

TKS-P20-CV01

Fanless Embedded Box

Intel® Atom™ N2600 1.6 GHz Processor

1 GbE LAN, 5 USB2.0, 2 COM

1 VGA, 1 HDMI, 1 Mini Card or mSATA

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Packing List

Before you begin operating your PC, please make sure that the following materials are enclosed:

- 1 TKS-P20-CV01 Embedded Controller
- 1 DVD-ROM for manual (in PDF format) and drivers

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

Safety & Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a firm surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.

- d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 55°C (131°F). IT MAY DAMAGE THE EQUIPMENT.

FCC

Warning!



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Boxer/ Industrial System

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
外壳	×	○	○	○	○	○
中央处理器 与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
电源	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 一、此产品所标示之环保使用期限，系指在一般正常使用状况下。 二、上述部件物质中央处理器、内存、硬盘、电源为选购品。</p>						

Contents

Chapter 1 General Information

1.1 Introduction.....	1-2
1.2 Features	1-3
1.3 Specifications	1-4

Chapter 2 Hardware Installation

2.1 Safety Precautions	2-2
2.2 Mechanical Drawing of TKS-P20-CV01	2-3
2.3 A Quick Tour of the TKS-P20-CV01	2-4
2.4 Installing mSATA and RAM module.....	2-8
2.5 List of Jumpers	2-9
2.6 List of Connector	2-9
2.7 Setting Jumpers	2-10
2.8 COM2 Pin8 Function Selection (JP1)	2-11
2.9 Clear CMOS Selection (JP2)	2-11
2.10 AT/ATX Power Supply Mode Selection (JP6).....	2-11
2.11 COM Port 1 Connector (CN1)	2-12
2.12 COM Port 2 Connector (CN2)	2-12
2.13 DIO Connector (CN3).....	2-14
2.14 +5V Output for SATA HDD Connector (CN4)	2-15
2.15 LPC Port Connector (CN10)	2-15
2.16 USB2.0 Port 1 ~ 5 Connector.....	2-16

2.17 VGA Port Connector (CN12).....	2-17
2.18 HDMI Type C Connector (CN17)	2-18
2.19 Mini Card Slot (PCIE1).....	2-19

Chapter 3 AMI BIOS Setup

3.1 System Test and Initialization.	3-2
3.2 AMI BIOS Setup.....	3-3

Chapter 4 Driver Installation

4.1 Installation	4-3
------------------------	-----

Appendix A Programming The Watchdog Timer

A.1 Watchdog Timer Registers	A-2
A.2 WatchDog Sample Program	A-3

Appendix B I/O Information

B.1 I/O Address Map.....	B-2
B.2 Memory Address Map.....	B-4
B.3 IRQ Mapping Chart.....	B-5
B.4 DMA Channel Assignments.....	B-7

Appendix C Mating Connector

C.1 List of Mating Connectors and Cables.....	C-2
---	-----

Appendix D AHCI Setting

D.1 Setting AHCI	D-2
------------------------	-----

Appendix E Digital I/O Ports

E.1 Electrical Specifications for Digital I/O Ports	E-2
---	-----

E.2 DIO ProgrammingE-2
E.3 Digital I/O RegisterE-3
E.4 Digital I/O Sample ProgramE-4

Chapter

1

General Information

1.1 Introduction

The newest EmBox series TKS-P20-CV01 has been introduced by AAeon and it utilizes Intel® Atom™ processor. In this era of information explosion, the advertising of consumer products will not be confined to the family television, but will also spread to high-traffic public areas, like department stores, the bus, transportation station, the supermarket etc. The advertising marketing industry will resort to every conceivable means to transmit product information to consumers. System integrators will need a multifunction device to satisfy commercial needs for such public advertising.

The TKS-P20-CV01 is designed for indoor environments due to the following reasons; first, the TKS-P20-CV01 offers low power consumption system that while operating in ambient temperatures ranging from 0° to 55°C. The TKS-P20-CV01 is a standalone high performance controller designed for long-life operation and with high reliability. It can replace traditional methods and become the mainstream controller for the multimedia entertainment market.

1.2 Features

- Intel® Atom™ N2600 Processor up to 1.6GHz
- SODIMM DDR3 800MHz Memory up to 2 GB
- DIN RAIL and Fanless system
- Mini HDMI and VGA Support
- Gigabit Ethernet LAN x 1
- USB2.0 x 5, COM x 2, 4-bits Digital I/O
- mSATA or Mini Card (Half size) x 1
- DC IN +12 or +7~30V Wide Range DC Input Optional

1.3 Specifications

CPU		Onboard Intel® Atom™ N2600 Processor up to 1.6 GHz
Chipset		Intel® Atom™ N2600 + NM10
System Memory		204-pin DDR3 SODIMM x 1, Max. 2GB
Display Interface	VGA	D-SUB 15 x 1
	HDMI	HDMI type C (Mini HDMI) x 1
Storage Device	SSD	mSATA x 1 (Half-size)
	HDD	Optional by request
Network	LAN	Gigabit Ethernet
	Wireless	Optional by Mini Card
Front I/O	USB Host	USB 2.0 x 2
	LAN	RJ-45 x 1
	Serial Port	RS-232 x 1, RS-232/422/485 x 1
	Others	System & HDD indicator LED x 2, Power Switch, DC-in
Rear I/O	DIO	DIO 4-bit with VCC and ground in
	Audio	Mic-in/ Line-out
Bottom I/O	USB Host	USB2.0 x 3
Expansion	Mini PCIe	Mini Card half size (or mSATA)
Indicator	Front	Power LED x 1, HDD LED x 1
Power Requirement		DC-in +12V ATX or DC-in +7~30V ATX (Optional)
Power Consumption		Intel® Atom™ N2600 1.6 GHz, DDR3 800 2GB, 1.5A @ +12V

System Cooling	Fanless
Mounting	Wallmount, DIN RAIL (optional)
Dimension	4.7" x 2.3" x 4.3" (120mm x 59.5mm x 110mm)
Gross Weight	2.2 lb (1 Kg)
Net Weight	1.8 lb (0.82 Kg)
Operating Temperature	32°F ~ 131°F (0°C ~ 55°C)
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
Operating Humidity	0%~90% relative humidity, non-condensing
Anti-Vibration	2 g rms/ 5 ~ 500Hz/ operation (mSATA)
Anti-Shock	20 G peak acceleration (11 msec. duration) (mSATA)
Certification EMC	CE/FCC Class A
OS Support	Windows® XP Embedded, Windows® XP, Windows® 7, Linux Fedora

Note: COM1 and COM2's performance will be among 9,600 to 115,200 bps depend on the system loadings.

Chapter

2

**Quick
Installation
Guide**

2.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

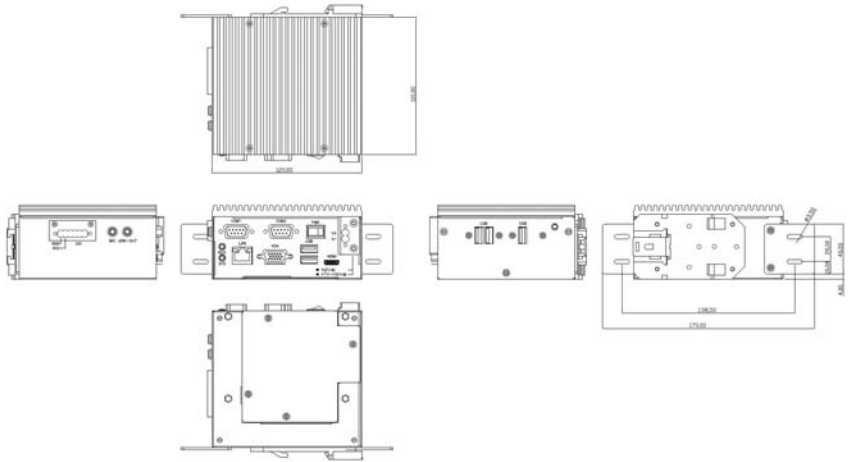
Caution!

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Mechanical Drawing of TKS-P20-CV01

Figure 2.1 Mechanical Drawing of TKS-P20-CV01

Dimension: 120mmx 59.5mmx 110mm



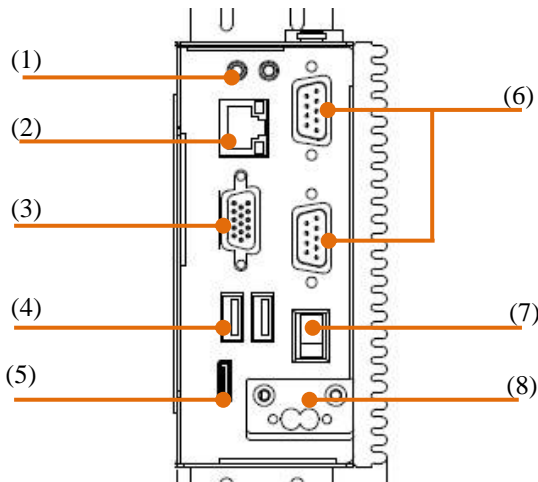
2.3 A Quick Tour of the TKS-P20-CV01

Before you start to set up the TKS-P20-CV01, take a moment to become familiar with the locations and purposes of the controls, drives, connections and ports, which are illustrated in the figures below.

When you place the TKS-P20-CV01 upright on the desktop, its front panel appears as Show in Figure 2-1.

Front View

Front View of the Point of Care Terminal



(1). Power and HDD indicator LED

(2). Gigabit Ethernet LAN Port

(3). VGA port

(4). USB x2

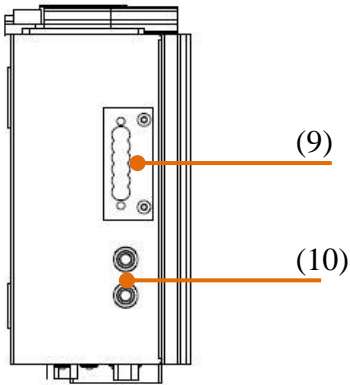
(5). Mini HDMI port

- (6). COM1 & COM2
- (7). Power Switch
- (8). Power DC-IN

Remark: Power DC-IN with +12V or option wide range power board for 7-30V DC input

Top Side View

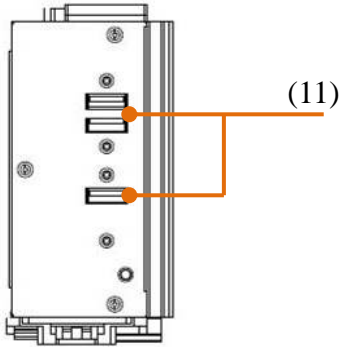
Top side View of the TKS-P20-CV01



- (9). 4 bit Digital IO with VCC and ground pin
- (10). Audio port with Mic-in & line-out

UBottom View

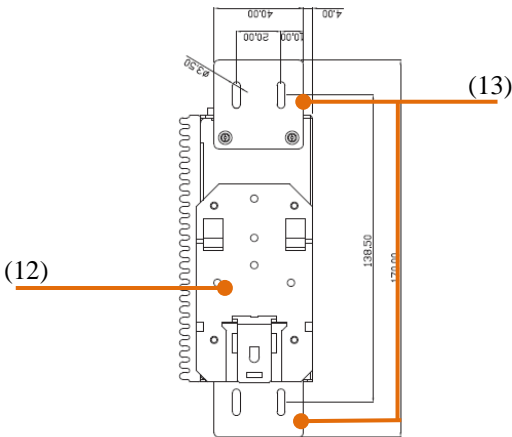
Top side View of the TKS-P20-CV01



(11). USB x3

Rear side View

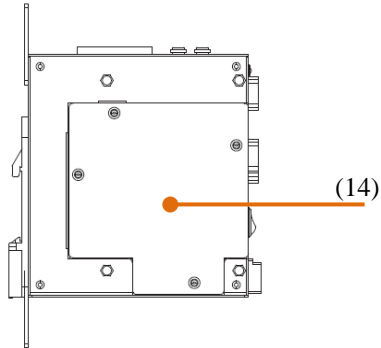
Rear side View of the TKS-P20-CV01



- (12). DIN RAIL kit (optional)
- (13). Wall mount Kit (optional)

Left side I/O View

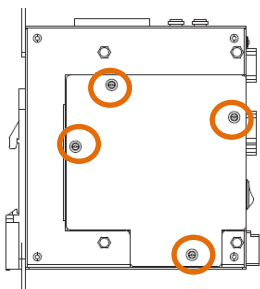
Figure 2.4 Left side View of the Point of Care Terminal



- (14). I/O cover

2.4 Installing mSATA and RAM module

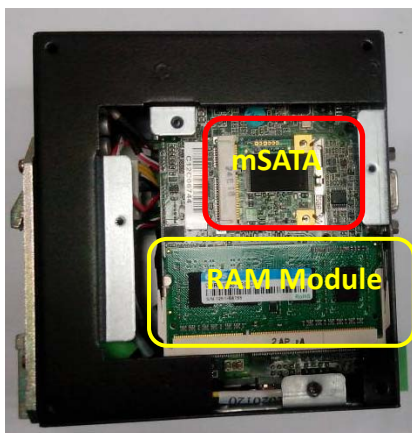
Step 1: Unfasten the screws on the I/O cover from Left side



Step 2: Remove the I/O cover then you can see the inside of system

Step 3: Locate the memory module, Insert the gold colored contact into the Memory Socket. Push the module down, until it is firmly seated locking two latches on the sides.

Step 4: Locate the mSATA module(same with mini card module), insert the gold colored contact into the Socket of mSATA mini card. Push the module down, until it is firmly seated by locking two latches on the sides.



Step 5: Please take the I/O cover back to the chassis. Then fasten the 4 screws of I/O cover.

2.5 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP1	COM2 RI/+5/+12V Selection
JP2	Clear CMOS
JP6	AT/ATX Power Mode Selection

2.6 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN1	COM Port 1
CN2	COM Port 2
CN3	Digital I/O
CN4	+5V Output for SATA HDD
CN5	SATA Port
CN7	RJ-45 Ethernet
CN10	LPC Expansion I/F
CN11	USB Port 5
CN12	Analog CRT Display
CN13	USB Port 3
CN14	USB Port 4
CN16	USB Port 1 and 2

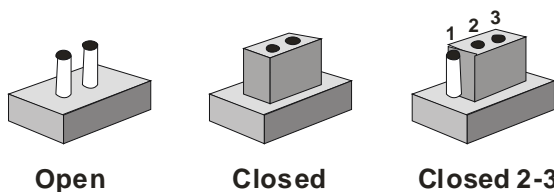
CN17	HDMI Type C
------	-------------

PCIE1	Mini Card
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2.7 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

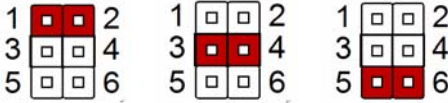
To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.8 COM2 Pin8 Function Selection (JP1)



JP1	Function
1-2	+12V
3-4	Ring (Default)
5-6	+5V

2.9 Clear CMOS Selection (JP2)



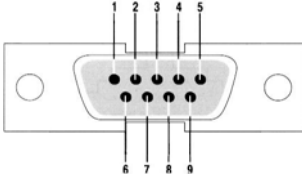
JP2	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.10 AT/ATX Power Supply Mode Selection (JP6)



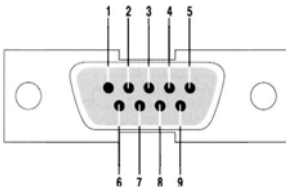
JP6	Function
1-2	AT Mode
2-3	ATX Mod (Default)

2.11 COM Port 1 Connector (CN)



Pin	Pin Name	Signal Type	Signal Level
1	DCD1	IN	
2	RX1	IN	
3	TX1	OUT	±9V
4	DTR1	OUT	±9V
5	GND	GND	
6	DSR1	IN	
7	RTS1	OUT	±9V
8	CTS1	IN	
9	RI1	IN	

2.12 COM Port 2 Connector (CN2)



RS-232

Pin	Pin Name	Signal Type	Signal Level
1	DCD2	IN	
2	RX2	IN	
3	TX2	OUT	±9V
4	DTR2	OUT	±9V
5	GND	GND	
6	DSR2	IN	
7	RTS2	OUT	±9V
8	CTS2	IN	
9	RI2/+5V/+12V	IN/ PWR	+5V/+12V

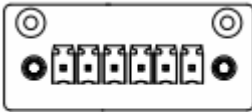
RS-422

Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	±5V
2	RS422_TX+	OUT	
3	RS422_RX+	IN	±5V
4	RS422_RX-	IN	
5	NC		
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

RS-485

Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	±5V
2	RS485_D+	I/O	±5V
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

2.13 DIO Connector (CN2)

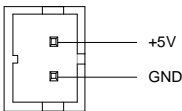


6 5 4 3 2 1

Pin	Pin Name	Signal Type	Signal Level
1	DIO0	I/O	+3.3V
2	DIO1	I/O	+3.3V
3	DIO2	I/O	+3.3V
4	DIO3	I/O	+3.3V
5	DIO_PWR	PWR	+3.3V
6	GND	GND	

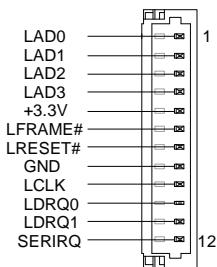
GPIO Port	Location (Pin #)	Access Address based on SIO	
		LDN6	
		Input	Output
GPIO1	2	Reg 0xD2, bit 0	Reg 0xD1, bit 0
GPIO2	3	Reg 0xD2, bit 1	Reg 0xD1, bit 1
GPIO3	4	Reg 0xD2, bit 2	Reg 0xD1, bit 2
GPIO4	5	Reg 0xD2, bit 3	Reg 0xD1, bit 3

2.14 +5V Output for SATA HDD Connector (CN4)



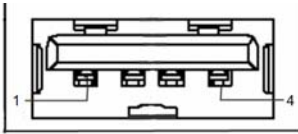
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

2.15 LPC Port Connector (CN10)



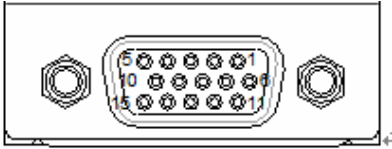
Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	LDRQ0	IN	
11	LDRQ1	IN	
12	SERIRQ	I/O	+3.3V

2.16 USB2.0 Port 1 ~ 5 Connector



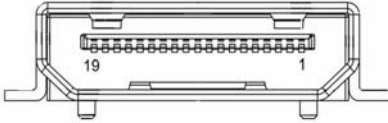
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB5_D-	DIFF	
3	USB5_D+	DIFF	
4	GND	GND	

2.17 VGA Port Connector (CN12)



Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	GND	GND	
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYSN	OUT	
15	DDC_CLK	I/O	+5V

2.18 HDMI Type C Connector (CN17)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	HDMI_TX2+	DIFF	
3	HDMI_TX2-	DIFF	
4	GND	GND	
5	HDMI_TX1+	DIFF	
6	HDMI_TX1-	DIFF	
7	GND	GND	
8	HDMI_TX0+	DIFF	
9	HDMI_TX0-	DIFF	
10	GND	GND	
11	HDMI_CLK+	DIFF	
12	HDMI_CLK-	DIFF	
13	GND	GND	
14	NC	NC	
15	HDMI_DDC_CLK	I/O	+5V
16	HDMI_DDC_DATA	I/O	+5V
17	NC	NC	
18	DPD_PWR	RWR	+5V
19	DPD_HPD	IN	

2.19 Mini Card Slot (PCIE1)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB/+3.3V	PWR	+3.3V
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	NC		
9	GND	GND	
10	NC		
11	PCIE_REF_CLK-	DIFF	
12	NC		
13	PCIE_REF_CLK+	DIFF	
14	NC		
15	GND	GND	
16	NC		
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	

22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-/mSATA_RX+	DIFF	
24	+3.3VSB/+3.3V	PWR	+3.3V
25	PCIE_RX+/mSATA_RX-	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-/mSATA_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+/mSATA_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB8_D-	DIFF	
37	GND	GND	
38	USB8_D+	DIFF	
39	+3.3VSB/+3.3V	PWR	+3.3V
40	GND	GND	
41	+3.3VSB/+3.3V	PWR	+3.3V
42	NC		
43	GND/NC	GND	
44	NC		
45	NC		

46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB/+3.3V	PWR	+3.3V

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。</p>						

Chapter

3

AMI
BIOS Setup

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The TKS-P20-CV01 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the

complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable/disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disables quiet boot option.

Security

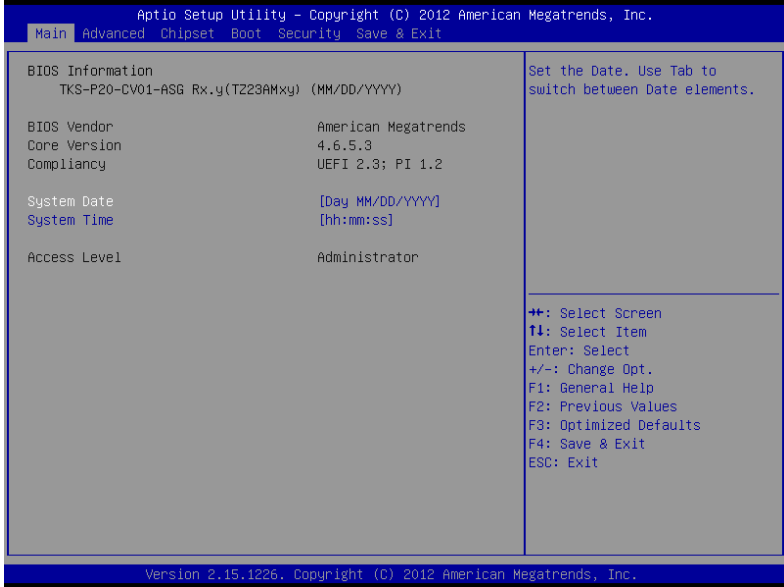
Set setup administrator password.

Save & Exit

Exit system setup after saving the changes.

Setup Menu

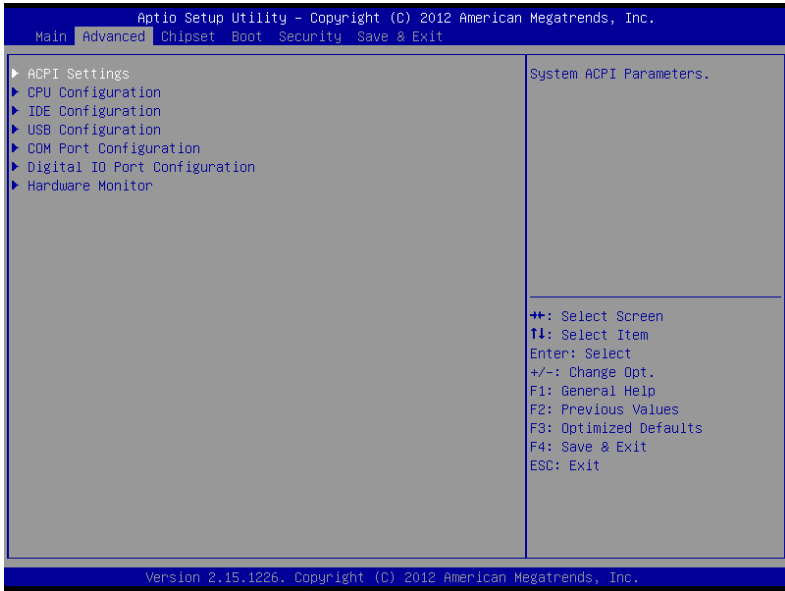
Setup submenu: Main



Options summary: (*default setting*)

System Date	Day MM:DD:YYYY	
Change the month, year and century. The 'Day' is changed automatically.		
System Time	HH : MM : SS	
Change the clock of the system.		

Setup submenu: Advanced

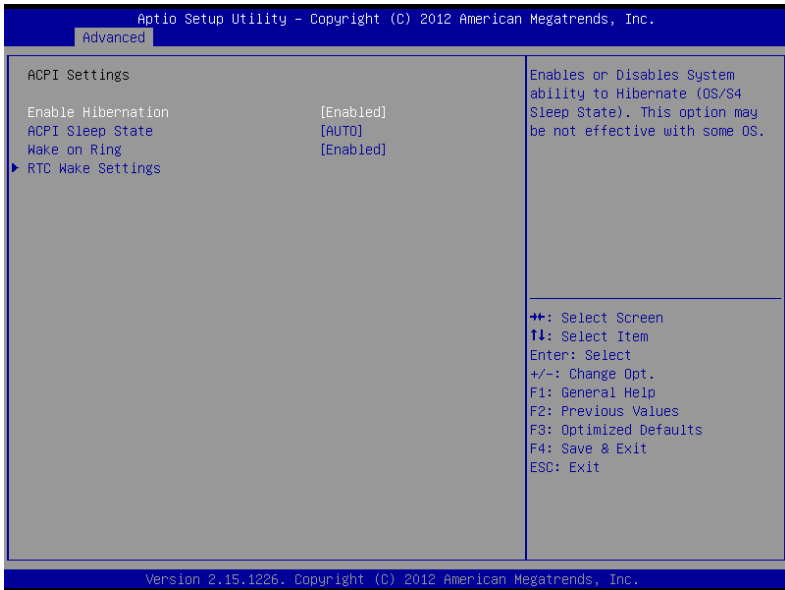


Options summary: **(default setting)**

ACPI Settings		
System ACPI Parameters		
CPU Configuration		
CPU Configuration Parameters		
IDE Configuration		
IDE Device Options Settings		
USB Configuration		
USB Configuration Parameters		
COM Port Configuration		

COM Port Configuration Parameters		
Digital IO Port Configuration		
DIO configuration		
H/W Monitor		
Monitor hardware status		

ACPI Settings



Options summary: **(default setting)**

Enable Hibernation	Enabled	
	Disabled	
Enabled or disabled hibernate (OS/S4 Sleep State).		

ACPI Sleep State	Suspend Disabled	
	S1 only(CPU Stop Clock)	
	S3 only(Suspend to RAM)	
	AUTO	
Select the ACPI state used for System Suspend		
Wake on Ring	Enabled	
	Disabled	
Enabled or disabled wake on ring function.		
RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		

RTC Wake Settings

```

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  Advanced
Wake system with Fixed Time      [Enabled]
Wake up day                      0
Wake up hour                     0
Wake up minute                   0
Wake up second                   0

Wake system with Dynamic Time    [Disabled]
Wake up minute increase          1

**: Select Screen
F1: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

Options summary: *(default setting)*

Wake system with Fixed Time	Disabled	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is setting by following settings.		
Wake up day	0-31	
Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up		
Wake up hour	0-23	
Wake up minute	0-59	
Wake up second	0-59	
Wake system with Dynamic Time	Disabled	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-5	

CPU Configuration

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Advanced

CPU Configuration		Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
Processor Type	Intel(R) Atom(TM) CPU N2	
EMT64	Not Supported	
Processor Speed	1600 MHz	
System Bus Speed	400 MHz	
Ratio Status	16	
Actual Ratio	16	
System Bus Speed	400 MHz	
Processor Stepping	30661	
Microcode Revision	269	
L1 Cache RAM	2x56 k	
L2 Cache RAM	2x512 k	
Processor Core	Dual	
Hyper-Threading	Supported	
Hyper-Threading	[Enabled]	++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Execute Disable Bit	[Enabled]	
Limit CPUID Maximum	[Disabled]	
▶ CPU Power Management		

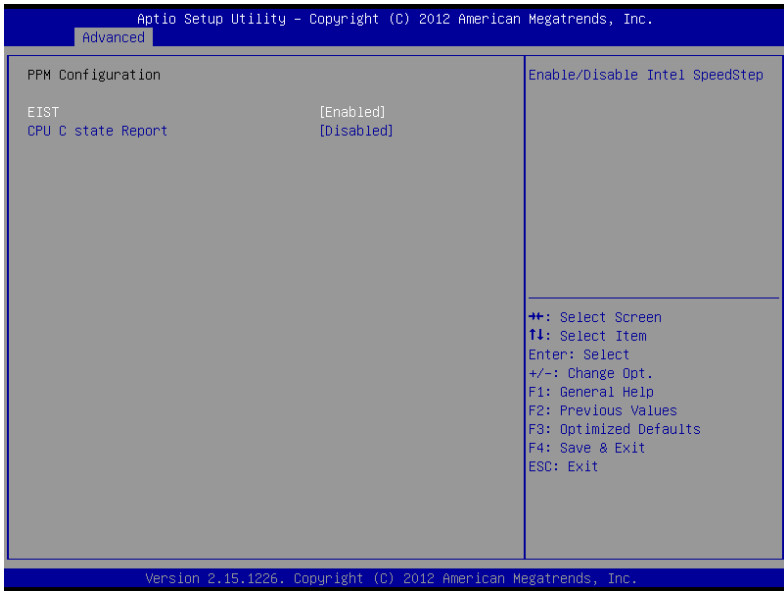
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

Options summary: (default setting)

Hyper-Threading	Disabled	
	Enabled	
En/Disable CPU Hyper-Threading function		
Execute Disable Bit	Disabled	
	Enabled	
En/Disable XD bit for supporting OS		
Limit CPUID Maximum	Disabled	
	Enabled	
Disabled for Windows XP		

CPU Power Management		
Configure CPU PPM parameters		

CPU Power Management



Options summary: **(default setting)**

EIST	Disabled	
	Enabled	
En/Disable Intel SpeedStep		
CPU C State Report	Disabled	
	Enabled	

Report C State support for ACPI OS

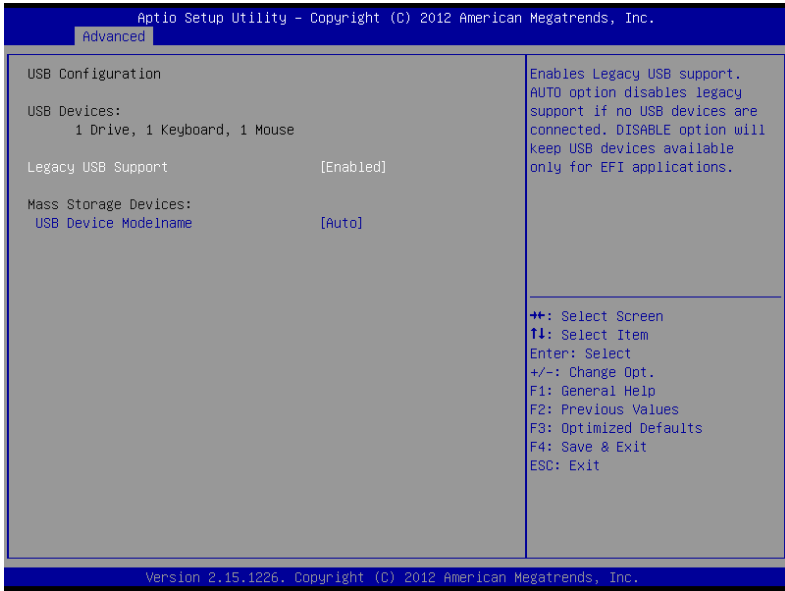
IDE Configuration



Options summary: **(default setting)**

SATA Controller(s)	Disabled	
	Enabled	
En/Disable SATA controller		
Configure SATA as	IDE	
	AHCI	
Configure SATA controller operating as IDE/AHCI mode.		

USB Configuration

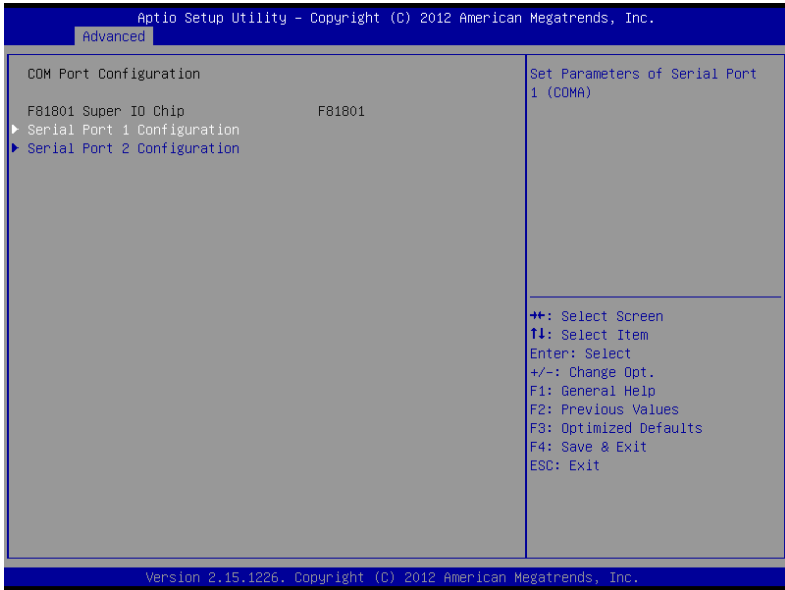


Options summary: *(default setting)*

Legacy USB Support	Enabled	
	Disabled	
	Auto	
<p>Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI application</p>		
Device Name (Emulation Type)	Auto	
	Floppy	

	Forced FDD	
	Hard Disk	
	CD-ROM	
<p>If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD(Ex. ZIP drive)</p>		

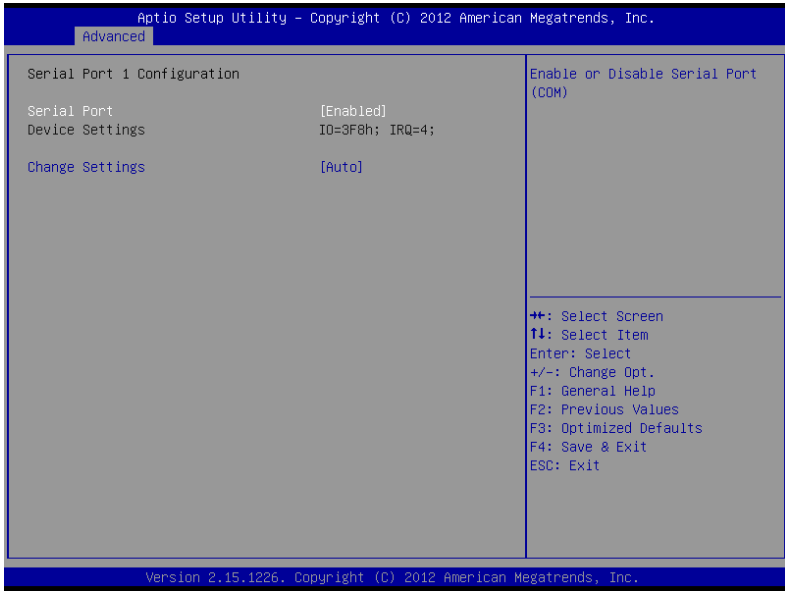
COM Port Configuration



Options summary: **(default setting)**

Serial Port 1/2 Configuration		
Set Parameters of Serial Port 1/2		

Serial Port 1 Configuration

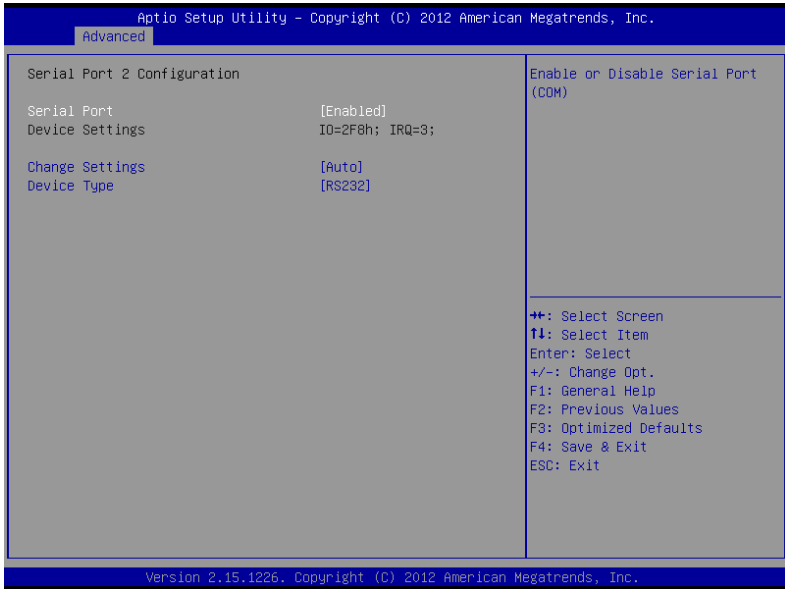


Options summary: (*default setting*)

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	Auto	
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	

Select a resource setting for Super IO device.

Serial Port 2 Configuration



Options summary: **(default setting)**

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	Auto	
	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	

	IO=3E8h; IRQ=3,4,5,7,10,11,12;	
	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		
Device Type	RS232	
	RS422	
	RS485	
Configure COM2 operated as RS232, RS422 or RS485.		

Digital IO Port Configuration



Options summary: (**default setting**)

GPIO1/GPIO2	Input	
-------------	--------------	--

Direction	Output	
Set GPIO1/GPIO2 as Input or Output		
GPIO3/GPIO4	Input	
Direction	Output	
Set GPIO3/GPIO4 as Input or Output		
Output Level	Hi	
	Low	
Set GPIO Level when used as Output		

H/W Monitor

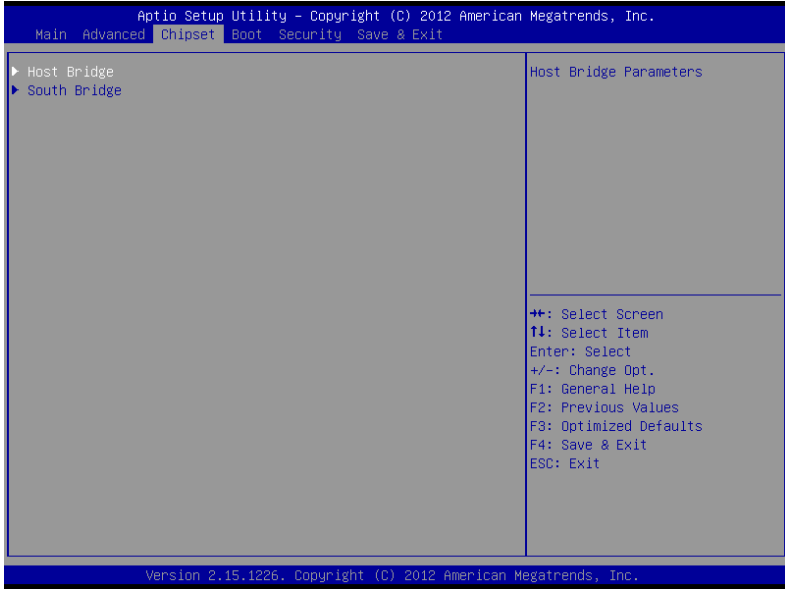
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Advanced

<p>Pc Health Status</p> <p>CPU temperature : +35 C</p> <p>System temperature : +35 C</p> <p>CPU_VCORE : +1.088 V</p> <p>VCC_DIMM : +1.512 V</p> <p>3.3V : +3.328 V</p> <p>3VSB : +3.360 V</p> <p>VBAT : +3.216 V</p>	<p>⇧⇧: Select Screen</p> <p>↑↓: Select Item</p> <p>Enter: Select</p> <p>+/-: Change Opt.</p> <p>F1: General Help</p> <p>F2: Previous Values</p> <p>F3: Optimized Defaults</p> <p>F4: Save & Exit</p> <p>ESC: Exit</p>
--	---

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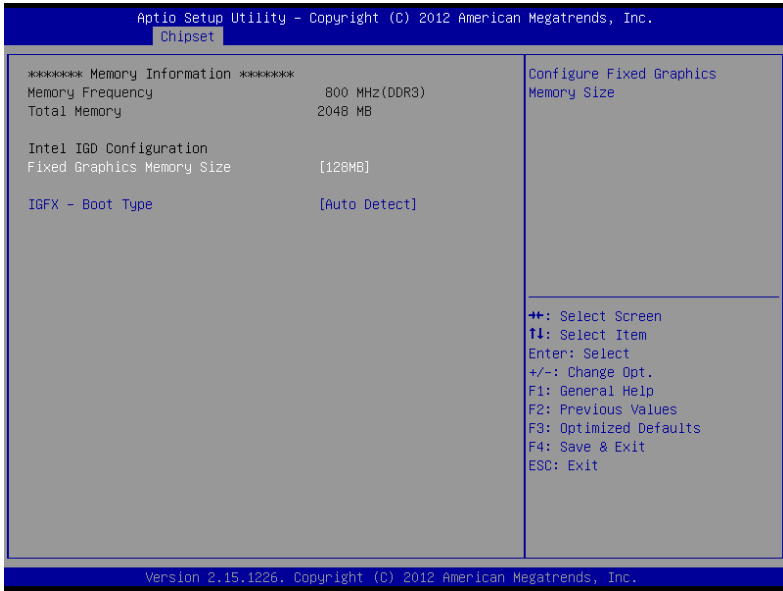
Setup submenu: Chipset



Options summary: **(default setting)**

Host Bridge		
Host Bridge Parameters		
South Bridge		
South Bridge Parameters		

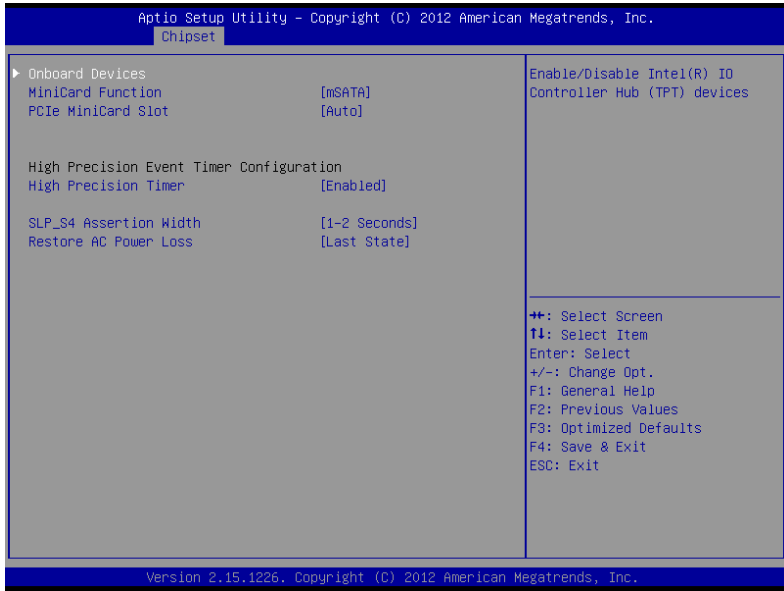
Host Bridge



Options summary: (default setting)

Fixed Graphics Memory	128MB	
Size	256MB	
Configure Fixed Graphics Memory Size		
IGFX - Boot Type	Auto Detect	
	CRT	
	HDMI	
Select Primary boot display device		

South Bridge

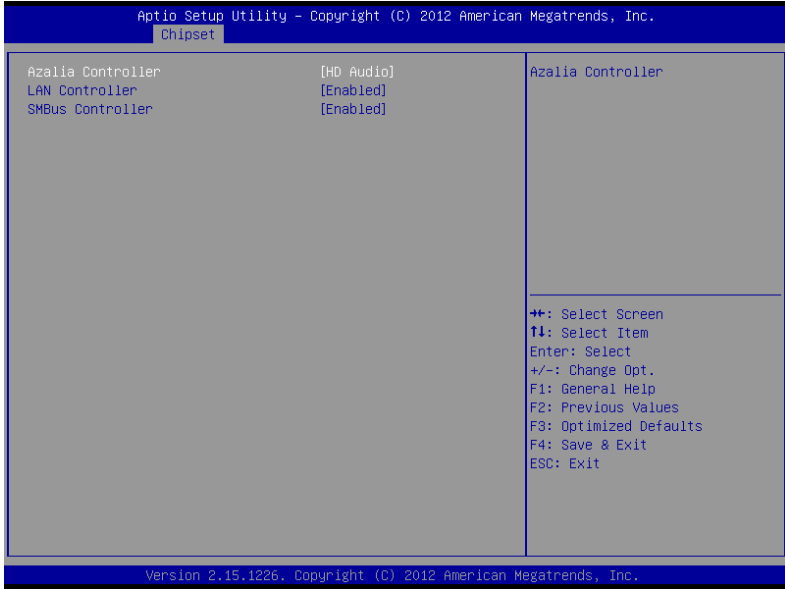


Options summary: (**default setting**)

Onboard Devices		
Onboard devices parameters configurations		
MiniCard Function	mSATA	
	PCIe	
Switch miniCard function to mSATA or PCIe		
PCIe MiniCard Slot	Auto	
	Enabled	
	Disabled	
Control the PCI Express Root Port.		

High Precision Timer	Enabled	
	Disabled	
Enable or Disable the High Precision Event Timer		
SLP_S4 Assertion Width	1-2 Seconds	
	2-3 Seconds	
	3-4 Seconds	
	4-5 Seconds	
Select a minimum assertion width of the SLP_S4# signal		
Restore AC Power Loss	Power On	
	Power Off	
	Last State	
Select AC power state when power is re-applied after a power failure.		

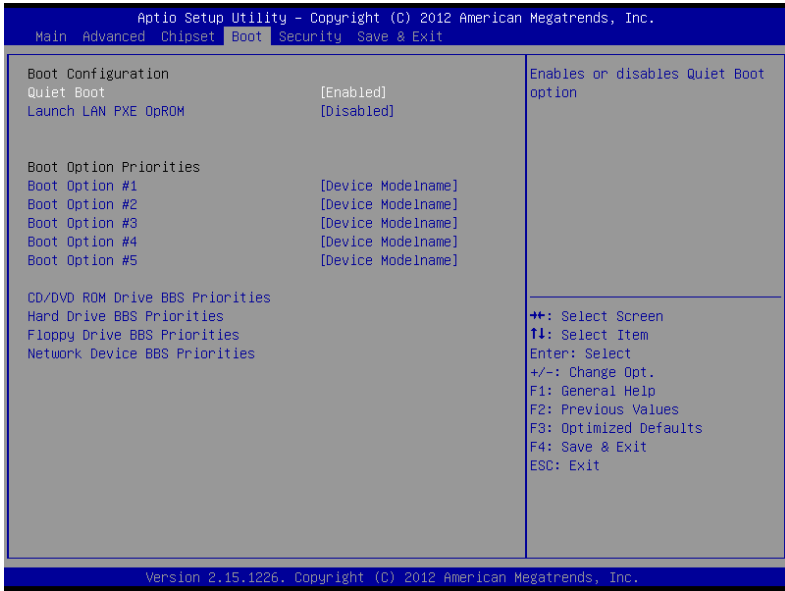
Onboard Devices



Options summary: (*default setting*)

Azalia Controller	Disabled	
	HD Audio	
Enable or disabled Azalia controller		
LAN Controller	Disabled	
	Enabled	
Enable or disable Realtek R8111E PCIE Lan Device		
SMBus Controller	Disabled	
	Enabled	
Enable or Disable OnChip SMBus Controller		

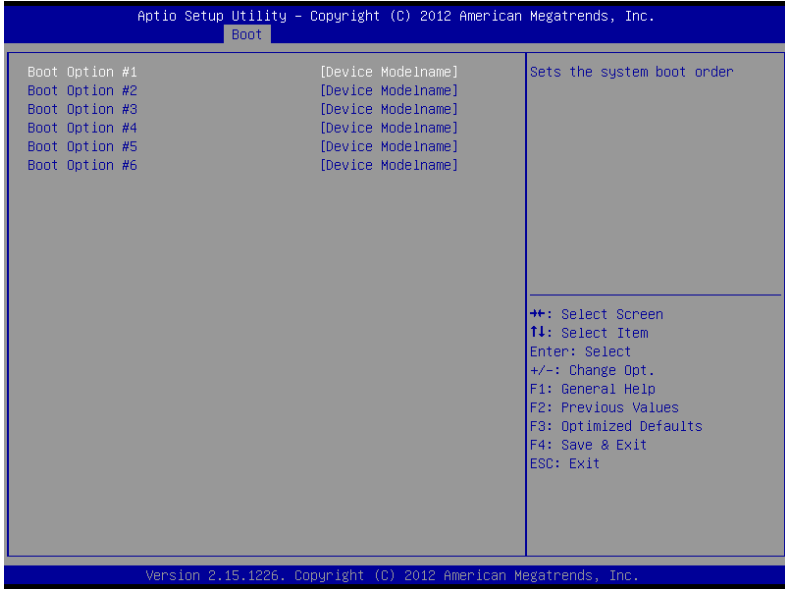
Setup submenu: Boot



Options summary: **(default setting)**

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch LAN PXE OpROM	Disabled	
	Enabled	
En/Disable PXE boot for RTL8111E LAN		
Boot Option #X/		
XXXX Drive BBS Priorities		
The order of boot priorities.		

BBS Priorities



Options summary: (*default setting*)

Boot Option #x	Disabled	
	Device name	
Sets the system boot order		

Setup submenu: Security



Options summary: (default setting)

Administrator Password/	Not set	
User Password		

You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

Install the Password:

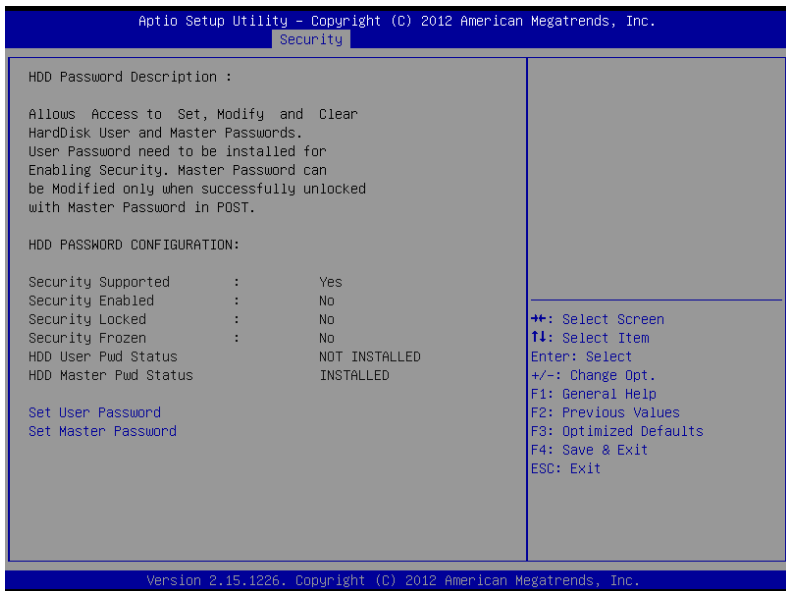
Press Enter on this item, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is

required at boot time, or when the user enters the Setup utility.

Removing the Password:

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

HDD Security



Options summary: (**default setting**)

Set User Password/	Not set	
Set Master Password		

You can install a Master and User password. Before booting to OS, HDD will be set to frozen state. On S3 resume HDD will be unlocked using the HDD Password we

entered while system booting.

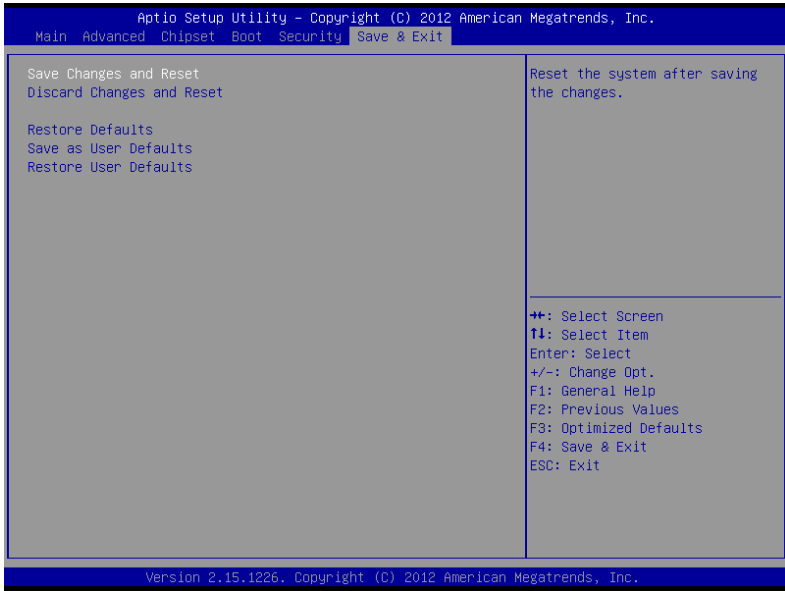
Install the Password:

Press Enter on this item, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password:

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

Setup submenu: Exit



Options summary: **(default setting)**

Save Changes and Reset		
Reset the system after saving the changes		
Discard Changes and Reset		
Reset system setup without saving any changes		
Restore Defaults		
Restore/Load Default values for all the setup options.		
Save as User Defaults		
Save the changes done so far as User Defaults		
Restore User Defaults		

Restore the User Defaults to all the setup options

Chapter

4

**Driver
Installation**

The TKS-P20-CV01 comes with an AutoRun DVD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver DVD, the driver DVD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

- Step 1 – Install Chipset Driver
- Step 2 – Install VGA Driver
- Step 3 – Install AHCI Driver
- Step 4 – Install LAN Driver
- Step 5 – Install Audio Driver
- Step 6 – Serial Port Driver (Optional)

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the TKS-P20-CV01 DVD-ROM into the DVD-ROM drive. And install the drivers from Step 1 to Step 6 in order.

Step 1 – Install Chipset Driver

1. Click on the **STEP1-CHIPSET** folder and select the OS folder your system is
2. Double click on the **infinst_autol_1034.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 2 – Install VGA Driver

For Windows® 7

1. Click on the **STEP2-VGA** folder and select the folder of **WIN7_32**
2. Double click on the **Setup.exe** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

For Windows® XP

1. Install Framework 3.5
 - Double click on the **dotnetfx35.exe**
 - Follow the instructions that the window shows
 - The system will help you install the driver automatically

2. Install IEMGD

- Double click on the **SETUP.exe**
- Select the configuration
- Follow the instructions that the window shows
- The system will help you install the driver automatically

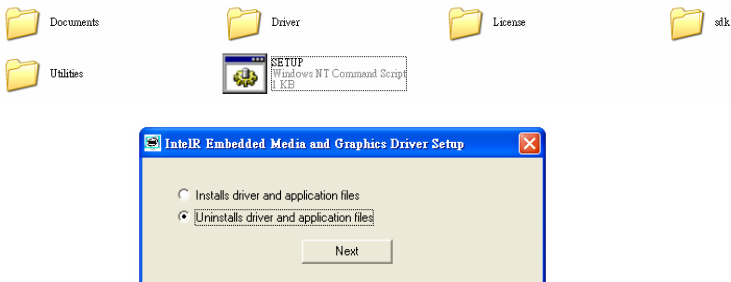




If you want to update driver, please uninstall driver first.

Uninstall IEMGD

1. Double click on the **SETUP.exe**
2. Follow the instructions that the window shows
3. The system will help you uninstall the driver automatically



Step 3 – Install AHCI Driver

Please refer to the Appendix D AHCI Setting

Step 4 – Install LAN Driver

1. Click on the **STEP4-LAN** folder and select the OS folder your system is
2. Double click on the **setup.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 5 – Install Audio Driver

1. Click on the **STEP5-AUDIO** folder and select the OS folder your system is
2. Double click on the **Setup.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 6– Serial Port Driver (Optional)

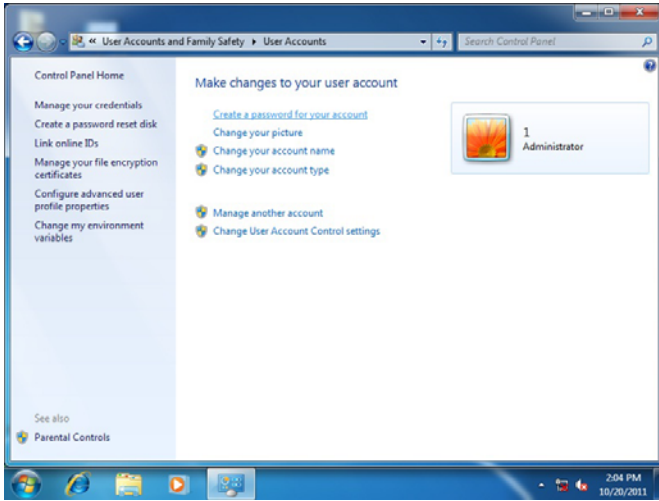
For Windows® XP:

1. Click on the **STEP6-Serial Port Driver (Optional)** and select the folder of **WINXP_32**
2. Double click on **patch.bat** file
3. Follow the instructions that the window shows

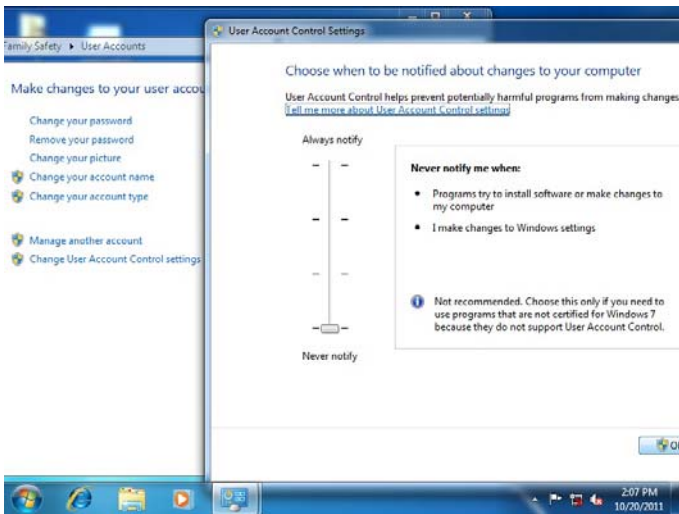
4. The system will help you install the driver automatically

For Windows® 7:

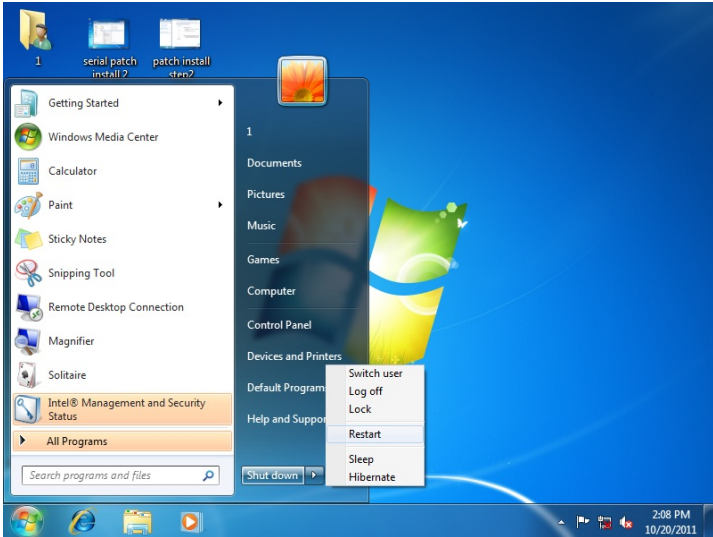
1. Create a password for Administrator account.



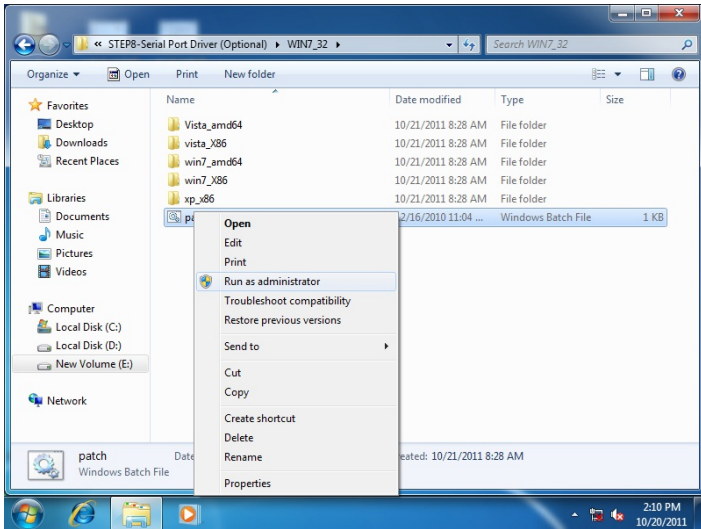
2. Change User Account Control Settings to [Never notify]



3. Reboot and Administrator login.



4. To run patch.bat with [Run as administrator].



Appendix

A

Programming the Watchdog Timer

A.1 Watchdog Timer Registers

Table 1 : Watch dog relative IO address		
	Default Value	Note
I/O Base Address	0xA00	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61.

Table 2 : Watchdog relative register table				
Register	Offset	BitNum	Value	Note
Watchdog WDTRST# Enable	0x00	7	1	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable
Pulse Width	0x05	0:1	01	Width of Pulse signal 00: 1ms (do not use) 01: 25ms 10: 125ms 11: 5s Pulse width is must longer then 16ms.
Signal Polarity	0x05	2	0	0: low active 1: high active Must set this bit to 0
Counting Unit	0x05	3	0	Select time unit. 0: second 1: minute
Output Signal Type	0x05	4	1	0: Level 1: Pulse Must set this bit to 1
Watchdog Timer Enable	0x05	5	1	0: Disable 1: Enable
Timeout Status	0x05	6	1	1: timeout occurred. Write a 1 to clear timeout status
Timer Counter	0x06			Time of watchdog timer (0~255)

A.2 WatchDog Sample Program

```

*****
// WDT I/O operation relative definition (Please reference to Table 1)
#define WDTAddr      0xA00 // WDT I/O base address
Void WDTWriteByte(byte Register, byte Value);
byte WDTReadByte(byte Register);
Void WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define DevReg      0x00 // Device configuration register
    #define WDRstBit 0x80 // Watchdog WDRST# (Bit7)
    #define WDRstVal 0x80 // Enabled WDRST#
#define TimerReg    0x05 // Timer register
    #define PSWidthBit 0x00 // WDRST# Pulse width (Bit0:1)
    #define PSWidthVal 0x01 // 25ms for WDRST# pulse
    #define PolarityBit 0x02 // WDRST# Signal polarity (Bit2)
    #define PolarityVal 0x00 // Low active for WDRST#
    #define UnitBit     0x03 // Unit for timer (Bit3)
    #define ModeBit     0x04 // WDRST# mode (Bit4)
    #define ModeVal     0x01 // 0: level 1: pulse
    #define EnableBit   0x05 // WDT timer enable (Bit5)
    #define EnableVal   0x01 // 1: enable
    #define StatusBit   0x06 // WDT timer status (Bit6)
#define CounterReg  0x06 // Timer counter register
*****

*****
VOID Main(){
    // Procedure : AeonWDTConfig
    // (byte)Timer : Counter of WDT timer.(0x00~0xFF)
    // (boolean)Unit : Select time unit(0: second, 1: minute).
    AeonWDTConfig(Counter, Unit);

    // Procedure : AeonWDTEnable
    // This procedure will enable the WDT counting.

```

```

    AeonWDTEnable();
}
*****

*****
// Procedure : AeonWDTEnable
VOID AeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AeonWDTConfig
VOID AeonWDTConfig (byte Counter, BOOLEAN Unit){
    // Disable WDT counting
    WDTEnableDisable(0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting(Timer, Unit);
}

VOID WDTEnableDisable(byte Value){
    If (Value == 1)
        WDTSetBit(TimerReg, EnableBit, 1);
    else
        WDTSetBit(TimerReg, EnableBit, 0);
}

VOID WDTParameterSetting(byte Counter, BOOLEAN Unit){
    // Watchdog Timer counter setting
    WDTWriteByte(CounterReg, Counter);
    // WDT counting unit setting
    WDTSetBit(TimerReg, UnitBit, Unit);
    // WDT output mode set to pulse
    WDTSetBit(TimerReg, ModeBit, ModeVal);
    // WDT output mode set to active low
    WDTSetBit(TimerReg, PolarityBit, PolarityVal);
    // WDT output pulse width is 25ms

```

```

    WDTSetBit(TimerReg, PSWidthBit, PSWidthVal);
    // Watchdog WDRST# Enable
    WDTSetBit(DevReg, WDRstBit, WDRstVal);
}

VOID WDTClearTimeoutStatus(){
    WDTSetBit(TimerReg, StatusBit, 1);
}

*****

*****
VOID WDTWriteByte(byte Register, byte Value){
    IOWriteByte(WDTAddr+Register, Value);
}

byte WDTReadByte(byte Register){
    return IOReadByte(WDTAddr+Register);
}

VOID WDTSetBit(byte Register, byte Bit, byte Val){
    byte TmpValue;

    TmpValue = WDTReadByte(Register);
    TmpValue &= ~(1 << Bit);
    TmpValue |= Val << Bit;
    WDTWriteByte(Register, TmpValue);
}

*****

```































Appendix

B

I/O Information

B.1 I/O Address Map
















































Input/output (IO)	
	[00000000 - 0000001F] Direct memory access controller
	[00000000 - 00000CF7] PCI bus
	[00000010 - 0000001F] Motherboard resources
	[00000020 - 00000021] Programmable interrupt controller
	[00000022 - 0000003F] Motherboard resources
	[00000024 - 00000025] Programmable interrupt controller
	[00000028 - 00000029] Programmable interrupt controller
	[0000002C - 0000002D] Programmable interrupt controller
	[0000002E - 0000002F] Motherboard resources
	[00000030 - 00000031] Programmable interrupt controller
	[00000034 - 00000035] Programmable interrupt controller
	[00000038 - 00000039] Programmable interrupt controller
	[0000003C - 0000003D] Programmable interrupt controller
	[00000040 - 00000043] System timer
	[00000044 - 0000005F] Motherboard resources
	[0000004E - 0000004F] Motherboard resources
	[00000050 - 00000053] System timer
	[00000060 - 00000060] Standard PS/2 Keyboard
	[00000061 - 00000061] Motherboard resources
	[00000062 - 00000063] Motherboard resources
	[00000063 - 00000063] Motherboard resources
	[00000064 - 00000064] Standard PS/2 Keyboard
	[00000065 - 00000065] Motherboard resources
	[00000065 - 0000006F] Motherboard resources
	[00000067 - 00000067] Motherboard resources
	[00000070 - 00000070] Motherboard resources
	[00000070 - 00000077] System CMOS/real time clock
	[00000072 - 0000007F] Motherboard resources
	[00000080 - 00000080] Motherboard resources
	[00000080 - 00000080] Motherboard resources
	[00000081 - 00000091] Direct memory access controller
	[00000084 - 00000086] Motherboard resources
	[00000088 - 00000088] Motherboard resources
	[0000008C - 0000008E] Motherboard resources
	[00000090 - 0000009F] Motherboard resources
	[00000092 - 00000092] Motherboard resources
	[00000093 - 0000009F] Direct memory access controller
	[000000A0 - 000000A1] Programmable interrupt controller
	[000000A2 - 000000BF] Motherboard resources
	[000000A4 - 000000A5] Programmable interrupt controller
	[000000A8 - 000000A9] Programmable interrupt controller
	[000000AC - 000000AD] Programmable interrupt controller

	[00000B0 - 00000B1]	Programmable interrupt controller
	[00000B2 - 00000B3]	Motherboard resources
	[00000B4 - 00000B5]	Programmable interrupt controller
	[00000B8 - 00000B9]	Programmable interrupt controller
	[00000BC - 00000BD]	Programmable interrupt controller
	[00000C0 - 00000DF]	Direct memory access controller
	[00000E0 - 00000EF]	Motherboard resources
	[00000F0 - 00000F0]	Numeric data processor
	[000002F8 - 000002FF]	Communications Port (COM2)
	[000003B0 - 000003BB]	Intel(R) Graphics Media Accelerator 3600 Series
	[000003C0 - 000003DF]	Intel(R) Graphics Media Accelerator 3600 Series
	[000003F8 - 000003FF]	Communications Port (COM1)
	[00000400 - 0000047F]	Motherboard resources
	[00000400 - 0000047F]	Motherboard resources
	[000004D0 - 000004D1]	Motherboard resources
	[000004D0 - 000004D1]	Programmable interrupt controller
	[00000500 - 0000053F]	Motherboard resources
	[00000500 - 0000057F]	Motherboard resources
	[00000600 - 0000061F]	Motherboard resources
	[00000680 - 0000069F]	Motherboard resources
	[000006A0 - 000006AF]	Motherboard resources
	[000006B0 - 000006EF]	Motherboard resources
	[00000A00 - 00000A0F]	Motherboard resources
	[00000A10 - 00000A1F]	Motherboard resources
	[00000D00 - 0000FFFF]	PCI bus
	[00001000 - 0000100F]	Motherboard resources
	[0000E000 - 0000E0FF]	Realtek PCIe GBE Family Controller
	[0000E000 - 0000EFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
	[0000F000 - 0000F01F]	Intel(R) N10/ICH7 Family SMBus Controller - 27DA
	[0000F020 - 0000F02F]	Intel(R) ICH7R/DH SATA AHCI Controller



















B.2 Memory Address Map

Address Range	Device
[00000000 - 00000FFF]	Motherboard resources
[00000000 - 00000FFF]	Motherboard resources
[00000000 - 00003FFF]	Motherboard resources
[000A0000 - 000BFFFF]	Intel(R) Graphics Media Accelerator 3600 Series
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	PCI bus
[000F0000 - 000FFFFF]	PCI bus
[7F800000 - 7FFFFFFF]	PCI bus
[80000000 - FEBFFFFF]	PCI bus
[DFD00000 - DFDFFFFF]	Intel(R) Graphics Media Accelerator 3600 Series
[DFE00000 - DFE03FFF]	Realtek PCIe GBE Family Controller
[DFE00000 - DFEFFFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
[DFE04000 - DFE04FFF]	Realtek PCIe GBE Family Controller
[DFF00000 - DFF03FFF]	High Definition Audio Controller
[DFF04000 - DFF043FF]	Intel(R) ICH7R/DH SATA AHCI Controller
[DFF05000 - DFF053FF]	Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
[E0000000 - EFFFFFFF]	System board
[FEC00000 - FEC00FFF]	Motherboard resources
[FED00000 - FED003FF]	High precision event timer
[FED14000 - FED19FFF]	System board
[FED1C000 - FED1FFFF]	Motherboard resources
[FED1C000 - FED1FFFF]	Motherboard resources
[FED20000 - FED8FFFF]	Motherboard resources
[FED45000 - FED8FFFF]	Motherboard resources
[FEE00000 - FEE00FFF]	Motherboard resources
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FFC00000 - FFFFFFFF]	Motherboard resources

B.3 IRQ Mapping Chart


Interrupt request (IRQ)	
	(ISA) 0x00000000 (00) System timer
	(ISA) 0x00000001 (01) Standard PS/2 Keyboard
	(ISA) 0x00000003 (03) Communications Port (COM2)
	(ISA) 0x00000004 (04) Communications Port (COM1)
	(ISA) 0x00000008 (08) System CMOS/real time clock
	(ISA) 0x0000000C (12) Microsoft PS/2 Mouse
	(ISA) 0x0000000D (13) Numeric data processor
	(ISA) 0x00000051 (81) Microsoft ACPI-Compliant System
	(ISA) 0x00000052 (82) Microsoft ACPI-Compliant System
	(ISA) 0x00000053 (83) Microsoft ACPI-Compliant System
	(ISA) 0x00000054 (84) Microsoft ACPI-Compliant System
	(ISA) 0x00000055 (85) Microsoft ACPI-Compliant System
	(ISA) 0x00000056 (86) Microsoft ACPI-Compliant System
	(ISA) 0x00000057 (87) Microsoft ACPI-Compliant System
	(ISA) 0x00000058 (88) Microsoft ACPI-Compliant System
	(ISA) 0x00000059 (89) Microsoft ACPI-Compliant System
	(ISA) 0x0000005A (90) Microsoft ACPI-Compliant System
	(ISA) 0x0000005B (91) Microsoft ACPI-Compliant System
	(ISA) 0x0000005C (92) Microsoft ACPI-Compliant System
	(ISA) 0x0000005D (93) Microsoft ACPI-Compliant System
	(ISA) 0x0000005E (94) Microsoft ACPI-Compliant System
	(ISA) 0x0000005F (95) Microsoft ACPI-Compliant System
	(ISA) 0x00000060 (96) Microsoft ACPI-Compliant System
	(ISA) 0x00000061 (97) Microsoft ACPI-Compliant System
	(ISA) 0x00000062 (98) Microsoft ACPI-Compliant System
	(ISA) 0x00000063 (99) Microsoft ACPI-Compliant System
	(ISA) 0x00000064 (100) Microsoft ACPI-Compliant System
	(ISA) 0x00000065 (101) Microsoft ACPI-Compliant System
	(ISA) 0x00000066 (102) Microsoft ACPI-Compliant System
	(ISA) 0x00000067 (103) Microsoft ACPI-Compliant System
	(ISA) 0x00000068 (104) Microsoft ACPI-Compliant System
	(ISA) 0x00000069 (105) Microsoft ACPI-Compliant System
	(ISA) 0x0000006A (106) Microsoft ACPI-Compliant System
	(ISA) 0x0000006B (107) Microsoft ACPI-Compliant System
	(ISA) 0x0000006C (108) Microsoft ACPI-Compliant System
	(ISA) 0x0000006D (109) Microsoft ACPI-Compliant System
	(ISA) 0x0000006E (110) Microsoft ACPI-Compliant System
	(ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
	(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
	(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
	(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
	(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
	(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
	(ISA) 0x00000075 (117) Microsoft ACPI-Compliant System
	(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
	(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
	(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System

(ISA) 0x00000079 (L21)	Microsoft ACPI-Compliant System
(ISA) 0x0000007A (L22)	Microsoft ACPI-Compliant System
(ISA) 0x0000007B (L23)	Microsoft ACPI-Compliant System
(ISA) 0x0000007C (L24)	Microsoft ACPI-Compliant System
(ISA) 0x0000007D (L25)	Microsoft ACPI-Compliant System
(ISA) 0x0000007E (L26)	Microsoft ACPI-Compliant System
(ISA) 0x0000007F (L27)	Microsoft ACPI-Compliant System
(ISA) 0x00000080 (L28)	Microsoft ACPI-Compliant System
(ISA) 0x00000081 (L29)	Microsoft ACPI-Compliant System
(ISA) 0x00000082 (L30)	Microsoft ACPI-Compliant System
(ISA) 0x00000083 (L31)	Microsoft ACPI-Compliant System
(ISA) 0x00000084 (L32)	Microsoft ACPI-Compliant System
(ISA) 0x00000085 (L33)	Microsoft ACPI-Compliant System
(ISA) 0x00000086 (L34)	Microsoft ACPI-Compliant System
(ISA) 0x00000087 (L35)	Microsoft ACPI-Compliant System
(ISA) 0x00000088 (L36)	Microsoft ACPI-Compliant System
(ISA) 0x00000089 (L37)	Microsoft ACPI-Compliant System
(ISA) 0x0000008A (L38)	Microsoft ACPI-Compliant System
(ISA) 0x0000008B (L39)	Microsoft ACPI-Compliant System
(ISA) 0x0000008C (L40)	Microsoft ACPI-Compliant System
(ISA) 0x0000008D (L41)	Microsoft ACPI-Compliant System
(ISA) 0x0000008E (L42)	Microsoft ACPI-Compliant System
(ISA) 0x0000008F (L43)	Microsoft ACPI-Compliant System
(ISA) 0x00000090 (L44)	Microsoft ACPI-Compliant System
(ISA) 0x00000091 (L45)	Microsoft ACPI-Compliant System
(ISA) 0x00000092 (L46)	Microsoft ACPI-Compliant System
(ISA) 0x00000093 (L47)	Microsoft ACPI-Compliant System
(ISA) 0x00000094 (L48)	Microsoft ACPI-Compliant System
(ISA) 0x00000095 (L49)	Microsoft ACPI-Compliant System
(ISA) 0x00000096 (L50)	Microsoft ACPI-Compliant System
(ISA) 0x00000097 (L51)	Microsoft ACPI-Compliant System
(ISA) 0x00000098 (L52)	Microsoft ACPI-Compliant System
(ISA) 0x00000099 (L53)	Microsoft ACPI-Compliant System
(ISA) 0x0000009A (L54)	Microsoft ACPI-Compliant System
(ISA) 0x0000009B (L55)	Microsoft ACPI-Compliant System
(ISA) 0x0000009C (L56)	Microsoft ACPI-Compliant System
(ISA) 0x0000009D (L57)	Microsoft ACPI-Compliant System
(ISA) 0x0000009E (L58)	Microsoft ACPI-Compliant System
(ISA) 0x0000009F (L59)	Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (L60)	Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (L61)	Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (L62)	Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (L63)	Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (L64)	Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (L65)	Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (L66)	Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (L67)	Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (L68)	Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (L69)	Microsoft ACPI-Compliant System
(ISA) 0x000000AA (L70)	Microsoft ACPI-Compliant System
(ISA) 0x000000AB (L71)	Microsoft ACPI-Compliant System
(ISA) 0x000000AC (L72)	Microsoft ACPI-Compliant System
(ISA) 0x000000AD (L73)	Microsoft ACPI-Compliant System
(ISA) 0x000000AE (L74)	Microsoft ACPI-Compliant System
(ISA) 0x000000AF (L75)	Microsoft ACPI-Compliant System

	(ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
	(PCI) 0x00000007 (07)	Intel(R) N10/ICH7 Family SMBus Controller - 27DA
	(PCI) 0x00000010 (16)	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
	(PCI) 0x00000010 (16)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB

B.4 DMA Channel Assignments

Direct memory access (DMA)

-  4 Direct memory access controller

Appendix

C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model number		
CN1	COM1 Port	CATCH	1201-700-09S	Serial Port Cable	1701090150
CN2	COM2 Port	CATCH	1201-700-09S	Serial Port Cable	1701090150
CN3	Digital I/O	CATCH	1201-700-06S	AAEON DIO Extension Cable	1701060150
CN4	+5V Output for SATA HDD	CATCH	1192-700-02S	2 Pins for SATA PWR Cable	1702150155
CN5	SATA Port	ASTRON	97-0912HA-7-R	7-Pin 50cm SATA Cable	1709070500
CN6	External 12V Input	CATCH	1191-700-04S	PWR Cable	170204010S
CN7	RJ-45 Ethernet	UDE	RT7-17FAAM1A	N/A	N/A
CN8	Buzzer	CATCH	1201-700-02S	Buzzer Cable	170302010C
CN9	Audio Line In/Out and MIC Connector	CATCH	1201-700-10S	Audio Cable	1709100254
CN10	LPC Expansion I/F	CATCH	1204-700-12S	AAEON LPC Cable	1703120130

Embedded Box**TKS-P20-CV01**

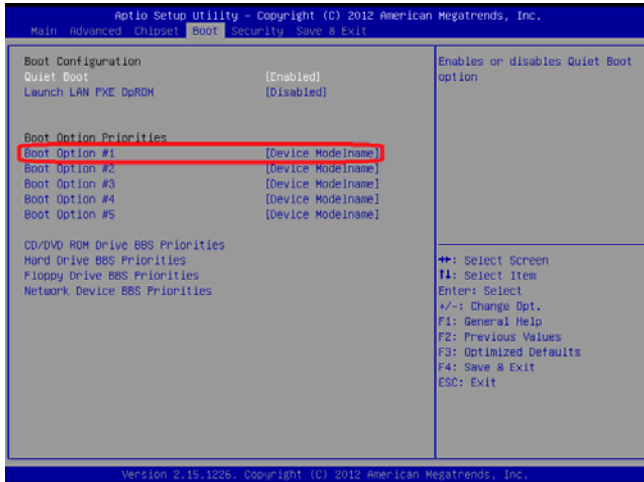
CN11	USB Port 5	CATCH	1201-700-05S	USB Port Cable	1700050207
CN12	Analog CRT Display	ASTRON	HDLH-B15-CF HN1T-1-R	N/A	N/A
CN13	USB Port 3	CATCH	1201-700-05S	USB Port Cable	1700050207
CN14	USB Port 4	CATCH	1201-700-05S	USB Port Cable	1700050207
CN15	18-bit LVDS Output	E-Call	0110-01-553-200	N/A	N/A
CN16	USB Port 1 and 2	TechBest	KS-002D-ANB(2.0)-L	N/A	N/A
CN17	HDMI Type C	ASTRON	360FC19-0N002T-R	N/A	N/A
CN18	LVDS Inverter/ Backlight Connector	CATCH	1192-700-05S	N/A	N/A
CN19	Front Panel	JVE	21B22050-XXS 10B-01G-4/2	AAEON Front Panel Cable	1701100156
BAT1	External RTC Battery Connector	CATCH	1201-700-02S	Battery Cable	175011901 M

Appendix

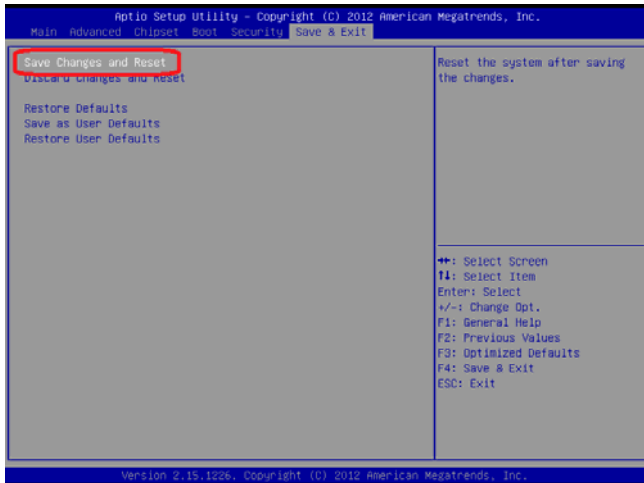
D

AHCI Setting

Step 4: Configure DVD/CD-ROM drive as the first boot device.

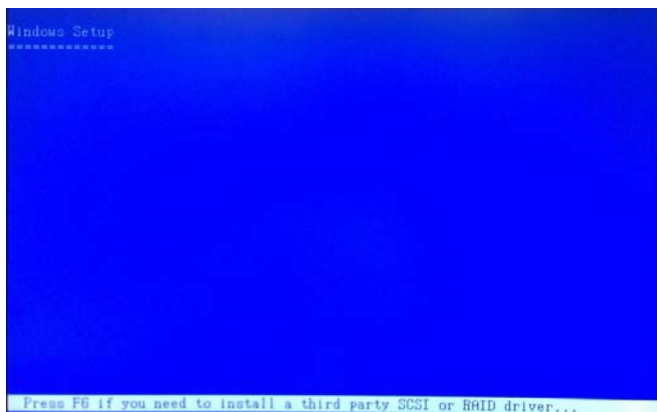


Step 5: Save changes and exit BIOS SETUP



Step 6 – Boot to DVD/CD-ROM device to install OS

Step 7 – Press “F6” to install AHCI driver



Step 8 – Press “S” to install AHCI driver



Step 9 – Choose “Intel(R) ICH7R/DH SATA AHCI Controller”

Step 10 – Windows Setup will display the controller name you selected in previous step and continue to install OS when “ENTER” pressed.

Appendix

E

Digital I/O Ports

E.1 Electrical Specifications for Digital I/O Ports

Table 1 : Digital Input/Output Pin Electrical Specification						
Pin	Type	Input Threshold Voltage		Output Voltage		Note
		Low	High	Low	High	
DIO1	I/O	0.8	2.0	0	3.3	
DIO2	I/O	0.8	2.0	0	3.3	
DIO3	I/O	0.8	2.0	0	3.3	
DIO4	I/O	0.8	2.0	0	3.3	

Note: All DIO pins are 5V tolerance in input mode.

E.2 DIO Programming

TKS-P20-CV01 utilizes FINTEK F81801U chipset as its Digital I/O controller. Below are the procedures to complete its configuration and the AAeon initial DIO program is also attached based on which you can develop customized program to fit your application. There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

E.3 Digital I/O Register

	Default Value	Note
Index	0x2E	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	0x2F)	SIO MB PnP Mode Data Register 0x2F or 0x4F

	LDN	Register	BitNum	Note
GPIO1 Direction	0x06	0xD0	0	0:input, 1: output
GPIO2 Direction	0x06	0xD0	1	
GPIO3 Direction	0x06	0xD0	2	
GPIO4 Direction	0x06	0xD0	3	
GPIO1 Output Level	0x06	0xD1	0	0:low, 1: high
GPIO2 Output Level	0x06	0xD1	1	
GPIO3 Output Level	0x06	0xD1	2	
GPIO4 Output Level	0x06	0xD1	3	
GPIO1 Status	0x06	0xD2	0	0:low, 1: high
GPIO2 Status	0x06	0xD2	1	
GPIO3 Status	0x06	0xD2	2	
GPIO4 Status	0x06	0xD2	3	

E.4 Digital I/O Sample Program

```

*****
// SuperIO relative definition (Please reference to Table 2)
#define SI0Index 0x2E
#define SI0Data 0x2F
#define DI0LDN 0x06
IOWriteByte(byte IOPort, byte Value);
IOReadByte(byte IOPort);
// DI0 relative definition (Please reference to Table 3)
#define DirReg 0xD0 // 0:input, 1: output
    #define InputPin 0x00
    #define OutputPin 0x01
#define OutputReg 0xD1 // 0:low, 1: high
#define StatusReg 0xD2 // 0:low, 1: high
    #define PinLow 0x00
    #define PinHigh 0x01
#define Pin1Bit 0x00
#define Pin2Bit 0x01
#define Pin3Bit 0x02
#define Pin4Bit 0x03
*****

*****
VOID Main(){
    Boolean PinStatus ;

    // Procedure : AeonReadPinStatus
    // Input :
    // Example, Read Digital I/O Pin 3 status
    // Output :
    // InputStatus :
    // 0: Digital I/O Pin level is low
    // 1: Digital I/O Pin level is High
    PinStatus = AeonReadPinStatus(Pin3Bit);

    // Procedure : AeonSetOutputLevel

```

```

// Input :
// Example, Set Digital I/O Pin 2 to high level
AaeonSetOutputLevel(Pin2Bit, PinHigh);
}
*****

*****
Boolean AaeonReadPinStatus(byte PinBit){
    Boolean PinStatus ;

    PinStatus = SIOBitRead(DIOLDN, StatusReg, PinBit);
    Return PinStatus ;
}
VOID AaeonSetOutputLevel(byte PinBit, byte Value){
    ConfigDioMode(PinBit, OutputPin);
    SIOBitSet(DIOLDN, OutputReg, PinBit, Value);
}
*****
*****

*****VOID SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

VOID SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

```

```

SIOEnterMBPnPMode();
SIOSelectLDN(LDN);
IOWriteByte(SIOIndex, Register);
TmpValue = IOReadByte(SIOData);
TmpValue &= ~(1 << BitNum);
TmpValue |= (Value << BitNum);
IOWriteByte(SIOData, TmpValue);
SIOExitMBPnPMode();
}

VOID SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}

*****
*****

```

TKS-P20-CV01-001- CXXX

嵌入式无风扇型工业控制计算机

USER'S MANUAL(中文版)

Version 1.0

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包装清单

在您打开包装后，请检查包装内如下对象是否齐全：

- TKS-P20-CV01-001-CXXX 整机一台
- 鼠标/键盘连接线一个
- 六角或者圆头螺丝一包
- 主板配线一套
- 系统安装光盘一片（内含使用手册）
- 保修证明以及合格证一套
- 如果以上任何物品不齐全或者有损坏，请立刻与当地经销商或者销售代表联系。

安全与警告

1. 请仔细阅读如下安全说明。
2. 请保存好本用户手册以供日后参考。
3. 在清洁本设备之前，首先要切断所有交流电源。不要用液体或者气雾清洁剂进行清洗。请使用潮湿的棉布进行清洁。
4. 电源插座必须安装在设备附近，以方便接通电源。
5. 保持设备干燥，以防潮湿
6. 安装过程中，须将本设备放置在牢固的桌面。如果跌落会造成损坏。
7. 在接入电源之前请确认设备与电源电压等是否匹配。
8. 请将电源线绑好，以防止被踩到。不要在电源线上放置任何物体。
9. 请认真阅读设备上的任何小心和警告提示内容
10. 如果长时间不使用本设备，请断开电源线以防瞬间高压带来损伤。
11. 请不要在机器上倾倒任何液体，因为可能导致火灾或者电源短路。
12. 请不要打开本设备，出于安全的原因，只有有资格的维修人员才能打开本设备。
13. 如有以下情况发生，请专业维修人员检查本设备：
 - a) 电源线或者插头损坏
 - b) 有液体渗入设备内部
 - c) 设备已经暴露在潮湿的环境中
 - d) 设备不能正常工作，或者不能使其按照使用说明书使其运转
 - e) 设备跌落或者损伤
 - f) 设备有任何明显的损坏的迹象
14. 不要将设备储存在温度低于-20°C (-4° F) 或者高于+80°C (158° F) 的环境中，以免造成损坏。

FCC 安全警告

Warning!



本设备与 Part 15 FCC 的规定相符合。任何操作都必须遵守如下两个条件：

- (1) 本设备不会引起严重的干涉，
- (2) 本设备必须能适应其收到的任何干涉包括会造成错误操作的干涉。

目 录

第一章	规格介绍	P5
1.1	无风扇型号工控机介绍.....	P5
1.2	可供选择的型号介绍.....	P8
1.3	可供选配的配件介绍.....	P9
第二章	安装及使用注意事项.....	P10
2.1	装箱单的核查	P10
2.2	软件的安装.....	P10
2.3	前后面板接口介绍.....	P11
2.4	硬盘模组的安装.....	P11
2.5	内容模组的安装.....	P16
2.6	电源线的安装.....	P17
第三章	搬运的注意事项	P19

第一章 规格介绍

1.1 TKS-P20-CV01-001-CXXX 无风扇型号工控机介绍

欢迎您购买研扬 TKS-P20-CV01-001-CXXX 系列无风扇型号工控机产品！

TKS-P20-CV01-001-CXXX 嵌入式控制器在目前市场上同类产品中体积最小、性能最佳的多功能模块中的一款。TKS-P20-CV01-001-CXXX 军工级紧凑型工业控制终端，主要技术指标包括：抗震能力可达 5G/5~500Hz (w/CFD)；抗冲击能力可达 100G (w/CFD)；主要应用于军工、楼宇自动化、工厂自动化等多个领域。另外 TKS-P20-CV01-001-CXXX 已经被权威媒体——Control Engineering 经过公正的客户和专家评选，评选为 2004 年优秀产品奖！

技术特色：

- 基于 Intel® Atom™ N2600 Processor up to 1.6GHz 处理器处理器的无风扇设计
- 支持嵌入式操作系统 Windows CE.NET 操作系统的应用
- 支持 CFast 卡和可选得 HDD 模块
- 专为节省空间而设计的滑轨安装或壁挂式安装
- 以太网 / 2 COM / 5 USB / VGA/ Audio
- 抗振动：2grms，抗冲击：20g
- DIN-Rail 导轨或挂壁式安装
- 获得 CE/FCC A 级认证

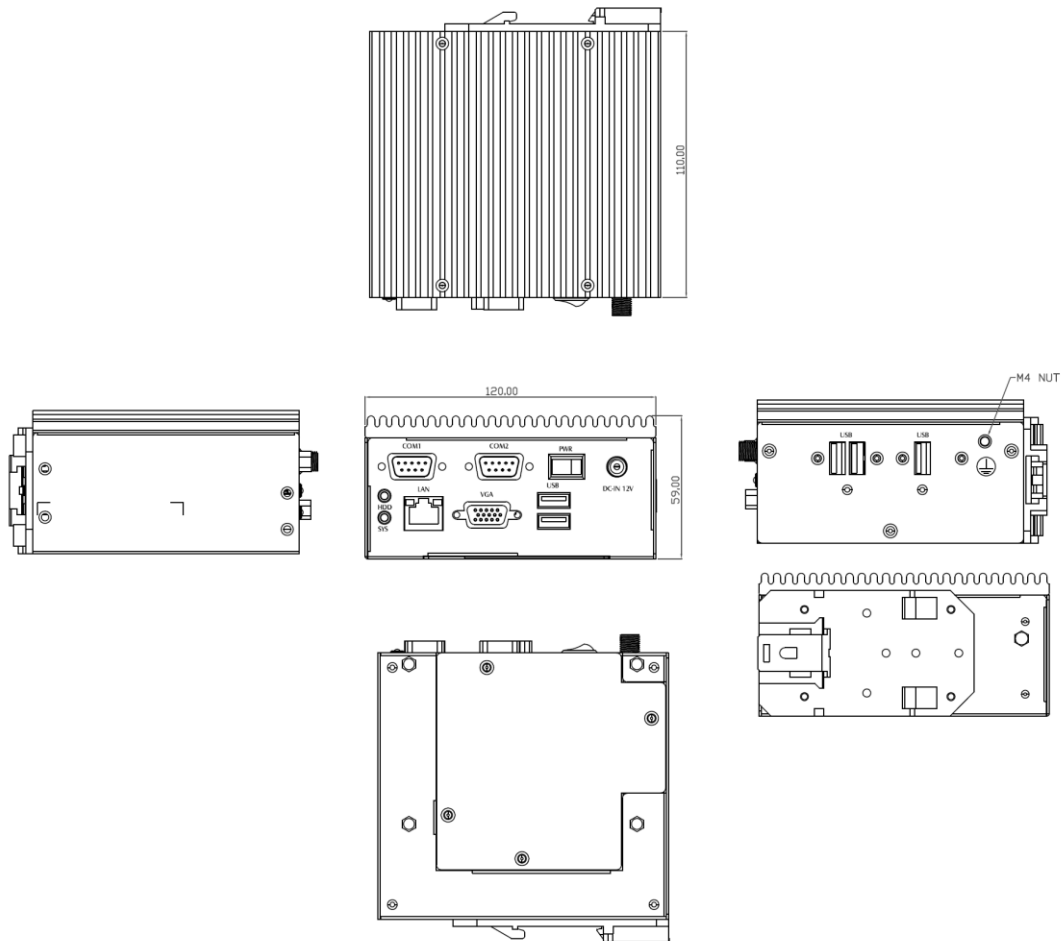
详细规格:

CPU	低功耗 Intel® Atom™ N26001.6GHz 处理器
系统内存	DDR3 800MHz SODIMM x 1, 最大 2GB
VGA/键盘鼠标	DB-15 VGA 连接器
以太网	10/100Base-TX RJ-45 连接器 x 1
SSD	mSATA 插槽x 1
串口	RS-232 x 1, RS-232/422/485 x 1
USB	USB 2.0 端口 x 5
监视定时器	可编程超时中断或系统复位
电源	交流输入- 外部电源适配器 (该产品销售不配带电源适配器) 输入电压: 100VAC~240VAC@50~60Hz 输出电压: +12V@5A 输出功率: 60W
系统控制	电源开关x1
LED 指示灯	电源指示灯x1, HDD 指示灯x1
操作系统	Windows®XP Embedded, Windows®XP, Windows®7, Linux Fedora
构造	铝挤型材的机箱, 鳍状散热设计
颜色	黑银
安装	壁挂式安装套件, DIN 导轨 (已配)
尺寸	120mm (宽) x 59.5mm (高) x 110mm (深) (4.7" x 2.3" x 4.3")
净重	1.8 lb (0.82 Kg)
总重	2.2 lb (1.0 Kg)
工作温度	32°F~131°F (0°C~55°C)
工作湿度	0~95%@40°C, 无冷凝
振动	mSATA 模块: 2grms/5~500Hz/随机/运行状态
冲击	20g 峰值加速度 (持续 11ms)
EMC	CE/FCC A 级

注意

- 1.此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。
- 2.用错误型号电池更换会有爆炸危险，务必按照说明处置用完的电池
若更换电池有问题,请洽研扬中国各地分公司询问

尺寸规格



1.2 可供选择的型号介绍

TKS-P20-CV01-001-CXXX 系列详细型号列举如下，用户可以根据自己的实际需求进行选择：

TKS-P20-CV01-001-C001	嵌入式控制 PC，Intel® Atom™ N2600 1.6GHz 处理器，2GB DRAM, 8GB mSATA
-----------------------	--

1.3 可供选配的配件介绍

附件选项

- **9741681003**
DIN 导轨工具包
- **9681681000**
USB 转并口的适配器
- **9789666605**
USB 转 4 串口的转换器
- **9789666606**
USB 转 2 串口的转换器
- **9741681006**
简易输入/输出模块
- **9741681007**
UPS 电池模块
- **9741681008**
超薄 CD-ROM+2.5"HDD 工具包

第二章 安装及使用注意事项

2.1 装箱单的核查

首先在使用前请您核对整机的实际配置是否与“研扬工控机”的装箱单一致、随机资料是否齐全，如有异议请您与销售商联系。

主机的标准配置一般包括：

- 1、主机（相关部件）及电源线
- 2、随机资料和驱动盘
- 3、其它可选件（显示器等）
- 4、机箱附件盒

检查完毕后，将主机与显示器或其它外设联接好后，接好电源；加电、打开工控机电源开关，核查工控机运行情况。

★ 注意：

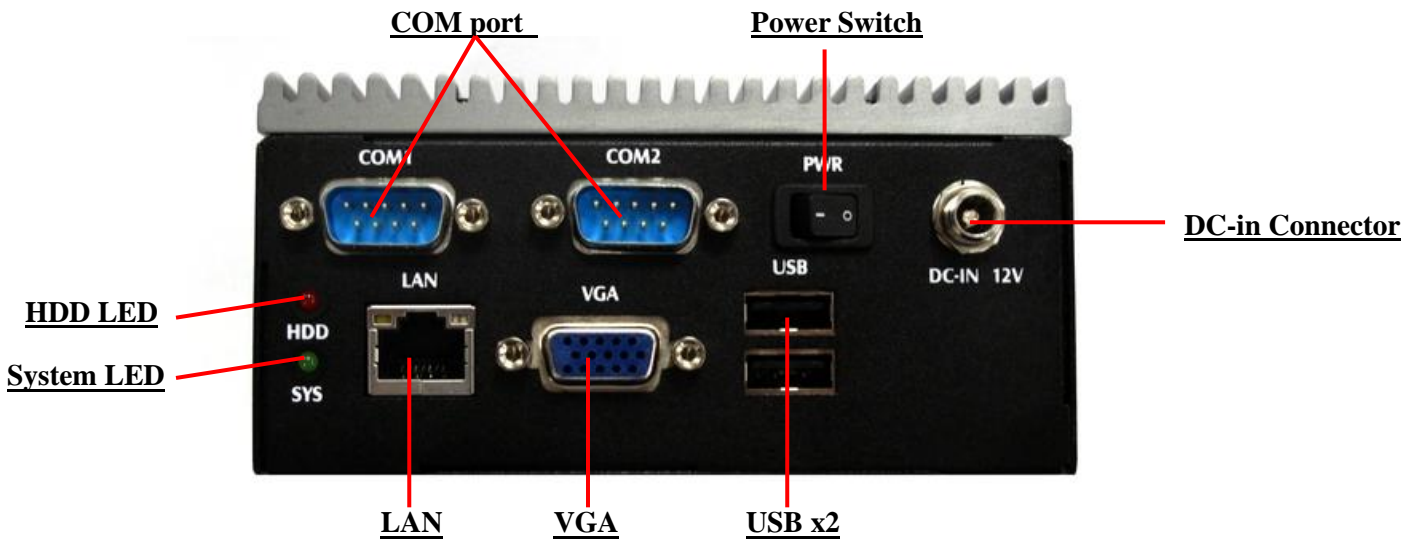
- 请不要丢掉产品原包装箱，此包装箱具有防震功能。在需要移动、运输或贮存时请使用本机的原始包装箱另返回的部件包装如不合要求将不予保修。
- 装箱单本身有保修单的功能，如另附保修单（质保书）请您在详细填写并将回执寄回研扬科技(中国)有限公司，如未附保修单（质保书）请在维修时携带装箱单以备说明。
- 请您认真阅读随机文件并妥善保管（请勿打开随机所带软盘的写保护，以避免感染病毒）

2.2 软件的安装

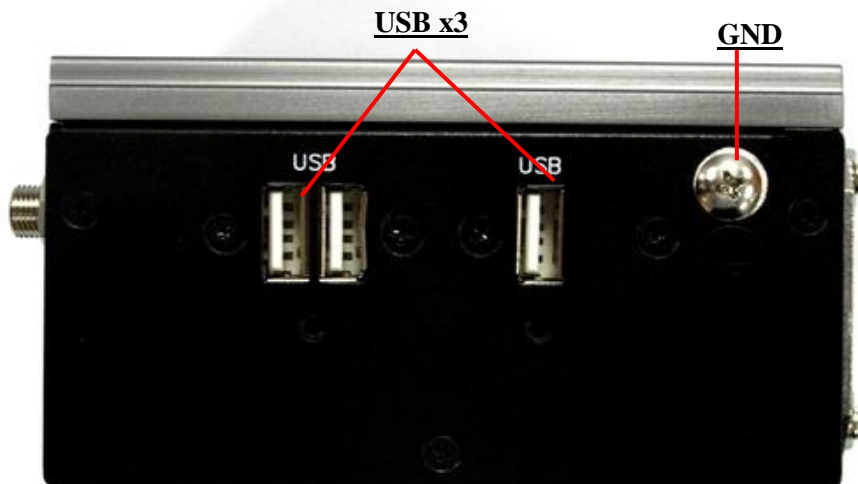
“研扬”工控机可支持大多数操作系统和应用软件，如 DOS、WINDOWS95/98/NT/XP/me 你可任意安装而不会产生任何兼容性问题。

2.3 前后面板接口介绍

Front Side



Rear Side

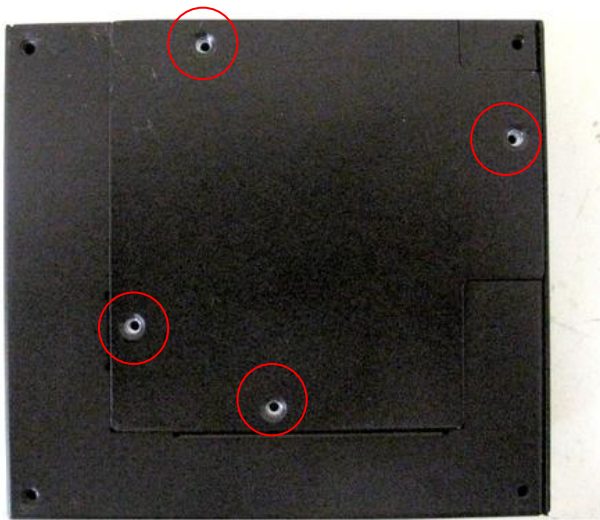


2.4 内存模组的安装

系统的安装只需一把螺丝刀，在安装前应准备好所有需要安装的零部件并把它们集中到一起。

警告：在安装前机箱不能与任何电源连接，不只是将电源关掉，应将电源插头从电源插座上拔下。如果不清楚如何安装，应请富有经验的人来指导

1. 用十字螺丝起子松开底部的4颗螺丝，如附图 2.1



2. 打开底盖

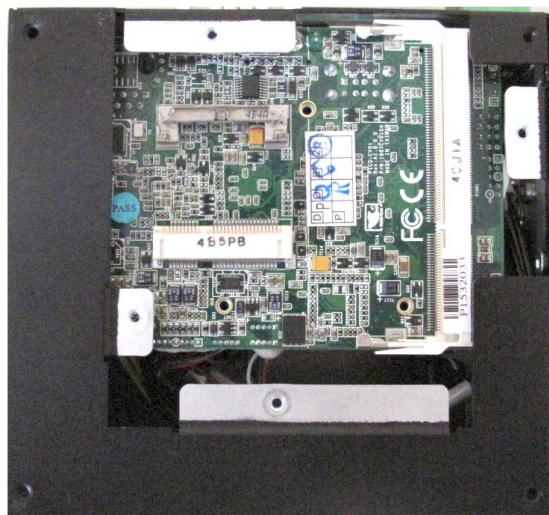
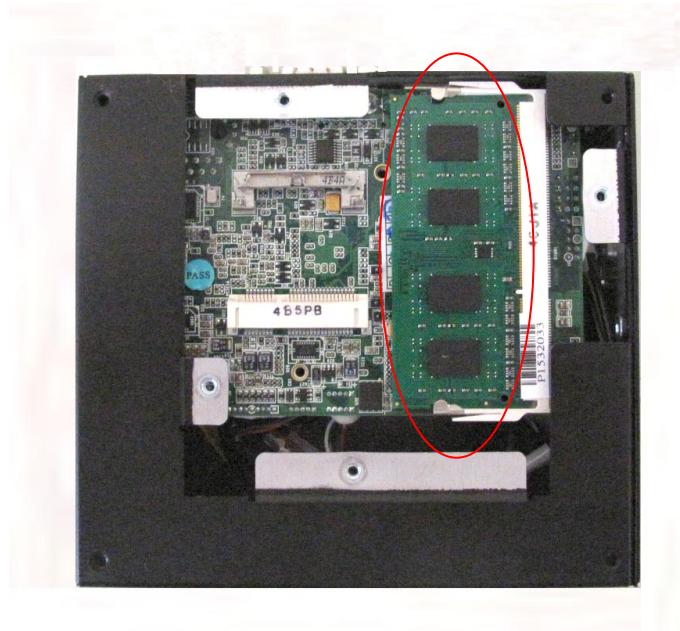
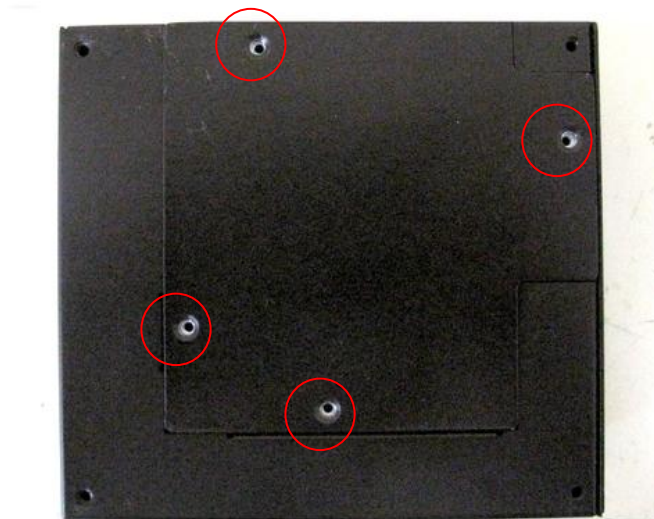


图 2.1 打开底盖

3. 插上内存模组



4. 用十字螺丝起子装上底部的4颗螺丝，如附图 2.1

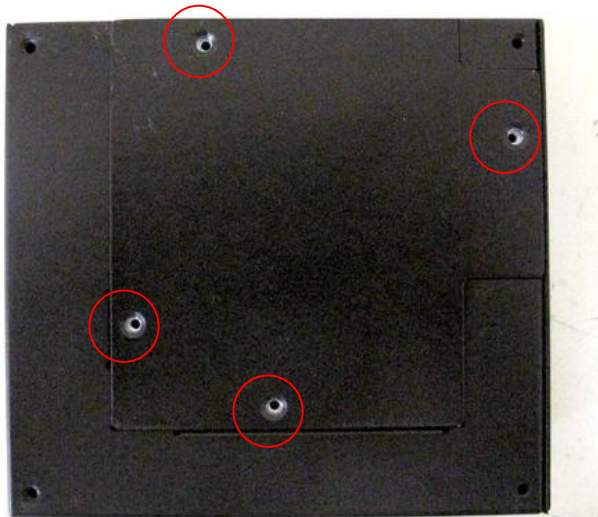


2.5 mSATA 模组的安装

系统的安装只需一把螺丝刀，在安装前应准备好所有需要安装的零部件并把它们集中到一起。

警告： 在安装前机箱不能与任何电源连接，不只是将电源关掉，应将电源插头从电源插座上拔下。如果不清楚如何安装，应请富有经验的人来指导

1. 用十字螺丝起子松开底部的 4 颗螺丝，如附图 2.1



2. 打开底盖

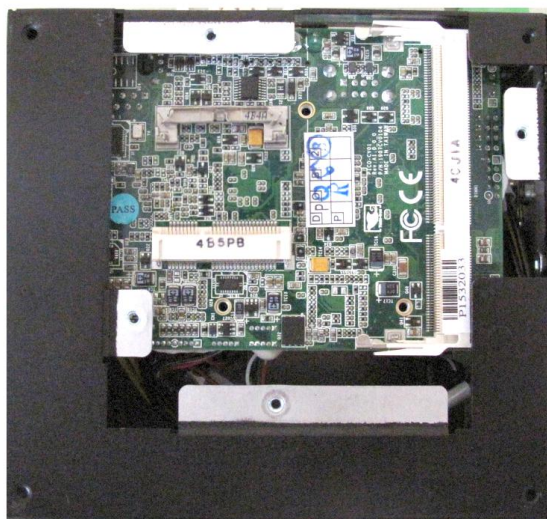
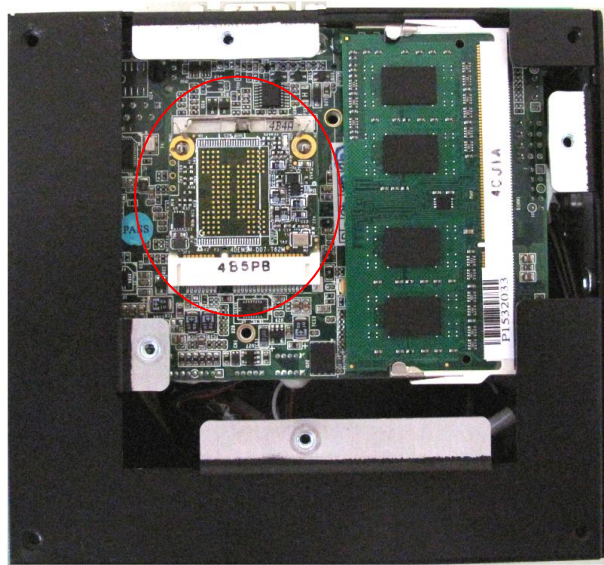
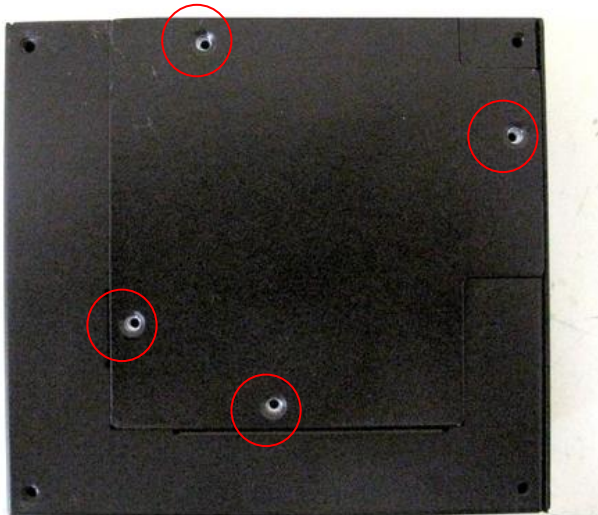


图 2.1 打开底盖

3. 插上 mSATA 模组



4. 用十字螺丝起子装上底部的 4 颗螺丝，如附图 2.1



2.5 电源线的安装

1.准备好电源线以及接头



2.将电源线插入到主机上

特别提示：电源线连接时请务必清楚电源的正负极性。

第三章 搬运的注意事项

“研扬工控机”的机箱及主机的外包装箱均采用特殊的设计，具有防震功能，能够承受运输过程中正常的碰撞。

产品在长途运输过程中不得装在敞开的船舱或车厢中，中途转运时不得存放在露天仓库中，在运输过程中不允许和易燃，易爆等物品共同装运，不允许被雨、雪或其它液体物质淋湿，不允许有机械损伤。贮存环境（-20 至+40℃，相对湿度 30%~85%），

如用户在使用过程中需要搬运主机，首先请妥善保护好所有仪器设备，在完成以下步骤后进行搬运动作。

- 保存好所使用的文件
- 从软盘驱动器中取出所有的软盘并妥善保管。
- 关闭工控主机电源并将电源插头从电源插座上拔下。
- 将主机与外设分开，拆下显示器电缆，拔下键盘电缆等安装在主机箱上的其它外部设备。
- 将工控主机重新包装于原始的包装箱中后即可搬运仪器设备。