

HABEY HB132

Mini-ITX Motherboard

User Manual V1.0

Safety Instructions

1. Please read this manual carefully before using this product.
2. Put all unused or uninstalled boards/cards in a static dissipative surface or static shielding bag.
3. Always ground yourself to remove any static discharge before touching the board , to place your hands on grounding metal object for a while or wear a grounding wrist strap at all times.
4. When taking or fetching the boards or cards, please wear antistatic gloves and have the habit of holding the cards by edges.
5. Make sure that your power supply is set to the correct voltage in your area. Incorrect voltage may cause personal injuries and damage the system.
6. To prevent electronic shock hazard or any damage to the product, please ensure that all power cables for the devices are unplugged when adding or removing devices or reconfiguring the system.
7. To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
8. When adding or removing devices to or from the system, ensure that all the power cables for the devices are unplugged in advance.
9. To prevent any unnecessary damage to the products due to frequent power on/off, please wait at least 30 seconds to restart the unit after the shutdown.
10. If system goes wrong during the operation, do not try to fix it by yourself. Contact a qualified service technician or your retailer.
11. This product belongs to Class A, which may cause radio interference. In this situation, users need to take measures against the radio interference.

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Chapter 1. Product Introduction

Chapter 1 Product Introduction

1.1 Specifications

Form Factor

- Standard Mini-ITX Motherboard

Dimension

- 170mm×170mm (L×W)

CPU

- Intel Sandy (Ivy) Bridge Processors

Chipset

- Intel H61

Display

- VGA: 1x standard DB15 VGA, resolution up to 2048×1536@60Hz

Memory

- 1x U-DIMM slot supports DDR3 1066/1333/1600MHZ RAM up to 8GB.

Storage

- 2x standard 7 Pin SATA port

LAN

- 1x standard RJ45 LAN port
- Transfer rate: 10/100/1000Mbps

USB

- 10x USB 2.0 ports: external 4x USB 2.0, 3x 2X5Pin USB header, to be converted to 6x USB2.0 ports.

I/O

- Adopt W83627DHG-P I/O chip
- 10x COM ports: one standard DB9 serial port, one 2 x 5Pin headers, two 2x20Pin header. COM1_COM10 support RS232. COM2 also supports RS485 (optional)
- 1x LPT expansion interface

Power Supply

- Standard ATX 20Pin + 4Pin

Watchdog

- Trigger system reset function

BIOS

- 4MB SPI BIOS

Environment

- Operating Temperature: 0°C ~ 60°C
- Storage Temperature: -40°C ~ 85°C
- Operating Humidity: 5% ~ 95%, non-condensing



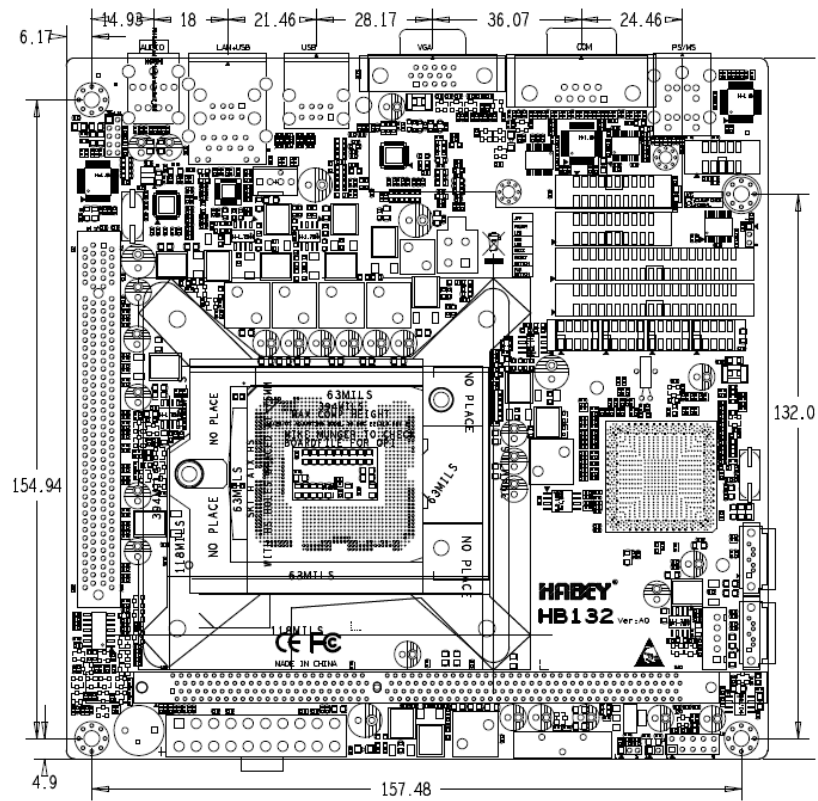
Chapter 2. Installation Instructions

Chapter 2 Installation Instructions

2.1 Interfaces Location & Dimension

Following picture illustrates the interfaces location and dimension of board HB132. Please take care of some components during the installation. Improper installation may leads to system failure.

Note: In case of any electrostatic damage caused to some components, please wear anti-static gloves to install the motherboard.




HABEY HB132 Interfaces Location & Dimension

2.2 Installation Steps

Please refer to following steps to assemble your computer:

1. Adjust all Jumpers on board HABEY HB132 according to the user manual.

2. Install Memory
3. Install other expansion cards
4. Connect all signal lines, cables, control panel circuit and power supply unit.
5. Start the computer and complete BIOS Settings.

 **Key components of this motherboard are Integrated circuit, and these components could be easily damaged by electrostatic influence. So, before installing this unit, please always keep the following precautions in mind:**

1. Hold the board by edges and don't touch any components, plugs or socket pins.
2. Wear anti-static gloves/wrist strap while touching the integrated circuit components, such as CPU, RAM, etc.
3. Put those unused or uninstalled components in static shielding bags or trays.
4. Please first check the power switch is off before connecting the power plug.

2.3 Install Memory

Board provides 1x DDRIII memory slot. Please pay attention to following two points when installing the memory bank:

1. Align the notch of the DIMM memory bank with that of the socket. Insert the memory bank into the socket and press the memory bank vertically and evenly on both sides until the memory bank enters into the slot.
2. Select the memory bank that matches your motherboard.

2.4 Jumper Settings

Please refer to following instructions to do jumper settings before installing your hardware devices.

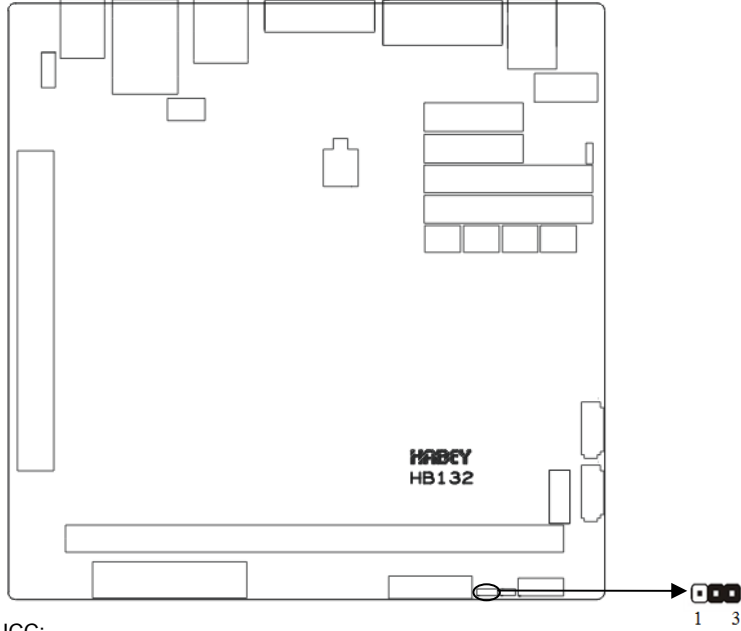
Remark: How to identify the PIN1 of all jumpers and interfaces: Please observe the word mark on the side of the plug socket, which will be a "1" or bold line or triangular symbol; And please look at the back of PCB, each with a square shape will be the PIN 1; and all the jumpers' PIN1 have a white arrow on the side.

2.4.1 CMOS Clear/Hold Jumper Setting (JCC)

CMOS is powered by the onboard button cell. Clear CMOS will lead to permanent elimination of previous system settings (factory default) .

Steps: (1) Turn off the computer, disconnect power supply

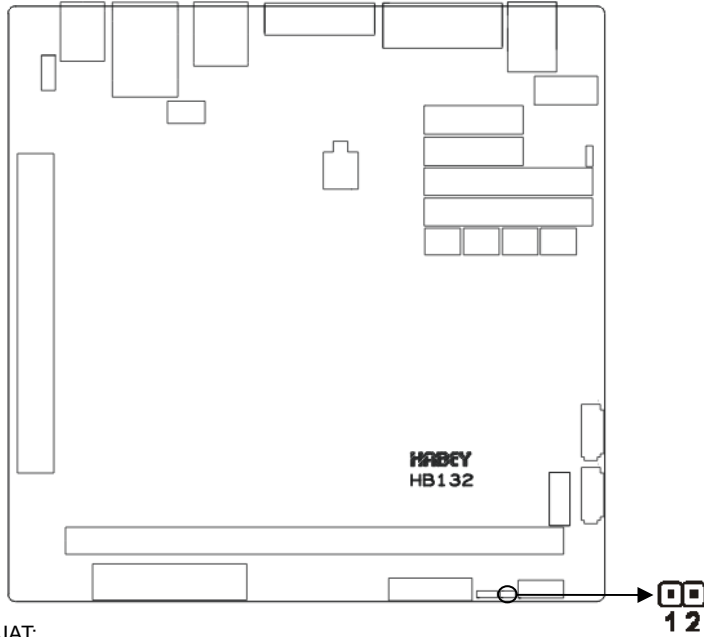
- (2) Use jumper Cap JCC Pin1-2 short for 5~6 seconds, then restore the default setting with Pin2-3 connected.
- (3) Start the computer, then press "Del" to enter BIOS setting and reload optimal defaults.
- (4) Save and Exit



JCC:

Setting	JCC
1-2	Clear CMOS, BIOS back to factory default
2-3	Normal status, system default

⚠ Do not clear CMOS when the computer is power on, otherwise, it will cause damage to the motherboard !

2.4.2 Hardware Switch for System Auto Boot upon Power On (JAT)

JAT:

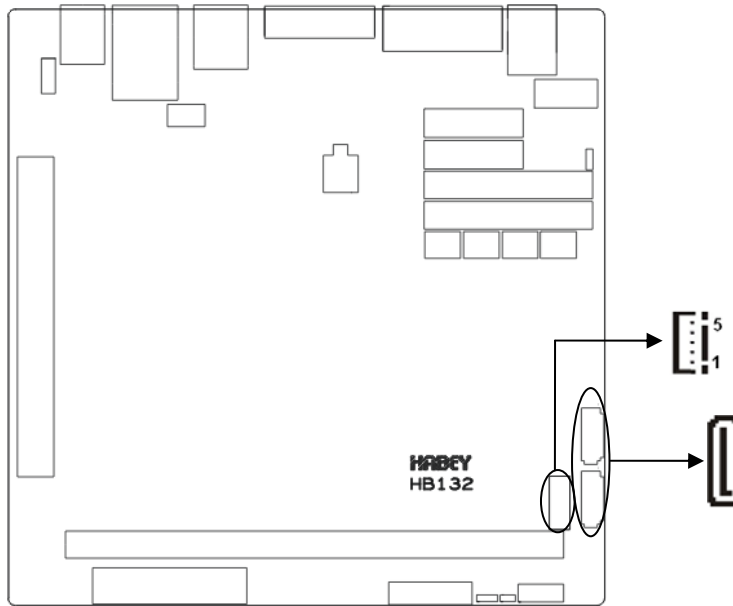
Setting	JAT
Open	Disable Auto Boot
Close	Enable Auto Boot

2.5 Interfaces Description

⚠ Please read this manual carefully before installing any external connectors, in case of any damage to the motherboard!

2.5.1 SATA Ports (SATA1, SATA2, J9)

Board provides 2x standard 7Pin SATA ports. One 5Pin SATA_PWR interface J9 to provide power to SATA HDD.

**SATA:**

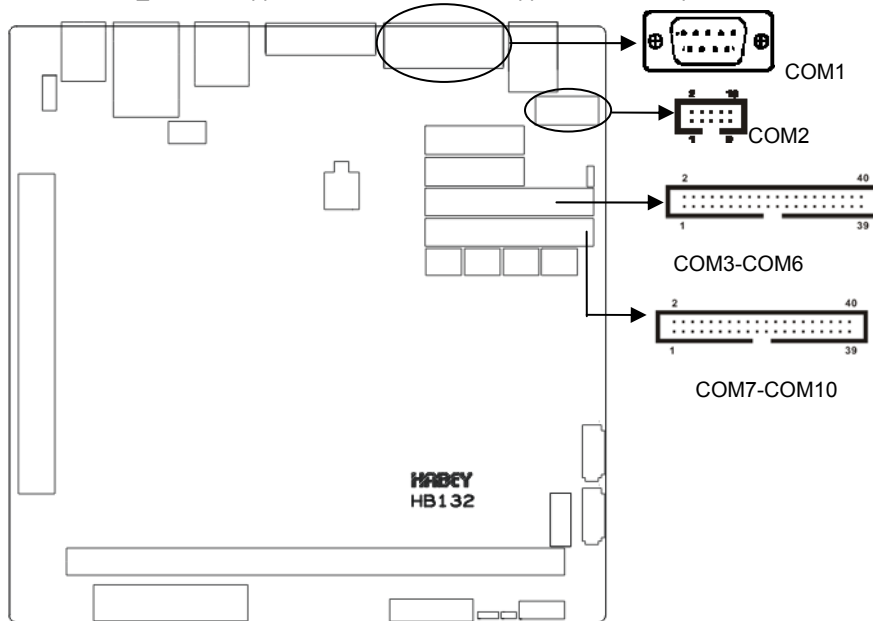
Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

J9:

Pin	Signal Name
1	+12V
2	GND
3	VCC
4	GND
5	VCC3

2.5.2 Serial Ports (COM1, COM2, COM3_COM6, COM7_COM10)

Board provides 10x COM ports: 1x standard DB9 COM port, one 2x5PIN header, two 2x20PIN header. COM1_COM10 support RS232. COM2 also supports RS485 (optional) .



COM1:

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

COM2:

Signal Name	Pin		Signal Name
DCD	1	2	DSR
SIN	3	4	RTS
SOUT	5	6	CTS

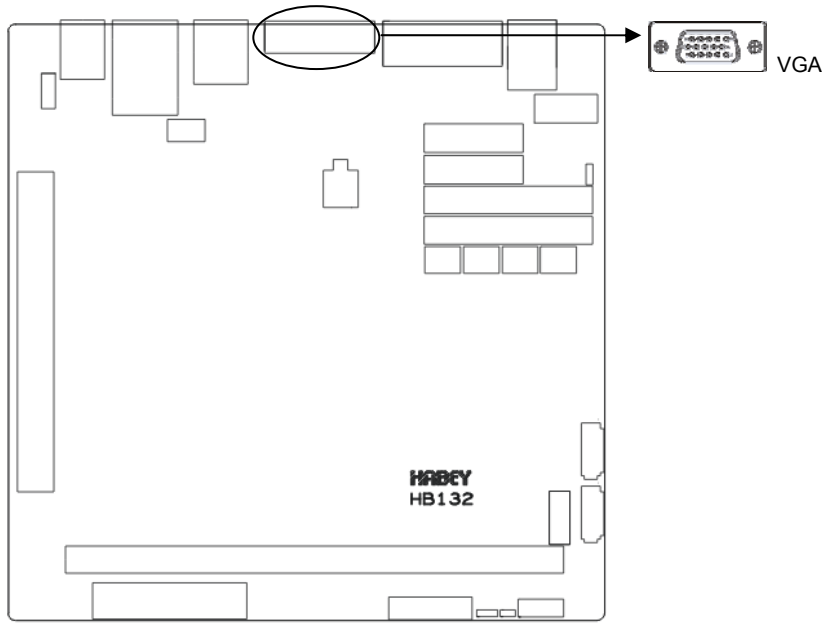
DTR	7	8	RI
GND	9	10	GND

COM3_COM6, COM7_COM10:

Signal Name	Pin		Signal Name
DCD3	1	2	DSR3
RXD3	3	4	RTS3
TXD3	5	6	CTS3
DTR3	7	8	RI3
GND	9	10	GND
DCD4	11	12	DSR4
RXD4	13	14	RTS4
TXD4	15	16	CTS4
DTR4	17	18	RI4
GND	19	20	GND
DCD5	21	22	DSR5
RXD5	23	24	RTS5
TXD5	25	26	CTS5
DTR5	27	28	RI5
GND	29	30	GND
DCD6	31	32	DSR3
RXD6	33	34	RTS6
TXD6	35	36	CTS6
DTR6	37	38	RI6
GND	39	40	GND

2.5.3 Display Interface (VGA)

Onboard 1x standard DB15 VGA port.

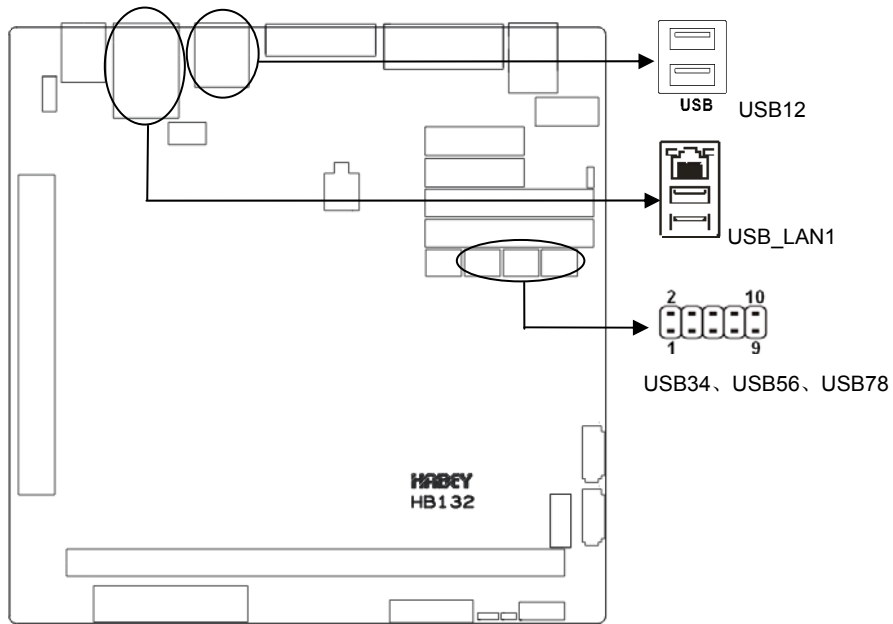


VGA:

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	SDA
3	BLUE	8	GND	13	HSYNC
4	NC	9	+5V	14	VSYNC
5	GND	10	GND	15	SCL

2.5.4 LAN_USB Port (USB_LAN1, USB12, USB34, USB56, USB78)

External USB & LAN ports, two separate sockets provide 2x standard USB 2.0 ports and 1x standard RJ45 LAN port. USB_34/USB_56/USB_78 are internal USB ports. Three 2x5Pin header are able to be converted to 6x standard USB ports. There will be one LED lamp on each side of the RJ-45 LAN port. The yellow one indicates data transfer status. The green one indicates network link status.



USB:

Pin	Signal Name
1	+5V
2	USB DATA-
3	USB DATA+
4	GND

USB_34, USB_56, USB_78:

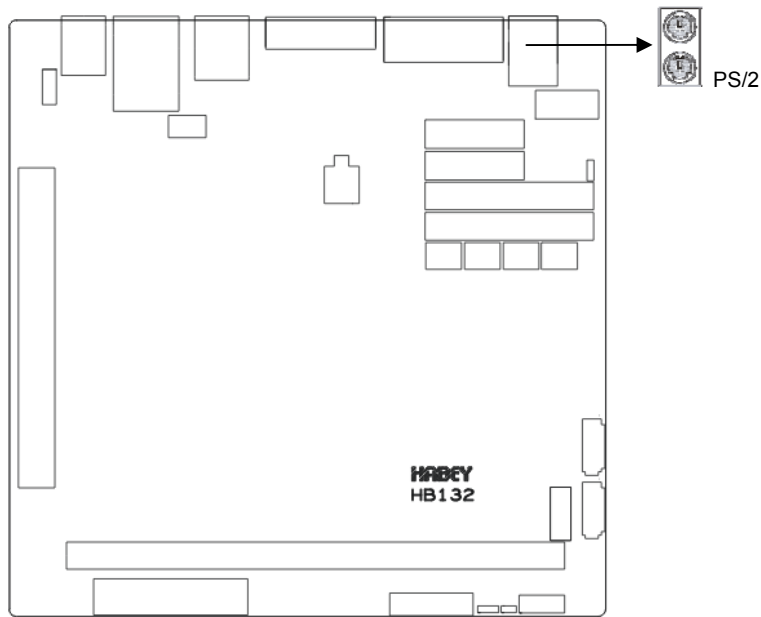
Signal Name	Pin		Signal Name
VCC	1	2	GND
USBD_N5	3	4	GND
USBD_P5	5	6	USBD_P6
GND	7	8	USBD_N6
GND	9	10	VCC

LAN_LED:

LILED (GREEN)	Function	ACTLED (YELLOW)	Function
On	10/100/1000M	Flash	Data transfer

2.5.5 Keyboard and Mouse Interface (KBMS)

Board provides one standard PS/2 KB/MS port.

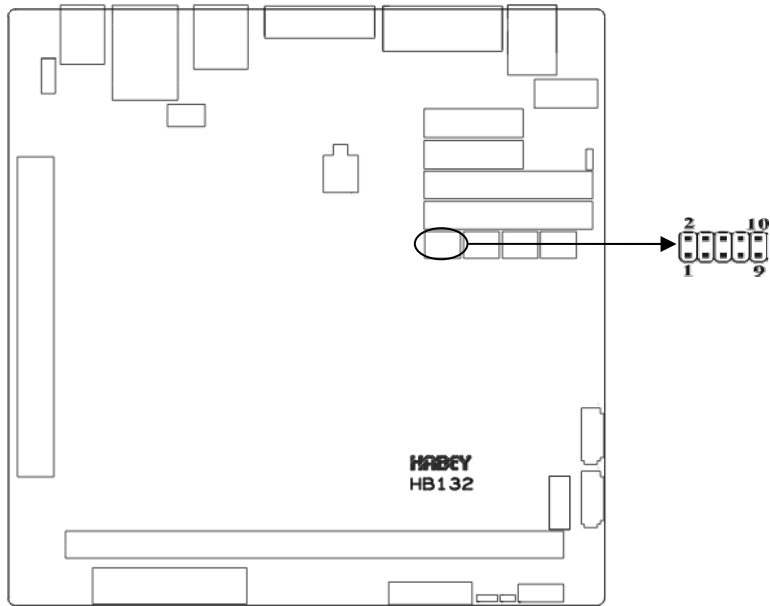


KB/MS:

Pin	Signal Name
1	+5V
2	GND
3	NC
4	KB_DATA
5	KB_CLK
6	NC
7	+5V
8	GND
9	NC
10	MS_DATA
11	MS_CLK
12	NC

2.5.6 GPIO (JGP)

General Purpose Input/Output Port, 8bit GPIO. One 2×5Pin Header.

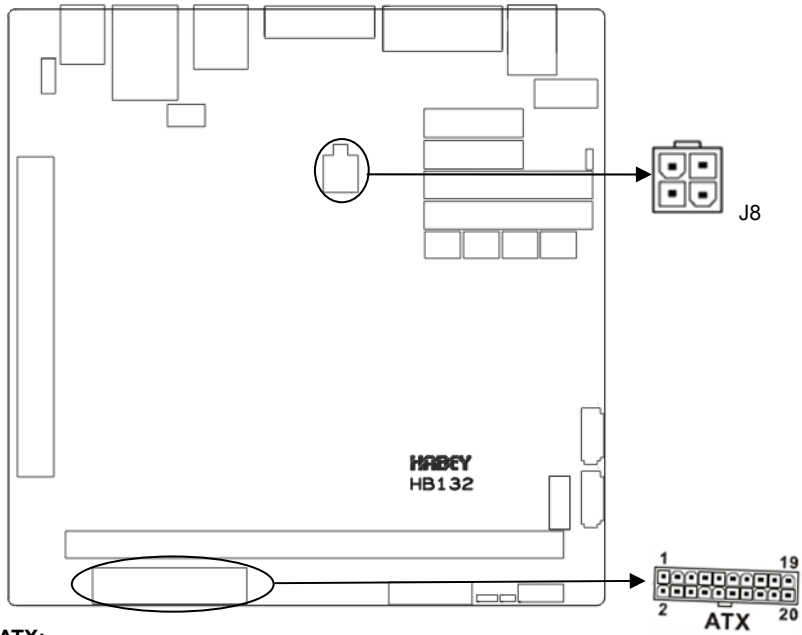


JGP:

Signal Name	Pin		Signal Name
PCH_GP12	1	2	VCC
PCH_GP24	3	4	PCH_GP8
PCH_GP35	5	6	PCH_GP32
PCH_GP61	7	8	PCH_GP33
GND	9	10	PCH_GP72

2.5.7 Power Interface (ATX, J8)

Board provides one standard ATX 20Pin + 4Pin Power Interface.



ATX:

Signal Name	Pin		Signal Name
+3.3V	1	11	+3.3V
+3.3V	2	12	-12V
GND	3	13	GND
+5V	4	14	PS-ON
GND	5	15	GND
+5V	6	16	GND
GND	7	17	GND
PW-OK	8	18	-5V
+5V SB	9	19	+5V
+12V	10	20	+5V

J8:

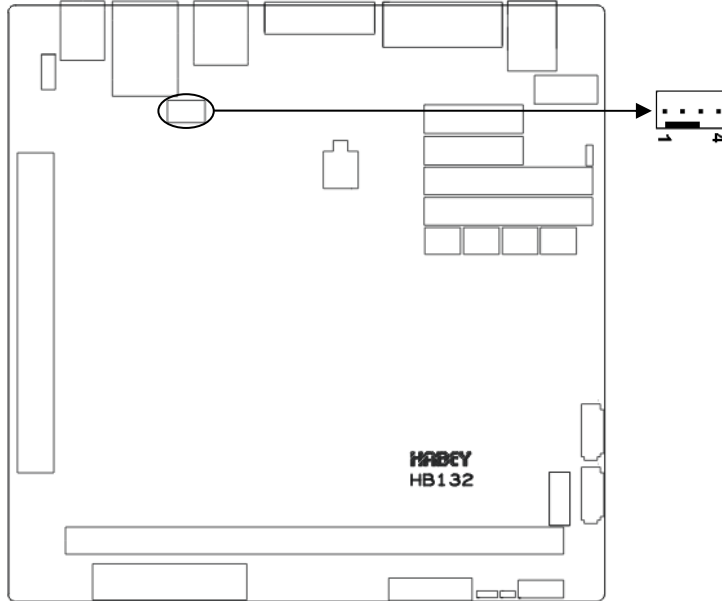
Pin	Signal Name
1	GND
2	GND
3	+12V

4	+12V
---	------

2.5.8 FAN Interface (CPU_FAN)

Board provides 1x CPU_FAN Interface. Please pay attention to following points when using this interface:

- (1) FAN Current $\leq 350\text{mA}$ (4.2W, 12V)
- (2) Pls confirm if the FAN cable matches the socket cable. Power cable (red) is in the middle. GND (black) & FAN speed pulse signal line (other color). Recommend to use Fans with speed detection function.



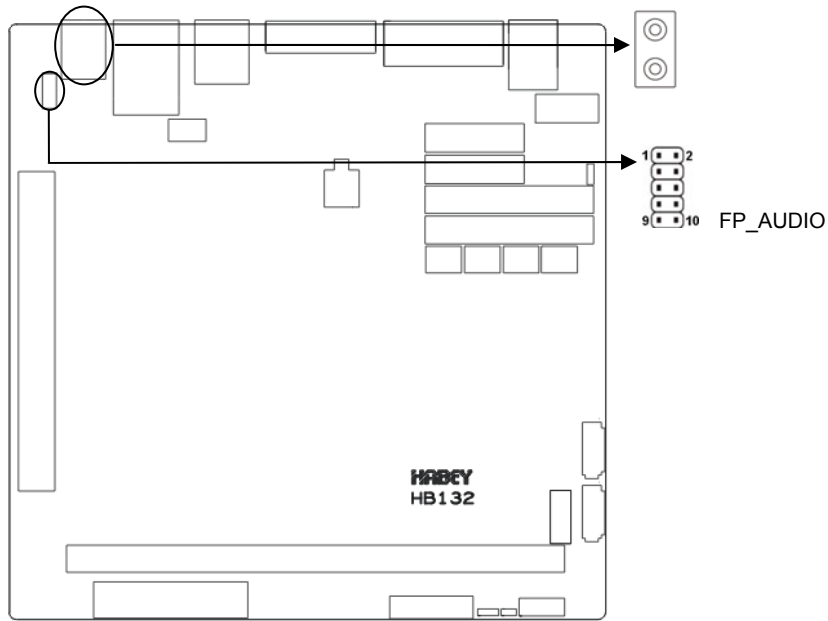
CPU_FAN:

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

2.5.9 Audio (JACK_HDA, FP_AUDIO)

Board provides one set Audio interface. The green one is Line-out. The red one is Mic-in.

In-built front audio pins.

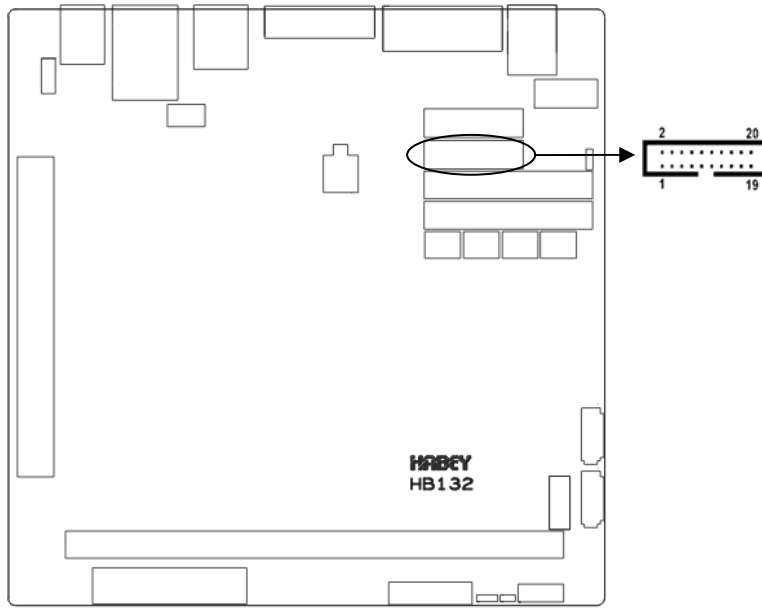


FP_AUDIO:

Signal Name	Pin		Signal Name
MIC2*L	1	2	AGND
MIC2*R	3	4	LINE1*L
LINE2*R	5	6	LINE1*R
AGND	7	8	NC
LINE2*L	9	10	AGND

2.5.10 Parallel Port (LPT)

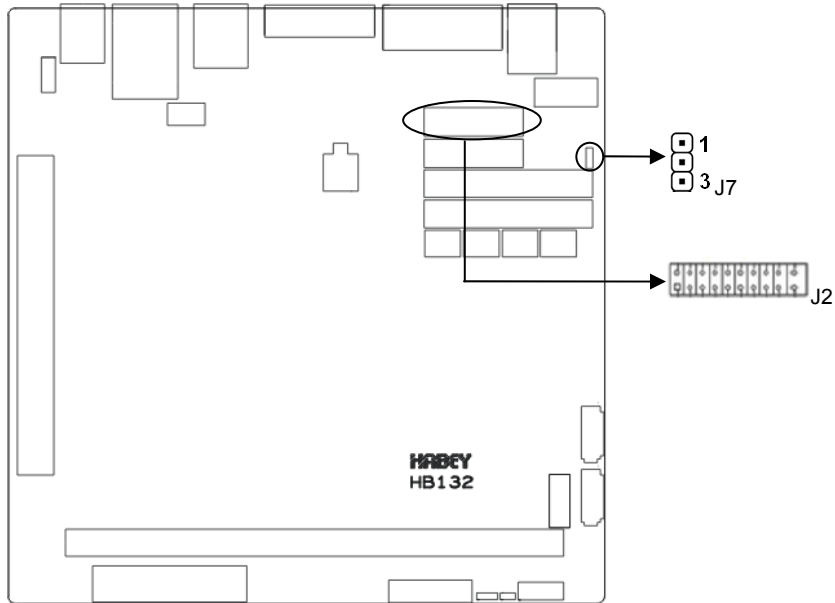
Board provides one standard parallel port.



LPT:

Signal Name	Pin		Signal Name
LPT_STB#	1	2	LPT_AFD#
LPT_PDQ0	3	4	LPT_ERR#
LPT_PDQ1	5	6	LPT_INIT#
LPT_PDQ2	7	8	LPT_SLIN#
LPT_PDQ3	9	10	GND
LPT_PDQ4	11	12	GND
LPT_PDQ5	13	14	GND
LPT_PDQ6	15	16	LPT_BUSY
LPT_PDQ7	17	18	LPT_PE
LPT_ACK#	19	20	LPT_SLCT

2.5.11 J7, J2



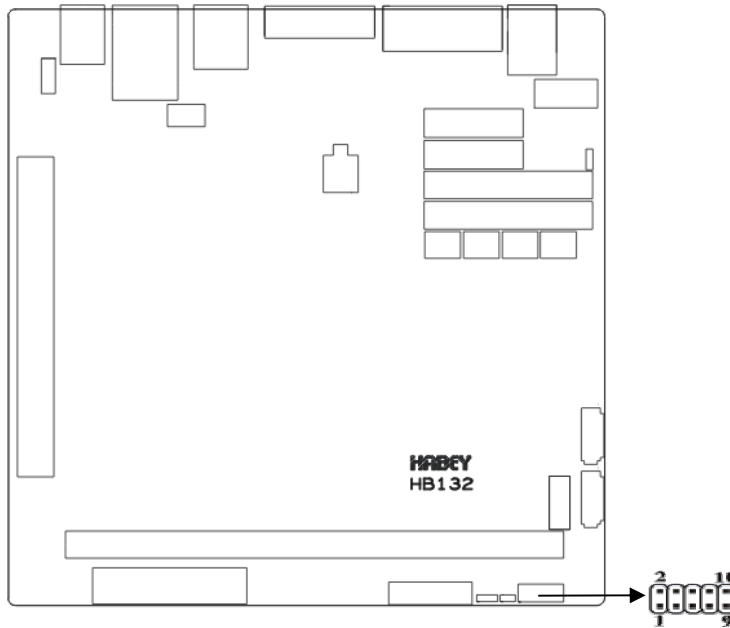
J2 is used to extend VGA or LVDS, combined with the onboard VGA to offer VGA + VGA or VGA + LVDS to support synchronic / asynchronous dual display.

J7 is used for COM3_6, COM7_10 power voltage select. COM port power supply can be output through PIN1, PIN9 (DB9 interface) or any user defined Pin with a customized cable. For details, please refer to following table:

Setting	J7
1-2	COM supports +5V power supply
2-3	COM supports +12V power supply

2.5.12 Front Panel Connector (JFP)

Front panel Pin, one 2x5Pin header, which is used to connect the functional buttons and LED lamps on the front panel.



JFP:

Signal Name	Pin		Signal Name
POWER LED+	1	2	POWER LED-
HD LED+	3	4	HD LED-
VCC	5	6	BUZZDATA-
RESET BUTTON	7	8	GND
POWER BUTTON	9	10	GND

Please follow the table below to connect, pay attention to the anode (+) and cathode (-), otherwise, some function can not be realized.

POWER LED
HDD LED
BUZZ
RESET BUTTON
PWR BUTTON

1) System power LED pins (pin1, pin2 for PWLED)

Connect system power LED cable with these pins. (pin 1 is LED anode) When system is power on, power LED is on; when system is power off, power LED is off.

2) HDD LED Pins (Pin 3/4 for HDD LED)

Case panel comes with one HD LED indicating HD status. When HD read and write, the LED will flash, indicating the device is working. Connect the LED cable to the LED pins (Pin3 is LED anode).

3) Buzzer Pins (pin 5, pin6 for SPEAKER)

External Pin for Speaker

4) Reset Button Pins (Pin 7, Pin8 for RESET BUTTON)

Connect the reset button cable to these two pins. When system fails, reset button can make the system continue to work and no need to turn on / off the power.

5) Power ON/OFF Pins (Pin 9, Pin10 for POWER BUTTON)


Connect these two pins to the bounce switch on the chassis to connect or disconnect the power supply.

2.5.13 DIMM Slot (DIMM)

Board provides 1x DIMM slot to support DDR3 1066/1333/1600 MHz RAM up to 8GB.

2.5.14 Expansion Interface (PCIEX16)

Board provides 1x standard PCIE X16 Socket.

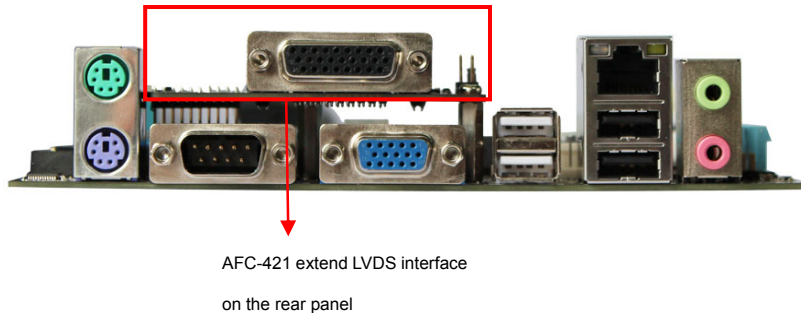
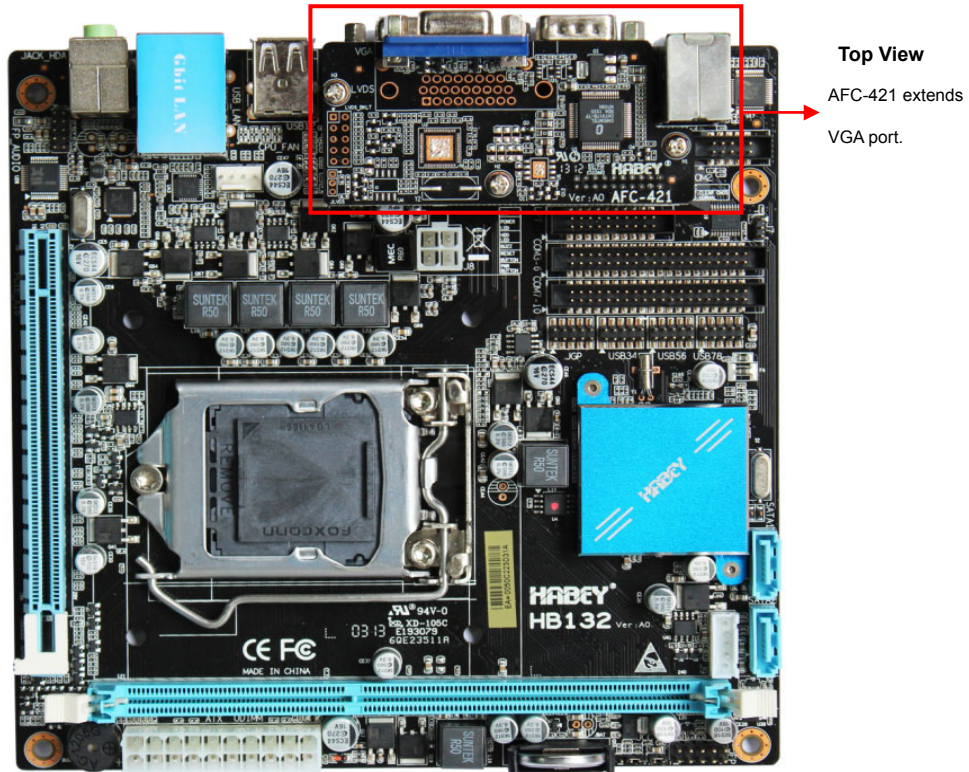
 **Note: Please follow the instructions below to connect Motherboard & PCIE adapter card and the PCIE card installation. Please check the cables and PCIE card installation before connecting power supply, otherwise, the motherboard or PCIE card will be damaged or burned.**

PCIE card installation: The PCIE card connecting finger has two notches. When installing the PCIE card, please make sure the PCIE notch that is far away from the IO is aligned with the fool-proof buckles of the PCIE socket.

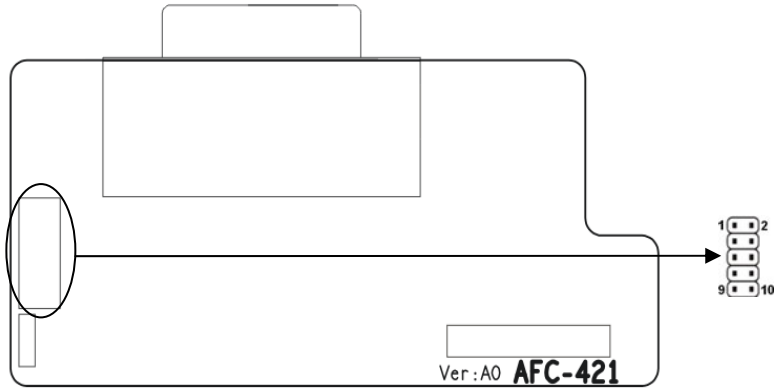
2.6 AFC-421 Expansion Card

J2 extends VGA port or LVDS port with the AFC-421 card. Co-working with the on board VGA, the board can support VGA+VGA or VGA+LVDS dual view to offer synchro/asynchro dual display.

Note: To extend VGA/LVDS via AFC-421 expansion card. If BIOS is different, you need to flash the BIOS.



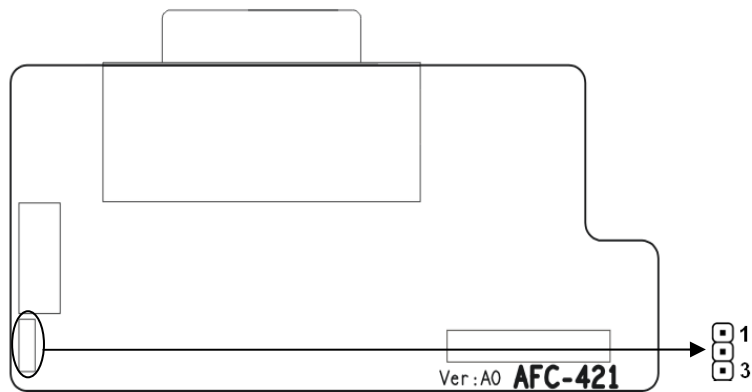
2.6.1 LVDS Power Voltage (LVDS_BKLT)



LVDS_BKLT:

Signal Name	Pin		Signal Name
+12 V_LVDS	1	2	BLUP
BKLT_EN	3	4	GND
GND	5	6	BLDN
BKLT_CTRL	7	8	GND
VCC_LVDS	9	10	PWRDN

2.6.2 LVDS Rated Voltage Select Jumper (JLVDS)



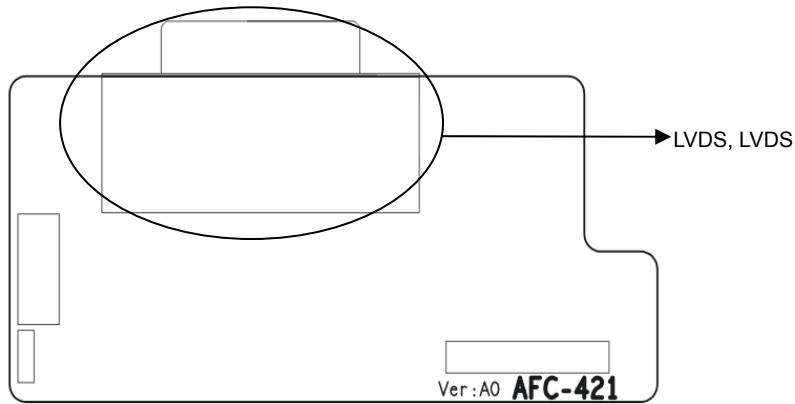
JLVDS:

Setting	JLVDS
1-2	3.3 V

2-3	5 V(Default)
-----	--------------

2.6.3 Display Interface (LVDS, VGA)

LVDS and VGA (alternative)



LVDS:

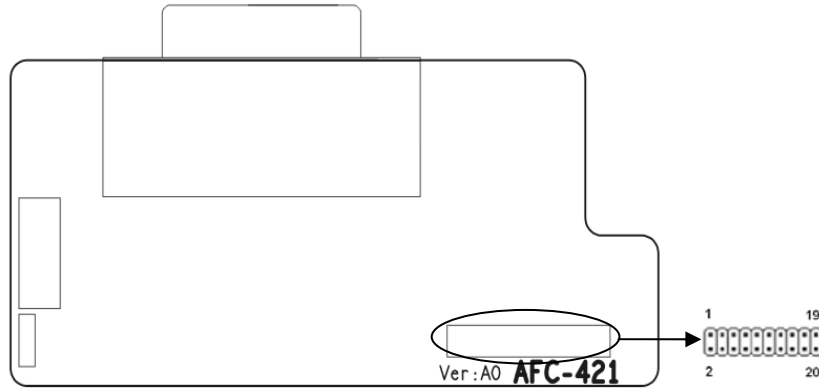
Signal Name	Pin		Signal Name
LVDSA_DATA0	1	2	LVDSA_DATA1
LVDSA_DATA2	3	4	LVDSA_DATA3
LVDSB_DATA0	5	6	LVDSB_DATA1
LVDSB_DATA2	7	8	LVDSB_DATA3
LVDSB_DATA3#	9	10	LVDSA_CLK#
LVDSA_DATA0#	11	12	LVDSA_DATA1#
LVDSA_DATA2#	13	14	LVDSA_DATA3#
LVDSB_DATA0#	15	16	LVDSB_DATA1#
LVDSB_DATA2#	17	18	LVDSB_CLK
LVDSA_CLK	19	20	VDD_PANEL
L_BKLTEN_R	21	22	GND
GND	23	24	GND
GND	25	26	LVDSB_CLK#

VGA:

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
1	VGA_R_R	6	GND	11	NC
2	VGA_G_R	7	GND	12	VGA_SDA_R

3	VGA_B_R	8	GND	13	VGA_HS_R
4	NC	9	VCC+5V	14	VGA_VS_R
5	GND	10	GND	15	VGA_SCL_R

2.6.4 J1



J1:

Signal Name	Pin		Signal Name
+12 V	1	2	GND
VCC	3	4	DDPB_P0
VCC3	5	6	DDPB_N0
GND	7	8	DDPB_P1
DDPB_HPD	9	10	DDPB_N1
DDPB_AUXP	11	12	DDPB_P2
DDPB_AUXN	13	14	DDPB_N2
SDVO_CTRLDATA	15	16	DDPB_P3
SDVO_CTRLCLK	17	18	DDPB_N3
PLTRST_N	19	20	GND



Chapter 3. BIOS SETUP

Chapter 3 BIOS SETUP

AMI BIOS Flash

BIOS functions as a bridge connecting hardware and operating system. Hardware and software are upgrading all the time, so when your system goes wrong, for example, your system can not support the newest CPU, you need to upgrade BIOS to keep up with the latest technology.

AFUDOS.EXE is the FLASH IC program for BIOS to upgrade, which needs to be run in DOS mode. Please use a boot disk to load DOS, then run AFUDOS.EXE to upgrade BIOS (for example: write XXXX.ROM into FLASH IC) .

Specific Command:

A: Flash BIOS: \ Afudos XXXX.rom / P /B /N /X

If you need to add other parameters after the order format, please add <space>/?

B. Flash BIOS to ME: FPT /F XXXX.bin

Reminder:

1. BIOS Flash is only executed when it is necessary
2. Please use the BIOS SETUP programs in the CD-ROM provided by us or download the latest version on related websites
3. Please do not power off or reboot the system during BIOS upgrading, otherwise, the BIOS maybe be damaged or system may not be able to boot again.
4. After finishing BIOS flash, users need to manually select to enter BIOS SETUP LOAD DEFAULT to optimize
5. To prevent any unexpected problems, please backup your BIOS in advance.

AMI BIOS Description

When the computer is power on, BIOS will conduct self-diagnosis to its hardware on motherboard and configure hardware parameter; finally the operating system will take control. BIOS is the communication bridge between hardware and O/S. Correct configuration of BIOS is critical for maintaining system stability and its optimized performance.

BIOS Setting

1. Power on or restart the system, self-detection message will display on the screen.

2. When system pops out the prompt "Press to enter setup" , please press key to enter BIOS setup interface.
3. Use the “← ↑ → ↓” to select the option which your want to modify, press <Enter> to go to the sub-menu.
4. Use the “← ↑ → ↓” and <Enter> to modify the value; press "Enter" to modify BIOS options that you choose.
5. At any time, press<Esc> can go back to the father-menu.

Note! BIOS settings have direct impacts to computer performance. Incorrect configurations will cause damage to the computer and even lead to system halted. Please use BIOS default settings to recovery system. As our company is always ceaselessly update the BIOS SETUP Utility, so, following BIOS SETUP screens are only for your reference. Some may be different from the BIOS you are using now.

3.1 Main Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
BIOS Information		Set the Date. Use Tab to switch between Date elements.
BIOS Vendor	American Megatrends	
BIOS Version	H132I601	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Build Date and Time	02/19/2013 16:19:52	
CPU Information		
Intel(R) Pentium(R) CPU G850 @ 2.90GHz		
Memory Information		
Total Memory	2048 MB (DDR3)	
Intel south Bridge Name	H61	
Stepping	05/B3	
ME FW Version	8.1.2.1248	
ME Firmware SKU	1.5MB	

System Date	[Tue 02/19/2013]	
System Time	[16:41:43]	
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

System Time

System Time Format: Hour/Minute/Second.

System Date

System Date Format: Month/Day/Year.

3.2 Advanced Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
Legacy OpROM Support	Enabled or Disabled Boot Option
Launch LAN PXE OpROM [Disabled]	for Legacy Network Devices.
<ul style="list-style-type: none"> ▶ ACPI Settings ▶ APM Configuration ▶ CPU Configuration ▶ SATA Configuration ▶ USB Configuration ▶ Super IO Configuration ▶ H/W Monitor ▶ Serial Port Console Redirection 	<ul style="list-style-type: none"> →← : Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F9 : Optimized Defaults F10 : Save&Exit ESC : Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.	

Launch LAN PXE OpROM

Enabled or disabled Boot Option for Legacy Network Devices.

3.2.1 ACPI Settings

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
ACPI Sleep State	[S1 (CPU Stop Clock)]	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S1 (CPU Stop Clock) :CPU stops working while other equipments are still power up.

S3(STR): Suspend to RAM.

3.2.2 APM Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
RTC Power On Function	[Disabled]	Enable or disable System wake on alarm event. When enabled. System will wake on the hr::min::sec specified
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

RTC Power On Function

Enable or disable System wake on alarm event. When enabled. System will wake on the hr::min::sec specified. Default setting is [Disabled].

3.2.3 CPU Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
Intel(R) Pentium(R) CPU G850 @ 2.90GHz		CPU PPM Configuration
CPU Signature	206a7	Parameters
Microcode Patch	28	→←: Select Screen
Max CPU Speed	2900 MHZ	↑↓: Select Item
Min CPU Speed	1600MHZ	Enter: Select
CPU Speed	2900MHZ	+/-: Change Opt.
Processor Cores	2	F1: General Help
Intel HT Technology	Not Supported	F2: Previous Values
Intel VT-x Technology	Supported	F9: Optimized Defaults
Intel SMX Technology	Not Supported	F10: Save&Exit
64-bit	Supported	ESC: Exit
L1 Data Cache	32KB*2	
L1 Code Cache	32KB*2	
L2 Cache	256KB*2	
L3 Cache	3072KB	
Active Processor Cores	[All]	
Limit CPUID Maximum	[Disabled]	
Execute Disable Bit	[Enabled]	
Intel Virtualization Technology	[Disabled]	
Hardware Prefetcher	[Enabled]	
Adjacent Cache Line Prefetch	[Enabled]	
CPU PPM Configuration		
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Active Processor Cores

To Active Processor Cores (When using multi-core processor) .

Limit CPUID Maximum

Please set this item as [Enabled] if the system OS doesn't support the extended CPUID

function.

Execute Disabled Bit

Execute Disable Bit (EDB) is a hardware-based security feature that introduced to its new generation CPU by Intel, which can help reduce system exposure to viruses and malicious code. EDB allows the processor to classify areas in memory where application code can or cannot execute. To use Execute Disable Bit you must have Windows XP SP2 operating system to support this function.

Intel Virtualization Technology

Disable or enable Intel Virtualization Technology. Intel virtualization technology enables to run multiple O/S of the same kind or different kind by using the same physical platform so as to realize the management and allocation of computer resources, maximizing the resource utilization.

Hardware Prefetcher

Enable or disable CPU L2 Cache Prefetcher Function.

Adjacent Cache Line Prefetch

Enable or disable the Adjacent Cache Line Prefetch Function.

3.2.3.1 CPU PPM Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
CPU PPM Configuration		Enable/Disable Intel Speed step
EIST	[Enabled]	→←: Select Screen
CPU C1 Report	[Enabled]	↑↓: Select Item
C1E	[Enabled]	Enter: Select
CPU C3 Report	[Enabled]	+/-: Change Opt.
Config TOP LOCK	[Disabled]	F1: General Help
Long duration power limit	0	F2: Previous Values
Long duration maintained	0	F9: Optimized Defaults
Short duration power limit	0	F10: Save&Exit
ACPI T State	[Disabled]	ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

CPU PPM Configuration: such as CPU C-STATE and IST function, etc.

EIST

Enhanced Intel SpeedStep Technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

CPU C1 Report

Enable or disable CPU C1 power-saving report.

C1E

Enable or disable CPU C1E energy-saving technology.

CPU C3 Report

Enable or disable CPU C3 power-saving report.

3.2.4 SATA Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
SATA Controller (s)	[Enabled]	Enable or disable SATA Device.
SATA Mode Selection	[IDE]	
Serial ATA Port 1	Empty	→←: Select Screen
Serial ATA Port 2	Empty	↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Serial-ATA Controller (S)

Disable or Enable SATA Controller.

SATA Mode

To setup SATA Mode: [AHCI] or [IDE].

Serial ATA Port1/2

Display the status of Serial ATA Port 1/2.

3.2.5 USB Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
USB Configuration		Enables Legacy USB support.
USB Devices		AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
1 Drive, 2 Hubs		
Legacy USB Support	[Enabled]	
XHCI Hand-off	[Enabled]	→←: Select Screen
EHCI Hand-off	[Disabled]	↑↓: Select Item
		Enter: Select
USB hardware delays and time-outs:		+/-: Change Opt.
USB transfer time-out	[20 sec]	F1: General Help
Device reset time-out	[20 sec]	F2: Previous Values
Device power-up delay	[Auto]	F9: Optimized Defaults
		F10: Save&Exit
Mass Storage Devices:		ESC: Exit
Kingston Data Traveler G2 1.00	[Auto]	
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Legacy USB Support

Legacy USB supports setting. To support USB devices in DOS mode, such as USB FLASH disk, USB keyboard, select this option as [Enabled] or [Auto]. Otherwise, select [Disabled].

XHCI Hand-off

Enable or disable XHCI Hand-off. Transfer rate up to 5Gpbs.

EHCI Hand-off

Enable or disable USB EHCI Hand-off. Transfer rate up to 480Mbps.

USB transfer time-out

Set USB device transfer command, data and time-out (second).

Device reset time-out

Set USB Devices reset time-out (second).

Device power-up delay

Set USB Device Power-up Delay (second).

Mass Storage Devices

To select the USB type connected, including [Auto], [Floppy], [Forced FDD], [Hard Disk], [CD-ROM]. Default setting is [Auto].

3.2.6 Supper IO Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
Super IO Configuration	Set Parameters of Parallel Port (LPT/LPTE)
▶ Parallel Port Configuration	→←: Select Screen
▶ Serial Port 1 Configuration	↑↓: Select Item
▶ Serial Port 2 Configuration	Enter: Select
▶ Serial Port 3 Configuration	+/-: Change Opt.
▶ Serial Port 4 Configuration	F1: General Help
▶ Serial Port 5 Configuration	F2: Previous Values
▶ Serial Port 6 Configuration	F9: Optimized Defaults
▶ Serial Port 7 Configuration	F10: Save&Exit
▶ Serial Port 8 Configuration	ESC: Exit
▶ Serial Port 9 Configuration	
▶ Serial Port 10 Configuration	
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.	

3.2.6.1 Parallel Port Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
Parallel Port Configuration		Enable or Disable Parallel Port (LPT/LPTE)
Parallel Port	[Enabled]	→←: Select Screen
Device Settings	IO=378h;IRQ=5	↑↓: Select Item
Change settings	[IO=378h;IRQ=5]	Enter: Select
Device Mode	[STD Printer Mode]	+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save&Exit
		ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Parallel Port

Enable or disable the parallel port.

Device Setting (Read Only)

Display the IRQ & I/O address of the parallel port.

Change Setting

Change the setting of parallel port, including its IRQ and I/O Address. Recommend to select default setting[Auto].

Device Mode

Select parallel device mode, including Standard, EPP, ECP, ECP+EPP, ect.

3.2.6.2 Serial Port Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
Serial Port 1 Configuration		Enable or Disable Parallel Port (COM)
Serial Port	[Enabled]	→←: Select Screen
Device Settings	IO=3F8h;IRQ=4	↑↓: Select Item
Change settings	[IO=3F8h;IRQ=4]	Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Serial Port 1 Configuration

Serial Port

Enable or disable Serial Port.

Device Setting (Read Only)

Display Serial Port IRQ and I/O Address.

Change Setting

Change the setting of serial port, including its IRQ and I/O Address. Recommend to select the default value [Auto].

Serial Port 2/3/4/5/6/7/8/9/10 Configuration follows the same steps as mentioned above.

3.2.7 H/W Monitor

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
PC Health Status		Enable or Disable Smart Fan
Smart Fan Function	[Enables]	
SYSTIN temperature	: +33°C	→←: Select Screen
CPUTIN temperature	: +47°C	↑↓: Select Item
		Enter: Select
CPUVCore	: +1.192V	+/-: Change Opt.
+3.3VIN	: +3.328V	F1: General Help
+5VIN	: +4.900V	F2: Previous Values
+12VIN	: +11.705V	F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

PC Health Status

Detect PC health status. BIOS will display the status of the system including system temperature, CPU temperature, CPU Fan Speed, Voltage etc.

Smart Fan Function

Enable or disable smart Fan function. System auto adjust FAN speed according to the CPU temperature, so as to achieve power saving status.

3.2.8 Serial Port Console Redirection

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
COM1	Console Redirection Enable or Disable.
Console Redirection [Disabled]	
▶ Console Redirection Settings	
COM2	→←: Select Screen
Console Redirection [Disabled]	↑↓: Select Item
▶ Console Redirection Settings	Enter: Select
Serial Port for Out-of-Band Management/ Windows Emergency Management Services(EMS)	+/-: Change Opt.
Console Redirection [Disabled]	F1: General Help
▶ Console Redirection Settings	F2: Previous Values
	F9: Optimized Defaults
	F10: Save & Exit
	ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.	

Console Redirection

Enable or disable Console Redirection Function.

3.2.8.1 COM1 Console Redirection Settings

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
COM1		Emulation:ANSI:Extended ASCII
Console Redirection Settings		Char set.VT100:ASCII char set.
		VT100+:Extends VT100 to support
Terminal Type	[VT100+]	Color,function keys,etc.VT-UTF8:
Bits per second	[115200]	Uses UTF8 encoding to map
Data Bits	[8]	Unicode chars onto 1 or more
Parity	[None]	bytes.
Stop Bits	[1]	→←: Select Screen
Flow Control	[None]	↑↓: Select Item
VT-UTF8 Combo Key Support	[Enabled]	Enter: Select
Recorder Mode	[Disabled]	+/-: Change Opt.
Resolution 100*31	[Disabled]	F1: General Help
Legacy OS Redirection Resolution	[80*24]	F2: Previous Values
Putty Keypad	[VT100]	F9: Optimized Defaults
Redirection After BIOS POST	[Always Enable]	F10: Save & Exit
		ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

This interface pops up only when the option "Console Redirection" is enabled. It mainly used to setup COM1 redirection, including Baud Rate, Parity Check Bit, Data bits, etc.

COM2& EMS (Emergency Management Services) description is similar to that mentioned above.

3.3 Chipset Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
▶ North Bridge	North Bridge Parameters
▶ South Bridge	
	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.	

3.3.1 North Bridge

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
VT-d Capability	Unsupported	Select which of IGFX/PEG/PCI Graphics device should be Primary
Primary Display	[IGD]	Display or select SG for Switchable Gfx.
Internal Graphics Mode Select	[Enabled]	
DVMT/FIXED Memory	[MAX]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Primary Display

Select IDG or PEG as the primary display.

Internal Graphics Mode Select

Enable or disable internal graphics mode select.

DVMT/FIXED Memory

Set DVMT/FIXED Memory Size.

3.3.2 South Bridge

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
Audio Controller	[Enabled]	Enabled/Disabled onboard Audio.
LAN Controller	[Enabled]	
Wake on LAN	[Enabled]	→←: Select Screen ↑↓: Select Item
Restore AC Power Loss	[Power On]	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Audio Controller

Enable or disable the onboard audio controller.

LAN Controller

Enable or disable the onboard LAN controller.

Wake –On-LAN

Enable or disable Wake-on-LAN function.

Restore AC Power Loss

Select the computer starting up status after restoring the AC power.

[Power Off]: Press the power button to restart the computer when restore the AC power.

[Power On]: system startup directly when restore the AC Power.

[Last State]: Stay the last state before the AC power loss.

3.4 Boot Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
Boot Configuration		Number of seconds to wait for setup activation key.
Setup Prompt Timeout	0	65535(0×FFFF) means indefinite waiting.
Bootup NumLock State	[On]	
Show Full Logo	[Enabled]	
Boot Option Priorities		→←: Select Screen
Boot Option #1	[Kingston Data Travele...]	↑↓: Select Item
Boot Option #2	[UEFI: Kingston Data T...]	Enter: Select
Boot Option #3	[UEFI: Built-in EFI...]	+/-: Change Opt.
Hard Drive BBS Priorities		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save&Exit
		ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0×FFFF) means indefinite waiting. If not press setup activation key within the preset time slot, system will continue starting up.

Bootup Numlock State

This function allows users to activate Numlock function when boot up.

[ON]: Numlock is activated when system boots up

[OFF]: Numlock under cursor control.

Show Full Logo

[Enabled]: supplier's LOGO will show when system starts up.

[Disabled]: Self-detect info will show when system boots.

Boot Option #1/#2/#3

System will detect devices according to the preset sequence until to find a boot device. Option #1 is the prior boot device.

Hard Drive BBS Priorities

This option contains HDDs that can be used as boot device. If multiple HDDs in this option, priority should set for these HDDs, then the prior one will show in Boot Option #1.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc		
Boot Option #1	[Kingston Data Travele...]	Sets the system boot order
		→←: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F9: Optimized Defaults
		F10: Save&Exit
		ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

3.6 Save & Exit Menu

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc	
Load Defaults	Restore/Load Default values for all the setup options.
Save Changes and Exit	
Discard Changes and Exit	
Boot Override	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save&Exit ESC: Exit
UEFI:Built-in EFI shell	
Kingston Data Traveler G2 1.00	
UEFI:Kingston Data Traveler G2 1.00	
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.	

Load Defaults

Restore/Load Default values for all the BIOS setup options.

Save Change and Exit

Press [Enter] to select this option and press [Enter] to confirm to save all BIOS changes and exit.

Discard Change and Exit

Press [Enter] to select this option and press [Enter] to confirm to discard all changes and exit.

Boot Override

All possible boot options are listed beneath. Move Mouse cursor to a target boot option and press [Enter] to start up.

HABEY

Appendix

Appendix

Appendix: Watchdog Programming Guide

watchdog reference code (C)

Set the port to realize watchdog function through DEBUG order, so that it can carry out

Watchdog Timer's various functions.

Port Instructions:

```
void main()
{
    int indexp = 0x4E, datap = 0x4F
    unsigned char temp;

    outportb(indexp, 0x87);
    outportb(indexp, 0x87); //unlock

    outportb(indexp, 0x2d);
    temp = (unsigned char)inportb(datap);
    temp &= 0xfe;
    outportb(indexp, 0x2d);
    outportb(datap, temp); //set pin for watchdog

    outportb(indexp, 0x07);
    outportb(datap, 0x08);
    outportb(indexp, 0x30);
    outportb(datap, 0x01); //enable logical device
    outportb(indexp, 0xf5);
    outportb(datap, 0x00); //set second
    /*outportb(datap, 0x08); set minute*/

    outportb(indexp, 0xf6);
```

```
    outportb(datap,0x03);    //set 3 seconds

    outportb(indexp,0xf7);
    outportb(datap,0x00);

    outportb(indexp,0xaa);  //lock
}
```


Appendix 2: IRQ & System Memory Map

IRQ:

Priority	Interr	Interrupt source
1	NMI	Parity error detected
2	00	System timer
3	01	Standard 101/102 key or Microsoft PS/2 keyboard
-	02	Interrupt from controller 2 (cascade)
4	08	System CMOS/real time clock
5	09	Microsoft ACPI-Compliant System
6	10	Intel(R) 6 Series/C200 Series Chipset Family SMBus Controll -1C22
7	11	Communication port (COM3,4,5,6,7,8,9,10)
8	12	Microsoft PS/2 Mouse
9	13	Numeric data processor
10	14	Available
11	15	Available
12	03	Communication Port (COM2)
13	04	Communication Port (COM1)
14	05	LPT Port (LPT1)
15	06	Available
16	07	Available

System Memory Map:

Addr. range	Device
000A0000-000BFFFF	PCI bus
000A0000-000BFFFF	Intel(R) HD Graphics
000D0000-000D3FFF	PCI bus
000D4000-000D7FFF	PCI bus
000D8000-000DBFFF	PCI bus
000DC000-000DFFFF	PCI bus
000E0000-000E3FFF	PCI bus
000E4000-000E7FFF	PCI bus
20000000-201FFFFFF	System board
40000000-401FFFFFF	System board

7EA00000-7EA00000	PCI bus
7EA00000-7EA00FFF	Motherboard resources
E0000000-EFFFFFFF	Intel(R) HD Graphics
F0000000-F00FFFFFFF	Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 3-1C14
F0000000-F0003FFF	Realtek PCIe GBE Family Controller
F0004000-F0004FFF	Realtek PCIe GBE Family Controller
F7800000-F7BFFFFFFF	Intel(R) HD Graphics
F7C00000-F7C03FFF	Microsoft UAA Bus Driver for High Definition Audio
F7C05000-F7C050FF	Intel(R) 6 Series/C200 Series Chipset Family SMBus Controller-1C22
F7C06000-F7C063FF	Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller-1C26
F7C07000-F7C073FF	Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller-1C2D
F7C09000-F7C0900F	Intel(R) Management Engine Interface
F8000000-FBFFFFFFF	Motherboard resources
FED00000-FED003FF	High precision event timer
FED10000-FED17FFF	Motherboard resources
FED18000-FED18FFF	Motherboard resources
FED19000-FED19FFF	Motherboard resources
FED1C000-FED1FFFF	Motherboard resources
FED20000-FED3FFFF	Motherboard resources
FED40000-FED44FFF	System board
FED45000-FED8FFFF	Motherboard resources
FEE90000-FED93FFF	Motherboard resources
FEE00000-FEEFFFFFFF	Motherboard resources
FF000000-FFFFFFFF	Intel(R) 82802 Firmware Hub Device

Appendix 3: Glossary

ACPI

Advanced Configuration and Power Management. ACPI specifications allow O/S to control most power of the computer and its add-ons

BIOS

Basic input/output system. It is a kind of software including all in/out control code interface in PC. It will do hardware testing while system is booting, and then the O/S runs. BIOS provides a interface between O/S and hardware and is stored in a ROM chip.

BUS

In a computer system, it is the channel among different parts for exchanging data; it is also a set of hardware lines. BUS here refers to part lines inside CPU and the main components of system memory.

Chipset

Chipset is a Integrated set of chips for executing one or more related functions. Here it refers to a system level chipset structured by Southbridge & Northbridge; It decides the structure and main functions of motherboard.

CMOS

Complementary Metal-Oxide Semiconductor, which is a widely used semiconductor with the characteristics of high-speed and low-power. COMS here refer to part of space on-board CMOS RAM for saving date, time, system information and system parameter, ect.

COM

Computer-Output Microfilmer.A universal serial communication interface, usually adopts normative OB 9 connector.

DIMM

Dual-Inline-Memory-Modules. It is a small circuit board with memory chipset providing 64 bit

memory bus width.

DRAM

Dynamic Random Access Memorizer. It's a normal type of memory often with a transistor and a capacitance to store 1 bit. With the development of the technology, more and more types of DRAM with different specifications exist in computer applications. For example: SDRAM/DDR SDRAM/RDRAM.

I2C

Inter—Integrated Circuit , generically referred to as "two-wire interface", is a multi-master serial single-ended computer bus invented by Philips that is used to attach low-speed peripherals to a motherboard, embedded system, or cell phone.

LAN

Network interface. Network grouped by correlative computers in a small area, generally in a company or a building. Local area network is buildup by sever, workstation, some communications links. Terminals can access data and devices anywhere through cables, which enables users to share costly devices and resource.

LED

Light-Emitting Diode. A semiconductor device that shines when power supply is connected, It is often used to denote information directly, for example, to denote power on or HDD working normally.

PnP

Plug-and-Play. It is a specification that allows PC to configure its external devices automatically and can work independently without the manual operation by its user . To achieve this function, its BIOS should be able to support PnP and a PnP expansion card

POST

Self-test when power on. While the system is booting, BIOS will do an uninterrupted testing to the system, including RAM, keyboard, hard disk driver to check if all the components are in

normal situation and work well.

PS/2

A keyboard & mouse connective interface specification developed by IBM.PS/2 is a DIN interface with only 6PIN; it also can connect other devices, like modem

USB

It is the Universal Serial Bus for short. A hardware interface adapts to low speed peripherals, and is always used to connect keyboard, mouse etc. One PC can connect maximum 127 USB devices, providing 12Mbit/s transmit bandwidth USB supports hot swap and multi- data stream, namely, you can plug USB devices while system is running, system can auto-detect and makes it work on.

Appendix 4: Install Driver

Please install the driver as per the following steps:

Insert the programmed disk into CD-ROM, so installation of the driver can be made either automatically or manually. Now manually installation instructions are given as below. (take graphics driver as an example)

- 1) A variety of options are available regarding manually installation, which you can check from Device Manager.
- 2) Right click "my computer ", select "management", and go to "Device Manager"
- 3) Right click "display controller" in the menu of graphic card, select "Properties ", click "Driver", select "update driver".
- 4) Select "Show the list of all drivers which are designated locations so that choices can be made from it ", select "next."
- 5) Select the location of display driver, click "ok"
- 6) Complete the installation, restart the system.

Proceed with the installation of other drivers after restarting the system, till all installations are completed. Then user can check from the device manager that it says device is working.

For more information, please visit

WWW.norco-group.com

The product information in this user manual is subject to change without prior notice. NORCO reserves the right to revise and to explain finally.