FSC-1817

PICMG 1.3 全长主板

PICMG 1.3 Full-Size Motherboard

Version: C02

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安全使用小常识

1. 在使用本产品前，请您务必仔细阅读产品说明书；
2. 对未准备安装的板卡，应将其保存在防静电保护袋中；
3. 在从防静电保护袋中拿出板卡前，应先将手置于接地金属物体上一会儿（比如 10 秒钟），以释放身体及手中的静电；
4. 在拿板卡时，需佩戴静电保护手套，并且应该养成只触及其边缘部分的习惯；
5. 为避免人体被电击或产品被损坏，在对板卡进行拔插或重新配置时，须先关断交流电源；
6. 在需对板卡或整机进行搬动前，须先关断交流电源；
7. 对整机产品，需增加或减少板卡时，务必先关断交流电源；
8. 当您需连接或拔除任何设备前，须先关断交流电源；
9. 为避免频繁开关机对产品造成不必要的损伤，关机后，应至少等待 30 秒后再开机。

目录

第一章　产品介绍

简介

FSC-1817是基于Intel® Sugar Bay平台开发的一款高性能主板。该项目采用Intel® B65/Q67芯片组，符合PICMG 1.3总线规范，支持Intel® Core™系列LGA1155封装 Sandy Bridge/Ivy Bridge CPU；支持两条800/1066M/1333M 的DDR3内存条，最大支持16G；板载双千兆LAN接口；支持VGA和DVI接口显示；提供4个SATA接口（1个CFast可选），支持AHCI，Q67支持RAID 0，1，5，10；提供8个USB接口；2个串口（其中一个支持RS232/422/485）、1个并口，支持HDA和数字输入输出接口；Q67支持AMT（Active Management Technology，主动管理技术）功能；通过底板扩展，共能提供6个SATA接口、12个USB接口；还可以通过LPC扩展，能提供6个串口。

FSC-1817主要针对未来采用PICMG 1.3总线规范的应用，具有最优性价比、供货周期长等特点，能广泛应用在过程控制，监控领域。

机械尺寸、重量与环境

- 外形尺寸：353mm（长）×142mm（宽）×80mm（高）；
- 净重：0.43 Kg；
- 工作环境：

  温度：0℃～60℃；

  湿度：10%～90%（非凝结状态）；
- 贮存环境：

  温度：-20℃～80℃；

  湿度：10%～90%（非凝结状态）；

典型功耗

典型功耗是基于以下配置闲置状态的数值。

CPU：Intel® Core™ i5-2500 6M Cache SROOT 3.3GHz LGA 1155 95W；

内存：DDR3 1066 2GB KINGTIGER hynix H5TQ1G83AFPG7C/双面/16颗粒/双面 X1；

操作系统：Windows XP

- +5V@ 0.34A；+5%/-3%；
- +3.3V@ 1.02A；+5%/-3%；
- +12V@1.33A；+5%/-3%；

微处理器

LGA1155封装Intel® Core™ Sandy Bridge/Ivy Bridge CPU。

芯片组

Intel® B65/Q67

系统内存

提供 2 条 240 Pin DDR3 内存插槽，支持 Un-buffered /Un-buffered ECC(需 CPU 支持)内存，支持双通道功能。单条内存插槽可支持最大内存容量 8GB，总支持最大内存容量 16GB。

显示功能

- 支持DVI、VGA显示，DVI支持热插拔功能，支持复制或扩展输出；
- VGA最大支持2048×1536@75HZ，32bit色深，DVI最大支持1920×1200@60HZ。

网络功能

提供2个10/100/1000Mbps网络接口，LAN1可支持网络唤醒功能。

音频功能

采用 HD 标准，支持 MIC-IN/LINE-IN/LINE-OUT。

电源特性

采用底板ATX电源供电，支持S0、S4、S5。

扩展总线

PICMG 1.3标准兼容扩展总线，提供4个32位PCI资源，1个PCI Express×16资源，4个PCI Express×1资源，并提供LPC（Low pin count）扩展。

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。

操作系统

支持操作系统：winxp 、win7、linux；

I/O接口

- 提供 1 个并口，支持 SSP/EEP/ECP 工作模式；支持 BIOS 修改工作模式；
- 提供 2 个串口，其中 COM1 支持 RS-232/RS-422/RS-485 模式选择；
- 提供 4 个 SATA 接口，支持热插拔功能，通过底板扩展共提供 6 个 SATA 接口；
- 提供 8 个 USB2.0 接口，通过底板扩展共提供 12 个 USB 接口；
- 提供 1 个 PS/2 键盘/鼠标接口；
- 提供 1 个键盘扩展接口；
- 提供 1 个 8 路数字 I/O 接口；
- 提供 1 个 CFAST 可选接口。

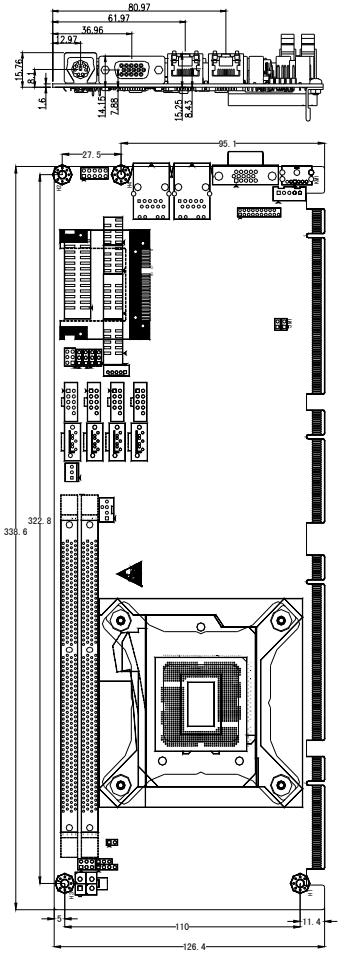
提示：如何识别报警声

1、长鸣声为系统内存出错。

2、短“嘀”一声为开机声。

第二章　安装说明

产品外形尺寸图

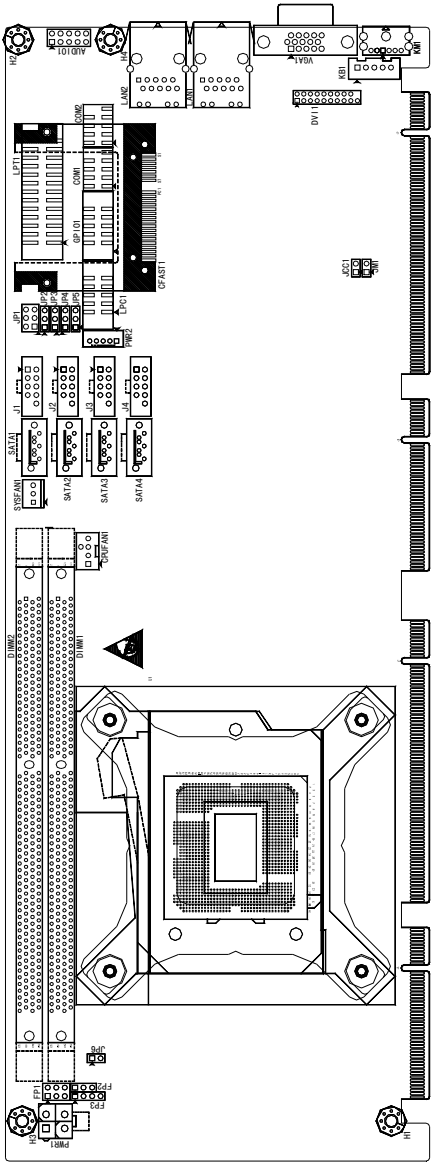


单位：mm

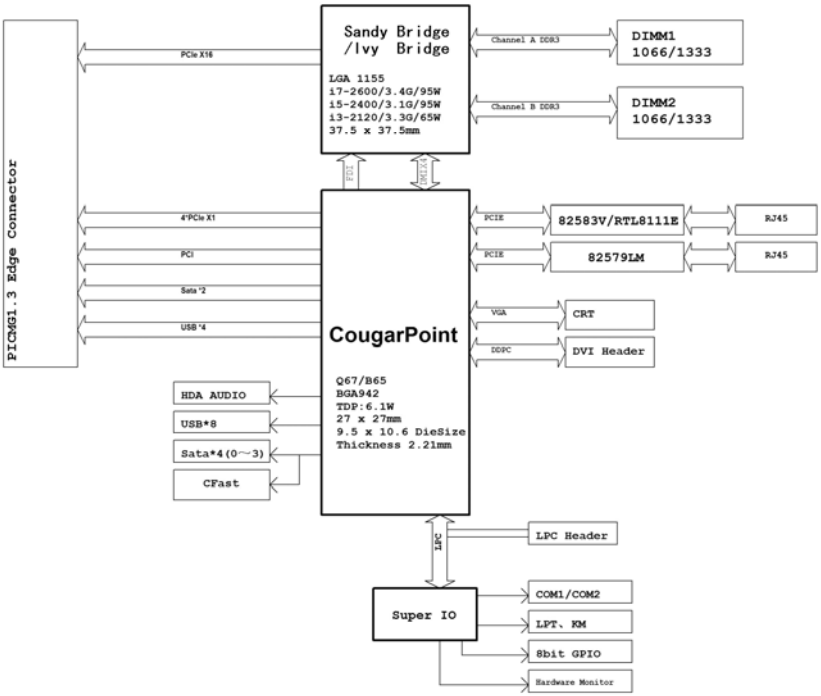
警告！

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 H1～H4 使用 M3×6 GB9074.4-88 螺钉。

接口位置示意图


AUD101
LAN2
LAN1
VGA1
KB1
DVI1
COM2
LPT1
COM1
GPT101
CFAST1
JCC1
JP1
JP2
JP3
JP4
JP5
CPU1
PWR2
J1
J2
J3
J4
SATA1
SATA2
SATA3
SATA4
SYSFAN1
CPUFAN1
DIMM2
DIMM1
JPW2
FP1
FP2
FP3
PWR1

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。

跳线设置

1.　CMOS内容清除/保持设置

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：

JCC1

（脚距：2.54mm）

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.　JM1（脚距：2.54mm）：ME寄存器内容清除/保持设置

JM1

设置	功能
1-2 开路	正常工作状态（Default）
1-2 短路	清除 ME RTC 寄存器内容，恢复成出厂值。

备注：B65无此功能。

3.　AC上电自动开机设置

为方便在无人监控的场合应用，计算机在电源上电时，实现自动开机的功能，可使用以下设置。

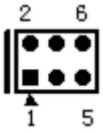
JP6

（脚距：2.54mm）

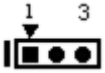
设置	功能
1-2 开路	按前面板 PWRBTN#开机（Default）
1-2 短路	AC 上电自动开机

4.　串口配置

COM1可通过JP1～JP5（脚距：2.54mm），对串口模式进行配置：



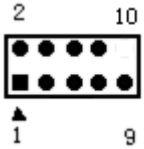
JP1



JP2～JP5

管脚	信号名称		
	RS-232	RS-485	RS-422
JP1	1-2	3-4	5-6
JP2	1-2	2-3	2-3
JP3	1-2	2-3	2-3
JP4	1-2	2-3	2-3
JP5	1-2	2-3	2-3

串口



COM1/COM2

脚距：2.54mm

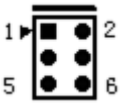
管脚	信号名称		
	RS-232（COM1/COM2）	RS-422（COM1）	RS-485（COM1）
1	DCD#	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	NC
4	DTR#	RXD-	NC
5	GND	GND	GND
6	DSR#	NC	NC
7	RTS#	NC	NC
8	CTS#	NC	NC
9	RI#	NC	NC
10	NA	NA	NA

注：1、COM1 在 RS485 模式下，数据收发方向为自动控制。

2、Q67 芯片组，使用 LPC 扩展接口的串口卡，安装驱动时，需要保证其串口不与 AMT 功能 SOL 的串口冲突。

状态指示控制接口

ATX电源开关及硬盘指示灯接口

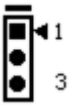


FP1

（脚距：2.54mm）

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+

电源指示灯接口



FP2（脚距：2.54mm）

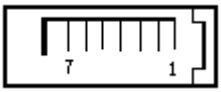
管脚	信号名称
1	PWR_LED+
2	NC
3	GND

扬声器输出接口

FP3（脚距：2.54mm）

管脚	信号名称
1	SPEAKER
2	NC
3	GND
4	+5V

7pin SATA接口



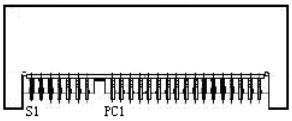
SATA1～SATA3

SATA4（可选）

管脚	信号名称
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

注：其中 SATA4 与 CFAST1 共用资源，其中只能使用一个接口。

CFAST接口

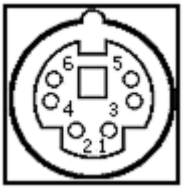


CFAST1

（在板背面，可选）

管脚	信号名称	管脚	信号名称
S1	GND	PC6	NC
S2	TX+	PC7	GND
S3	TX-	PC8	NC
S4	GND	PC9	NC
S5	RX-	PC10	NC
S6	RX+	PC11	NC
S7	GND	PC12	NC
PC1	CDI	PC13	+3.3V
PC2	GND	PC14	+3.3V
PC5	NC	PC17	CDO

Mini一转二PS/2 接口



KM1

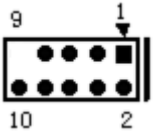
管脚	信号名称
1	KB_DATA
2	MS_DATA
3	GND
4	+5V
5	KB_CLK
6	MS_CLK

键盘扩展接口

KB1（脚距：2.5MM）

管脚	信号名称
1	KB_CLK
2	KB_DATA
3	NC
4	GND
5	+5V

USB接口

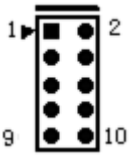


J1～J4

（脚距：2.54mm）

管脚	信号名称	管脚	信号名称
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NA	10	GND

音频接口

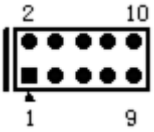


AUDIO1

（脚距：2.54mm）

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

GPIO接口



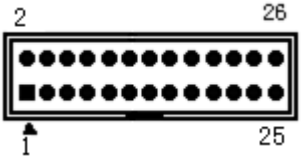
GPIO1

（脚距：2.54mm）

管脚	信号名称	管脚	信号名称
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	GND	10	NC

注：出厂 Default 值为连接器的第 1、3、5、7 脚为 TTL 输入，第 2、4、6、8 脚为 CMOS 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。

并口



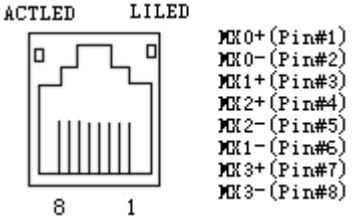
LPT1

（脚距：2.54mm）

管脚	信号名称	管脚	信号名称
1	STB#	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

网络接口

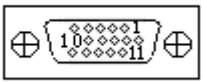
本主板提供1个10/100/1000Mbps网络接口LAN1。支持网络唤醒、网络PXE启动和AMT7.0功能。ACTLED和LILED是以太网接口两边的绿色和双色LED，它们显示着LAN的活动指示状态和网络速度指示状态。请参考以下每一个LED的状态描述：



LAN1、LAN2（可选）

ACTLED （单色：绿色灯）	网络活动 指示状态		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

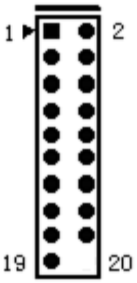
标准DB15 VGA接口



VGA1

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		

DVI接口

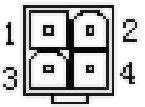


DVI1

(脚距：2.0mm)

管脚	信号名称	管脚	信号名称
1	DATA2-	2	DATA2+
3	GND	4	GND
5	DATA1-	6	DATA1+
7	GND	8	GND
9	DATA0-	10	DATA0+
11	GND	12	GND
13	CLK+	14	CLK-
15	+5V	16	HPDET
17	DDCDATA	18	DDCCLK
19	GND	20	NA

ATX 12V CPU供电接口

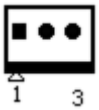


PWR1

脚距：2.0mm

管脚	信号名称
1	GND
2	GND
3	+12V
4	+12V

3 针风扇接口



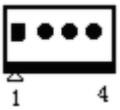
SYSFAN1

脚距：2.54mm

管脚	信号名称
1	GND
2	+12V
3	FAN_IO

注：FAN_IO ：风扇转速脉冲输出。

4 针风扇接口



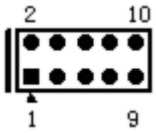
CPUFAN1

脚距：2.54mm

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

注：FAN_IO：风扇转速脉冲输出；FAN_PWM：风扇转速 PWM 控制。

LPC 扩展接口



LPC1

（脚距：2.54mm）

管脚	信号名称	管脚	信号名称
1	+3.3V	2	DATA3
3	FRAME#	4	DATA2
5	RESET	6	DATA1
7	SERIRQ	8	DATA0
9	GND	10	33MHz clk

LPC扩展供电接口

PWR2

脚距：2.0mm

管脚	信号名称
1	GND
2	VCC5
3	VCC5
4	GND
5	VCC5

SATA硬盘热插拔

SATA 硬盘热插拔需注意：

（1）　硬盘必须支持：SATA 2.0 接口，并且采用 15 芯 SATA 硬盘电源接口。

（2）　芯片组驱动程序支持 SATA 硬盘的热插拔。

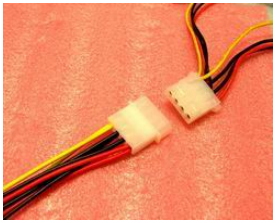
（3）　不能对操作系统所在的 SATA 硬盘进行带电热插拔。

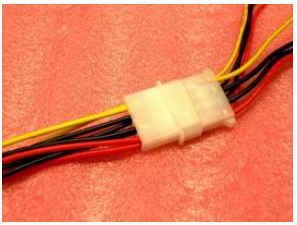
SATA 硬盘数据线

SATA 硬盘电源线

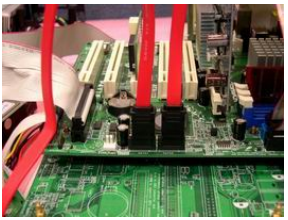
请按照如下步骤进行 SATA 硬盘热插拔，否则，操作不当会导致硬盘损坏和数据丢失。

热插入SATA硬盘步骤：





步骤1：请将SATA电源线1x4-针脚(白色)一端接到电源适配器的1x4-针脚电源线一端。



步骤2：将SATA 数据线接到主板上的SATA接口。

步骤3：将SATA电源线15-针脚接口（黑色）一端接到SATA硬盘。

步骤4：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）。

第三章 BIOS功能介绍

UEFI简介

UEFI(Unified Extensible Firmware Interface：标准的可扩展固件接口)，是新一代的计算机固件，用于取代传统的BIOS。UEFI固件存储在主板的闪存存储器中，主要功能包括：初始化系统硬件，设置各系统部件的工作状态，调整各系统部件的工作参数，诊断系统各部件的功能并报告故障，给上层软件系统提供硬件操作控制接口，引导操作系统等。UEFI提供用户一个菜单式的人机接口，方便用户配置各系统参数设置，控制电源管理模式，调整系统设备的资源分配等。

正确设置UEFI的各项参数，可使系统稳定可靠地工作，同时也能提升系统的整体性能。不适当的甚至错误的UEFI参数设置，则会使系统工作性能大为降低，使系统工作不稳定，甚至无法正常工作。

UEFI参数设置

每当系统接通电源，正常开机后，便可看见进入UEFI设置程序提示的信息。此时(其它时间无效)，按下提示信息所指定的按键（通常为<Del>键或<F2>键）即可进入UEFI设置程序。

通过UEFI设置程序修改的所有设置值（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；而日期、时间则保存在系统的CMOS存储器中，该CMOS存储器由电池供电，即使切断外部电源，其内容也不会丢失，除非执行清除CMOS内容的操作。

注意！UEFI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UEFI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UEFI，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UEFI设置程序不完全相同。

UEFI基本功能设置

当SETUP程序启动之后，您可以看到Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.主画面如下：

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
Motherboard Information Project Name EC7-1819V2NA BIOS Name P9146004 BIOS Version C01 Build Date and Time 07/16/2012 11:09:23 Total Memory 2048 MB (DDR3) Memory Frequency 1333 Mhz System Date [Thu 10/06/2011] System Time [09:41:55] Access Level Administrator	Set the Date. Use 'Tab' to switch between Date elements. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

◆ **Main**

➢ **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)。

◆ Advanced

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main **Advanced** Chipset Boot Security Save & Exit	
WARNING: Setting wrong values in below sections may cause system to malfunction!	
▶ CPU Configuration	→←: Select Screen
▶ SATA Configuration	↑ ↓: Select Item
▶ AMT Configuration	Enter: Select
▶ USB Configuration	+/-: Change Opt
▶ Second Super IO Configuration	F1: General Help
▶ Super IO Configuration	F2: Previous Values
▶ H/W Monitor	F3: Optimized
▶ Serial Port Console Redirection	Defaults
▶ CPU PPM Configuration	F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **CPU Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.		
Advanced		
CPU Configuration		→←: Select Screen
Genuine Intel® CPU @ 2.20GHz		↑ ↓: Select Item
CPU Signature	306a4	Enter: Select
Microcode Patch	7	+/-: Change Opt
Max CPU Speed	2200 MHz	F1: General Help
Min CPU Speed	1600 MHz	F2: Previous Values
CPU Speed	2200 MHz	F3: Optimized Defaults
Processor Cores	4	F4: Save
Intel HT Technology	Not Supported	ESC: Exit
Intel VT-x Technology	Supported	
Intel SMX Technology	Supported	
64-bit	Supported	
L1 Data Cache	32 kB x 4	
L1 Code Cache	32 kB x 4	
L2 Cache	256 kB x 4	
L3 Cache	8192 kB	
Hyper-threading	[Enabled]	
Active Processor Cores	[All]	
Intel Virtualization Technology	[Disabled]	
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.		

显示CPU的相关信息。注意，CPU的相关信息跟平台所安装的CPU有关，不同系列的CPU所显示的信息不同。

- **Hyper-Threading**

  Hyper Threading Technology功能的控制开关。

- **Active Processor Cores**

  使能CPU的核的个数，只对多核CPU有效。

- **Intel Virtualization Technology**

  Intel虚拟技术的开关。

➢ **SATA Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
SATA Controller(s) [Enabled] SATA Mode Selection [IDE] IDE Legacy/Native Mode Selection [Native] Serial ATA Port 1 Empty Serial ATA Port 2 Empty Serial ATA Port 3 Empty Serial ATA Port 4 Empty Serial ATA Port 5 Empty Serial ATA Port 6 Empty	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **SATA Controller(s)**

  SATA Controller(s)的开关。

- **SATA Mode Selection**

  SATA控制器的类型选择，对应IDE，RAID和AHCI三个选择项。

注意，选择AHCI或者RAID Mode进行系统安装时，需要Floppy设备和特定芯片组对应的驱动。

- **Serial ATA Port 1～ 6**

  Serial ATA Port 1～ 6动态侦测主板上有没有接SATA设备，如果对应的Port上有接设备，则显示该SATA设备的型号。否则，显示Empty。

- **IDE Legacy/Native Mode Selection**

  IDE 模式选择

➢ **AMT Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.		
Advanced		
Intel AMT	[Enabled]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Un-Configure ME	[Disabled]	

- **AMT**

  设置Intel主动管理技术（Intel Active Management Technology BIOS Extension）。注意，Intel AMT硬件一直是Enabled的，该选项只是控制BIOS Extension（MEbx）的执行。如果设置为Enabled,则需要有附加在SPI设备中的相应的Firmware。此项只有支持AMT功能的平台才会显示。

- **UnConfigure ME**

  无需密码重新配置ME的开关，该项设置为Enabled时，POST阶段会在不需要密码的情况下自动重新配置ME（Load ME Default Value）。

➢ USB Configuration

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
USB Configuration USB Devices: 1 Keyboard, 1 Mouse, 2 Hubs Legacy USB Support [Enabled] Mass Storage Devices: Netac [Auto]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- Legacy USB Support

  此选项用于支持传统的USB设备（键盘，鼠标，存储设备等），当该项设为Enabled时，即使不支持USB的操作系统如DOS下也能使用USB设备。当设置成Disabled时，传统设备在不支持USB的操作系统中将不可用。

  注意，EFI application下USB仍然可用，如Shell下。

➢ Second Super IO Configuration

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Second Super IO Configuration ►Serial Port 3 Configuration ►Serial Port 4 Configuration ►Serial Port 5 Configuration ►Serial Port 6 Configuration	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- Serial Port 3～6 Configuration

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Serial Port 3～6 Configuration	→←: Select Screen ↑ ↓: Select Item
Serial Port [Enabled]	Enter: Select
Device Settings IO=200h; IRQ=11;	+/-: Change Opt
	F1: General Help
Change Settings [Auto]	F2: Previous Values
	F3: Optimized Defaults
	F4: Save
	ESC: Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

*** Serial Port3～6**

此项用于打开或关闭当前串口。

*** Device Settings**

此项用于显示串口当前的资源配置。

*** Change Settings**

此项用于配置串口所用的资源（IO和IRQ）。

- Super IO Configuration

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Super IO Configuration	→←: Select Screen ↑ ↓: Select Item
►Serial Port 0 Configuration	Enter: Select
►Serial Port 1 Configuration	+/-: Change Opt
►Parallel Port Configuration	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save
	ESC: Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- Serial Port 0～1 Configuration

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Serial Port 0～1 Configuration Serial Port [Enabled] Device Settings IO=3F8h; IRQ=4; Change Settings [Auto]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

*** Serial Port0～1**

此项用于打开或关闭当前串口。

*** Device Settings**

此项用于显示串口当前的资源配置。

*** Change Settings**

此项用于配置串口所用的资源（IO和IRQ）。

- Parallel Port Configuration

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Parallel Port Configuration Parallel Port [Enabled] Device Settings IO=378h; IRQ=5; Change Settings [Auto] Device Mode [STD Printer Mode]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

*** Parallel Port**

此项用于打开或关闭当前并口。

*** Device Settings**

此项用于显示并口当前的资源配置。

*** Change Settings**

此项用于配置并口所用的资源（IO和IRQ）。

*** Device Mode**

此项用于配置并口的工作模式。

➢ **H/W Monitor**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.		
Advanced		
PC Health Status		→←: Select Screen ↑ ↓: Select Item
CPU Temperature	: +57 C	Enter: Select
System Temperature	: +26 C	+/-: Change Opt
		F1: General Help
SYSFAN1	: N/A	F2: Previous Values
CPUFAN1	: N/A	F3: Optimized Defaults
Vcore	: +0.95 V	F4: Save
V3.3	: +3.296 V	ESC: Exit
V5.0	: +5.007 V	
V12.0	: +12.091 V	
VBAT	: +3.21 V	
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.		

显示当前所侦测到得硬件的电压，温度，风扇转速等监控信息。

- **System Temperature**

  当前系统温度，一般主板上有热敏电阻监测。

- **CPU Temperature**

  当前CPU温度。CPU的温度由板上的温度传感器监测。

- **SYSFAN1/CPUFAN1**

  当前系统风扇及CPU风扇转速的监测。

- **Vcore**

  CPU核心电压。

- **V3.3/ V5.0/V12.0**

  开关电源输出电压。

- **VBAT**

  CMOS电池电压。

➢ **Serial Port Console Redirection**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
COM0(Disabled) Console Redirection Port Is Disabled COM1(Pci Bus0,Dev0,Func0) (Disabled) Console Redirection Port Is Disabled Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS) Console Redirection [Enabled] ▶Console Redirection Settings	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

显示串口重定向信息

- **Console Redirection**

  打开或关闭串口重定向功能

➢ **CPU PPM Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.		
Advanced		
CPU PPM Configuration		→←: Select Screen ↑ ↓: Select Item
EIST	[Enabled]	Enter: Select
Turbo Mode	[Enabled]	+/-: Change Opt
CPU C3 Report	[Enabled]	F1: General Help
CPU C6 Report	[Enabled]	F2: Previous Values
CPU C7 Report	[Enabled]	F3: Optimized Defaults
		F4: Save
		ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.		

显示CPU的相关信息。注意，CPU的相关信息跟平台所安装的CPU有关，不同系列的CPU所显示的信息不同。

- **EIST**

  使能CPU的SpeedStep功能。

- **Turbo Mode**

  使能Turbo Mode功能。

- **CPU C3～C7 Report**

  使能CPU的节电功能

◆ Chipset

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced **Chipset** Boot Security Save & Exit	
WARNING: Setting wrong values in below sections may cause system to malfunction! ► PCH-IO Configuration ► System Agent (SA) Configuration	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ PCH-IO Configuration

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.		
Chipset		
► USB Configuration LAN2 Controller Audio Controller PCIe Slot2 Speed PCIe Slot3 Speed PCIe Slot4 Speed Restore AC Power Loss	 [Enabled] [Auto] [Auto] [Auto] [Auto] [Last State]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.		

● LAN2 Controller

使能LAN2控制开关。

- **Audio Controller**

  使能声卡控制开关

- **PCIe Slot2-4 Speed**

  PCIe Slot所接设备的速度控制开关

- **Restore AC Power Loss**

  使用该选项可以设置计算机在交流电停电而后再来电时系统所处状态。“Power Off”，让系统处于关机状态，“Power On”，系统自动开启，“Last State”，则保持到断电前的状态

- **USB Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Chipset	
USB Configuration EHCI1 [Enabled] EHCI2 [Enabled] USB Ports Per-Port Disable Control [Disabled]	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

* **EHCI 1**

EHCI 控制器 1 的开关。

* **EHCI 2**

EHCI 控制器 2 的开关。

* USB Ports Per-Port Disable Control

USB Port 的总控制开关

* USB 1~14 Disable

USB Port 1～14 的开关。

➢ System Agent (SA) Configuration

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.		
Chipset		
System Agent Bridge Name	IvyBridge	→←: Select Screen
System Agent RC Version	1.5.0.0	↑ ↓: Select Item
VT-d Capability	Supported	Enter: Select
		+/-: Change Opt
VT-d	[Enabled]	F1: General Help
PEG0 - Gen X	[Auto]	F2: Previous Values
De-emphasis Control	[-3.5 dB]	F3: Optimized Defaults
		F4: Save
▶ Graphics Configuration		ESC: Exit
▶ Memory Configuration		
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.		

- VT-d

  Intel 虚拟技术的开关。

- PEG0 - Gen X

  PCIE1设备的速度控制开关

- De-emphasis Control

  PCIE1设备的降噪控制开关

➢ **Graphics Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
Graphics Configuration	→←: Select Screen
Primary Display [Auto]	↑ ↓: Select Item
DVMT Pre-Allocated [64M]	Enter: Select
DVMT Total Gfx Mem [256M]	+/-: Change Opt
Primary IGFX Boot Display [VBIOS Default]	F1: General Help
Secondary IGFX Boot Display [Disabled]	F2: Previous Values
	F3: Optimized Defaults
	F4: Save
	ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **DVMT Pre-Allocated**

  选择DVMT预分配内存的大小

- **DVMT Total Gfx Mem**

  选择DVMT总Gfx内存的大小

- **Primary Display**

  此选项用于指定优先启动的显示设备类型。

- **Primary IGFX Boot Display**

  设置IGFX启动主显示设备。

- **Secondary IGFX Boot Display**

  设置IGFX启动从显示设备。

➢ **Memory Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
Memory Information	→←: Select Screen
Memory Frequency 1067 Mhz	↑ ↓: Select Item
Total Memory 2048 MB (DDR3)	Enter: Select
DIMM1 Not Present	+/-: Change Opt
DIMM2 2048 MB (DDR3)	F1: General Help
CAS Latency(tCL) 7	F2: Previous Values
Minimum delay time	F3: Optimized Defaults
CAS to RAS (tRCDmin) 7	F4: Save
Row Precharge (tRPmin) 7	ESC: Exit
Active to Rrecharge (tRASmin) 20	
XMP Profile 1 Not Supported	
XMP Profile 2 Not Supported	
Memory Remap [Enabled]	
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **Memory Remap**

  此项用于在北桥芯片支持 4G 以上的平台上（如：64GB），将传统的 4G 以下，如 BIOS，APIC，PCIE，PCI MEMORY 等设备占用的地址影射到 4G 以上。这样的作用是，在插上较多的物理内存条时，OS 能使用更多的物理内存。

◆ **Boot**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced Chipset **Boot** Security Save & Exit	
Boot Configuration Quiet Boot [Disabled] **Boot Option Priorities** Boot Option #1 [Netac] Boot Option #2 [UEFI:Netac] **Hard Drive BBS Priorities**	→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **Quiet Boot**

Boot模式选择开关，用于打开或关闭Quiet Boot功能。

➢ **Boot Option Priorities**

此项用于配置系统引导的优先次序。其中，#1优先级最高，#n优先级最低。

➢ **Hard Drive BBS Priorities**

此项用于配置传统设备在BBS中的优先次序。#1优先级最高，#n最低。

◆ Security

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot **Security** Save & Exit	
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The psssword length must be in the following range: Minimum length 3 Maximum length 20 Administrator Password User Password	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **Administrator Password**

此项用于设置管理员密码。

➢ **User Password**

此项用于设置用户密码。

◆ **Save & Exit**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot Security **Save & Exit**	
Save Changes and Reset Discard Changes and Reset Boot Override Netac UEFI:Netac	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save ESC: Exit
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➢ **Save Changes and Reset**

此项用于保存修改并重启。

➢ **Discard Changes and Reset**

此项用于放弃所作修改并重启。

➢ **Boot Override**

此项用于选择启动设备

x86 平台下UEFI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DMA号。

◆ **DMA**

级别	功能
DMA0	未分配
DMA1	未分配
DMA2	未分配
DMA3	未分配
DMA4	用于 DMAC 的级联
DMA5	未分配
DMA6	未分配
DMA7	未分配

◆ **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的主板可以有多达28个中断源。但要启用该功能必须相应的操作系统支持。

◆ **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
000h - 01Fh	DMA 控制器
00h - CF7h	PCI bus
010h - 01Fh	主板资源

020h – 021h	可编程中断控制器
022h – 03Fh	主板资源
024h – 025h	可编程中断控制器
028h – 029h	可编程中断控制器
02Ch – 02Dh	可编程中断控制器
02Eh – 02Fh	主板资源
02Eh – 02Fh	主板资源
030h – 031h	可编程中断控制器
034h – 035h	可编程中断控制器
038h – 039h	可编程中断控制器
03Ch – 03Dh	可编程中断控制器
040h – 043h	系统计时器
044h – 05Fh	主板资源
04Eh – 04Fh	主板资源
050h – 053h	系统计时器
060h	标准 101/102 键或 Microsoft 自然 PS/2 键盘
061h	主板资源
062h – 063h	主板资源
063h	主板资源
064h	标准 101/102 键或 Microsoft 自然 PS/2 键盘
065h	主板资源
065h – 06Fh	主板资源
067h	主板资源
070h	主板资源
070h – 077h	实时时钟， NMI
072h – 07Fh	主板资源

080h	主板资源
080h	主板资源
081h - 091h	DMA 控制器
084h - 086h	主板资源
088h	主板资源
08Ch - 08Eh	主板资源
090h - 09Fh	主板资源
092h	主板资源
093h - 09Fh	DMA 控制器
0A0h - 0A1h	可编程中断控制器
0A2h - 0BFh	主板资源
0A4h - 0A5h	可编程中断控制器
0A8h - 0A9h	可编程中断控制器
0ACh - 0ADh	可编程中断控制器
0B0h - 0B1h	可编程中断控制器
0B2h - 0B3h	主板资源
0B4h - 0B5h	可编程中断控制器
0B8h - 0B9h	可编程中断控制器
0BCh - 0BDh	可编程中断控制器
0C0h - 0DFh	DMA 控制器
0E0h - 0EFh	主板资源
0F0h - 0FFh	Numeric data processor
274h - 277h	ISAPNP Read Data Port
279h	ISAPNP Read Data Port
2C0h - 2C7h	串行端口 6
2C8h - 2CFh	串行端口 5

2D0h - 2D7h	串行端口 4
2D8h - 2DFh	串行端口 3
2F8h - 2FFh	串行端口 2
3B0h - 3BBh	Intel(R) HD Graphics
3C0h - 3DFh	Intel(R) HD Graphics
3F8h - 3FFh	串行端口 1
400h - 453h	主板资源
454h - 457h	主板资源
458h - 47Fh	主板资源
4D0h - 4D1h	主板资源
4D0h - 4D1h	可编程中断控制器
500h - 57Fh	主板资源
680h - 69Fh	主板资源
A00h - A0Fh	主板资源
A30h - A3Fh	主板资源
A79h	ISAPNP Read Data Port
0D00h-FFFFh	PCI bus

◆ **IRQ中断分配表**

系统共0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。

级别	功能
IRQ0	系统计时器
IRQ1	PS2 键盘
IRQ2	可编程的中断控制器
IRQ3	串口 2
IRQ4	串口 1
IRQ5	保留
IRQ6	保留
IRQ7	保留
IRQ8	系统 CMOS/实时时钟
IRQ9	ACPI 兼容系统
IRQ10	保留
IRQ11	串口 3，4，5，6
IRQ12	鼠标
IRQ13	数据数值处理器
IRQ14	主要 IDE 通道
IRQ15	次要 IDE 通道

第四章　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。

附录

Watchdog编程指引

本主板提供一个可按分或按秒计时的，最长达255级的

可编程看门狗定时器(以下简称WDT)。通过编程，WDT超时事件可用来

将系统复位或者产生一个可屏蔽中断。

本主板可使用的中断号为：3，4，5，7，9，10，11。

注：中断模式的说明仅适用于ACPI和APIC同时打开的OS。

以下用C语言形式提供了WDT的编程范例，对WDT的编程需遵循以下步骤：

进入WDT编程模式

配置WDT工作方式，启动或关闭WDT

(1) 进入WDT编程模式。

```
/*
    描述：函数PreInitWDT用于初始化WDT相关的寄存器，请在设置并使用WDT
之前调用一次此              函数。
    输入：无
    输出：无
    注意：无
*/

        #define   INDEX_PORT     0x2E
        #define   DATA_PORT      0x2F

VOID PreInitWDT()
```

```
{
        outportb(INDEX_PORT, 0x87);
        outportb(INDEX_PORT, 0x87);
        outportb(INDEX_PORT, 0x07);
        outportb(DATA_PORT, 0x08);
        outportb(INDEX_PORT, 0x30);
        outportb(DATA_PORT, 0x01);
        outportb(INDEX_PORT, 0x07);
        outportb(DATA_PORT, 0x09);
        outportb(INDEX_PORT, 0x30);
        outportb(DATA_PORT, 0x04);

}
```

(2) 配置WDT工作方式，启动或关闭WDT.

```
/*
    描述：函数SetWDT用于配置WDT需要的参数，启动或关闭WDT。
    输入：Wmode:    0  -  配置WDT成复位工作方式
                    IRQ_NO  -  配置WDT成中断工作方式,此处请用需要使用的中断号替
                    换掉常量IRQ_NO,文档前端已经列出可使用中断号的范围
          Wtime:    0  -  配置WDT按分计时
                    1  -  配置WDT按秒计时
          Timeout:  0  -  停止WDT
                    TIME_OUT_VALUE  -  启动WDT, 以超时时间单位数量
```

```
                    (0x01~0xFF)替换掉常量TIME_OUT_VALUE
    注意：
*/
SetWDT(int Wmode,  int Wtime,  int Timeout)
{
        unsigned char oldval, tempval, tempval2;

       outportb(INDEX_PORT,0xe0);
        tempval2 = inportb(DATA_PORT);
       tempval2 &= 0xef;
       outportb(DATA_PORT, tempval2);        ;Set GPIO24 to output pin.

        outportb(INDEX_PORT,0xe9);
        oldval = inportb(DATA_PORT);

    If (Wmode == 0)
        {
          oldval |= 0x10;                  //cr e9h,bit 4: 0---
      GPIO,1---WDT
          outportb(DATA_PORT, oldval);
        }
    else
        {
          oldval &= 0xef;
          outportb(DATA_PORT, oldval);
```

```
            outportb(INDEX_PORT, 0x07);
            outportb(DATA_PORT, 0x08);

            outportb(INDEX_PORT,0xf7);
            outportb(DATA_PORT, Wmode);
          }

            outportb(INDEX_PORT, 0x07);
            outportb(DATA_PORT, 0x08);

          outportb(INDEX_PORT,0xf5);
     If (Wtime == 0)
           outportb(DATA_PORT,0x08);
     Else
           outportb(DATA_PORT,0x00);
     outportb(INDEX_PORT,0xf6);
     If (Timeout == 0)
           outportb(DATA_PORT,0x00);
     Else
           outportb(DATA_PORT, Timeout);

}
```

GPIO编程指引

本主板提供8路可编程数字I/O引脚，其中4路为输入，4路为输出。

以下用C语言形式提供了数字I/O的编程范例，对数字I/O的编程需遵循以下步骤：

（本主板GPIO Input PIN为：GP05、GP06、GP30、GP31；

Output PIN为：GP47、GP76、GP36、GP35）

初始化数字I/O

输入输出编程

1. 初始化数字I/O

```
#define   INDEX_PORT    0x2E
#define   DATA_PORT     0x2F
VOID PreInitGPIO()
    {

        outportb(INDEX_PORT,0x87);
        outportb(INDEX_PORT,0x87);
        outportb(INDEX_PORT,0x07);
        outportb(DATA_PORT,0x09);
        outportb(INDEX_PORT,0x30);
        outportb(DATA_PORT,0x98);    // enable GPIO3,4,7.

        outportb(INDEX_PORT,0x07);
        outportb(DATA_PORT,0x08);
        outportb(INDEX_PORT,0x30);
```

```
        outportb(DATA_PORT,0x02);   //enable GPIO0
    }
        outportb(INDEX_PORT,0x24);
        Temp_val=inportb(DATA_PORT)&0xBF;
        outportb(DATA_PORT, Temp_val);   //GP05,GP06 select as gpio

        outportb(INDEX_PORT,0x27);
        Temp_val=(inportb(DATA_PORT)|0x40)
        outportb(DATA_PORT, Temp_val);   //GP76 select as gpio

        outportb(INDEX_PORT,0x2B);
        Temp_val=inportb(DATA_PORT)|0x63;
        outportb(DATA_PORT, Temp_val);   //GP30,GP31,GP35,GP36
        select as gpio

        outportb(INDEX_PORT,0x1B);
        Temp_val=inportb(DATA_PORT)|0x80;
        outportb(DATA_PORT, Temp_val);   // GP47 select as gpio

        outportb (INDEX_PORT, 0xe4) ;
        Temp_val=inportb(DATA_PORT) &0x9F;
        outportb(DATA_PORT, Temp_val);      // //config gp05, 06 to
        gpio.
```

```
outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x09);
outportb (INDEX_PORT, 0Xea) ;
Temp_val=inportb(DATA_PORT) &0x9C;
outportb(DATA_PORT,  Temp_val);          //  //config  gp30,
gp31,35,36 to gpio.

outportb (INDEX_PORT, 0Xee) ;
Temp_val=inportb(DATA_PORT) &0x7F;
outportb(DATA_PORT, Temp_val);     // //config gp47 to gpio.

outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x07);
outportb (INDEX_PORT, 0Xec) ;
Temp_val=inportb(DATA_PORT) &0xbf;
outportb(DATA_PORT, Temp_val);     // //config gp76 to gpio.
```

注意：使用多功能PIN的GPIO要初始化成GPIO功能

2. 输入输出编程

```
outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x09);

outportb (INDEX_PORT, 0xe4) ;
```

```
Temp_val=(inportb(DATA_PORT)|0x03)&0x9F;
outportb(DATA_PORT,  Temp_val);          //  //config  gp30,31
input,gp35,36output.

outportb（INDEX_PORT, 0Xf0）;
Temp_val=inportb(DATA_PORT)|&0x7F;
outportb(DATA_PORT, Temp_val);     // //config gp47 output.

outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x07);
outportb（INDEX_PORT, 0Xe0）;
Temp_val=inportb(DATA_PORT)&0xBF;
outportb(DATA_PORT, Temp_val);     //gp76 output.

outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x08);
outportb（INDEX_PORT, 0Xe0）;
Temp_val=inportb(DATA_PORT) |0x60;  .
outportb(DATA_PORT, Temp_val);     //config gp05,06 to input
```

3. 结束编程

```
outportb（0x2e，0xaa);
```

常见故障分析与解决

序号	故障现象	故障分析解决
1	BIOS 设置不能保存	分析：可能是 CMOS 电池的问题。
		解决方法：用万用表测量 CMOS 电池，电压不足就更换新电池，重新设置保存。
2	时可开机时不可开机	分析：可能是电源接触不良，从主板电源插座上拔下电源，发现主板电源插针某根插针经多次用力插压，已经倒向一边。
		解决方法：关机拔下电源插头，用镊子将弯曲的电源插针弄直插上电源开关，重新启动，多次试验，没有出现此类故障。
3	当接上U盘时，系统提示一个高速设备接到一个低速接口上。	分析：U 盘是高速 USB2.0，接到电脑上有提示一个高速设备接到一个低速接口上，说明主板的接口被认为是一个 USB1.1 的接口。
		解决方法：将主板上 USB 高速传输模式打开即可。不同的主板有不同的设置。一般是将 USB 设备选项中的 FULLSPEED 改为 HISPEED 即可。
4	更换新内存后屏幕无显示，呈现黑屏状态，无法正常进入系统，换上原来的内存仍然无法启动。	分析：可能是由于在插拔内存的过程中操作不当引起主板上部件工作不正常，需要重点检查主板上与内存相关的电路。
		解决方法：首先检查内存、显卡等硬件，结果显示这些硬件都没有问题，都可以正常使用。仔细检查主板上内存插槽周围的电路，最终发现第一个内存插槽里的两根与内存金手指接触的针脚搭在一起，对照第二个内存插槽没有该现象，由此判断是第一个内存插槽短路了。用镊子小心地将两根针脚拨回原处，插上内存，重新启动，系统顺利启动。

5	更换光驱后系统无法启动	分析：可能是由于在安装光驱时不小心碰撞了硬盘的数据线，从而使硬盘数据线接口接触不良导致的，或者是硬盘和光驱上的主从跳线设置不正确。
		解决方法：首先对硬盘数据线和硬盘及主板上的 IDE 接口进行检查，发现没有问题；然后检查主从跳线的设置，发现硬盘和光驱连接在不同的数据线上，而且硬盘和光驱的跳线都设置为主盘，从而导致硬盘无法启动；将光驱的跳线设置为从盘，重新安装好。
6	进入系统后无法检测到 PCI 卡	分析：确认 PCI 卡功能是否正常；将 PCI 卡重插或插入其他 PCI 插槽，看能否正常；了解使用的电源类型（是 AT 还是 ATX）；了解客户的 PCI 卡的电压需求。
		解决方法：如 PCI 卡功能问题，更换 PCI 卡解决；重插或插入其他 PCI 插槽即可正常，则为 PCI 卡与插槽接触问题。如果使用的是 AT 电源，但 PCI 卡需要 3.3V 电压，因为 AT 电源不提供 3.3V 电压，电源需更换为 ATX 电源方可使用 PCI 卡。（建议：在选购电源时，先了解所使用的 PCI 卡是否需要 3.3V 电压。）
7	找不到外接设备	分析：没有连接；没有装驱动；设备已坏。
		解决方法：查看设备与主板的连接线是否正常，如正常则更换正常连接线确定连接无问题；重新安装设备驱动，看是否可以识别；检测设备是否正常；如设备正常考虑与主板是否兼容。

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or send an email to the Technical Support Mailbox support@evoc.com (International) or support@evoc.cn (Domestic) for consultation.

Hotline: 4008809666

Safety Instructions

1. Please read this manual carefully before using the product;
2. Leave the board or card in the antistatic bag until you are ready to use it;
3. Touch a grounded metal object (e.g. for 10 seconds) before removing the board or card from the anti-static bag;
4. Before installing or removing a board, wear the ESD gloves or ESD wrist strap; handle the board by its edges only;
5. Before inserting, removing or re-configuring motherboards or expansion cards, first disconnect the computer and peripherals from their power sources to prevent electric shock to human bodies or damage to the product;
6. Remember to disconnect the AC power cord from the socket before removing the board or moving the PC;
7. For PC products, remember to disconnect the computer and peripherals from the power sources before inserting or removing a board;
8. Before connecting or disconnecting any terminal, peripheral or any device, be sure the system is powered off and all the power sources are disconnected;
9. After turning off the computer, wait at least 30 seconds before turning it back on.

Contents

Chapter 1 Product Introduction

Overview

FSC-1817 is a high-performance motherboard, developed based on Intel® Sugar Bay platform. The product adopts Intel® B65/Q67 chipset and complies with PICMG 1.3 bus standard. It supports Intel® Core™ series Sandy Bridge/Ivy Bridge CPU of LGA1155 package; two 800/1066M/1333M DDR3 memory modules up to 16G; dual gigabit LAN ports on-board; VGA and DVI display connector; four SATA connectors (one optional CFast connector); Supports AHCI; Q67 supports RAID 0, 1, 5 and 10; provides eight USB ports, two serial ports (one of the serial port supports RS232/422/485) and one parallel port; supports HDA and digital IO connector; Q67 supports AMT function; expandable by carrier up to six SATA connectors and twelve USB ports; also expandable by LPC expansion up to six serial ports.

Targeting the future application of PICMG 1.3 bus standard, FSC-1817 features the best price-performance ratio and long product life cycle; thus, it can be widely applied in the fields of process control and surveillance.

Mechanical Dimensions, Weight and Environment

- Dimensions: 353mm (L) x 142mm (W) x 80mm (H);
- Net Weight: 0.43 Kg;
- Operating Environment:

  Temperature: 0°C ~ 60°C;

  Humidity: 10% ~ 90% (non-condensing);
- Storage Environment:

  Temperature: -20°C ~ 80°C;

  Humidity: 10% ~ 90% (non-condensing);

Typical Consumption

The typical consumption is based on the following idle status values.

CPU: Intel® Core™ i5-2500 6M Cache SR00T 3.3GHz LGA 1155 95W;

Memory: DDR3 1066 2GB KINGTIGER hynix H5TQ1G83AFPG7C/dual side/16 ICs/d X1;

Operating System: Windows XP

- +5V@ 0.34A; +5%/-3%;
- +3.3V@ 1.02A; +5%/-3%;
- +12V@1.33A; +5%/-3%;

Microprocessor

Intel® Core™ Sandy Bridge/Ivy Bridge CPU of LGA1155 package.

Chipset

Intel® B65/Q67

System Memory

Provides two 240Pin DDR3 memory slots, supporting Un-buffered/Un-buffered ECC (CPU support required) and dual-channel function. The maximum memory capacity for a single memory module is 8GB which brings the total maximum memory capacity to 16GB.

Display Function

- Supports DVI and VGA display; DVI supports hot-swap function and clone or expansion output;
- The maximum resolution supported by VGA is 2048x1536@75Hz, 32bit color depth while that supported by DVI is 1920x1200@60Hz.

Network Function

Provides two 10/100/1000Mbps LAN ports: LAN1 supports Wake-on-LAN function.

Audio Function

Adopts HD standard, supporting MIC-IN/LINE-IN/LINE-OUT;

Power Feature

Adopts ATX power, supplying power via carrier, supporting S0, S4 and S5;

Expansion Bus

Expansion bus compliant with PICMG 1.3 standard, providing with four 32-bit PCIs, one PCI Expressx16, four PCI Expressx1 and LPC (Low pin count) expansion.

Watchdog Function

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

Operating System

Supported OSs: winxp, win7 and linux;

On-board I/O

- One parallel port, supporting SSP/EEP/ECP operating mode and BIOS modifies operating mode;
- Two serial ports, COM1 supports RS-232/RS-422/RS-485 mode;
- Four SATA connectors, supporting hot-swap function,Expanable to six SATA connectors via carrier.
- Eight USB2.0 ports, Expanable to twelve USB connectors via carrier.
- One PS/2 keyboard/mouse connector;
- One keyboard expansion connector;

- One 8-channel digital I/O connector;
- One optional CFAST connector.

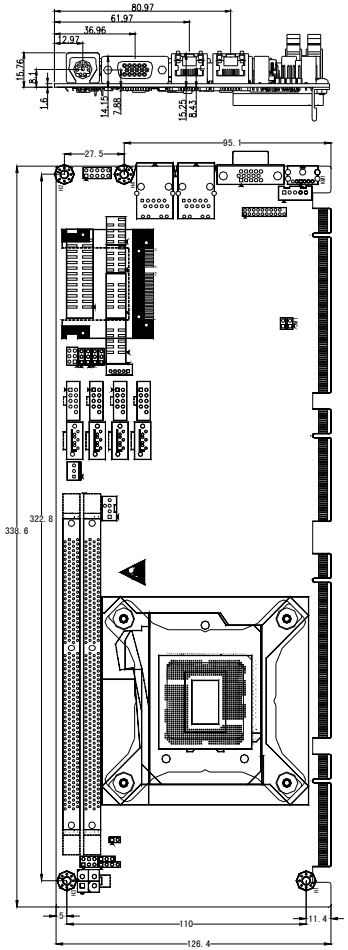
Tips: how to identify the alarms

1. Long “beep” indicates system memory error;

2. Short “beep” indicates to power on the computer.

Chapter 2 Installation

Product Outline

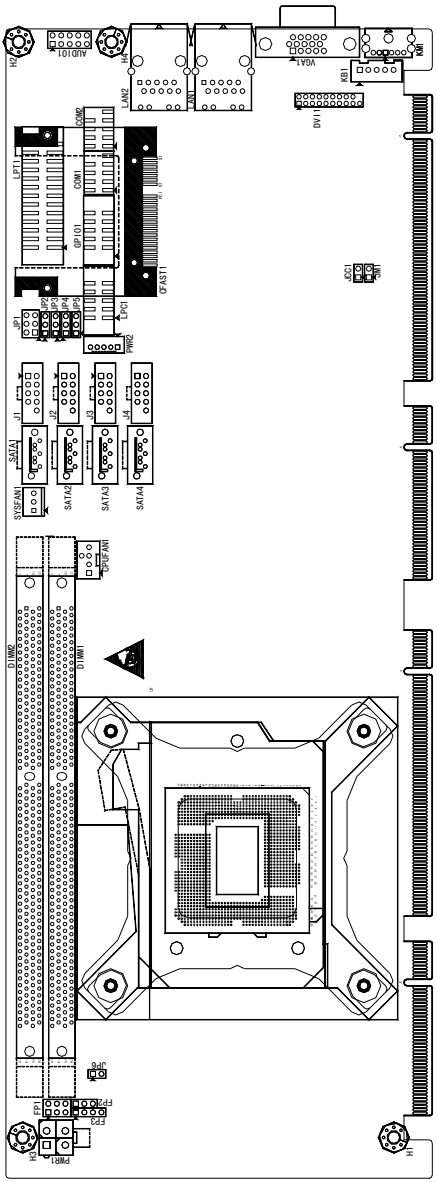


Unit: mm

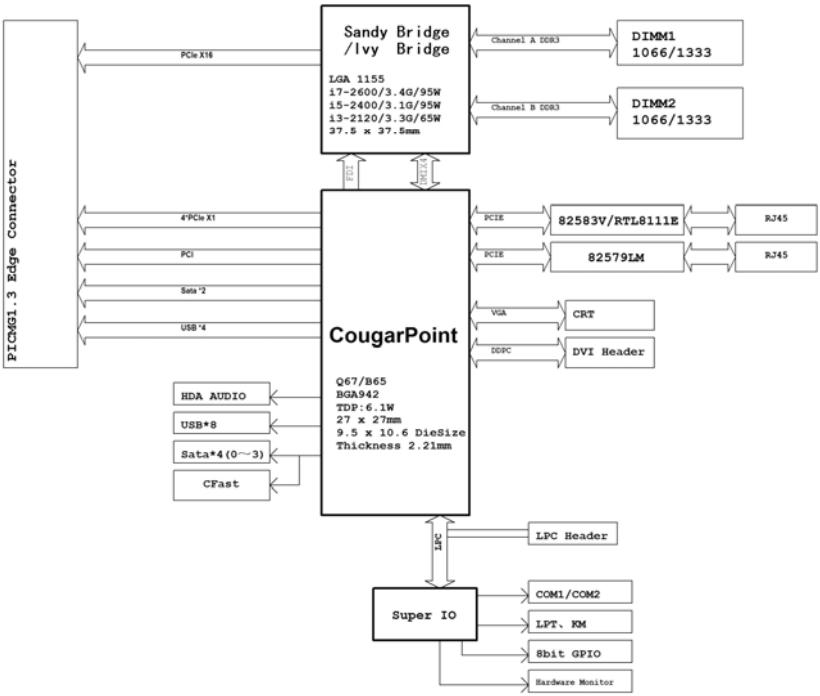
Warning!

Please adopt appropriate screws and proper installation methods (including board allocation, CPU and heat sink installation, etc); otherwise, the board may be damaged. It is recommended to use M3x6 GB9074.4-88 screws at H1 ~ H4.

Locations of Connectors



Structure


PICMG1.3 Edge Connector
PCIe X16
Sandy Bridge
/Ivy Bridge
LGA 1155
i7-2600/3.4G/95W
i5-2400/3.1G/95W
i3-2120/3.3G/65W
37.5 x 37.5mm
Channel A DDR3
DIMM1
1066/1333
Channel B DDR3
DIMM2
1066/1333
FDI
DMI X4
4*PCIe X1
PCI
Sata *2
USB *4
PCIE
82583V/RTL8111E
RJ45
PCIE
82579LM
RJ45
VGA
CRT
DDPC
DVI Header
CougarPoint
Q67/B65
BGA942
TDP:6.1W
27 x 27mm
9.5 x 10.6 DieSize
Thickness 2.21mm
HDA AUDIO
USB*8
Sata*4(0~3)
CFast
LPC
LPC Header
Super IO
COM1/COM2
LPT、KM
8bit GPIO
Hardware Monitor

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; the square pad is the first pin.

Jumper Setting

1. Clear/Keep CMOS Setting

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

(Pitch: 2.54mm)

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. JM1：Clear/Keep ME Setting

JM1

（Pitch：2.54mm）

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

Note: this function is not supported by B65.

3. Automatic Power-on When Connected with AC Power

To facilitate the application in unattended monitoring field, the following settings are adopted; the computer is powered on automatically when connected to AC power.

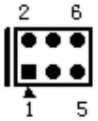
JP6

(Pitch: 2.54mm)

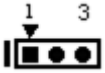
Setup	Function
1-2 Open	Power on the computer by pressing the PWRBTN# on the front panel(Default)
1-2 Short	Automatic Power-on When Connected with AC Power

4. Serial Port Configuration

COM1 The mode of the serial port can be set by JP1 ~ JP5 (Pitch: 2.54mm):



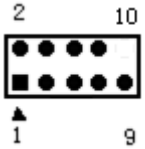
JP1



JP2 ~ JP5

Pin	Signal Name		
	RS-232	RS-485	RS-422
JP1	1-2	3-4	5-6
JP2	1-2	2-3	2-3
JP3	1-2	2-3	2-3
JP4	1-2	2-3	2-3
JP5	1-2	2-3	2-3

Serial Port



COM1/COM2

Pitch: 2.54mm

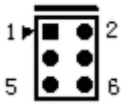
Pin	Signal Name		
	RS-232 （COM1/COM2）	RS-422 （COM1）	RS-485 （COM1）
1	DCD#	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	NC
4	DTR#	RXD-	NC
5	GND	GND	GND
6	DSR#	NC	NC
7	RTS#	NC	NC
8	CTS#	NC	NC
9	RI#	NC	NC
10	NA	NA	NA

Note:1.COM1 the data transmission direction is controlled automatically under RS485 mode.

2.Q67 chipset adopts the COM card with LPC expansion connector; when installing the driver, please make sure the serial port won't conflict with the SOL serial port of the AMT function.

Status Indicating and Control Connector

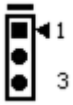
ATX Power Switch and HDD Indicator Connector



FP1
(Pitch: 2.54mm)

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

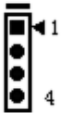
Power Indicator Connector



FP2 (Pitch: 2.54mm)

Pin	Signal Name
1	PWR_LED+
2	NC
3	GND

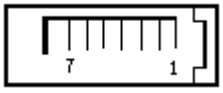
Loudspeaker Output Connector



FP3 (Pitch: 2.54mm)

Pin	Signal Name
1	SPEAKER
2	NC
3	GND
4	+5V

7pin SATA Connector

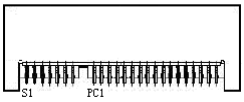


SATA1 ~ SATA3
SATA4 (Optional)

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Note: SATA4 and CFAST1 share resources and they are alternative.

CFAST Connector

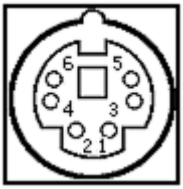


CFAST1

(On the rear of the board, optional)

Pin	Signal Name	Pin	Signal Name
S1	GND	PC6	NC
S2	TX+	PC7	GND
S3	TX-	PC8	NC
S4	GND	PC9	NC
S5	RX-	PC10	NC
S6	RX+	PC11	NC
S7	GND	PC12	NC
PC1	CDI	PC13	+3.3V
PC2	GND	PC14	+3.3V
PC5	NC	PC17	CDO

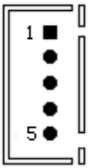
Mini 1-to-2 PS/2 Connector



KM1

Pin	Signal Name
1	KB_DATA
2	MS_DATA
3	GND
4	+5V
5	KB_CLK
6	MS_CLK

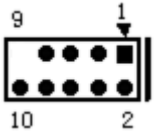
Keyboard Expansion Connector



KB1 (Pitch: 2.55mm)

Pin	Signal Name
1	KB_CLK
2	KB_DATA
3	NC
4	GND
5	+5V

USB Connector

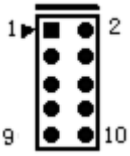


J1 ~ J4

(Pitch: 2.54mm)

Pin	Signal Name	Pin	Signal Name
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NA	10	GND

Audio Connector

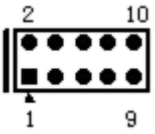


AUDIO1

(Pitch: 2.54mm)

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

GPIO Connector



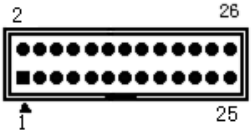
GPIO1

(Pitch: 2.54mm)

Pin	Signal Name	Pin	Signal Name
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	GND	10	NC

Note: the factory default values are Pin 1, 3, 5 and 7 are for TTL input while Pin 2, 4, 6 and 8 are for CMOS output. The factory default status is high level and the voltage range for IO signals are between 0 ~ 5V.

Parallel Port



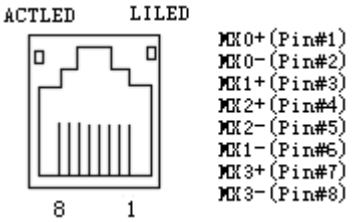
LPT1

(Pitch: 2.54mm)

Pin	Signal Name	Pin	Signal Name
1	STB#	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

LAN Port

The board provides one 10/100/1000Mbps LAN port, LAN1, which supports Wake-on-LAN, LAN PXE booting and AMT7.0 functions. ACTLED and LILED are the green and dual color LED indicators on both sides of the Ethernet port, which respectively indicates the activity status and the speed of LAN. Please refer to the status description for each LED:



LAN1（LAN2Optional)

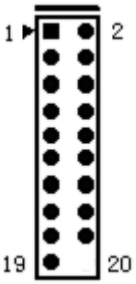
ACTLED (Green)	LAN Activity Status Indicator		LILED (Dual-Color: O/G)	LAN Speed Indicator
			Green	1000Mbps
Blink	Data Transmitting		Orange	100Mbps
Off	No Data to Transmit		Off	10Mbps

Standard DB15 VGA Connector

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		

DVI Connector

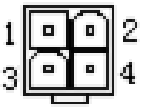


DVI1

(Pitch: 2.0mm)

Pin	Signal Name	Pin	Signal Name
1	DATA2-	2	DATA2+
3	GND	4	GND
5	DATA1-	6	DATA1+
7	GND	8	GND
9	DATA0-	10	DATA0+
11	GND	12	GND
13	CLK+	14	CLK-
15	+5V	16	HPDET
17	DDCDATA	18	DDCCLK
19	GND	20	NA

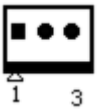
ATX 12V CPU Power Connector



PWR1
Pitch: 2.0mm

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

3-pin Fan Connector

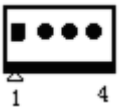


SYSFAN1
Pitch: 2.54mm

Pin	Signal Name
1	GND
2	+12V
3	FAN_IO

Note: FAN_IO: fan speed impulse output.

4-pin Fan Connector

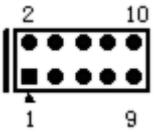


CPUFAN1
Pitch: 2.54mm

Pin	Signal Name
1	GND
2	+12V
3	FAN_IO
4	FAN_PWM

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

LPC Expansion Connector



LPC1
(Pitch: 2.54mm)

Pin	Signal Name	Pin	Signal Name
1	+3.3V	2	DATA3
3	FRAME#	4	DATA2
5	RESET	6	DATA1
7	SERIRQ	8	DATA0
9	GND	10	33MHz clk

LPC Expansion Power Connector

PWR2
Pitch: 2.0mm

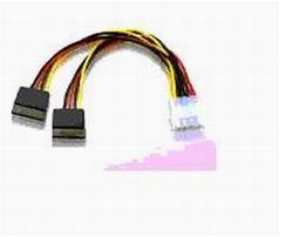
Pin	Signal Name
1	GND
2	VCC5
3	VCC5
4	GND
5	VCC5

Hot-swap of SATA Hard Disk

Notes for hot-swap of SATA hard disk:

1. The hard disk shall support SATA 2.0 and use 15-pin SATA hard disk power connector.
2. The driver of chipset shall support the hot-swap of SATA hard disk.
3. Hot-swap of SATA hard disk with the operating system is forbidden when system is powered-on.

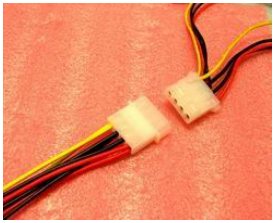
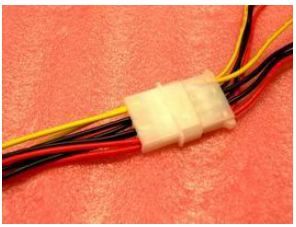
SATA Data Cable



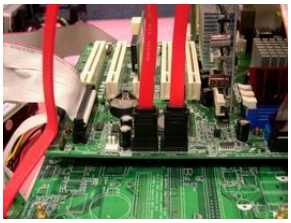
SATA Power Cable

Please carry out hot plugging as follows. Improper operation may destroy the hard disk or result in data loss.

Hot Plug

Step 1: Please plug the 1 x 4 pin SATA power connector (white) into the power adapter.



Step 2: Please connect the SATA data cable to the SATA connector on board.

Step 3: Please connect the 15-pin SATA power connector (black) to the SATA hard disk.

Step 4: Please connect the SATA data cable to the SATA hard disk.

Hot Unplug

Step 1: Uninstall the hard disk from the device manager.


Step 2: Unplug the data cable from the SATA hard disk.


Step 3: Unplug the SATA 15-pin power connector (black) from the SATA hard disk.

Chapter 3 BIOS Setup

UEFI Overview

UEFI (Unified Extensible Firmware Interface) is the latest computer firmware to replace traditional BIOS. UEFI is solidified in the flash memory on the CPU board. Its main functions include: initialize system hardware, set the operating status of the system components, adjust the operating parameters of the system components, diagnose the functions of the system components and report failures, provide hardware operating and control interface for the upper level software system, guide operating system and so on. UEFI provides users with a human-computer interface in menu style to facilitate the configuration of system parameters for users, control power management mode and adjust the resource distribution of system device, etc.

Setting the parameters of the UEFI correctly can enable the system to operate stably and reliably; meanwhile it can also improve the overall performance of the system. Improper even incorrect UEFI parameter setting will decrease the system operating capability and make the system unstable even unable to operate normally.

UEFI Parameter Setup

Prompt message for BIOS setting may appear once powering on the system. At that time (invalid at other time), press the key specified in the prompt message (usually <Del> or <F2>) to enter UEFI setting.

All the setup values modified by UEFI (excluding date and time) are saved in the flash storage in system; the contents will not be lost even if power is disconnected or the battery of the board is removed. The date and time are saved in CMOS storage, which is powered by battery; unless clearing CMOS is executed, its content would not be lost even if external power is cut off.

Note! UEFI setting will influence 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 UEFI to restore the system.

Our company is constantly researching and updating UEFI, its setup interface may be a bit different. The figure below is for reference only; it may be different from your UEFI setting in use.

Basic Function Setting for UEFI

After starting SETUP program, the main interface of Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc. will appear as below:

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc. copyright (C)	
Main Advanced Chipset Boot Security Save & Exit	
Motherboard Information Project Name EC7-1819V2NA BIOS Name P9146004 BIOS Version C01 Build Date and Time 07/16/2012 11:09:23 Total Memory 2048 MB (DDR3) Memory Frequency 1333 Mhz System Date [Thu 10/06/2011] System Time [09:41:55] Access Level Administrator	Set the Date. Use'Tab' to switch between Date elements. →←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **Main**

  - **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).

◆ **Advanced**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main **Advanced** Chipset Boot Security Save & Exit	
WARNING: Setting wrong values in below sections may cause system to malfunction! ▶ CPU Configuration ▶ SATA Configuration ▶ AMT Configuration ▶ USB Configuration ▶ Second Super IO Configuration ▶ Super IO Configuration ▶ H/W Monitor ▶ Serial Port Console Redirection ▶ CPU PPM Configuration	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **CPU Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
CPU Configuration	→←：Select Screen
Genuine Intel® CPU @ 2.20GHz	↑↓：Select Item
CPU Signature 306a4	Enter：Select
Microcode Patch 7	+/-：Change Opt
Max CPU Speed 2200 MHz	F1：General Help
Min CPU Speed 1600 MHz	F2：Previous Values
CPU Speed 2200 MHz	F3：Optimized Defaults
Processor Cores 4	F4：Save
Intel HT Technology Not Supported	ESC：Exit
Intel VT-x Technology Supported	
Intel SMX Technology Supported	
64-bit Supported	
L1 Data Cache 32 kB x 4	
L1 Code Cache 32 kB x 4	
L2 Cache 256 kB x 4	
L3 Cache 8192 kB	
Hyper-threading [Enabled]	
Active Processor Cores [All]	
Intel Virtualization Technology [Disabled]	
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

Display the relevant information of CPU. Note: the information to be displayed are related to the CPU installed in the platform, and different information will be displayed for different series of CPUs.

- **Hyper-Threading**

  Control switch of the Hyper Threading Technology function.

- **Active Processor Cores**

  Active CPU core number, only available for multi-core CPU.

- **Intel Virtualization Technology**

  Switch of the Intel virtualization technology.

➢ **SATA Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
SATA Controller(s) [Enabled] SATA Mode Selection [IDE] IDE Legacy/Native Mode Selection [Native] Serial ATA Port 1 Empty Serial ATA Port 2 Empty Serial ATA Port 3 Empty Serial ATA Port 4 Empty Serial ATA Port 5 Empty Serial ATA Port 6 Empty	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **SATA Controller(s)**

Switch of SATA Controller(s).

- **SATA Mode Selection**

SATA controller type selection, corresponding to three options: IDE, RAID and AHCI.

Note: when choosing AHCI or RAID Mode to implement system installation, the relevant drivers of the Floppy device and specific chipset are required.

- **Serial ATA Port 1～ 6**

SATA Port1 ~ 6 dynamically detect whether there are SATA devices on motherboard. If devices are connected with the corresponding ports, then it will display the SATA device type. Otherwise, it will display “Empty”.

- **IDE Legacy/Native Mode Selection**

IDE mode selection

➢ **AMT Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.		
Advanced		
Intel AMT	[Enabled]	→←：Select Screen
Un-Configure ME	[Disabled]	↑↓：Select Item
		Enter：Select
		+/-：Change Opt
		F1：General Help
		F2：Previous Values
		F3：Optimized Defaults
		F4：Save
		ESC：Exit

- **AMT**

  Set the Intel Active Management Technology, BIOS Extension. Note: the Intel AMT hardware is always Enabled. This option only controls the implementation of BIOS Extension (MEbx). If it is set to Enabled, relevant Firmware is required to be added in the SPI device. This option is only displayed for platforms that support AMT function.

- **UnConfigure ME**

  Switch for reconfiguring the ME without password. When it is set to Enabled, ME will be automatically re-configured (Load ME Default Value) during POST period without password.

➢ **USB Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
USB Configuration USB Devices: 1 Keyboard，1 Mouse, 2 Hubs Legacy USB Support [Enabled] Mass Storage Devices: Netac [Auto]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **Legacy USB Support**

This option is used to support legacy USB devices (keyboard, mouse, storage device, etc). When it is set to Enabled, the USB devices can be used in the OS that does not support USB, such as DOS. When it is set to Disabled, the legacy devices cannot be used in the OS that does not support USB.

Note: USB can be used in EFI application, such as in Shell.

➢ **Second Super IO Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Second Super IO Configuration ►Serial Port 3 Configuration ►Serial Port 4 Configuration ►Serial Port 5 Configuration ►Serial Port 6 Configuration	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- **Serial Port 3～6 Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Serial Port 3～6 Configuration	→←：Select Screen ↑↓：Select Item
Serial Port [Enabled]	Enter：Select
Device Settings IO=200h; IRQ=11;	+/-：Change Opt
	F1：General Help
Change Settings [Auto]	F2：Previous Values
	F3：Optimized Defaults
	F4：Save
	ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

*** Serial Port3～6**

This option is used to enabled or disable the current serial port.

*** Device Settings**

This option is used to display the current resource configuration of the serial port.

*** Change Settings**

This option is used to configure the resources (IO and IRQ) used by the serial port.

- **Super IO Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Super IO Configuration	→←：Select Screen ↑↓：Select Item
►Serial Port 0 Configuration	Enter：Select
►Serial Port 1 Configuration	+/-：Change Opt
►Parallel Port Configuration	F1：General Help
	F2：Previous Values
	F3：Optimized Defaults
	F4：Save
	ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- **Serial Port 0～1 Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Serial Port 0～1 Configuration	→←：Select Screen ↑↓：Select Item
Serial Port [Enabled]	Enter：Select
Device Settings IO=3F8h; IRQ=4;	+/-：Change Opt
	F1：General Help
Change Settings [Auto]	F2：Previous Values
	F3：Optimized Defaults
	F4：Save
	ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

*** Serial Port0～1**

This option is used to enabled or disable the current serial port.

*** Device Settings**

This option is used to display the current resource configuration of the serial port.

*** Change Settings**

This option is used to configure the resources (IO and IRQ) used by the serial port.

- **Parallel Port Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Parallel Port Configuration	→←：Select Screen ↑↓：Select Item
Parallel Port [Enabled]	Enter：Select
Device Settings IO=378h; IRQ=5;	+/-：Change Opt
	F1：General Help
Change Settings [Auto]	F2：Previous Values
Device Mode [STD Printer Mode]	F3：Optimized Defaults
	F4：Save
	ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

*** Parallel Port**

This option is used to enabled or disable the current parallel port.

*** Device Settings**

This option is used to display the current resource configuration of the parallel port.

*** Change Settings**

This option is used to configure the resources (IO and IRQ) used by the parallel port.

*** Device Mode**

This option is used to configure working mode of the parallel port.

- **H/W Monitor**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
PC Health Status	→←：Select Screen
	↑↓：Select Item
CPU Temperature : +57 C	Enter：Select
System Temperature : +26 C	+/-：Change Opt
	F1：General Help
SYSFAN1 : N/A	F2：Previous Values
CPUFAN1 : N/A	F3：Optimized Defaults
Vcore : +0.95 V	F4：Save
V3.3 : +3.296 V	ESC：Exit
V5.0 : +5.007 V	
V12.0 : +12.091 V	
VBAT : +3.21 V	
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

Display the currently detected hardware monitoring information, such as voltage, temperature, fan speed, etc.

- **System Temperature**

Current system temperature, usually monitored by the thermal resistor on motherboard.

- **CPU Temperature**

Current CPU temperature, monitored by the temperature sensor on the motherboard.

- **SYSFAN1/CPUFAN1**

Monitoring of current system fan and CPU fan speed.

- **Vcore**

CPU core voltage.

- **V3.3/ V5.0/V12.0**

Switching power output voltage.

- **VBAT**

CMOS battery voltage.

➢ **Serial Port Console Redirection**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
COM0(Disabled) Console Redirection Port Is Disabled COM1(Pci Bus0,Dev0,Func0) (Disabled) Console Redirection Port Is Disabled Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS) Console Redirection [Enabled] ►Console Redirection Settings	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

Display serial port redirection information

- **Console Redirection**

Enable or disable serial port redirection function.

➢ **CPU PPM Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
CPU PPM Configuration	→←：Select Screen ↑↓：Select Item
EIST [Enabled]	Enter：Select
Turbo Mode [Enabled]	+/-：Change Opt
CPU C3 Report [Enabled]	F1：General Help
CPU C6 Report [Enabled]	F2：Previous Values
CPU C7 Report [Enabled]	F3：Optimized Defaults
	F4：Save
	ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

Display the relevant information of CPU. Note: the relevant information of the CPU is related to the CPU installed within the platform, and different information will be displayed for different series of CPUs.

- **EIST**

Enable the SpeedStep function for CPU.

- **Turbo Mode**

Enable Turbo Mode function.

- **CPU C3～C7 Report**

Enable power saving function for CPU.

◆ **Chipset**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced **Chipset** Boot Security Save & Exit	
WARNING: Setting wrong values in below sections may cause system to malfunction! ▶ PCH-IO Configuration ▶ System Agent (SA) Configuration	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **PCH-IO Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.		
Chipset		
▶ USB Configuration		→←：Select Screen ↑↓：Select Item
LAN2 Controller	[Enabled]	Enter：Select
Audio Controller	[Auto]	+/-：Change Opt
PCIe Slot2 Speed	[Auto]	F1：General Help
PCIe Slot3 Speed	[Auto]	F2：Previous Values
PCIe Slot4 Speed	[Auto]	F3：Optimized Defaults
		F4：Save
		ESC：Exit
Restore AC Power Loss	[Last State]	
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.		

● **LAN2 Controller**

Enable control switch for LAN2;

- **Audio Controller**

Enable control switch for audio card;

- **PCIe Slot2-4 Speed**

Control switch for the speed of devices connected to PCIe Slot.

- **Restore AC Power Loss**

This option can set the system status when the computer is powered on after powered off under AC. “Power Off” is to make the system at power off status; “Power On” is to power on the system automatically; “Last State” is to recover the status before powering off.

- **USB Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Chipset	
USB Configuration EHCI1 [Enabled] EHCI2 [Enabled] USB Ports Per-Port Disable Control [Disabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

*** EHCI 1**

Switch for EHCI controller 1.

*** EHCI 2**

Switch for EHCI controller 2.

***** USB Ports Per-Port Disable Control

General control switch for USB Port.

***** USB 1~14 Disable

Switches for USB Port 1 ~ 14.

➢ **System Agent (SA) Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.		
Chipset		
System Agent Bridge Name	IvyBridge	→←：Select Screen
System Agent RC Version	1.5.0.0	↑↓：Select Item
VT-d Capability	Supported	Enter：Select
		+/-：Change Opt
VT-d	[Enabled]	F1：General Help
PEG0 – Gen X	[Auto]	F2：Previous Values
De-emphasis Control	[-3.5 dB]	F3：Optimized Defaults
		F4：Save
▶ Graphics Configuration		ESC：Exit
▶ Memory Configuration		
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.		

- **VT-d**

Switch for the Intel virtualization technology.

- **PEG0 – Gen X**

Speed control switch for PCIE1 device.

- **De-emphasis Control**

De-emphasis control switch for PCIE1 device.

➢ **Graphics Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
Graphics Configuration Primary Display [Auto] DVMT Pre-Allocated [64M] DVMT Total Gfx Mem [256M] Primary IGFX Boot Display [VBIOS Default] Secondary IGFX Boot Display [Disabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **DVMT Pre-Allocated**

Choose DVMT pre-allocated memory size.

- **DVMT Total Gfx Mem**

Choose DVMT total Gfx memory size.

- **Primary Display**

This option is used to specify the boot display device with priority.

- **Primary IGFX Boot Display**

Set the primary IGFX boot display device.

- **Secondary IGFX Boot Display**

Set the secondary IGFX boot display device.

➢ **Memory Configuration**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
Memory Information	
Memory Frequency 1067 Mhz	→←：Select Screen
Total Memory 2048 MB (DDR3)	↑↓：Select Item
DIMM1 Not Present	Enter：Select
DIMM2 2048 MB (DDR3)	+/-：Change Opt
CAS Latency(tCL) 7	F1：General Help
Minimum delay time	F2：Previous Values
CAS to RAS (tRCDmin) 7	F3：Optimized Defaults
Row Precharge (tRPmin) 7	F4：Save
Active to Precharge (tRASmin) 20	ESC：Exit
XMP Profile 1 Not Supported	
XMP Profile 2 Not Supported	
Memory Remap [Enabled]	
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

- **Memory Remap**

This option is used on the platform with North Bridge supporting above 4G (for example: 64GB), which will map the addresses occupied by legacy device below 4G, such as BIOS, APIC, PCIE, PCI MEMORY, etc. to that above 4G. Therefore, when several physical memory modules are installed, the OS can use more physical memories.

◆ **Boot**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced Chipset **Boot** Security Save & Exit	
Boot Configuration Quiet Boot [Disabled] **Boot Option Priorities** Boot Option #1 [Netac] Boot Option #2 [UEFI:Netac] **Hard Drive BBS Priorities**	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **Quiet Boot**

Boot mode selection switch, which is used to enable or disable Quiet Boot function.

➢ **Boot Option Priorities**

This option is used to configure the system booting priorities. #1 represents the highest priorities while #n represents the lowest priorities.

➢ **Hard Drive BBS Priorities**

This option is used to configure the priorities of the legacy devices in BBS. #1 represents the highest priorities while #n represents the lowest priorities.

◆ **Security**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot **Security** Save & Exit	
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: Minimum length 3 Maximum length 20 Administrator Password User Password	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **Administrator Password**

This option is used to set administrator password.

➢ **User Password**

This option is used to set user password.

◆ **Save & Exit**

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.	
Main Advanced Chipset Boot Security **Save & Exit**	
Save Changes and Reset Discard Changes and Reset Boot Override Netac UEFI:Netac	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.14.1219. Copyright (C) 2011,American Megatrends, Inc.	

➢ **Save Changes and Reset**

The option is used to save changes and reset.

➢ **Discard Changes and Reset**

The option is used to discard changes and reset.

➢ **Boot Override**

This option is used to choose boot device.

System Resource Managed by UEFI under X86 Platform

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

◆ **DMA**

Level	Function
DMA0	Unassigned
DMA1	Unassigned
DMA2	Unassigned

DMA3	Unassigned
DMA4	Used for DMAC cascade
DMA5	Unassigned
DMA6	Unassigned
DMA7	Unassigned

◆ **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.

◆ **IO Port Address**

Only 16 IO address lines are designed for X86, from 0 ~ 0FFFFh; there is 64K for the system I/O address space. In traditional ISA connector, only the foregoing 1024 (0000 ~ 03FFh) are adopted while the ports above 0400h are adopted by PCI and EISA connectors. Each peripheral will occupy portion of the space. The table below shows the I/O connectors used in X86 platform.

Address	Device Description
000h - 01Fh	DMA Controller
00h – CF7h	PCI bus
010h - 01Fh	Motherboard Resource
020h - 021h	Programmable Interrupt Controller
022h - 03Fh	Motherboard Resource
024h - 025h	Programmable Interrupt Controller
028h - 029h	Programmable Interrupt Controller

02Ch – 02Dh	Programmable Interrupt Controller
02Eh - 02Fh	Motherboard Resource
02Eh - 02Fh	Motherboard Resource
030h - 031h	Programmable Interrupt Controller
034h - 035h	Programmable Interrupt Controller
038h – 039h	Programmable Interrupt Controller
03Ch – 03Dh	Programmable Interrupt Controller
040h - 043h	System Timer
044h - 05Fh	Motherboard Resource
04Eh - 04Fh	Motherboard Resource
050h - 053h	System Timer
060h	Standard 101/102 Key or Microsoft Natural PS/2
061h	Motherboard Resource
062h – 063h	Motherboard Resource
063h	Motherboard Resource
064h	Standard 101/102 Key or Microsoft Natural PS/2
065h	Motherboard Resource
065h - 06Fh	Motherboard Resource
067h	Motherboard Resource
070h	Motherboard Resource
070h - 077h	Real Time Clock, NMI
072h – 07Fh	Motherboard Resource
080h	Motherboard Resource
080h	Motherboard Resource
081h - 091h	DMA Controller
084h - 086h	Motherboard Resource

088h	Motherboard Resource
08Ch – 08Eh	Motherboard Resource
090h - 09Fh	Motherboard Resource
092h	Motherboard Resource
093h – 09Fh	DMA Controller
0A0h - 0A1h	Programmable Interrupt Controller
0A2h – 0BFh	Motherboard Resource
0A4h - 0A5h	Programmable Interrupt Controller
0A8h - 0A9h	Programmable Interrupt Controller
0ACh - 0ADh	Programmable Interrupt Controller
0B0h – 0B1h	Programmable Interrupt Controller
0B2h – 0B3h	Motherboard Resource
0B4h – 0B5h	Programmable Interrupt Controller
0B8h – 0B9h	Programmable Interrupt Controller
0BCh – 0BDh	Programmable Interrupt Controller
0C0h – 0DFh	DMA Controller
0E0h - 0EFh	Motherboard Resource
0F0h - 0FFh	Numeric data processor
274h – 277h	ISAPNP Read Data Port
279h	ISAPNP Read Data Port
2C0h – 2C7h	COM 6
2C8h – 2CFh	COM 5
2D0h – 2D7h	COM 4
2D8h – 2DFh	COM 3
2F8h - 2FFh	COM 2
3B0h – 3BBh	Intel(R) HD Graphics

3C0h – 3DFh	Intel(R) HD Graphics
3F8h - 3FFh	COM 1
400h - 453h	Motherboard Resource
454h –457h	Motherboard Resource
458h –47Fh	Motherboard Resource
4D0h – 4D1h	Motherboard Resource
4D0h – 4D1h	Programmable Interrupt Controller
500h - 57Fh	Motherboard Resource
680h - 69Fh	Motherboard Resource
A00h – A0Fh	Motherboard Resource
A30h – A3Fh	Motherboard Resource
A79h	ISAPNP Read Data Port
0D00h-FFFFh	PCI bus

◆ **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.

Level	Function
IRQ0	System Timer
IRQ1	PS2 Keyboard
IRQ2	Programmable Interrupt Controller
IRQ3	COM2
IRQ4	COM1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	Reserved
IRQ8	System CMOS/Real Time Clock
IRQ9	ACPI-compliant system
IRQ10	Reserved
IRQ11	COM3/4/5/6
IRQ12	Mouse
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel

Chapter 4 Installing the Drivers

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

Appendix

Watchdog Programming Guide

The board provides a programmable watchdog timer (WDT) up to 255 levels and timed by minute or second. Watchdog timeout event can be programmed to reset system or generate maskable interrupts.

The available IRQ numbers for this board are: 3, 4, 5, 7, 9, 10 and 11.

Note: the instructions for the interrupt mode are only suitable for the OS with both ACPI and APIC enabled.

The following describes WDT program in C language. The steps to program WDT are listed as follows:

- Enter WDT programming mode;
- Set WDT operating mode, enable WDT/disable WDT.

(3) Enter WDT Programming Mode

```
/*
    Description: the function, PreInitWDT, is used to initialize the registers relevant
  to WDT; please invoke the function before configuring and using WDT.
    Input: none
    Output: none
    Note: none
*/

        #define     INDEX_PORT   0x2E
        #define     DATA_PORT          0x2F

VOID PreInitWDT()
{
        outportb(INDEX_PORT, 0x87);
        outportb(INDEX_PORT, 0x87);
```

```
    outportb(INDEX_PORT, 0x07);
    outportb(DATA_PORT, 0x08);
    outportb(INDEX_PORT, 0x30);
    outportb(DATA_PORT, 0x01);
    outportb(INDEX_PORT, 0x07);
    outportb(DATA_PORT, 0x09);
    outportb(INDEX_PORT, 0x30);
    outportb(DATA_PORT, 0x04);

}
```

(4) Configure the WDT operating mode to enable or disable WDT

/*

Description: the function, SetWDT, is used to configure the parameter required when configuring WDT to enable or disable WDT.

Input: Wmode: 0 - Configure WDT to reset mode

IRQ_NO - Configure WDT to interrupt mode. Please replace the constant IRQ_NO with the interrupt number need to be used. The available range of the interrupt number has been listed in the beginning of this chapter

Wtime: 0 - Configure WDT to time by minute

1 - Configure WDT to time by second

Timeout: 0 - disable WDT

TIME_OUT_VALUE - Enable WDT. Please replace the constant TIME_OUT_VALUE with the unit number of timeout value (0x01 ~ 0xFF)

Note:

*/

```
SetWDT(int Wmode,    int Wtime,    int Timeout)
```

```
{
        unsigned char oldval, tempval, tempval2;

      outportb(INDEX_PORT,0xe0);
        tempval2 = inportb(DATA_PORT);
      tempval2 &= 0xef;
      outportb(DATA_PORT, tempval2);          ;Set GPIO24 to output pin.

        outportb(INDEX_PORT,0xe9);
        oldval = inportb(DATA_PORT);

  If (Wmode == 0)
      {
        oldval |= 0x10;                       //cr e9h,bit 4: 0--- GPIO,1---WDT
        outportb(DATA_PORT, oldval);
      }
  else
      {
        oldval &= 0xef;
        outportb(DATA_PORT, oldval);

       outportb(INDEX_PORT, 0x07);
       outportb(DATA_PORT, 0x08);

        outportb(INDEX_PORT,0xf7);
        outportb(DATA_PORT, Wmode);
```

```
        }

            outportb(INDEX_PORT, 0x07);
            outportb(DATA_PORT, 0x08);

          outportb(INDEX_PORT,0xf5);
    If (Wtime == 0)
            outportb(DATA_PORT,0x08);
    Else
            outportb(DATA_PORT,0x00);
    outportb(INDEX_PORT,0xf6);
    If (Timeout == 0)
            outportb(DATA_PORT,0x00);
    Else
            outportb(DATA_PORT, Timeout);

}
```

GPIO Programming Guide

The board provides 8-channel programmable digital IO pins, four for input while the other four for output.

The following provides digital I/O program in C language; please follow the steps below to implement digital I/O programming:

(The GPIO Input PIN on the board include: GP05, GP06, GP30 and GP31; the Output PIN include: GP47, GP76, GP36 and GP35)

- Initialize digital I/O
- Input/output program

1. Initialize Digital I/O:

```
#define     INDEX_PORT   0x2E
#define     DATA_PORT          0x2F
VOID PreInitGPIO()
    {

        outportb(INDEX_PORT,0x87);
        outportb(INDEX_PORT,0x87);
        outportb(INDEX_PORT,0x07);
        outportb(DATA_PORT,0x09);
        outportb(INDEX_PORT,0x30);
        outportb(DATA_PORT,0x98);     // enable GPIO3,4,7.

        outportb(INDEX_PORT,0x07);
        outportb(DATA_PORT,0x08);
        outportb(INDEX_PORT,0x30);
        outportb(DATA_PORT,0x02);     //enable GPIO0
    }
        outportb(INDEX_PORT,0x24);
        Temp_val=inportb(DATA_PORT)&0xBF;
        outportb(DATA_PORT, Temp_val);      //GP05,GP06 select as gpio

        outportb(INDEX_PORT,0x27);
        Temp_val=(inportb(DATA_PORT)|0x40)
        outportb(DATA_PORT, Temp_val);      //GP76 select as gpio
```

```
outportb(INDEX_PORT,0x2B);
Temp_val=inportb(DATA_PORT)|0x63;
outportb(DATA_PORT, Temp_val);      //GP30, GP31, GP35, GP36
select as gpio

outportb(INDEX_PORT,0x1B);
Temp_val=inportb(DATA_PORT)|0x80;
outportb(DATA_PORT, Temp_val);      // GP47 select as gpio

outportb(INDEX_PORT, 0xe4);
Temp_val=inportb(DATA_PORT) &0x9F;
outportb(DATA_PORT, Temp_val);         // //config gp05, 06 to gpio.

outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x09);
outportb(INDEX_PORT, 0Xea);
Temp_val=inportb(DATA_PORT) &0x9C;
outportb(DATA_PORT, Temp_val);         // //config gp30, gp31, 35, 36 to
gpio.

outportb(INDEX_PORT, 0Xee);
Temp_val=inportb(DATA_PORT) &0x7F;
outportb(DATA_PORT, Temp_val);         // //config gp47 to gpio.

outportb(INDEX_PORT,0x07);
```

```
outportb(DATA_PORT,0x07);
outportb(INDEX_PORT, 0Xec);
Temp_val=inportb(DATA_PORT) &0xbf;
outportb(DATA_PORT, Temp_val);          // //config gp76 to gpio.
```

Note: when using the GPIO with multi-function PIN, please initialize it to GPIO function first.

2. Input/output program:

```
outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x09);

outportb(INDEX_PORT, 0xe4);
Temp_val=(inportb(DATA_PORT)|0x03)&0x9F;
outportb(DATA_PORT,  Temp_val);          //  //config  gp30,31
input,gp35,36output.

outportb(INDEX_PORT, 0Xf0);
Temp_val=inportb(DATA_PORT)|&0x7F;
outportb(DATA_PORT, Temp_val);          // //config gp47 output.

outportb(INDEX_PORT,0x07);
outportb(DATA_PORT,0x07);
outportb(INDEX_PORT, 0Xe0);
Temp_val=inportb(DATA_PORT)&0xBF;
outportb(DATA_PORT, Temp_val);          //gp76 output.
```

```
outportb(INDEX_PORT,0x07);

outportb(DATA_PORT,0x08);

outportb(INDEX_PORT, 0Xe0);

Temp_val=inportb(DATA_PORT) |0x60;    .

outportb(DATA_PORT, Temp_val);          //config gp05,06 to input
```

3. Complete programming

```
outportb(0x2e, 0xaa);
```

Troubleshooting and Solutions

NO.	Phenomenon	Troubleshooting and Solution
1	BIOS setting cannot be saved	Analysis: it could be the problem of the CMOS battery.
		Solution: measure the CMOS battery with a multi-meter; if the voltage is insufficient, replace the battery; re-set the BIOS and save again.
2	The computer can only be powered-on occasionally	Analysis: it may be caused by poor connection. Remove the power plug from power socket on motherboard, you may find that certain pin of the motherboard power has been collapsed to one side after some forceful insertion.
		Solution: power off the computer and remove the power plug; erect the bended power pin with tweezers and re-insert in the power socket. Reboot the computer and test for several times until the problem no longer exits.
3	When connecting with a USB flash drive, the system prompts that a high-speed device has been connected with a low-speed connector.	Analysis: A USB flash drive is a high-speed USB2.0; when connecting with the computer, it prompts that a high-speed device has been connected with a low-speed connector, which indicates that the connector on motherboard is regarded as a USB1.1 port.
		Solution: enable the USB high-speed transmission mode on the motherboard. Different motherboards may have different settings. Change the FULLSPEED option to HISPEED in USB device option.
4	The screen has no display after replacing with a new memory and cannot enter system; even when the former memory is re-installed, the system cannot be booted as well.	Analysis: it could result from improper operation when inserting or removing the memory and cause abnormal operation of the components on the motherboard. Focus on the circuit related to the memory on the motherboard.
		Solution: check the hardware such as memory, video card first; if it shows that the hardware are all OK, then check the circuit around the memory slot on motherboard carefully; you may find that the two pins connected with the gold finger in the first memory slot are shorted while the second memory slot is normal, then you may know that there is short circuit in the first memory slot. Remove the two pins to their original location with tweezers carefully, insert the memory, reboot the system and the system will be booted smoothly.

5	The system cannot be booted after replacing a CD-ROM.	Analysis: the data cable of the hard disk may get knocked when installing the CD-ROM, which leads to poor connection of the hard disk data cable, or the master and slave jumpers on hard disk and CD-ROM are wrongly set.
		Solution: check the data cable of the hard disk and the IDE connectors on hard disk and motherboard first; if there are no problems, then check the master and slave jumper setting. You may find that the hard disk and CD-ROM are connected with different data cables while their jumpers are all set to master; thus, the hard disk cannot be booted. Set the CD-ROM jumper to slave and then re-install it.
6	No PCI card can be detected after entering the system.	Analysis: make sure the PCI card functions normally; re-insert the PCI card or insert it into another PCI slot to see whether it is normal; find out the power type in use (AT or ATX); find out users' requirement for the PCI card voltage.
		Solution: if the PCI card functions abnormally, replace it with a new one; if it functions normally when re-inserted or inserted in another PCI slot, then there is something wrong between the PCI card and the slot. If AT power is adopted and the PCI card requires 3.3V voltage, then the AT power shall be replaced with ATX power because AT power cannot provide 3.3V voltage. (Suggestion: when purchasing power supplies, please check whether the PCI card in use requires 3.3V voltage or not).
7	No peripheral devices can be detected.	Analysis: devices are not connected; no drivers are loaded; devices are broken.
		Solution: check whether the cable between the device and the motherboard is normal; if it is normal, replace it with a new cable to make sure the connection is OK. Re-install the device driver and check whether it can be recognized; check whether the device is normal; if the device is normal, then check whether the device is compatible with the motherboard.