode**

Boot in legacy video mode, used to support specific system or software.

- **Boot Priority**

Boot priority setup switch, used to adjust priority of UEFI and Legacy boot.

◆ **Advanced**

Phoenix SecureCore Technology Setup					
Main	Advanced	Security	Boot	Exit	
Setup Warning: Setting items on this screen to incorrect values may cause system to malfunction! ▶ Hardware Monitor OS Selection [Windows7/Linux] IGD Boot Type [Auto] LCD Panel Type [Auto] LCD Backlight Value [100%] COM1 Port [Enable] COM1 Mode Selection [RS232] COM2 Port [Enable] COM2 Mode Selection [RS232] COM3 Port [Enable] COM4 Port [Enable] xHCI Controller [Disable] EHCI Controller [Enable] Audio Controller [Enable] SATA Controller Mode [AHCI] SD Card Support [Enable] Power State [Power On] Lan1 PXE ROM [Disable] RTC Alarm [Disable]					Item Specific Help Hardware Monitor.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit					

➤ **Hardware Monitor**

Select this submenu, press < Enter >, to check information related to hardware monitoring.

Phoenix SecureCore Technology Setup	
Advanced	
Hardware Monitor	
SYS Temperature : CPU Temperature: CPUVCORE: VCC3.3V VCC5V VCC12V	[45 C] [45 C] [0.880 V] [3.264 V] [5.040 V] [11.711 V]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

- **OS Selection**

Operating system options, including Windows 8.x, Android and Windows7 /Linux three options.

- **IGD Boot Type**

IGD boot display setup options, used to configure display output ports during boot-up, including VGA, HDMI, and LVDS. The Auto option is a default output by VBIOS.

- **LCD Panel Type**

LCD panel type option. The Auto option is a default output resolution by VBIOS. Integrated display resolution output can be selected according to the connected LVDS screen. If the supported LVDS screen resolution is not in the options, please contact EVOC customer service for customization.

- **COM1~4 Port**

COM1~4 switch control option. When it is disabled, they cannot be used under the system by default.

- **COM1~2 Mode Selection**

COM1~2 mode selection, used to configure working mode of COM1, 2. There are RS-232, RS-485 and RS-422.

- **xHCI Controller / EHCI Controller**

These two options are used to select USB controller mode. The options are xHCI Controller and EHCI Controller. They cannot be set to Enable at the same time.

- **SATA Controller Mode**

SATA controller mode option. There are AHCI, IDE options.

- **SD Card Support**

SD card support switch option.

- **Power State**

Used to select system power state. If it is Power On, the system will be booted up once the system is connected to power; If it is Power Off, Power Button action or other method is needed to wake up the system after the system is connected to power.

- **Lan1 PXE ROM**

Used to set lan1, to disable or enable.

- **RTC Alarm**

Used to set timed startup. If it is enabled, the wakeup time setup bar will appear. After hour, minute and second are set up, when the time is up, power will be automatically connected to wake up the system.

- ◆ **Security**

Phoenix SecureCore Technology Setup					
Main	Advanced	Security	Boot	Exit	
Secure Boot Activation		[Disabled]	Item Specific Help		
▶ Secure Boot Configuration			Set or clear the Supervisor account's password.		
Supervisor Password is:		Cleared			
User Password is:		Cleared			
Set Supervisor Password		[Enter]			
Supervisor Hint String		[]			
Set User Password		[Enter]			
User Hint String		[]			
Min. Password length		[1]			
Authenticate User on Boot		[Disabled]			
HDD Password Select					
No HDD detected					
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit					

- **Secure Boot Activation**

Secure boot activation option. This option can be used only when Supervisor Password has been set. Once this option is set to Enable, it cannot be disabled.

- **Secure Boot Configuration**

Secure boot configuration submenu. This submenu can be used only when

Supervisor Password has been set.

- **Supervisor/User Password is:**

These two options are used to display password status of supervisor and common user. When there is no password, Cleared will be displayed; If there is password, “Set” will be displayed.

- **Set Supervisor/User Password**

These two options are used to set passwords for supervisor and common user. Press < Enter > to enter into setup interface.

- **Supervisor/User Hint String**

These two options are used to set prompt information for supervisor and common user respectively. They can be directly entered.

- **Min. Password length**

To set minimum password length.

- **Authenticate User on Boot**

To authenticate user on boot. When this option is Enabled, the user password needs to be entered for each boot-up. When it is Disabled, the user password needs to be entered during Setup, and this option needs to be set as Supervisor Password.

- **HDD Password Select**

Used to select HDD password authority. There are User Only/User+Master options. These options are displayed only when a hard disk is connected.

- **HDD Security Status**

Used to display HDD security information status. If no HDD is detected, “No HDD” will be displayed. If HDD is detected, corresponding HDD Password State and Set HDD User Password option will be displayed, which are used to check HDD password state, and set up HDD password function.

- ◆ **Boot**

Phoenix SecureCore Technology Setup					
Main	Advanced	Security	Boot	Exit	
Boot Priority Order 1. ATAPI CD: 2. ATA HDD0: WDC WD5000LPVT-08G33T1 3. ATA HDD1: 4. USB HDD: SanDisk U3 Cruzer Micro 5. USB CD: 6. USB FDD: 7. SD Card: 8. Internal Shell				Item Specific Help Keys used to view or configure devices: ^ and v arrows Select a device. '+' and '-' move the device up or down. 'Shift + I' enables or disables a device. 'Del' deletes an unprotected device.	
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit					

➤ **Boot Priority Order**

This option is used to configure priority of system boot. A larger number means a lower priority. 1 has highest priority. There is information after “:” of the corresponding type, which indicates that the system has device of such type, and it can be used for booting. Internal Shell is an internal EFI Shell environment within the system, which is used to maintain the system.

The direction keys ↑↓ are used to select devices; “+”/“-” keys are used to adjust priority of devices; “Shift + I” combination key is used to enable or disable corresponding device; “Del” is used to delete unprotected device.

◆ **Exit**

Phoenix SecureCore Technology Setup					
Main	Advanced	Security	Boot	Exit	
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Load Optimized Defaults Discard Changes Save Changes				Item Specific Help Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.	
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit					

● **Exit Saving Changes**

Exit and save changes.

- **Exit Discarding Changes**

Exit and discard previous changes.

- **Load Setup Defaults**

Load factory defaults.

- **Load Optimized Defaults**

Load optimized defaults.

- **Discard Changes**

To discard changes.

- **Save Changes**

To save changes.

3.3 System Resource Managed by BIOS under X86 Platform

We define three kinds of system resources here: I/O port address, IRQ interrupt number and DMA number.

- ◆ **IO Port Address**

Only 16 I/O address cables of X86 are designed, 0~0FFFFh. I/O address space has 64K in total. For traditional ISA slot, only the 1024 (0000~03FFh) at the front are used, and ports above 0400h are used by PCI slots and EISA slots. Each peripheral device will occupy a section of I/O address space. The following table shows the list of I/O ports to be used on the X86 platform.

Address	Device Description
0000-006F	PCI bus
0020-0021	Programmable interrupt controller
0024-0025	Programmable interrupt controller
0028-0029	Programmable interrupt controller
002C-002D	Programmable interrupt controller
002E-002F	Motherboard resources
0030-0031	Programmable interrupt controller
0034-0035	Programmable interrupt controller
0038-0039	Programmable interrupt controller
003C-003D	Programmable interrupt controller
0040-0043	System timer
004E-004F	Motherboard resources
0050-0053	System timer
0060-0060	PS/2 standard keyboard
0061-0061	Motherboard resources
0063-0063	Motherboard resources
0064-0064	PS/2 standard keyboard
0065-0065	Motherboard resources
0067-0067	Motherboard resources
0070-0070	Motherboard resources
0070-0077	System CMOS/real time clock
0078-0CF7	PCI bus
0080-008F	Motherboard resources
0092-0092	Motherboard resources
00A0-00A1	Programmable interrupt controller
00A4-00A5	Programmable interrupt controller
00A8-00A9	Programmable interrupt controller

00AC-00AD	Programmable interrupt controller
00B0-00B1	Programmable interrupt controller
00B2-00B3	Motherboard resources
00B4-00B5	Programmable interrupt controller
00B8-00B9	Programmable interrupt controller
00BC-00BD	Programmable interrupt controller
02E8-02EF	COM4
02F8-02FF	COM2
03B0-03BB	Standard VGA graphics adapter
03C0-03DF	Standard VGA graphics adapter
03E8-03EF	COM3
03F8-03FF	COM1
0400-047F	Motherboard resources
04D0-04D1	Programmable interrupt controller
0500-05FE	Motherboard resources
0600-061F	Motherboard resources
0680-069F	Motherboard resources
0D00-FFFF	PCI bus
1000-1FFF	PCI standard PCI-to-PCI bridge
2000-2FFF	PCI standard PCI-to-PCI bridge
3000-301F	Standard VGA graphics adapter
3020-303F	Standard AHCI1.0 serial ATA controller
3040-3047	Standard AHCI1.0 serial ATA controller
3048-304F	Standard AHCI1.0 serial ATA controller
3050-3057	Standard VGA graphics adapter
3058-305B	Standard AHCI1.0 serial ATA controller
305C-305F	Standard AHCI1.0 serial ATA controller

◆ IRQ Assignment Table

There are 15 interrupt sources of the system. Some are occupied by the system devices. Only the ones that are not occupied can be assigned to other devices. ISA device requests exclusive use of its interrupt. Only the plug and play ISA devices can be assigned by the UEFI or the OS. And several PCI devices share one interrupt, which is assigned by UEFI or OS. Interrupt assignment of some devices of X86 platform is shown in the table below, but it does not show the interrupt source occupied by the PCI devices.

Interrupt No.	Device Description
IRQ0	System timer
IRQ1	PS/2 standard keyboard
IRQ2	Reserved
IRQ3	COM2
IRQ4	COM1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	Reserved
IRQ8	High precision event timer
IRQ9	Reserved
IRQ10	COM3
IRQ11	COM4
IRQ12	PS/2 compatible mouse
IRQ13	Reserved
IRQ14	Reserved
IRQ15	Reserved

◆ APIC

Advanced programmable interrupt controller. Most motherboards above P4 level support APIC and provide more than 16 interrupt sources, like IRQ16 - IRQ23; while some others can have up to 28 interrupt sources, such as motherboard supporting PCI-X. However, relevant OS are required to enable that function.

◆ Memory Address

Address	Device Description
000A0000-000BFFFF	PCI bus
000A0000-000BFFFF	Standard VGA graphics adapter
000C0000-000DFFFF	PCI bus
000E0000-000FFFFFF	PCI bus
80000000-8FFFFFFF	Standard VGA graphics adapter
80000000-908FFFFE	PCI bus
90000000-903FFFFF	Standard VGA graphics adapter
90400000-9047FFFF	Ethernet controller
90400000-904FFFFF	PCI standard PCI-to-PCI bridge
90480000-90483FFF	Ethernet controller
90500000-9057FFFF	Ethernet controller
90500000-905FFFFF	PCI standard PCI-to-PCI bridge
90580000-90583FFF	Ethernet controller
90600000-906FFFFF	PCI encryption/decryption controller
90700000-907FFFFF	PCI encryption/decryption controller
90800000-90803FFF	High Definition Audio controller
90804000-90804FFF	SDA Standard Compliant SD Host Controller
90805000-90805FFF	SDA Standard Compliant SD Host Controller

90806000-90806FFF	SDA Standard Compliant SD Host Controller
90807000-90807FFF	SDA Standard Compliant SD Host Controller
90808000-908087FF	Standard AHCI1.0 serial ATA controller
90808800-90808BFF	Standard Enhanced PCI to USB Host Controller
90808C00-90808C1F	SM bus controller
E0000000-EFFFFFFF	Motherboard resources
E00000D0-E00000DB	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor MBI Device - 33BD
FED00000-FED003FF	High precision event timer
FED01000-FED01FFF	Motherboard resources
FED03000-FED03FFF	Motherboard resources
FED04000-FED04FFF	Motherboard resources
FED08000-FED08FFF	Motherboard resources
FED0C000-FED0FFFF	Motherboard resources
FED1C000-FED1CFFF	Motherboard resources
FEE00000-FEEFFFFFFF	Motherboard resources
FEF00000-FEFFFFFFF	Motherboard resources
FF000000-FFFFFFFF	Intel(R) 82802 Firmware Hub Device

4. Installing the Drivers

Regarding the driver program of this product, please refer to the enclosed CD.

5. Appendix

5.1 GPIO Programming Guide

The GPIO function of this board uses ARM chip which is connected on SMBUS. The selected chip is NUVOTON M054LDN. M054LDN controls GPIO input/output.

On the OS layer, connection with M054LDN is established based on SMBUS communication. Users can set GPIO output level, and read GPIO input level.

M054LDN communicates with the motherboard via SMBUS. This motherboard is the primary device, while M054LDN is secondary device. As for SMBUS communication programming, users can refer to related files and specifications, such as ICH7. Operation of SMBUS bottom-layer port function has already been realized, and users can call provided API to meet their own requirements.

Following is the introduction to the port function. Please see the enclosed CD for detailed program.

```
(1). SMBWriteByteEx(UCHAR ucSlaveAddress,
                    UCHAR ucCommand,
                    UCHAR ucData,
                    BOOLEAN bPecCheck
                    );
```

Function description: Write one byte (UCHAR) data on SMBUS

Parameter: ucSlaveAddress——from device address

ucCommand——write operation command

ucData——data

bPecCheck——false: Not to check; true: Check

Returned value:

Non-0 --- Function execution failed

0 --- Function execution successful

```
(2) . SMBReadByteEx(UCHAR ucSlaveAddress,  
                    UCHAR ucCommand,  
                    PUCHAR pData,  
                    BOOLEAN bPecCheck  
                    );
```

Function description: Read one byte (UCHAR) data on SMBUS

Parameter: ucSlaveAddress—From device address

ucCommand—Read operation command

pData—Returned data

bPecCheck—false: Not to check, true: Check

Returned value:

Non-0 --- Function execution failed

0 --- Function execution successful

The above two API port functions are written based on protocol specifications such as SMBUS register. Users can establish normal communication with M054LDN according to SMBUS specifications and related protocol commands we specified.

This product now specifies that M054LDN secondary device address is 0x75, and the current GPIO communication protocol commands are as follows:

```
typedef enum
```

```
{
```

```
SMBUS_POST_INFO = 0,
```

```
SMBUS_INITGPIO = 0x01, //init gpio
```

```
SMBUS_DEINITGPIO = 0x02, //deinit gpio
```

```
SMBUS_GETARMINFO = 0x03, //get arm version
```

```
SMBUS_SETGPOHIGH=0x06, //set one gpo output high
```

```
SMBUS_SETGPOLOW=0x07, //set one gpo output low
```

```

SMBUS_GETGPILEVEL=0x08,//get one gpi input level
SMBUS_SETALLGPOLEVEL=0x0A,//set ALL gpo output LEVEL(0/1)
SMBUS_GETALLGPILEVEL=0x0B,//Get all gpi input LEVEL(0/1)
SMBUS_GPIOEND=0x5A
} SMBUS_GPIO_CMD;

```

The function parameter values are shown in the following table:

Address	Command	Parameter	Check
slaveAddress	command	parameter	false

Parameter means GPO/GPI index values, 1-8.

Then it sends message to M054LDN, and calls SMBWriteByteEx function to control GPO output electric level. Because M054LDN is a secondary device, GPI input electric level needs to be actively read by the host. First execute the write function 数 SMBWriteByteEx, then execute read function SMBReadByteEx, to acquire GPI input electric level information.

5.2 WDT Programming Guide

Watchdog is controlled by Super I/O NCT6106D. Users can realize control of Watchdog by operating WATCHDOG_TIMER register.

Operation of Watchdog bottom layer port function has already been realized. Users can call provided API to meet their own requirements.

The following is the introduction to the port function. Please refer to the enclosed Cd for the detailed program.

(1). WDT_Start(UINT8 time, UINT8 count_mode);

Function description: Start Watchdog

Parameter: time——Watchdog time, within 1-255;

count_mode——0: counting unit second, 1: counting unit minute

Returned value:

BPI_STATUS_INVALID_PARAMETER --- Function execution failed;

BPI_STATUS_SUCCESSFUL --- Function execution successful

(2). WDT_Feed(UINT8 time);

Function description: Feed Watchdog;

Parameter: time——Watchdog time, within 1-255;

Returned value: None

(3). WDT_Stop();

Function description: Disable Watchdog

Parameter: None;

Returned value: None

(4). Get_WDT_Current_Timeout_Value();

Function description: Acquire current Watchdog timeout value;

Parameter: None;

Returned value:

timeout --- Timeout time

The above is the Watchdog operation port function. Call WDT_Start, to configure Watchdog and start Watchdog; Call WDT_Feed to feed the Watchdog; Call WDT_Stop to stop the Watchdog; Call Get_WDT_Current_Timeout_Value, to acquire the Watchdog timeout value at the moment.

During the operation, users can call our library file DLL or static file LIB, corresponding Macro and commands. Users only have to include our header file.

5.3 LVDS Backlight Control Programming Guide

LVDS backlight control is realized by ICH. Users can operate PWM register to realize control of LVDS screen backlight luminance.

After operation of LVDS screen bottom layer port functions has been realized, users can call the provided API to realize their own requirements.

The following is the introduction of port functions. Please refer to the CD for detailed program.

(1). `BPI_STATUS Set_SIO_LVDS_BL(UINT8 PWM_Value);`

Function description: to set backlight control parameter value

Parameter: `PWM_Value`—— backlight parameter. Ranging within 1-255

Returned value:

`BPI_STATUS_INVALID_PARAMETER` --- Function execution failed

`BPI_STATUS_SUCCESSFUL` --- Function execution successful

(2). `BPI_STATUS Get_SIO_LVDS_BL(UINT8 *PWM_Value);`

Function description: to acquire backlight control parameter value

Parameter: `*PWM_Value`—— return to backlight parameter value, ranging within 1-255

Returned value:

`BPI_STATUS_INVALID_PARAMETER` --- Function execution failed

`BPI_STATUS_SUCCESSFUL` --- Function execution successful

The above is the port function for LVDS backlight control operation. The backlight control register BIOS has been initialized by default, so users only need to call `Set_SIO_LVDS_BL`, to carry out setup of backlight parameter operation; call `Get_SIO_LVDS_BL`, to read backlight parameter; the backlight parameter setup range is 0-255, 0 means black screen, and 255 means highest brightness.

During the operation, users can call our library file DLL or static file LIB, corresponding Macro and commands, which include our header files.

5.4 Troubleshooting and Solutions

Common Fault	Issues to be Checked
Unable to bootup after powered on	<ol style="list-style-type: none"> 1. Please make sure whether the power cord is well connected; 2. Please make sure whether the adopted power supply meets the power requirement of the motherboard; 3. Please check whether the CPU has been properly installed and whether the CPU has been buckled properly; 4. Remove and install the memory module again; 5. Replace the memory module; 6. Please clear the CMOS according to the Manual; 7. Please make sure whether there are peripheral cards connected, and whether it is normal after removing the peripheral cards;
BIOS Setup cannot be saved	Please check whether the CMOS battery voltage is lower than 2.8V; if so, replace it with a new battery, set and save the BIOS Setup again.
No bootable device can be found	<ol style="list-style-type: none"> 1. Please make sure the power cable or data cable of the HDD is connected properly; 2. Please check whether there is physical damage to the HDD; 3. Please make sure operating system has been normally installed in the HDD.
Blue screen or computer crush occurred when entering system	<ol style="list-style-type: none"> 1. Please check whether the memory module or the peripheral card is loose; 2. Try to remove the newly installed hardware, uninstall the driver or software; 3. Try to replace the memory module.

Slow to enter operating system	<ol style="list-style-type: none"> 1. Please check whether there are bad tracks on the hard disk by third party software; 2. Please make sure the remaining space on the system partition is enough; 3. Please check whether the CPU fan is operating normally.
System reboots automatically	<ol style="list-style-type: none"> 1. Please make sure the CPU fan is operating normally; 2. Please check whether the reset button has been triggered by accident; 3. Please check whether the system is affected by virus using anti-virus software; 4. Please check whether the memory module or the peripheral card is loose; 5. Please make sure the load carrying capability of the adopted power supply is enough; you may try to replace the power.
No USB device can be detected	<ol style="list-style-type: none"> 1. Please confirm whether independent power supply is required on the USB device; 2. Please check whether ill contact exists on the USB port; 3. Please make sure the USB controller in BIOS Setup has been enabled.
No PCI card can be detected	<ol style="list-style-type: none"> 1. Please check whether additional power supply is needed on the PCI card; 2. Please make sure whether the operating voltage of the PCI card is in accord with that supplied by motherboard (5V by default); 3. Please make sure whether the PCI slot can be identified after replacement.

<p>No ISA card can be detected</p>	<ol style="list-style-type: none"> 1. Please make sure the resources used by ISA card have been reserved by BIOS according to the ISA card manual -- there are reserved options in BIOS Setup for ISA to use I/O or memory resource on most of the motherboards; and check whether the IRQ used by ISA card has been reserved in BIOS Setup; 2. The ISA card usually cannot be identified directly under the system; please choose “Add Hardware” in the “Control Panel” in Windows system to set.
------------------------------------	--

5.5 Abbreviations

Abbreviations	Terminology	Meaning
AC	Alternate current	Alternate current
APM	Advanced Power Management	A tool used to monitor and lower PC power consumption.
ACPI	Advanced Configuration and Power Interface	
AHCI	Advanced Host Controller Interface	Standard control interface of serial ATA, Microsoft windows XP (above SP1 version) and IAA driver program supports the interface
APIC	Advanced Programmable Interrupt Controller	Extended programmable interrupt controller
ASPM	Active State Power Management	A power saving mode control for PCIE devices in idle status
ATM	Asynchronous Transfer Mode	

ASCII	American Standard Code for Information Interchange	
API	Application Program Interface	
ATM	Asynchronous Transfer Mode	
AT	Advanced Technology	AT power supply
ATX	Advanced Technology Extended	ATX motherboard structure or ATX power supply
AWG	American wire gauge	An American standard to differentiate wire diameter
BIOS	Basic Input/Output System	BIOS code
bps	Bit/Second	A description of data transfer rate
BGA	Ball Grid Array	A chip package type
Buffer	Buffer	
Battery	Battery	
BBS	Bulletin Board System	
BMP	Bitmap	A graphics format
CAN	Controller Area Network	A universal industrial site bus
CD-ROM	Compact Disc Read-only Memory	Large data storage read-only disc
CD-RW	CD Read & Write	Burner disc
CE	Communate Europene (European Conformity) (CE Certificate Mark)	Unified certificate mark of European Union products
CF	CF card	
CGA	Color Graphic Adapter	Standard monitor interface
CLK	Clock Pulse	Clock Signal
CMOS	Complementary Metal-oxide	

	Semi-conductor	
COA	Certificate Of Authenticity	Microsoft Windows product key
CoL	Certificate of License	License authorization
COM	Serial Communication Port	Serial Port
CP	Communications Processor	Communication PC
CPU	Central Processing Unit	
CRT	Cathode Ray Tube	CRT monitor
CSA	Canada Standard Association	A Canada organization which carries out test and certification by the standard of Canada or the two countries (using UL/USA)
CTS	Clear to Send	
CPCI	Compact PCI	A high-performance industrial bus port standard
CISC	Complicated Instruction Set Computer	
CRC	Cycle Redundant Check	An error check code
CGI	Common Gateway Interface	
Cache	High Speed Cache Memory	
DRAM	Dynamic Random Access Memory	
DDRAM	Double Data Rate Random Access Memory	Memory chip with high speed port
DC	Direct Current	
DCD	Data Carrier Detect	Data carrier signal detect
DMA	Direct Memory Access	Direct memory access
DOS	Disk Operating System	Operating system without graphic interface

DP	Display Port	Display Port
DQS	German Certification body for Quality and Environment Management Systems	
DSR	Data Set Ready	Operation ready
DTR	Data Terminal Ready	
DVD	Digital Video Disc	
DVI-D	Digital Video Interface	Digital monitor interface
DVI-I	Digital Video Interface	Monitor port with digital and VGA analog signals
dB	Decibel	A counting unit to indicate ratio of two values
DCE	Data Communications Equipment	Data communication terminal device
DOM	DOM electronic hard disk	Abbreviation of Disk on module
DOC	Disk On Chip	Abbreviation of Disk on Chip
DDC	Display Data Channel	Bus standard for communication between monitor and host
DDR	Double Data Rate	A memory specification
Decode	Command Decode	
DFP	Digital Flat Panel	
DHCP	Dynamic Host Configuration Protocol	A network protocol of local area network
DES	Data Encryption Standard	A symmetrical encryption algorithm
DIMM	Double In-Line Memory Module	
DMI	Direct Media Interface	Data transmission channel between CPU and IO controller

		(PCH, ICH).
DNS	Domain Name System	A core service of Internet
Dot Pitch	Dot Pitch	Distance between two neighboring pixel dots on the screen
DPMS	Display Power Management Signaling	A display power management standard stipulated by VESA organization
DVMT	Dynamic video memory technology	A technology used to set shared memory size which can be used by video card
ECC	Error Correcting Code	
ECP	Enhanced Capability Port	Extended parallel port
EGA	Enhanced Graphics Adapter	Connector between PC and monitor
ESD	Electrostatic Discharge	
EDID	Extend display Identification Data	A VESA standard data format
EIDE	Enhanced IDE	Enhanced electronic integrated drive
EISA	Extended Industry Standard Architecture	Extended ISA standard
EM64T	Extended Memory 64 Technology	
EN	European Norm	The national standards of member countries must be compliant with EN standards
EEPROM	Electrically Erasable Programmable Read-Only Memory	Use sub-module of EEPROM chip

EPP	Enhanced Parallel Port	
ESC	Character for exit	Control character
EC	Embedded Controller	
EMI	ElectroMagnetic Interference	
EMC	Electro Magnetic Compatibility	
ES	Energy Star	
ESCD	Extended System Configuration Data	
EIA	Electronic Industries Association	
FAQ	Frequently Asked Question	
FAT32	32-bit File Allocation Table	
FDD	Floppy Disk Drive	
FSB	Front Side Bus	External bus
FCPGA	Flip Chip Pin Grid Array	A chip package type
FCBGA	Flip Chip Ball Grid Array	A chip package type
FIFO	First IN First Out	
FireWire	Fire Wire	IEEE1394 standard
Firmware	Firmware	Firm software
FWH	Firm Ware Hub	
FPU	Float Point Unit	
FTP	File Transfer Protocol	
GND	Grounding	
GB	Gigabit	
GPS	Global Positioning System	
GSM	Global System for Mobile communication	
GUI	Graphical User Interface	

GMCH	Graphics & Memory controller hub	
GPU	Graphics Processing Unit	
HDD	Hard Disk Drive	
HDTV	High Definition TV	
HEX	Hexadecimal	
HTML	Hyper Text Markup Language	Used to create script language of Internet page
HTTP	Hyper Text Transfer Protocol	Data transfer protocol on the Internet
HardWare	Hardware	
HW Monitor	Hardware monitor	
Hz	Hertz	
HDMI	High Definition Multimedia Interface	A high definition display port
H D A	High Definition Audio	
HT	Hyper-Thread technology	
HS	Hot Swap	Hotswap operation of device card under power-on status
I/O	Input/Output	Data input/out of the computer
IDE	Integrated Drive Electronics	
IGD	Integrated Graphic Device	
IP	Ingress Protection	
IP	Internet Protocol	
IR	Infrared	A low-speed short-distance wireless transmission
IRDA	Infrared Data Association	Used for the standard of data transmitted by IR module
IRQ	Interrupt Request	
ISA	Industrial Standard	Used for bus of extended

	Architecture	module
IC	Integrated Circuit	
IDSL	Internet Digital Subscriber Line	
IE	Internet Explorer	
IEEE	Institute of Electrical and Electronic Engineers	
IPC	Industrial PC	
ISO	International Standards Organization	
IT	Information Technology	
IA	Intel Architecture	
ICH	I/O Controller Hub	
ID	Identity code	
IDF	Intel Development Forum	
INI File	Initialization File	
ISP	Internet Server Provider	
IPMI	Intelligent Platform Management Interface	
JEDEC	Solid State Technology Association	Standard and specification formulation association for storage devices
KB	Keyboard	
Kbps	Kb per second	A transmission rate
L2 Cache	Level2 Cache	
LAN	Local Area Network	Computer network confined for local communication
LCD	Liquid Crystal Display	
LED	Light Emitting Diode	
LPT	Line Print Terminal	

LVDS	Low-Voltage Differential Signaling	
Latency time	Latency Time	
LBA	Logic Block Addressing	A block addressing mode for mechanical hard drive
LFP	LCD Flat Panel	LCD flat panel display
MAC	Media Access Control	
MMC	Micro Memory Card	32*24.5mm format memory card
MPI	Multiple Point Interface Used for Programming Devices	
MS-DOS	Microsoft Disk Operating System	
MTBF	Meantime between Failure	
MB	Megabyte	
MPEG	Moving Pictures Experts Group	A video compression standard
MTTR	Meantime to Repair	
MBR	Main Boot Record	
MHz	Mega Hertz	A unit of frequency
MCU	Micro Control Unit	A single-chip micro computer
MODEM	MODulator/DEMulator	
NA	Not Available	
NC	Not Connected	
NP	Not Installed	
NCQ	Native Command Queuing	Automatically rearrange the files and disc access, to improve performance
NMI	Non Maskable Interrupt	

NTFS	New Technology File System	Windows XP, Windows Server 2008
		Vista and Windows 7 standard file system
NIC	Network Interface Card	Network adapter
NB	Northbridge	Northbridge chip
ODD	Optical Disc Drive	
OS	Operating System	
OSD	On-screen Display	
PATA	Parallel ATA	A storage interface standard
PC	Personal PC	Personal computer
PCI	Peripheral Component Interconnect	PCI bus
PCIE	Peripheral Component Interconnect Express	A high-speed serial differential full-duplex bus transfer specification
PCMCIA	Personal Computer Memory Card International Association	
PEG	PCI EXPRESS Graphics	
POST	Power On Self Test	
PXE	Pre-boot Execution Environment	Used to operate software without HDD data PC via network
PMC	PCI Mezzanine Card	PCI Mezzanine Card
PS2	PS2 Interface Device	PS2 mouse/keyboard standard port type developed by IBM
PICMG	The PCI Industrial Computer Manufacturers Group	
RAID	Redundant Arrays of	Redundant HDD array

	independent Disks	
RI	Ringing	Call in wake-up signal
RS485	Reconciliation Sub layer 485	Designed to be used for bidirectional bus system of up to 32 nodes
RTC	Real Time Clock	
RTS	Request to Send	
RXD	Receive Data	
RF	Radio Frequency	Wireless transmission of electro-magnetic wave with frequency ranging from 300KHz~30GHz
RSV	Reserve Use of Pin	
RST	Reset	Reset
SCSI	Small Computer System Interface	
SDK	Software Development Kit	
SSD	Solid State Drive	
SV	Standard Voltage	
SMART	Self-Monitoring, Analysis and Reporting Technology	Hard drive error diagnosis program
SO-DIMM	Small Outline Dual Inline Memory Module	A laptop memory
SRAM	Static Random Access Memory	
SDRAM	Synchronous Dynamic Random Access Memory	
SVGA	Super Video Graphics Array	
SW	Software	Software
S5	Power-off	All hardware devices

		(including power supply) are shut off
S4	Suspend to Disk	Write the memory information into hard drive, and all components stop working
S3	Suspend to Memory	Write the data in operation into memory and shut off hard disk
S1	POS (Power on Suspend)	CPU stops working, and all the other hardware devices are still working normally
S0	Normal Operation of the Computer	All hardware devices are turned on or in normal operation status
SMB	System Management Bus	
SMD	Surface Mounted Devices	
SMI	System Management Interrupt	Only when SMI is triggered, can the system enter into SMM mode
SMM	System Management Mode	
SNR	Signal to Noise Ratio	
SPD	Serial Presence Detect	A 256KB EEPROM
S/PDIF	Sony/Philips Digital Interconnect Format	A civil digital audio interface protocol
SCI	System Control Interrupt	Notification of ACPI interrupt event of OS generated by hardware
TFT	Thin Film Transistor	An LCD screen type
TxD	Transmit Data	Data transmission signal
TDP	Thermal Design Power	Thermal Design Power
TTL	Transistor-Transistor-Logic	
Turbo	Instantaneous Acceleration	Intel Turbo boost

	Automatic Overclocking Technology	
TPM	Trusted Platform Module	
USB	Universal Serial Bus	
UPS	Uninterruptible Power Supply	
UL	Underwriters Laboratories	UL certification
U	Server size unit, 1U=44.45mm	
UEFI	Unified Extensible Firmware Interface	Intel latest firmware interface standard, using C language
VGA	Video Graphics Array	A video adapter to meet industrial standard
VRM	Voltage Regulator Module	
VT	Virtualization Technology	Analog closed environment can be used by Internet technology
VID	Voltage Identification	
VSYNC	Vertical Synchronization	Vertical synchronization update
VESA	Video Electronics Standards Association	
VRAM	Video Random Access Memory	
VIO	VIO voltage	IO voltage on PCI bus equipment
VPX	New-generation High-speed Serial Bus	
WDT	Watchdog	Watch dog
WLAN	Wireless Local Area	

	Network	
WOL	Wake-On-LAN	LAN wakeup
WWW	World Wide Web	World Wide Web
WAN	Wide Area Network	Wide Area Network
WAP	Wireless Application Protocol	
XGA	Extended Graphics Array	Supports maximum resolution of 1024×768
XMC	XMC Express Mezzanine Card	XMC Switched Mezzanine Card