

NanoCOM-CV Rev.A

Intel® Atom™ N2600 1.6GHz Processor

Intel® NM10

Gigabit Ethernet

2 SATA 3.0 Gb/s

8 USB2.0, 3 PCI-E[x1]

COM Express Compact Module

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 4 M2.5 Screw
- 1 CD-ROM for manual (in PDF format) and drivers
- 1 NanoCOM-CV Rev.A

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

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Chapter

1

**General
Information**

1.1 Introduction

AAEON, a leading embedded board manufacturer, is pleased to announce the debut of their new generation COM Express Module-NanoCOM-CV Rev.A. The NanoCOM-CV Rev.A is a cutting-edge product that provides high performance and low power consumption in the embedded market.

NanoCOM-CV Rev.A adopts the latest Intel® Atom™ N2600 processor. The system memory deploys with onboard 204-pin DDR3 800 memory up to 2 GB. In addition, Intel® 82583V supports 10/100/1000Base-TX that allows faster network connections. This model applies three PCI-Express[x1], one LPC bus, and one SMBus. Moreover, two SATA 3.0Gb/s (one shared with SSD) are configured on the NanoCOM-CV Rev.A. NanoCOM-CV Rev.A also equips eight USB2.0 for flexible I/O expansions.

The display of NanoCOM-CV Rev.A supports CRT/LVDS simultaneous and dual view displays. This brand new COM Express Module is developed to cater to the requirements of Automation, Medical, ticket machine, transportation, gaming, KIOSK, and POS/POI applications.

1.2 Features

- Onboard Intel® Atom™N2600 Processor
- Intel® NM10
- SODIMM DDR3 800 Memory, Max. 2 GB
- Intel® 82583V Gigabit Ethernet
- CRT, Up to 18-bit Single Channel LVDS LCD, DisplayPort™
- High Definition Audio Interface
- SATA 3.0Gb/s x 2 (One Shared with SSD)
- USB2.0 x 8
- PCI-Express[x1] x 3
- Nano Module Size, Pin-out Type 1, 84mm x 55mm

1.3 Specifications

System

- | | |
|-------------------------|---|
| ● Form Factor | Nano Module, Pin-out Type 1 |
| ● Processor | Intel® Atom™ N2600 processor, 1.6 GHz |
| ● System Memory | 204-pin DDR3 800 SODIMM x 1, Max. 2 GB |
| ● Chipset | Intel® NM10 |
| ● I/O Chipset | Intel® NM10 |
| ● Ethernet | Intel® 82583V, 10/100/1000Base-TX |
| ● BIOS | AMI BIOS SPI type, 4MB ROM |
| ● EEPROM | Atmel® AT24C02 |
| ● Wake On LAN | Yes |
| ● BIOS Boot Spec. (BBS) | Yes |
| ● Watchdog Timer | Fintek F75111 |
| ● H/W Status Monitoring | Supports CPU temperature monitoring |
| ● Expansion Interface | PCI-Express [x1] x 3
LPC bus x 1
SMBus x 1 |
| ● Power Requirement | Nominal: +12V
Wide DC input range: +4.75V to +14.7V (optional) |
| ● Board Size | 3.31"(L) x 2.17"(W) (84mm x 55mm) |
| ● Gross Weight | 0.44 lb (0.2 Kg) |
| ● Operating Temperature | 32°F ~ 140°F (0°C ~ 60°C) |

- Storage Temperature -40°F ~ 176°F (-40°C ~ 80°C)
- Operating Humidity 0% ~ 90% relative humidity, non-condensing

Display: Supports CRT/LVDS Simultaneous/ dual view displays

- Chipset Intel® Atom™ N2600 processor integrated
- Memory Shared system memory up to 512MB/ DVMT 5.0
- Resolution Up to 1920x1200 @ 60Hz for CRT
Up to 1366x768 @ 18-bit for LCD
- LCD Interface Up to 18-bit single channel LVDS

I/O

- Storage SATA 3.0Gb/s x 2 (on shared with SSD)
SATA SSD x 1 up to 16GB (optional)
- USB USB 2.0 x 8
- Audio High definition audio
- GPIO Up to 4 in and 4 out
- K/B & Mouse From LPC interface on carrier board

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.

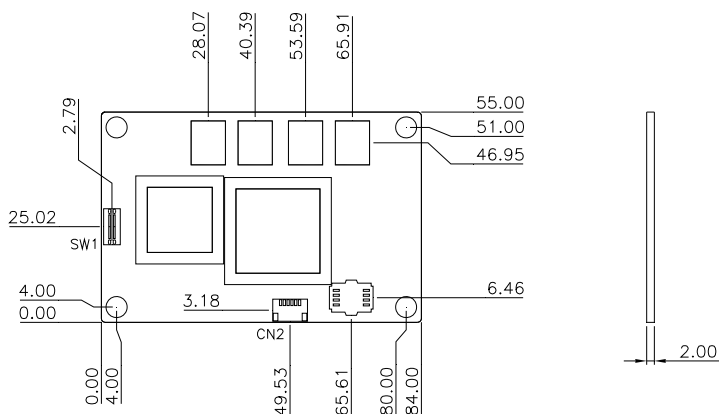
Caution!



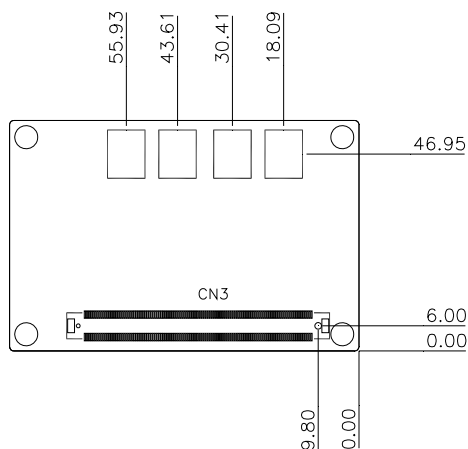
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

2.2 Location and Mechanical Drawings of Connectors and Switches

Component Side



Solder Side



2.3 List of Switch

There is a switch on the board that allows you to configure your system to suit your application. The table below shows the function of the switch.

Label	Function
SW1	1. AT & ATX mode 2. SSD Write Protect Function

2.4 AT/ATX Selection and SSD Write Protect Function (SW1)

	ON	OFF
1	ATX Mode	AT Mode
2	Write protect	Writable

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 NanoCOM-CV Rev.A 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

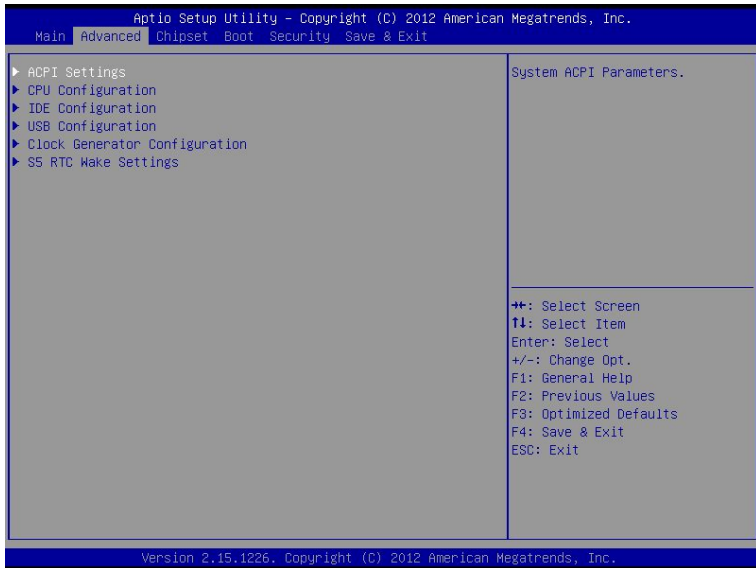
Exit system setup after saving the changes.

Setup Menu

Setup submenu: Main



Setup submenu: Advanced



ACPI Settings

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.	
advanced	
ACPI Settings	Select ACPI sleep state the system will enter when the SUSPEND button is pressed.
ACPI Sleep State [S3 only(Suspend to ...)]	
	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.	

Options summary:

ACPI Sleep State	S3 only (Suspend to RAM)	Optimal Default, Failsafe Default
Select the ACPI state used for System Suspend		

CPU Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

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	
EHT64	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 (B2 Stepping)	
Microcode Revision	269	
L1 Cache RAM	2x56 k	
L2 Cache RAM	2x512 k	
Processor Core	Dual	
Hyper-Threading	Supported	
Hyper-Threading	[Enabled]	

++: Select Screen
 ↑↓: 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:

Hyper-Threading	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable CPU Hyper-Threading function		

IDE Configuration (IDE)

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
advanced		
SATA Port0	Not Present	Select a configuration for SATA Controller.
SATA Port1	Not Present	
Configure SATA as	[IDE]	
		++: Select Screen ↓↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.		

IDE Configuration (AHCI)

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

advanced

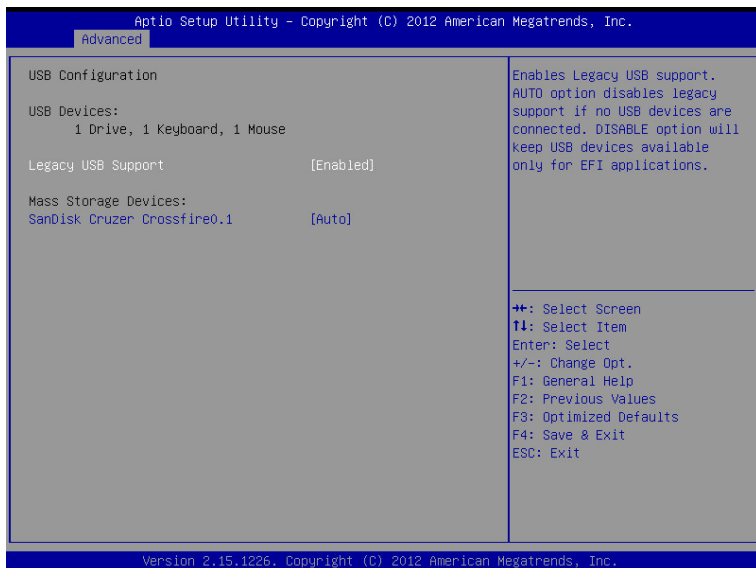
SATA Port0	Not Present	Select a configuration for SATA Controller.
SATA Port1	Not Present	
Configure SATA as	[AHCI]	
SATA Port 0	[Enabled]	
SATA Port 0 Hot Plug	[Enabled]	
SATA Port 1	[Enabled]	
SATA Port 1 Hot Plug	[Enabled]	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Options summary:

SATA Port 0/1	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable SATA Port		
SATA Port 0/1 Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable		

USB Configuration



Options summary:

Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
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		
Device Name (Emulation Type)	Auto	Optimal Default, Failsafe Default
	Floppy	
	Forced FDD	
	Hard Disk	
	CDROM	
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)		

Clock Generator Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

Clock Generator Configuration		Enable/Disable Clock Generator Spread Spectrum function
Spread Spectrum	[Disabled]	
		++: Select Screen ↑↓: 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:

Spread Spectrum	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Clock Generator Spread Spectrum function		

S5 RTC Wake Settings (Fixed Time)

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

advanced

Wake system with Fixed Time	[Enabled]	Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified
Wake up day	0	
Wake up hour	0	
Wake up minute	0	
Wake up second	0	
Wake system with Dynamic Time	[Disabled]	

++: Select Screen
 ↑↓: 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:

Wake system with Fixed Time	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable System wake on alarm event. When enabled, System will wake on the hr:min:sec specified		
Wake up day	0-31	Default 0
Select 0 for daily system wake up, 1-31 for witch day of the moth that you would like the system to wake up.		
Wake up day	0-23	Default 0
Select 0-23 For example enter 3 for 3am and 15 for 3pm		
Wake up day	0-59	Default 0
Select 0-59		
Wake up day	0-59	Default 0
Select 0-59		

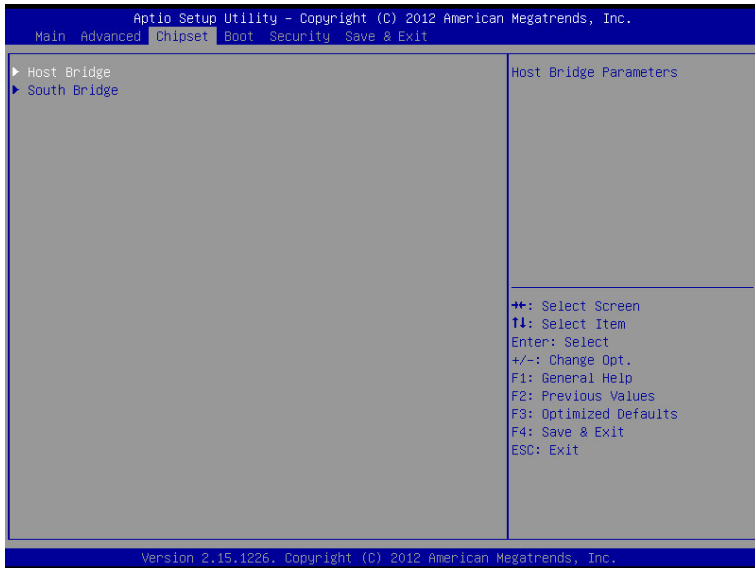
S5 RTC Wake Settings (Dynamic Time)

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
advanced		
Wake system with Fixed Time	[Disabled]	Enable or disable System wake on alarm event. When enabled, System will wake on the current time + Increase minute(s)
Wake system with Dynamic Time	[Enabled]	
Wake up minute increase	1	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.		

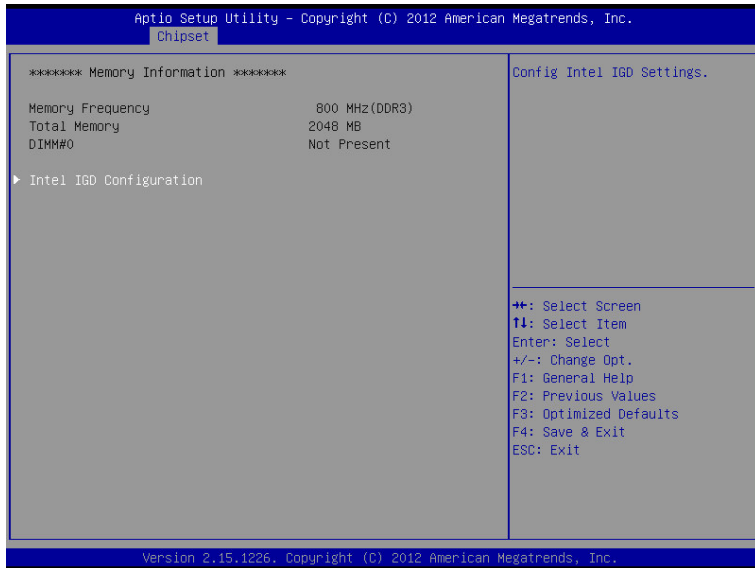
Options summary:

Wake system with	Disabled	Optimal Default, Failsafe Default
Dynamic Time	Enabled	
En/Disable System wake on alarm event. When enabled, System will wake on current time + Increases minutese(s)		
Wake up day	1-5	Default 1
Select 1-5		

Setup submenu: Chipset



HOST Bridge



Intel IGD Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Chipset

Intel IGD Configuration		Select the Video Device which will be activated during POST. This has no effect if external graphics present.
IGFX - Boot Type	[VBIOS Default]	
LCD Panel Type	[VBIOS Default]	

++: Select Screen
 ↑↓: 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:

IGFX – Boot Type	VBIOS Default	Optimal Default, Failsafe Default
	CRT	
	LFP	
	CRT + LFP	
Select the Video Device which will be activated during POST. This has no effect if external graphics present.		
LCD Panel Type	VBIOS Default	Optimal Default, Failsafe Default
	640x480 LVDS	
	800x600 LVDS	
	1024x768 LVDS	
	1280x1024 LVDS	
	1366x768 LVDS	
	1024x600 LVDS	
1280x800 LVDS		
Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.		

South Bridge

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Chipset

Power Mode	[ATX Type]	Select power supply mode.
Azalia Controller	[HD Audio]	
PCI Express Port 0	[Enabled]	
PCI Express Port 1	[Auto]	
PCI Express Port 2	[Auto]	
PCI Express Port 3	[Auto]	

++: Select Screen
 ↑↓: 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:

Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode.		
Azalia Controller	Disabled	Optimal Default, Failsafe Default
	HD Audio	
En/Disable Azalia Controller		
PCI Express Port 0	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable PCI Express Root Port 0		
PCI Express Port 1/2/3	Disabled	Optimal Default, Failsafe Default
	Enabled	
	Auto	
En/Disable PCI Express Root Port 1/2/3		

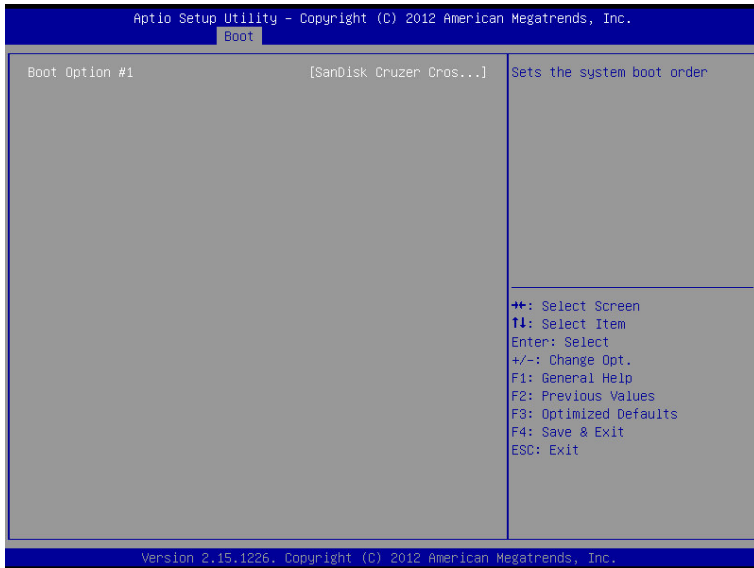
Setup submenu: Boot

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.	
Main Advanced Chipset Boot Security Save & Exit	
Boot Configuration	Enables or disables Quiet Boot option
Quiet Boot	[Enabled]
Launch PXE OpROM	[Disabled]
Boot Option Priorities	
Boot Option #1	[UEFI: SanDisk Cruze...]
Boot Option #2	[SanDisk Cruzer Cros...]
Hard Drive BBS Priorities	
	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.	

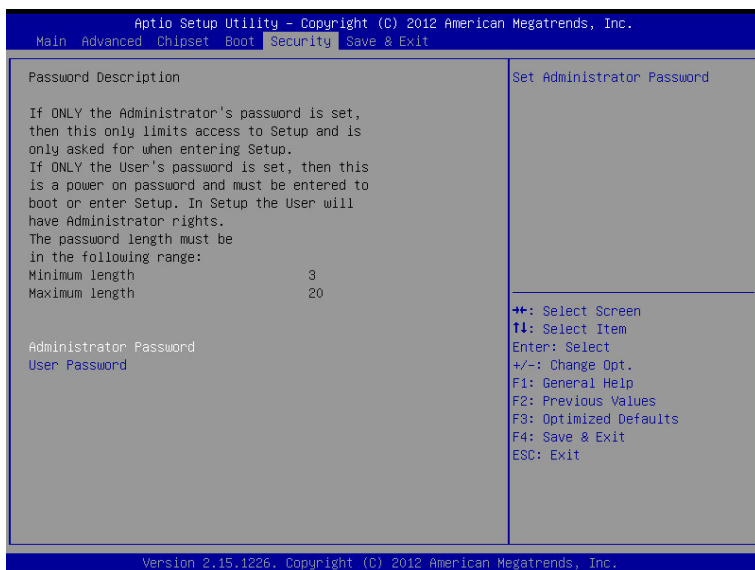
Options summary:

Quiet Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable showing boot logo.		
Launch PXE OpROM	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Legacy PXE OpROM		

BBS Priorities



Security



Change User/Supervisor Password

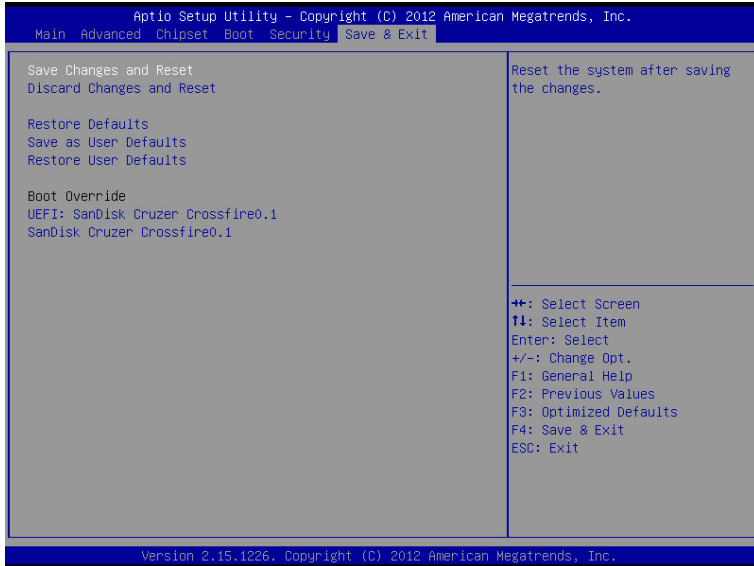
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, 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



Chapter

4

**Driver
Installation**

The NanoCOM-CV Rev.A comes with a CD-ROM that contains all drivers your need.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install LAN Driver

Step 4 – Install Audio Driver

Step 5 – Install Rapid Storage Technology Driver

Please read following instructions for detailed installations.

4.1 Installation:

Insert the NanoCOM-CV Rev.A CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Chipset Driver

1. Click on the **Step1 - CHIPSET** folder and double click on **Setup.exe** file
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

Step 2 – Install VGA Driver

1. Click on the **Step2 - VGA** folder and select the OS folder your system is
2. Double click on **.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 3 – Install LAN Driver

1. Click on the **Step3 - LAN** folder and select the OS folder your system is
2. Double click on **PROWin32.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 4 – Install Audio Driver

1. Click on the **Step4 - AUDIO** folder and select the OS folder your system is
2. Double click on **Setup.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you to install the driver automatically

Step 5 – Install Rapid Storage Technology Driver

1. Click on the **Step5 - Rapid Storage Technology** folder and double click on **iaata_cd.exe** file
2. Follow the instructions that the window shows
3. The system will help you to install the driver automatically

Appendix

A

Programming the Watchdog Timer

A.1 Watchdog Timer Initial Program

Table 1 : Smbus IO relative register table		
	Default Value	Note
Smbus Base Address	0xF000 (Note1)	Chipset smbus base address
Smbus Status	0x00 (Note2)	Smbus status register
Smbus Control	0x02 (Note3)	Smbus control register
Smbus Offset	0x03 (Note4)	Smbus offset register
Smbus Slave Address	0x04 (Note5)	Smbus device slave address register
Smbus Data1	0x05 (Note6)	Smbus data 1 register
Smbus Data2	0x06 (Note7)	Smbus data 2 register
Device Slave Address	0x37 (Note8)	Device smbus slave address(Non shift format)

Table 2 : Watchdog relative register table				
	Register	BitNum	Value	Note
Timer Counter	0x37 (Note9)		(Note10)	Time of watchdog timer (0~255) This register is byte access
Counting Unit	0x36 (Note11)	3 (Note12)	0 (Note13)	Select time unit. 0: second 1: minute
Watchdog Enable	0x36 (Note14)	5 (Note15)	(Note16)	0: Disable 1: Enable
Timeout Status	0x36 (Note17)	6 (Note18)	1	1: Clear timeout status

```

*****
#define void SmbusWriteByte(byte SlaveAddress, byte Offset, byte Value);
#define byte SmbusReadByte(byte SlaveAddress, byte Offset);
#define void IOWriteByte(byte IOPort, byte Value);
#define byte IOReadByte(byte IOPort);

// Smbus IO relative definition (Please reference to Table 1)
#define word SMBBase //This parameter is represented from Note1
#define byte SMBStatus //This parameter is represented from Note2
#define byte SMBControl //This parameter is represented from Note3
#define byte SMBOffset //This parameter is represented from Note4
#define byte SMBSlave //This parameter is represented from Note5
#define byte SMBData1 //This parameter is represented from Note6
#define byte SMBData2 //This parameter is represented from Note7
#define byte DeviceSlave //This parameter is represented from Note8

// Watch Dog relative definition (Please reference to Table 2)
#define byte TimerReg //This parameter is represented from Note9
#define byte TimerVal // This parameter is represented from Note10
#define byte UnitReg //This parameter is represented from Note11
#define byte UnitBit //This parameter is represented from Note12
#define byte UnitVal //This parameter is represented from Note13
#define byte EnableReg //This parameter is represented from Note14
#define byte EnableBit //This parameter is represented from Note15
#define byte EnableVal //This parameter is represented from Note16
#define byte StatusReg // This parameter is represented from Note17
#define byte StatusBit // This parameter is represented from Note18
*****

```

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

    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.
    AaeonWDTEnable();
}
*****
```

```
*****
// Procedure : AaeonWDTEnable
VOID AaeonWDTEnable (){
    WDTEnableDisable(DeviceSlave, EnableReg, EnableBit, 1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(DeviceSlave, EnableReg, EnableBit, 0);
    // Clear Watchdog Timeout Status
    WDTClearSmbusStatus();
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID WDTEnableDisable(byte SlaveAdd, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    TmpValue = SmbusReadByte(SlaveAdd, SMBCControl);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum)
    SmbusWriteByte(SlaveAdd, SMBCControl, TmpValue);
}
*****
```

```
*****
VOID WDTParameterSetting(){
    Byte TmpValue;

    // Watchdog Timer counter setting
    SmbusWriteByte(DeviceSlave, TimerReg, TimerVal);
    // WDT counting unit setting
    TmpValue = SmbusReadByte(DeviceSlave, UnitReg);
    TmpValue &= ~(1 << UnitBit);
    TmpValue |= (UnitVal << UnitBit);
    SmbusWriteByte(DeviceSlave, UnitReg, TimerVal);
    // WDT pulse width default as 20ms for FINTEK F75111
    TmpValue = SmbusReadByte(DeviceSlave, 0x36);
    TmpValue &= 0xFC;
    TmpValue |= 0x01;
    SmbusWriteByte(DeviceSlave, 0x36, TimerVal);
}

VOID WDTClearSmbusStatus(){
    SmbusWriteByte(DeviceSlave, SMBStatus, 0xFE);
}
*****
```

```
*****
VOID BeforeSmBusAccess(word SMBBase){
    Byte TmpValue;

    TmpValue = IOReadByte(SMBBase + SMBStatus);
    While( TmpValue & 0x40 ){ //Check inuse status
        IODelay();
    }
    While( TmpValue & 0x01 ){ //Check host busy status
        IODelay();
    }
    IOWriteByte(SMBBase + SMBStatus, 0xFE); //Clear all status
}
VOID WaitSmBusAccess(word SMBBase){
    Byte TmpValue = 0;

    While( !(TmpValue & 0x02) ){
        TmpValue = IOReadByte(SMBBase + SMBStatus);
        IODelay();
    }
}
*****
```



```
*****
VOID SmbusWriteByte(byte SlaveAddress, byte Offset, byte Value){
    BeforeSmBusAccess(SMBBase);

    //Write smbus slave address
    IOWriteByte( SMBBase + SMBSlave, (SlaveAddress<<1 & 0xFE) );
    IOWriteByte(SMBBase + SMBOffset, Offset); //Write offset
    IOWriteByte(SMBBase + SMBData1, Value); //Write value
    IOWriteByte(SMBBase + SMBControl, 0x48); //byte command
    WaitSmBusAccess(SMBBase);
}
byte SmbusReadByte(byte SlaveAddress, byte Offset){
    Byte TmpValue;

    BeforeSmBusAccess(SMBBase);

    //Write smbus slave address
    IOWriteByte( SMBBase + SMBSlave, (SlaveAddress<<1 | 0x01) );
    IOWriteByte(SMBBase + SMBOffset, Offset); //Write offset
    IOWriteByte(SMBBase + SMBControl, 0x48); // byte command
    WaitSmBusAccess(SMBBase);

    TmpValue = IOReadByte(SMBBase + SMBData1);
    Return 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
[00000061 - 00000061]	Motherboard resources
[00000062 - 00000063]	Motherboard resources
[00000063 - 00000063]	Motherboard resources
[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



















































	[000000B0 - 000000B1]	Programmable interrupt controller
	[000000B2 - 000000B3]	Motherboard resources
	[000000B4 - 000000B5]	Programmable interrupt controller
	[000000B8 - 000000B9]	Programmable interrupt controller
	[000000BC - 000000BD]	Programmable interrupt controller
	[000000C0 - 000000DF]	Direct memory access controller
	[000000E0 - 000000EF]	Motherboard resources
	[000000F0 - 000000F0]	Numeric data processor
	[000003B0 - 000003BB]	Intel(R) Graphics Media Accelerator 3600 Series
	[000003C0 - 000003DF]	Intel(R) Graphics Media Accelerator 3600 Series
	[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 - 000006FF]	Motherboard resources
	[00000D00 - 0000FFFF]	PCI bus
	[00001000 - 0000100F]	Motherboard resources
	[0000D000 - 0000DFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D6
	[0000E000 - 0000EFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
	[0000F000 - 0000F01F]	Intel(R) N10/ICH7 Family SMBus Controller - 27DA
	[0000F020 - 0000F03F]	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB
	[0000F040 - 0000F05F]	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
	[0000F060 - 0000F07F]	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
	[0000F080 - 0000F09F]	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
	[0000F0A0 - 0000F0AF]	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
	[0000F0B0 - 0000F0B3]	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
	[0000F0C0 - 0000F0C7]	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
	[0000F0D0 - 0000F0D3]	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
	[0000F0E0 - 0000F0E7]	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
	[0000F0F0 - 0000F0F7]	Intel(R) Graphics Media Accelerator 3600 Series
	[0000FFFF - 0000FFFF]	Motherboard resources
	[0000FFFF - 0000FFFF]	Motherboard resources

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
[DFC00000 - DFCFFFFF]	Intel(R) Graphics Media Accelerator 3600 Series
[DFD00000 - DFD1FFFF]	Intel(R) 82583V Gigabit Network Connection
[DFD00000 - DFD0FFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D6
[DFD20000 - DFD23FFF]	Intel(R) 82583V Gigabit Network Connection
[DFE00000 - DFE1FFFF]	Intel(R) 82583V Gigabit Network Connection #2
[DFE00000 - DFE0FFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
[DFE20000 - DFE23FFF]	Intel(R) 82583V Gigabit Network Connection #2
[DFF00000 - DFF03FFF]	High Definition Audio Controller
[DFF04000 - DFF043FF]	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
[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) 0x00000008 (08)	System CMOS/real time clock
(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 (121)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
 (ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
 (ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
 (ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
 (ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
 (ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
 (ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
 (ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
 (ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
 (ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
 (ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
 (ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
 (ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
 (ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
 (ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
 (ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System
 (ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System
 (ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System
 (ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
 (ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
 (ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System

(ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
(ISA) 0x000000AF (175)	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) 0x00000005 (05)	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
(PCI) 0x00000012 (18)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CA
(PCI) 0x00000013 (19)	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D6
(PCI) 0x00000013 (19)	Intel(R) N10/ICH7 Family Serial ATA Storage Controller - 27C0
(PCI) 0x00000013 (19)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C9
(PCI) 0x00000016 (22)	High Definition Audio Controller
(PCI) 0x00000017 (23)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27C8
(PCI) 0x00000017 (23)	Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
(PCI) 0xFFFFF0FC (-4)	Intel(R) 82583V Gigabit Network Connection
(PCI) 0xFFFFF0FD (-3)	Intel(R) 82583V Gigabit Network Connection #2
(PCI) 0xFFFFF0FE (-2)	Intel(R) Graphics Media Accelerator 3600 Series

B.4 DMA Channel Assignments

- Direct memory access (DMA)
 - 4 Direct memory access controller