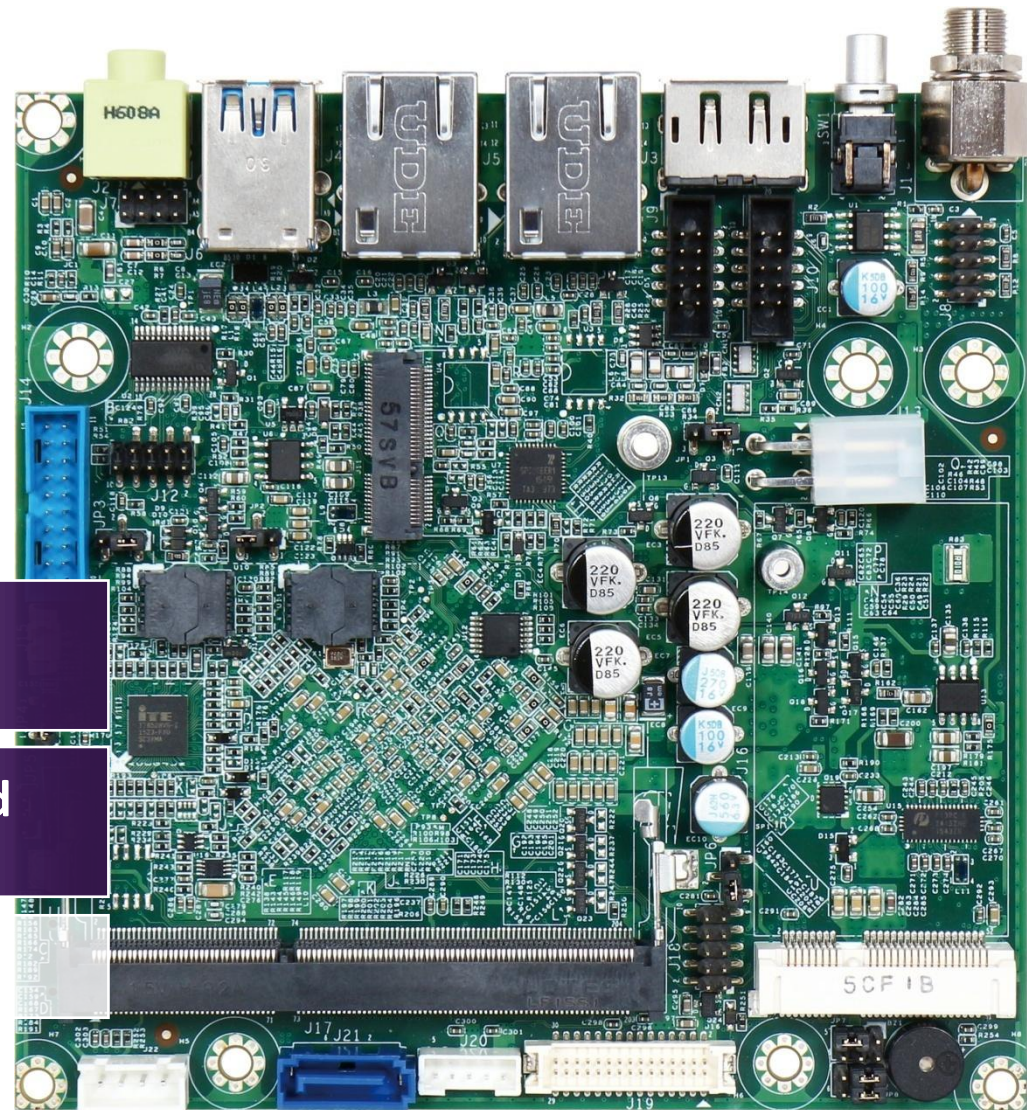


NANO-6062

NANO-6062

NANO-ITX Embedded Motherboard

Version 1.3



Revision History

R1.0	Preliminary
R1.1	Modify typo
R1.2	Update Block Diagram information
R1.3	Update information about E3930 support Dual Lan port

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Preface

This user's guide provides information about the components, features, connectors and BIOS Setup menus available on the NANO-6062. This document should be referred to when designing NANO-ITX application. The other reference documents that should be used include the following:

- ✧ Intel Apollo Lake Design Guide
- ✧ Intel Apollo Lake I Specification

Please contact Portwell Sales Representative for above documents.

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1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Embedded and Communications Alliance (Intel ECA), announced today the Portwell NANO-6062 utilizing the NANO-ITX form factor based on the Intel® Atom™ processor E3900 series. The NANO-6062 supports one DDR3L SODIMM socket up to 8GB system memory and comes with one SATA III, one Mini-PCIe/mSATA socket, one M.2 E key socket, triple display by VGA, DP and LVDS, two GbE Ethernet, one SD socket and four USB ports. The NANO-6062 can provide the low power consumption for low profile fanless applications such as POS, Print Imaging, ATM, Kiosk, Medical, Panel PC, Digital Security and Digital Signage.

2 Specifications

Main Processor	◆ Intel® Atom™ Dual/Quad Core E3900 series Processor
System BIOS	◆ AMI UEFI BIOS
Main Memory	◆ Up to 8 GB in 1 slots DDR3L SO-DIMM sockets. ◆ Supports DDR3L 1866/1600 MHz.
Graphics	◆ Controller: Intel® HD Graphics 505 ◆ LVDS: Supports Dual Channel 24bit up to resolution 1920 x 1200 ◆ DP: Supports DP up to resolution 4096 x 2160 ◆ VGA: Supports VGA up to resolution 2560 x 1600
Expansion Interface	◆ One M.2(NGFF) E key socket for wireless application
SATA Interface	◆ One SATA ports(SATA 6Gb/s) ◆ One mSATA socket (Switch mSATA or Mini-PCIe by BIOS)
Input/Output	◆ Serial Port: 1x RS-232/422/485, switched by BIOS ◆ USB Port: 2x USB 3.0 on REAR I/O, 2x USB 3.0 on board header ◆ Audio Interface: Audio jack on rear I/O with Line-out and on board pin header with Line-in, Line- out, and Mic-in.
Ethernet	◆ Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus. ◆ Controller: Intel I210IT
High Drive GPIO	◆ One pin-header for GPIO(8bit in / out)

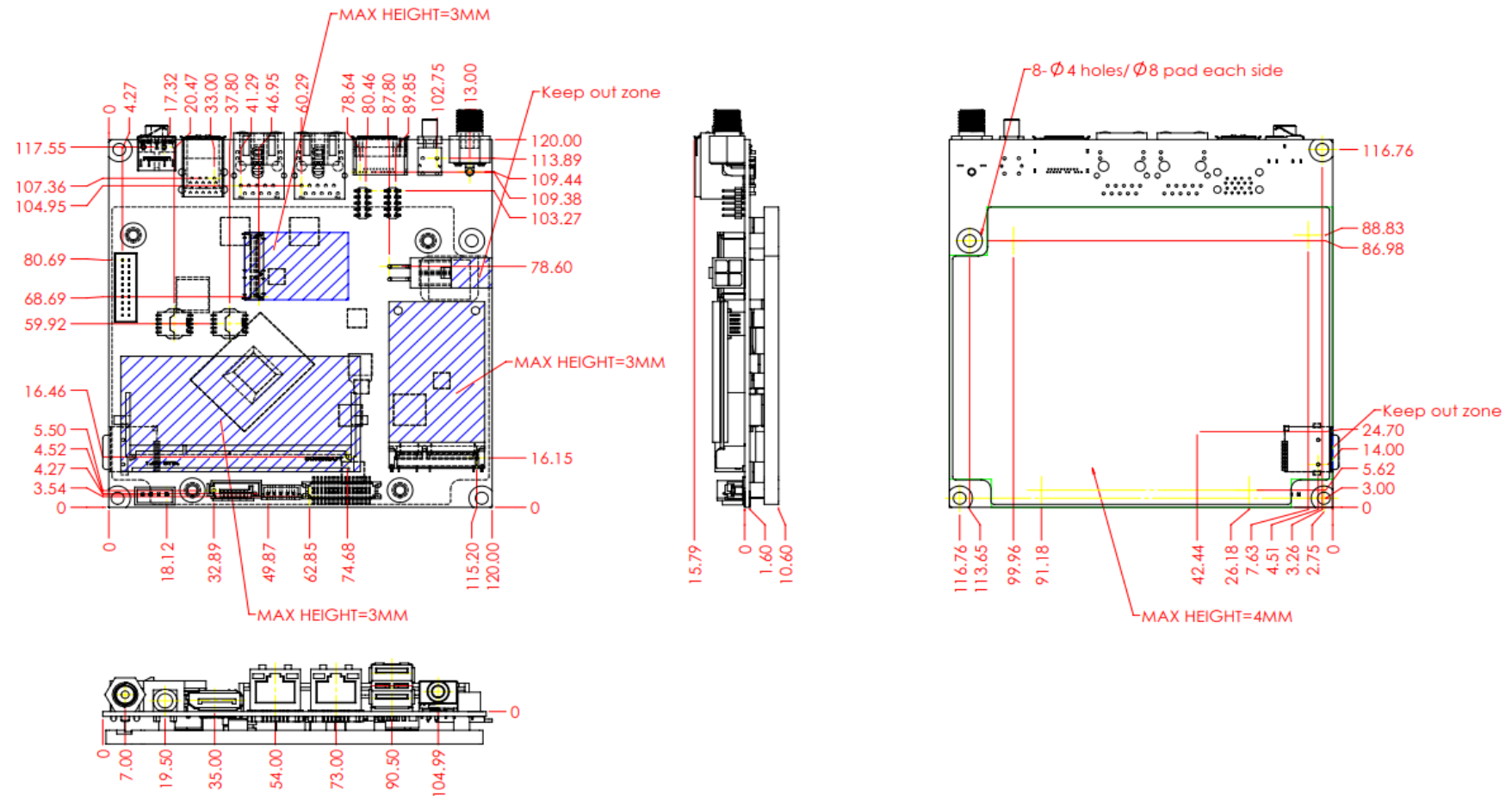
Mechanical and environmental specifications	<ul style="list-style-type: none"> ◆ Operating temperature: -40 ~ 85° C ◆ Storage temperature:-20 ~ 80° C ◆ Humidity: 5 ~ 90% non-condensing ◆ Power supply voltage: 12~24V DC in ◆ Board size: 120mm x 120 mm (4.72" x 4.72")
EMI/ESD	<ul style="list-style-type: none"> ◆ ESD: IEC 61000-4-2:2008 ◆ EMI: EN 55022: 2010/ AC:2011 Class B

2.1 Supported Operating Systems

The NANO-6062 supports the following operating systems.

- ✧ Windows 10* (64 bit), IoT Core(32/64bit)
- ✧ Wind River* 8.0 Linux Distribution(64 bit)
- ✧ Yocto* Tool-based Embedded Linux Distribution (64 bit)
- ✧ Android* 6.0(64bit)
- ✧ VxWorks*7.0 (RTOS) (64 bit)

2.2 Mechanical Dimensions



2.3 Power Consumption

Test Configuration	
CPU Type	Intel® Atom™ Processor E3950 @ 1.60GHz
SBC BIOS	Portwell, Inc. NANO-6062 TEST BIOS (70117T00)
Memory	Transcend DDR3L SO-DIMM 8GB/1866 *1
VGA Card	Onboard Intel ® HD Graphics
VGA Driver	Intel ® HD Graphics ,Version:21.20.16.4526
LAN Card #1	Onboard Intel® I210 Gigabit Network Connection
LAN Driver #1	Intel® I210 Gigabit Network Connection ,Version:12.12.226.0
LAN Card #2	Onboard Intel® I210 Gigabit Network Connection #2
LAN Driver #2	Intel® I210 Gigabit Network Connection #2 ,Version:12.12.226.0
Audio Card	Onboard Realtek High Definition Audio
Audio Driver	Realtek High Definition Audio ,Version:6.0.1.7541
Chip Driver	Intel® Chipset Device Software ,Version:10.1.1
USB 3.0 Driver	Intel ® USB 3.0 eXtensible Host Controller – 1.0(Microsoft),Ver:10.0.14393.0
EC Version	70223T00 (02/23/2017)
CDROM	BUFFALO DVSM-PC58U2V (USB-DVD)
Power Supply	PLUTO-D3501PJ

Power consumption(12V)			
ATX:			
Item	Power ON	Full Loading 10Min	Full Loading 30Min
CPU +12V	1.1A	1.5A	1.5A
Device +12V	0.1A	0.1A	0.1A
CPU+ Device +12V	1.1A	1.5A	1.5A
USB 3.0 Loading Test	4.85 V/ 960 mA		

2.4 Environmental Specifications

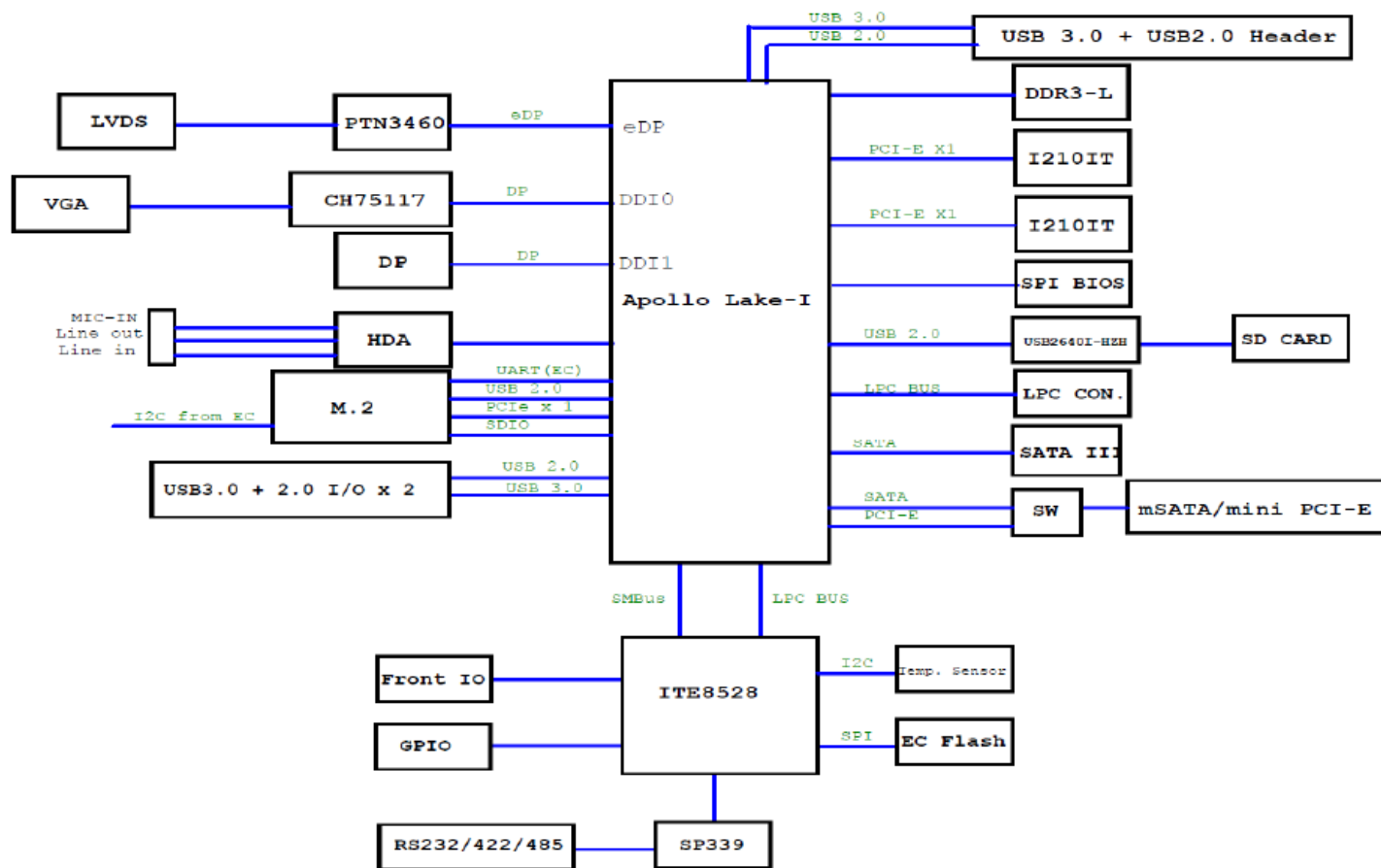
Storage Temperature : -40~85°C

Operation Temperature : 0~60°C

Storage Humidity : 5~90%

Operation Humidity: 10~90%

3 Block Diagram



4 Hardware Configuration

4.1 Jumpers and Connectors

Figure 1,NANO-6062 Top View

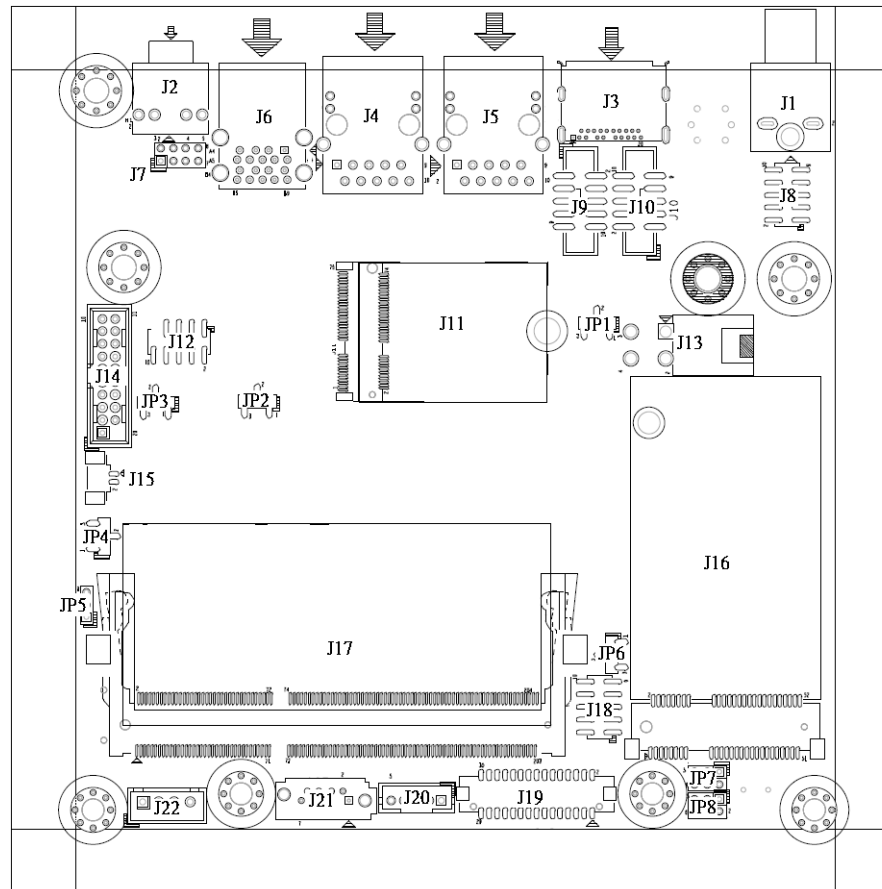
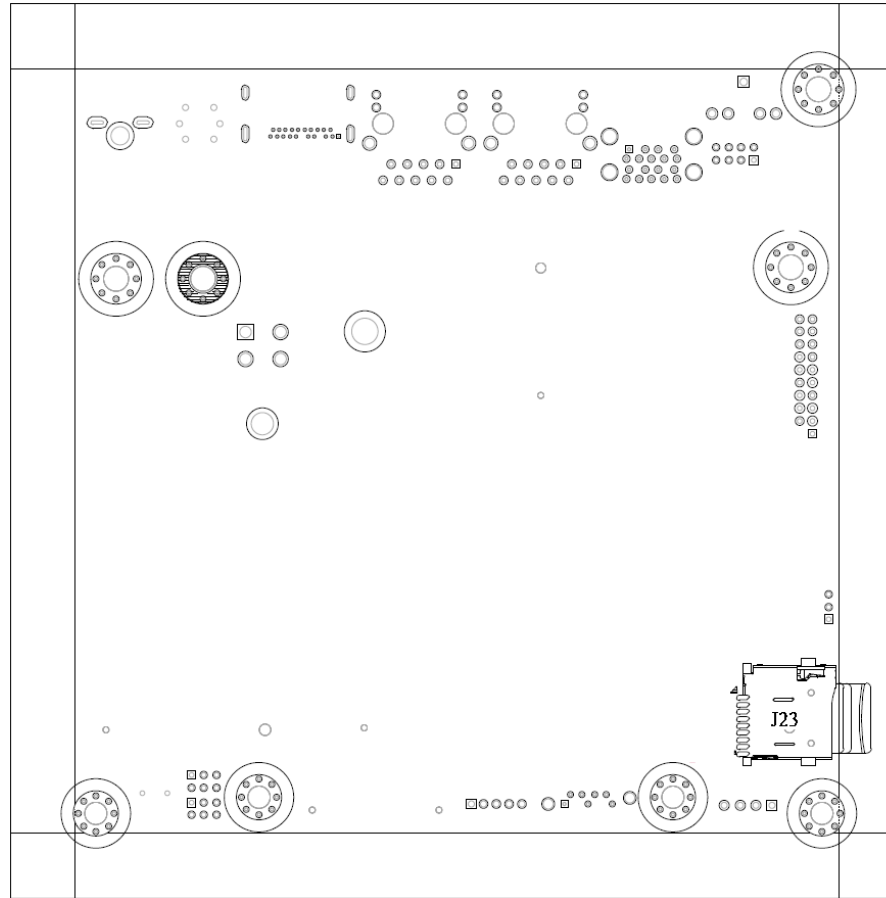


Figure 2,NANO-6062 Bottom View

This chapter indicates jumpers, headers, and connector's locations. Users may find useful information related to hardware settings in this chapter.

4.2 Jumper Settings

For users to customize NANO-6062's features. In the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 1 for the Jumper allocations.

Jumper Table

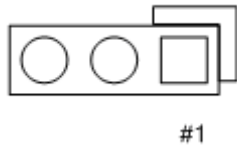
The jumper settings are schematically depicted in this manual as follows:

Jump Function List:

Jump	Function	Remark
J1	DC Jack	+12V Input
J2	Audio Jack (Line_out)	
J3	DP++ Port	
J4/J5	RJ45 Connector	
J6	USB3 Connector	
J7	External Audio (Mic + Line_in + Line_out)Pin HDR.	4x2 pin header
J8	Front Panel Pin HDR	5x2 pin header
J9	VGA Pin HDR.	5x2 pin header
J10	RS232/422/485 Pin HDR	5x2 pin header
J11	M.2 key E Socket	2230
J12	80 Port Connector	10x2 connector
J13	ATX 4 Pin Connector	+12V Input
J14	External USB3 Connector	

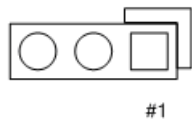
J15	Battery Socket	
J16	mSATA/mini PCIE Socket	
J17	DDR3 SO-DIMM Socket	
J18	General Purpose I/O Pin HDR	5x2 pin header
J19	LVDS Connector	
J20	Backlight Connector	
J21	SATA GEN3 Connector	
J22	SATA Power Connector	
J23	SD Card Socket	
U10	EC Flash	
U11	BIOS Flash	

JP1 : BKLCTRL Signal Level Selection



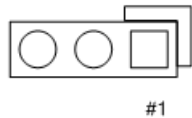
PIN No.	Signal Description
1-2 Short	+3.3V ★
2-3 Short	+5V

JP2 : BKLCTRL Signal Source Selection

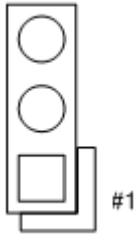


PIN No.	Signal Description
1-2 Short	EC
2-3 Short	SOC ★

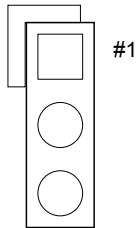
JP3 : CMOS Clear



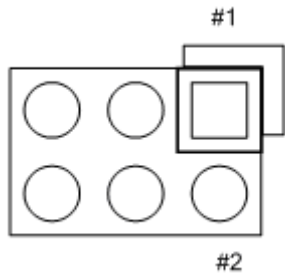
PIN No.	Signal Description
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents

JP5 : Power On Mode Selection

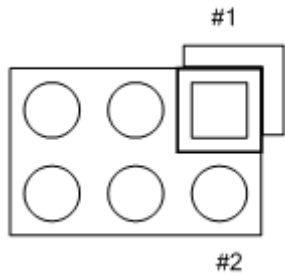
PIN No.	Signal Description
1-2 Short	AT
2-3 Short	ATX ★

JP6: GPIO4~7 Voltage Output Level Selection

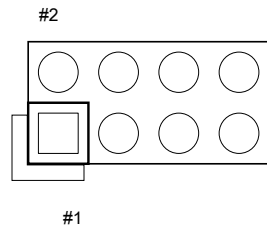
PIN No.	Signal Description
1-2 Short	5V
2-3 Short	3.3V ★

JP7 : PANEL Voltage Selection

PIN No.	Signal Description
1-3 Short	VCC3
3-5 Short	VCC5 ★
3-4 Short	+12V

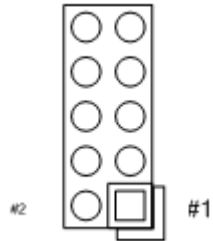
JP8: BACKLIGHT Enable Voltage Level Selection

PIN No.	Signal Description
1-3, 2-4	5V, Active High ★
1-3, 4-6	12V, Active High
3-5, 2-4	5V, Active Low
3-5, 4-6	12V, Active Low

J7 : External Audio Connector

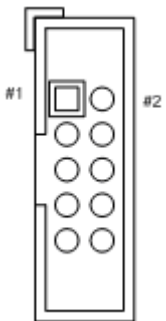
PIN No.	Signal Description	PIN No.	Signal Description
1	MIC_L	2	Line_in_L
3	Ground	4	Line_in_R
5	Line_out_L	6	Ground
7	Line_out_R	8	MIC_R

J8 : Front Panel Pin HDR



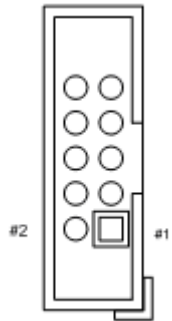
PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	N/C
3	External Power LED(+)	4	External Power LED(-)
5	HDD_LED(+)	6	HDD_LED(-)
7	Reset (+)	8	Power On(-)
9	Reset (-)	10	Power On(+)

J9 : VGA Connector



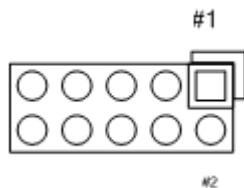
PIN No.	Signal Description	PIN No.	Signal Description
1	RED	2	SCL
3	GREEN	4	GND
5	BLUE	6	SDA
7	VSYNC	8	GND
9	HSYNC	10	+5V

J10: RS-232/422/485 I/O Connector



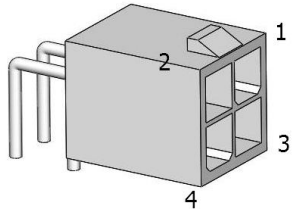
PIN No.	Signal Description	PIN No.	Signal Description
1	DCD#/485D-/422T-	2	RXD#/485D+/422T+
3	TXD#/422R+	4	DTR#/422R-
5	Ground	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	N/C

J12 : 80 Port Connector



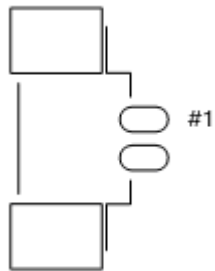
PIN No.	Signal Description	PIN No.	Signal Description
1	LAD0	2	3.3V
3	LAD1	4	PLTRST
5	LAD2	6	LFRAME
7	LAD13	8	LPC_CLK
9		10	GND

J13 : ATX 4 Pin Connector



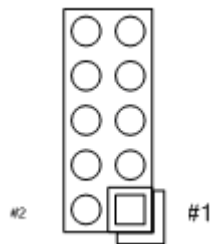
PIN No.	Signal Description
1	+12V
2	+12V
3	Ground
4	Ground

J15 : Battery Connector



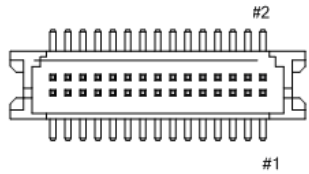
PIN No.	Signal Description
1	Battery Voltage
2	Ground

J18: General Purpose I/O Connector



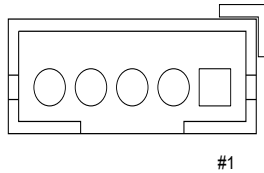
PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO0	2	GPIO4 (Output Only)
3	GPIO1	4	GPIO5 (Output Only)
5	GPIO2	6	GPIO6 (Output Only)
7	GPIO3	8	GPIO7 (Output Only)
9	Ground	10	+5V

J19 : LVDS Connector



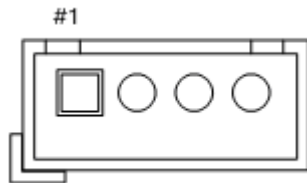
PIN No.	Signal Description	PIN No.	Signal Description
1	VDD_LVDS	2	VDD_LVDS
3	LVDSA_DATA0	4	LVDSA_DATA#0
5	LVDSA_DATA1	6	LVDSA_DATA#1
7	LVDSA_DATA2	8	LVDSA_DATA#2
9	LVDSA_DATA3	10	LVDSA_DATA#3
11	LVDSA_CLKP	12	LVDSA_CLKN
13	DDC_SCL	14	DDC_SDA
15	Ground	16	Ground
17	LVDSB_DATA0	18	LVDSB_DATA#0
19	LVDSB_DATA1	20	LVDSB_DATA#1
21	LVDSB_DATA2	22	LVDSB_DATA#2
23	LVDSB_DATA3	24	LVDSB_DATA#3
25	LVDSB_CLKP	26	LVDSB_CLKN
27	N/C	28	N/C
29	Ground	30	Ground

J20 : Backlight Connector



PIN No.	Signal Description
1	+5V
2	BL_CTRL
3	+12V
4	Ground
5	BL_Enable

J22 : SATA Power Connector



PIN No.	Signal Description
1	+12V
2	Ground
3	Ground
4	+5V

5 Signal Descriptions

5.1 Watch Dog Signal

```
#Define WDTCFG 0x06      // WDT Timer Control Register
#Define WDTMIN 0x07      // WDT Timer Counter Register (Minute)
#Define WDTSEC 0x08      // WDT Timer Counter Register (Second)
#Define EC_IOPort 0xE300  // Default, reference to BIOS configuration
```

```
VOID Write_EC_SRAM(UINT8 Offset,UINT8 Value){
```

```
    IoWrite8(EC_IOPort+Offset,Value);
}
```

```
Byte Read_EC_SRAM(UINT8 Offset){
    IoRead8(EC_IOPort+offset,Value);
    return Value;
}
```

```
void WDT()
```

```
{  
    // Enable WDT 30sec  
    Write_EC_SRAM(WDTSEC,30);  
    Write_EC_SRAM(WDTCFG,0x01);    //Bit0: WDT Enable, BIT1: 0:Second Mode  
  
    // Enable WDT 5min  
    Write_EC_SRAM(WDTSEC,5);  
    Write_EC_SRAM(WDTCFG,0x03);    //Bit0: WDT Enable, BIT1: 1:Minute Mode  
  
    // Enable WDT 10min, 20sec  
    Write_EC_SRAM(WDTSEC,20);  
    Write_EC_SRAM(WDTSEC,10);  
    Write_EC_SRAM(WDTCFG,0x03);    //Bit0: WDT Enable, BIT1: 1:Minute Mode  
}
```

5.2 Signal GPIO Signal

```
#Define GPCR 0x2B      // GPIO Control Register, Bit7 = GPIO7, Bit6 = GPIO6, ...,  
                        // 0: Output; 1: Input
```

```
#Define GPDR 0x2C      // GPIO Status Register, Bit7 = GPIO7, Bit6 = GPIO6, ...,  
                        // 0: Low; 1: High
```

```
#Define EC_IOPort 0xE300 // Default, reference to BIOS configuration
```

```
VOID Write_EC_SRAM(UINT8 Offset,UINT8 Value){
```

```
    IoWrite8(EC_IOPort+Offset,Value);  
}
```

```
Byte Read_EC_SRAM(UINT8 Offset){  
    IoRead8(EC_IOPort+offset,Value);  
    return Value;  
}
```

```
void GPIO()  
{
```

```
int Temp;
// Set GPIO7 Input & get status
Temp = Read_EC_SRAM(GPCR);
Write_EC_SRAM(GPCR,Temp|0x80);    //Bit7: GPIO7 control, 0: Output 1: Input
Temp = Read_EC_SRAM(GPDR);        //Bit7: GPIO7 status, 0: Output 1: Input

// Set GPIO7 Output & High
Temp = Read_EC_SRAM(GPCR);
Write_EC_SRAM(GPCR,Temp&0x7F);    //Bit7: GPIO7 control, 0: Output 1: Input
Temp = Read_EC_SRAM(GPDR);
Write_EC_SRAM(GPDR,Temp|0x80);    //Bit7: GPIO7 status, 0: Low 1: High
}
```

6 System Resources

6.1 Intel® Apollo Lake SoC

Intel® Atom™ x7-E3950 Processor(2M Cache, up to 2.00 GHz)

Intel® Atom™ x5-E3940 Processor(2M Cache, up to 1.80 GHz)

Intel® Atom™ x5-E3930 Processor(2M Cache, up to 1.80 GHz)

6.2 Main Memory

NANO-6062 provides 1 x 204-pin SO-DIMM sockets which supports DDR3L non-ECC memory. The maximum memory can be up to 8GB. Memory clock and related settings can be detected by BIOS via SPD interface.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

6.3 Installing the Single Board Computer

To install your NANO-6062 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position

Step 2 : Install and configure memory module on right position

Step 3 : Place NANO-6062 into the dedicated position in the system

Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that motherboard is properly inserted and fixed by mechanism.

Note:

Please refer to section 6.3.1 to 6.3.4 to install INF/Graphic/LAN

6.3.1 Chipset Component Driver

The NANO-6062 build with Intel® Atom™ processor E3900 series including E3950 / E3940 / E3930 sku . It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 8, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in NANO-6062 CD-title

6.3.2 Intel® HD Graphics 50X

NANO-6062 has integrated Intel® HD Graphics 50X(E3950_ Intel® HD Graphics 505, E3940 / E3930_ Intel® HD Graphics 500)

Processor Graphics indicates graphics processing circuitry integrated into the processor, providing the graphics, compute, media, and display capabilities. Intel® HD Graphics, Iris™ Graphics, Iris Plus Graphics, and Iris Pro Graphics deliver enhanced media conversion, fast frame rates, and 4K Ultra HD (UHD) video. NANO-6062 supports LVDS, DP, VGA display output. This combination makes NANO-6062 an excellent performance hardware.

Drivers Support

Please find the Graphic driver in the NANO-6062 CD-title. The driver supports Windows 10.

6.3.3 Intel LAN I210IT/I219LM Gigabit Ethernet Controller

- Intel I210IT Gigabit Ethernet controller and 2x RJ45 connectors on rear I/O

Drivers Support

Please find Intel I210IT LAN driver in Ethernet directory of NANO-6062 CD-title. The driver supports Windows 10.

7 BIOS Setup Items

7.1 Introduction

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

7.2 BIOS Setup

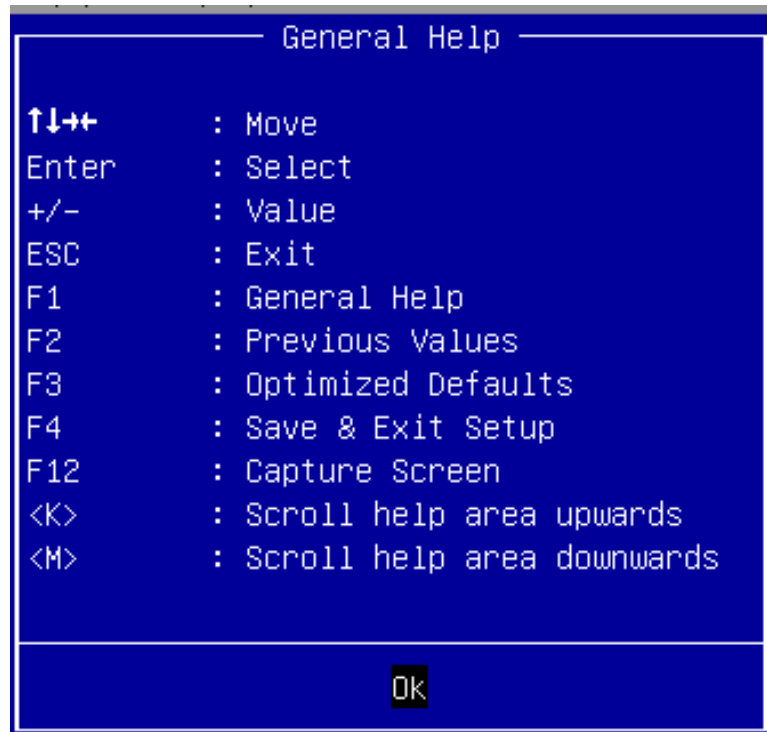
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

Press<Delete> or <ESC> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

Press <F1> to Run General Help or Resume

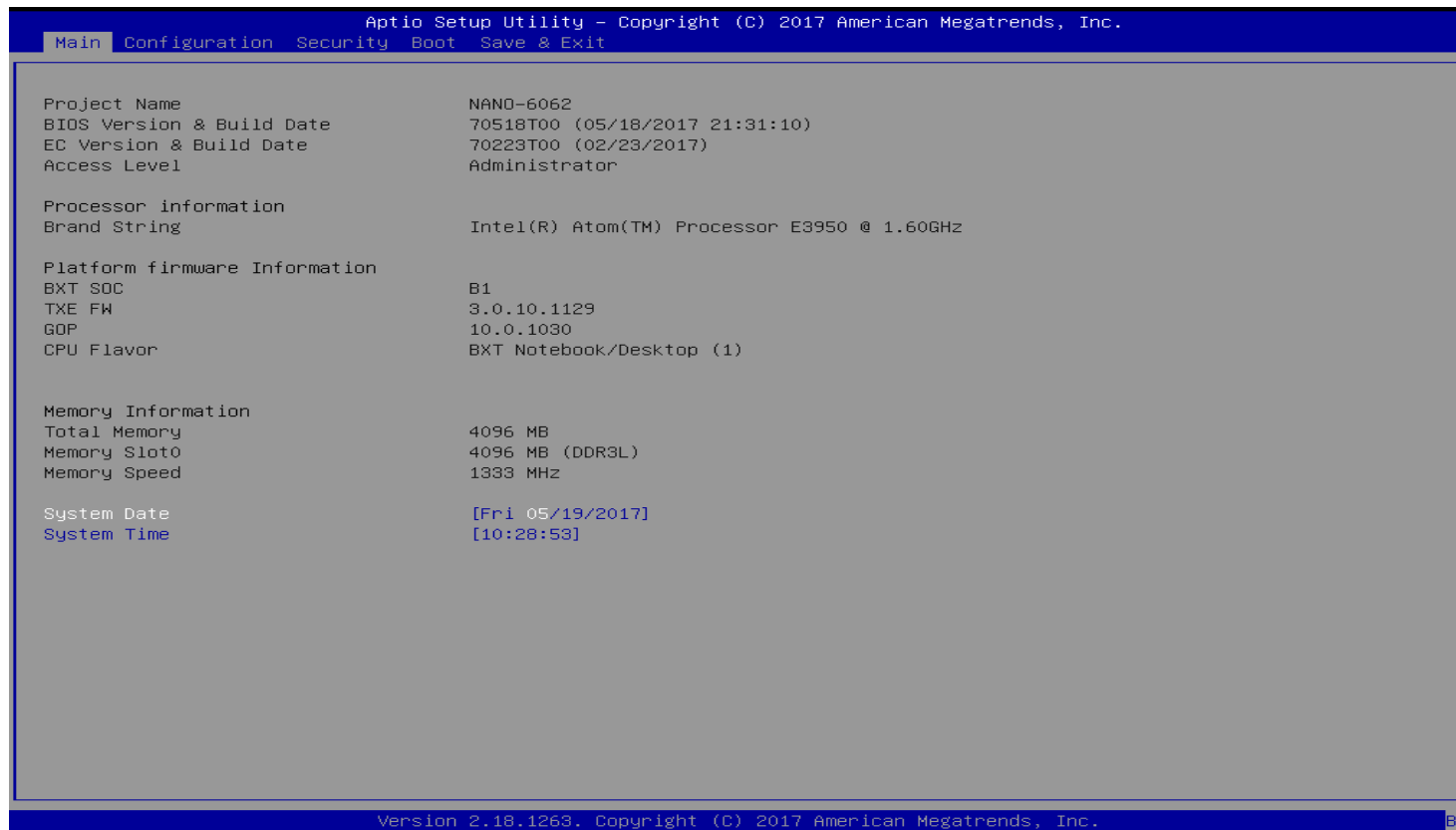
The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.



NANO-6062

7.2.1 Main

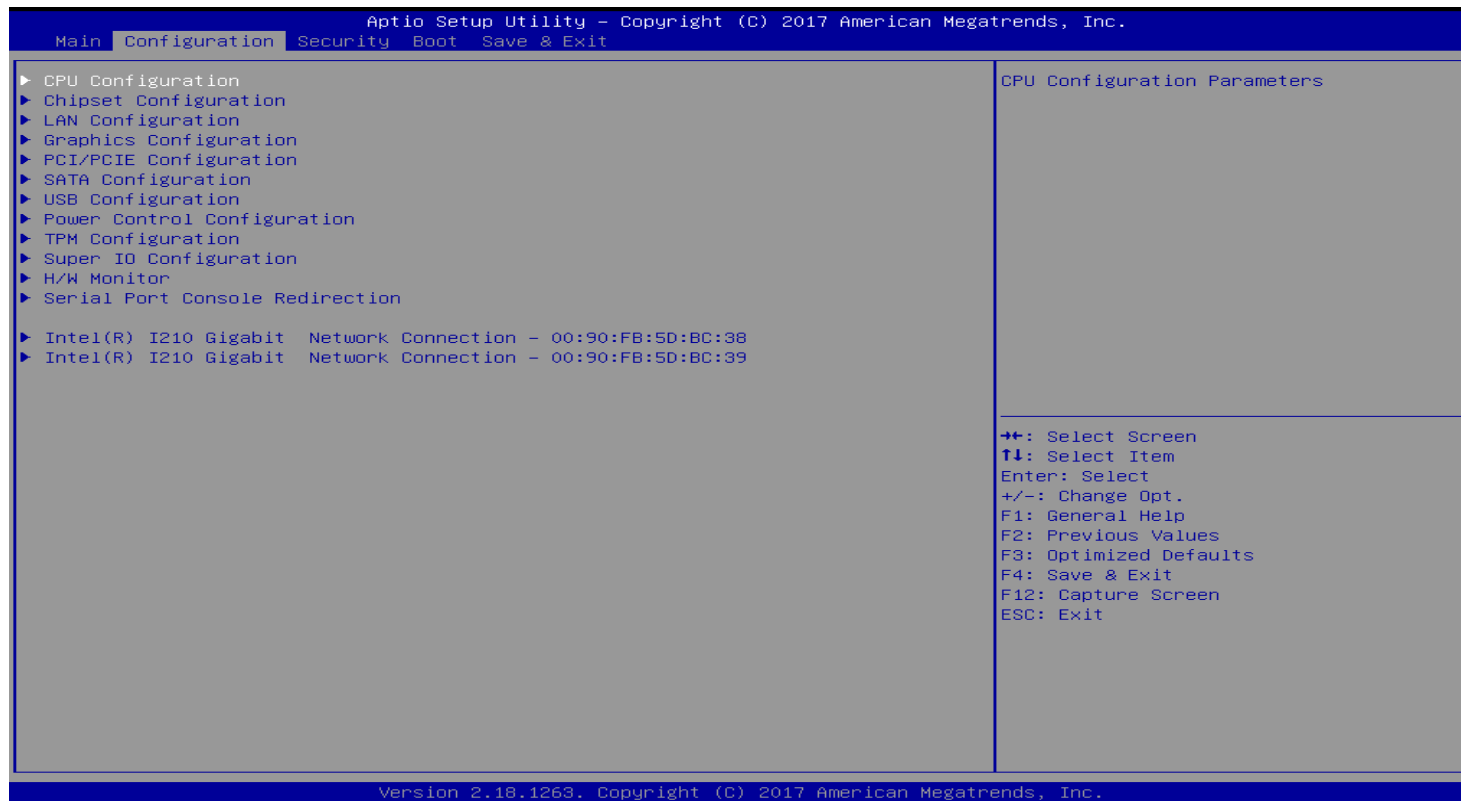
Use this menu for basic system configurations, such as time, date etc.



Feature	Description	Options
System Date	The date format is <Day>, <Month> <Date> <Year>. Use [+] or [-] to configure system Date.	
System Time	The time format is <Hour> <Minute> <Second>. Use [+] or [-] to configure system Time.	

7.2.2 Configuration

Use this menu to set up the items of special enhanced features



CPU Configuration

CPU Configuration Parameters

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Configuration		
CPU Configuration		Number of cores to enable in each processor package.
CPU Signature	506C9	
Microcode Patch	20	
Max CPU Speed	1600 MHz	
Min CPU Speed	800 MHz	
Processor Cores	4	
Intel HT Technology	Not Supported	
Intel VT-x Technology	Supported	
64-bit	Supported	
L1 Data Cache	24 KB x 4	
L1 Code Cache	32 KB x 4	
L2 Cache	1024 KB x 2	
L3 Cache	Not Present	
Active Processor Cores	[Disabled]	
Intel Virtualization Technology	[Enabled]	
VT-d	[Enabled]	
CPU Power Management Configuration		
EIST	[Enabled]	
Turbo Mode	[Enabled]	
C-States	[Disabled]	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.		

Feature	Description	Options
Active Processor Cores	Number of cores to enable in each processor package.	★Disabled, Enabled
Active Processor Cores [Enabled]		
Core 0		★Enabled
Core 1		★Enabled, Disabled
Core 2		★Enabled, Disabled
Core 3		★Enabled, Disabled
Intel Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.	★Enabled, Disabled
VT-d	Enable/Disable CPU VT-d.	★Enabled, Disabled
EIST	Enable/Disable Intel SpeedStep.	★Enabled, Disabled
EIST [Enabled]		
Turbo Mode	Turbo Mode.	★Enabled, Disabled
CPU C states	Enable or disable CPU C states	★Disabled, Enabled
CPU C states [Enabled]		
Enhanced C-states	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.	★Enabled, Disabled

Chipset Configuration

Configuration Chipset feature



Feature	Description	Options
High Precision Timer	Enable or Disable the High Precision Event Timer.	★Enabled, Disabled
HD-Audio Support	Enable or Disable HD-Audio Support.	★Enabled, Disabled

LAN Configuration

Configuration on Board LAN device

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Configuration	
<p>LAN Configuration</p> <p>Intel Ethernet Controller WGI210AT LAN MAC Address 00-90-FB-5D-BC-38 PCIe LAN1 Control [Enable]</p> <p>Intel Ethernet Controller WGI210AT LAN MAC Address 00-90-FB-5D-BC-39 PCIe LAN2 Control [Enable]</p> <p>Wake On Lan [Disable]</p> <p>► Network Stack Configuration</p>	<p>Control the PCIe Port 3 LAN function.</p> <p> ⇧⇧: Select Screen ⇧↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit </p>
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.	

Feature	Description	Options
PCIe LAN1 Control	Control the PCIe Port 3 LAN function	★Enabled, Disabled
PCIe LAN2 Control	Control the PCIe Port 4 LAN function	★Enabled, Disabled
Wake on LAN	Enable or disable the Wake on LAN.	★Disabled, Enable,

Network Stack Configuration

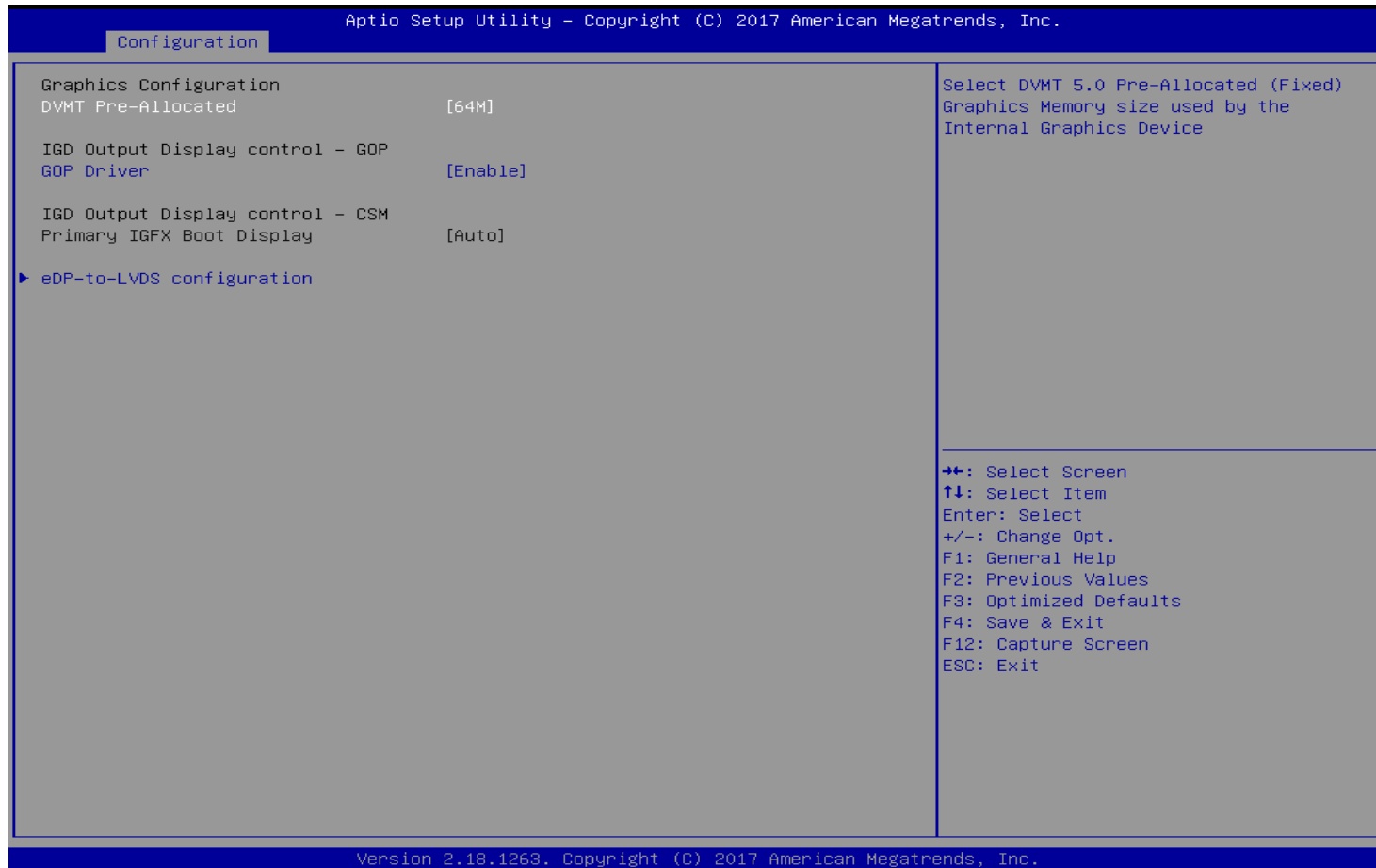
Network Stack Settings

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Configuration		
Network Stack	[Enabled]	Enable/Disable UEFI Network Stack
Ipv4 PXE Support	[Disabled]	
Ipv4 HTTP Support	[Disabled]	
Ipv6 PXE Support	[Disabled]	
Ipv6 HTTP Support	[Disabled]	
PXE boot wait time	0	
Media detect count	1	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.		

Feature	Description	Options
Network Stack	Enable/disable UEFI Network Stack	★ Disabled, Enable
Network Stack [Enable]		
Ipv4 PXE Support	Enable Ipv4 PXE Boot Support. If disabled Ipv4 PXE Boot Option will not be created.	★ Disabled, Enabled
Ipv4 HTTP Support	Enable Ipv4 HTTP Boot Support. If disabled Ipv4 HTTP Boot Option will not be created.	★ Disabled, Enabled
Ipv6 PXE Support	Enable Ipv6 PXE Boot Support. If disabled Ipv6 PXE Boot Option will not be created.	★ Disabled, Enabled
Ipv6 HTTP Support	Enable Ipv6 HTTP Boot Support. If disabled Ipv6 HTTP Boot Option will not be created.	★ Disabled, Enabled
PXE boot wait time	Wait time to press ESC key to abort the PXE boot	★ 0, 1, 2, 3, 4, 5
Media detect count	Number of times presence of media will be checked.	★ 1, Max 50

Graphics Configuration

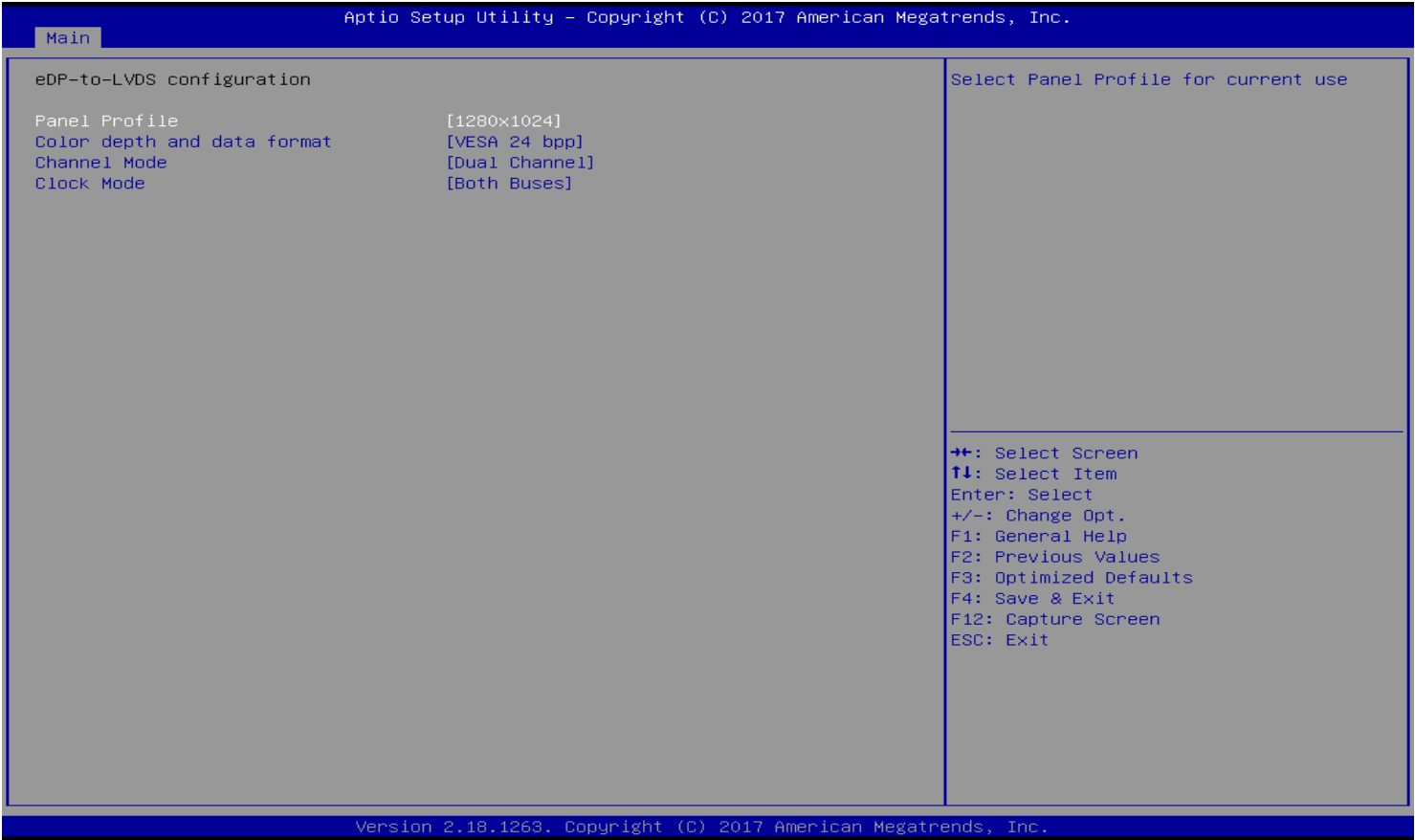
Configuration Graphics Settings



Feature	Description	Options
DVMT Pre-Allocated	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.	★64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M
IGD Output Display control – GOP (Boot item CSM Support [Disabled])		
GOP Driver	Enable GOP Driver will unload VBIOS; Disable it will load VBIOS.	★Enabled, Disabled
IGD Output Display control – CSM (Boot item CSM Support [Enabled])		
Primary IGFX Boot Display	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA mode will be supported only on primary display.	★Auto, VGA, LVDS, DP

eDP-to-LVDS Configuration

eDP-to-LVDS (PTN3460)



Feature	Description	Options
Copyright © Portwell 2017	NANO-6062 User's Guide	48

Panel Profile	Select Panel Profile for current use	★1280x1024, 640x480, 800x480, 800x600, 1024x768, 1280x800, 1280x1024,1366x768, 1440x900,1920x1080, OEM Profile
Color depth and data format	Select Color depth and data format.	★VESA 24 bpp JEIDA 24 bpp VESA and JEIDA 18 bpp
Channel Mode	Select LVDS Channel Mode.	★Dual channel Single channel
Clock Mode	Select Clock output for LVDS.	★Both Bus Even Bus Odd Bus

PCI/PCIE Configuration

PCI, PCI-X and PCI Express Settings

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.

Configuration

PCI/PCIE Configuration

PCIE Port 1 is assigned to USB
 PCIE Port 2 is assigned to USB
 PCIE Port 3 is assigned to LAN
 PCIE Port 4 is assigned to LAN
 ▶ PCIE Port 5 is assigned to M.2
 ▶ PCI Express Root Port 6
 Mini-PCIE & mSATA Switch [mSATA]

PCIE Port	PCIE Port Config	Current Link Width	Current Link Speed
P1(D20/F0)	x1	--	--
P2(D20/F1)	x1	--	--
P3(D19/F0)	x1	x1	GEN1 (2.5GT/s)
P4(D19/F1)	x1	x1	GEN1 (2.5GT/s)
P5(D19/F2)	x1	--	--
P6(D19/F3)	x1	--	--

Control the PCI Express Root Port.
 AUTO: To disable unused root port automatically for the most optimum power savings.
 Enable: Enable PCIE root port
 Disable: Disable PCIE root port

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 F12: Capture Screen
 ESC: Exit

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Feature	Description	Options
Mini-PCle & mSATA Switch		★mSATA, Mini-PCle

PCIe Port5 is assigned to M.2



Feature	Description	Options
PCI Express Root Port 5	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe Root port Disable: Disable PCIe root port	★Enable, Disable
ASPM	PCI Express Active State Power Management settings	★Disable, L0s, L1, L0sL1,Auto
Hot Plug	PCI Express Hot Plug Enable/Disable	★Disable, Enable
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2
PCIe Selectable De-emphasis	When the Link is operating at 5.0 GT/s speed, this bit selects the level of de-emphasis for an Upstream component. 1b -3.5 dB, 0b – 6 dB	★Enabled, Disabled

PCI Express Root Port 6

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Configuration		
PCI Express Root Port 6	[Enable]	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port
ASPM	[Disable]	
Hot Plug	[Disable]	
PCIe Speed	[Auto]	
PCIe Selectable De-emphasis	[Enabled]	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.		

Feature	Description	Options
PCI Express Root Port 6	Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe Root port Disable: Disable PCIe root port	★Enable, Disable
ASPM	PCI Express Active State Power Management settings	★Disable, L0s, L1, L0sL1,Auto
Hot Plug	PCI Express Hot Plug Enable/Disable	★Disable, Enable
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2
PCIe Selectable De-emphasis	When the Link is operating at 5.0 GT/s speed, this bit selects the level of de-emphasis for an Upstream component. 1b -3.5 dB, 0b – 6 dB	★Enabled, Disabled

SATA Configuration

SATA Device Options Settings

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Configuration		
SATA Configuration		Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).
SATA Controller	[Enable]	
SATA Speed Selection	[Auto]	
SATA Port 0	[Not Installed]	
Port 0	[Enabled]	
SATA Port 0 Hot Plug Capability	[Disabled]	
SATA Device Type	[Hard Disk Drive]	
SATA Port 1	[Not Installed]	
Port 1	[Enabled]	
SATA Port 1 Hot Plug Capability	[Disabled]	
SATA Device Type	[Hard Disk Drive]	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.		

Feature	Description	Options
SATA Controller	Enable or disable the chipset SATA Controller. The Chipset controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port)	★Enable, Disable
SATA Speed Selection	Select SATA interface speed.	★Auto, Gen1, Gen2, Gen3
SATA Port 0		
Port 0	Enable or Disable SATA Port.	★Enabled, Disabled
SATA Port 0 Hot Plug Capability	If enabled, SATA port will be reported as hot Plug capable.	★Disabled, Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive	★Hard Disk Drive, Solid State Drive
SATA Port 1		
Port1	Enable or Disable SATA Port.	★Enabled, Disabled
SATA Port 1 Hot Plug Capability	If enabled, SATA port will be reported as hot Plug capable.	★Disabled, Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive	★Hard Disk Drive, Solid State Drive

USB Configuration

USB Configuration Parameters.

Configuration	
<p>Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.</p>	
<p>USB Configuration</p> <p>USB Controllers: 1 XHCI</p> <p>USB Devices: 1 Drive, 1 Keyboard, 1 Hub</p> <p>SoC USB Configuration</p> <p>USB Port Disable Override [Disable]</p> <p>Common USB Configuration</p> <p>Legacy USB Support [Enabled]</p> <p>USB Mass Storage Driver Support [Enabled]</p> <p>USB hardware delays and time-outs:</p> <p>USB transfer time-out [20 sec]</p> <p>Device reset time-out [20 sec]</p> <p>Device power-up delay [Manual]</p> <p>Device power-up delay in seconds 5</p> <p>Mass Storage Devices:</p> <p>Generic Ultra HS-SD/MMC [Auto]</p>	<p>Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.</p> <p>++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</p>
<p>Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.</p>	

Feature	Description	Options
SoC USB Configuration		
USB Port Disable Override	Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.	★Disable, Enable
USB Port Disable Override [Enable]		
USB Port #0	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled
USB Port #1	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled
USB Port #2	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled
USB Port #3	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled
USB 3 Port #0	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled
USB 3 Port #1	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled
USB 3 Port #2	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled
USB 3 Port #3	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.	★Enable, Disabled

Common USB Configuration		
Legacy USB Support	Enables Legacy USB Support. Auto option disable legacy Support if no USB devices are connected. Disable option will keep USB device available only for EFI applications.	★ Enabled, Disabled, Auto
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support.	★ Enabled, Disabled
USB Hardware delays and time-outs		
USB transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers.	★ 20 sec, 1 sec, 5 sec, 10 sec
Device reset time-out	USB mass storage device Start Unit command time-out.	★ 20 sec, 10 sec, 30 sec, 40 sec
Device power-up delay	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.	★ Auto, Manual
Mass Storage Devices		
Generic Ultra HS-SD/MMC	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.	★ Auto, Floppy, Forced FDD, Hard Disk, CD-ROM

Power Control Configuration

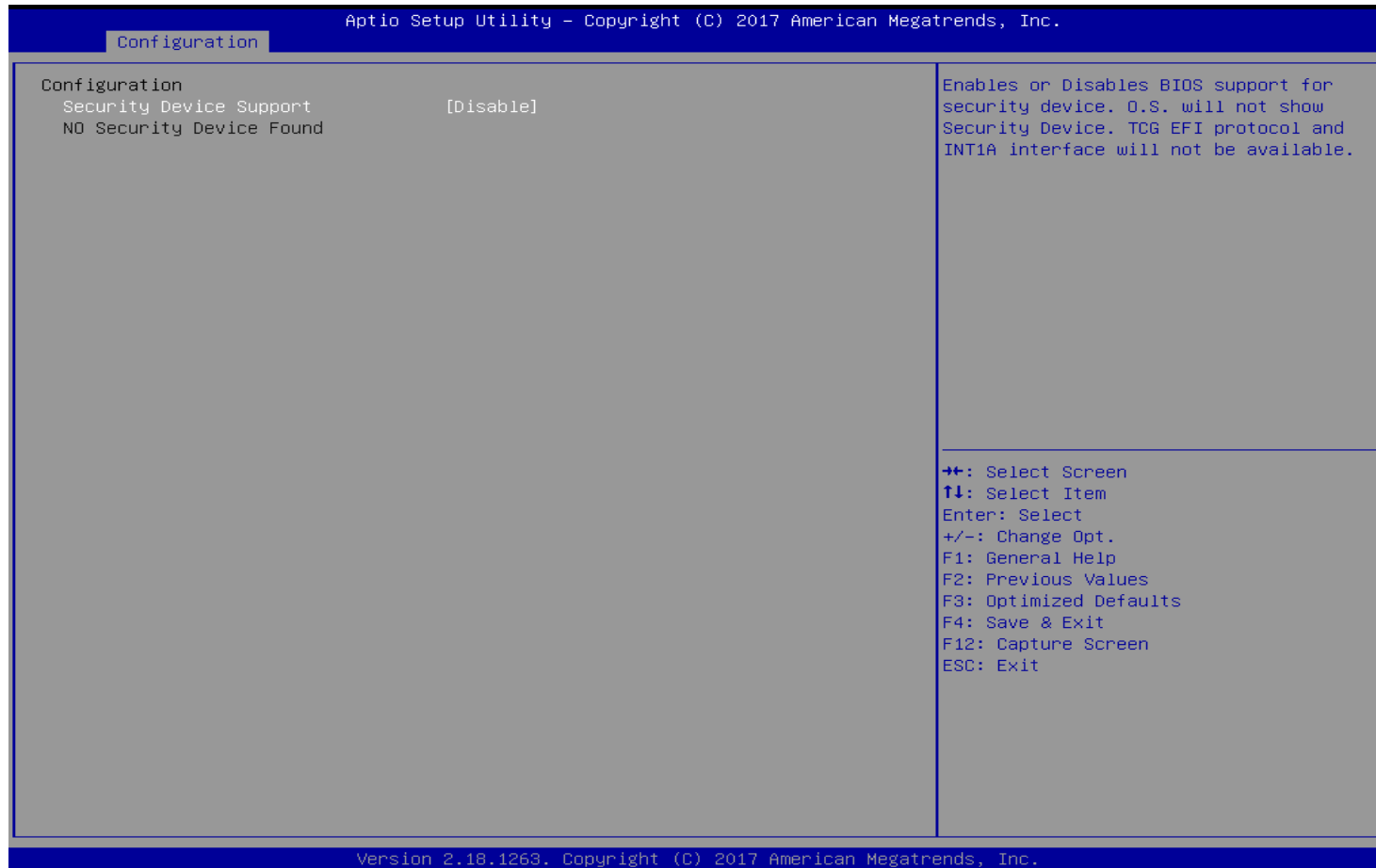
System Power Control Configuration Parameters

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.		
Configuration		
Power Control Configuration		Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
Enable Hibernation	[Enabled]	
ACPI Sleep State	[S3 (Suspend to RAM)]	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit
Restore AC Power Loss	[Power Off]	
RTC Wakeup	[Disabled]	
System Time	[11:18:15]	
Wake up day	0	
Wake up Time (HH:mm:ss)	[00:00:00]	
Wake On Ring	[Disable]	
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Feature	Description	Options
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.	★Enabled, Disabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	★S3 (Suspend to RAM), Suspend Disabled
Restore AC Power Loss	Specify what state to go to when power is re-applied after a power failure (G3 state). Power On: System will boot directly as soon as power applied. Power Off: System keeps in power-off state until power button is pressed.	★Power Off, Power On, Last State
RTC Wake up	Enable or disable System wake on alarm event. [Enabled], system will wake up the Hour: Min: Sec specified. [Disabled] Turn off RTC Wakeup.	★Disabled, Enabled
RTC Wake up [Enabled]		
Wake up day	Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up	★0, 0-31
Wake up Time(HH: mm: ss)	Use [Enter], [TAB] to select field, HH: 0-23, mm: 0-59, ss: 0-59	HH: 0-23, mm: 0-59, ss: 0-59
Wake On Ring	Enable or Disable the Wake on Ring	★Disable, Enable

TPM Configuration

Trusted Computing settings



Feature	Description	Options
Security Device Support	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A Interface will not be available.	★ Disabled, Enabled

Super IO Configuration

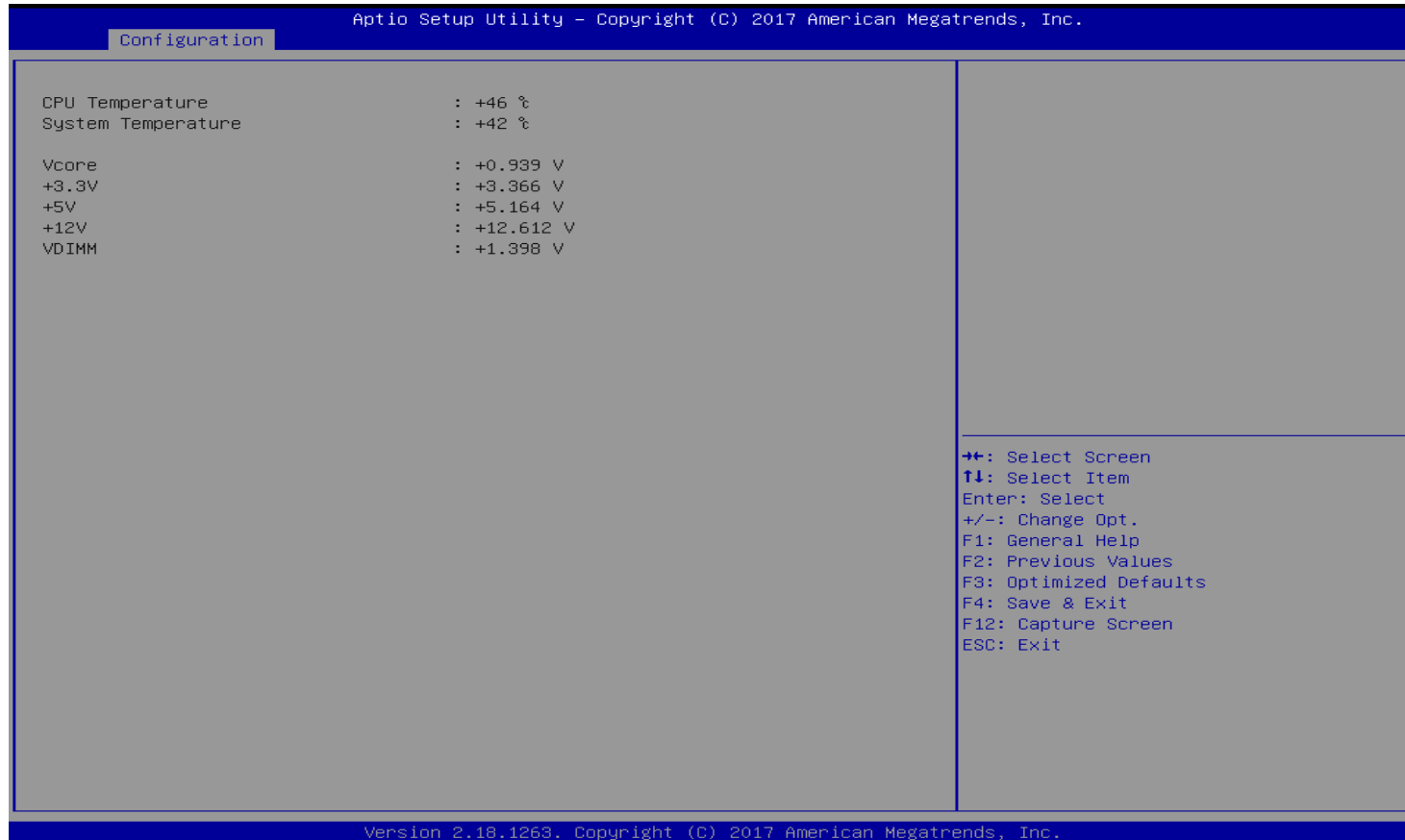
System Super IO Chip Parameters.

Configuration		Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Super IO Configuration		Enable/Disable Watch Dog Timer	
Serial Port 1	[Enabled]		
UART Mode	[RS232]		
Device Settings	IO=3F8h; IRQ=4;		
Serial Port 2	[Enabled]		
Device Settings	IO=3E8h; IRQ=3;		
Watch Dog Timer	[Enabled]		
Timer Unit	[Second]		
Timer value	20		
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit	
		Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.	

Feature	Description	Options
Serial Port 1	Enable or Disable Serial Port (COM)	★ Enabled, Disabled
UART Mode	Set Current UART Mode: RS232, RS485, RS485/422	★ RS-232, RS-485 HALF DUFLEX RS-485/422 FULL DUFLEX
Serial Port 2	Enable or Disable Serial Port (COM)	★ Enabled, Disabled
Watch Dog Timer	Enable/Disable Watch Dog Timer	★ Disabled, Enabled
Watch Dog Timer [Enabled]		
Timer Unit	Select Timer count unit of WDT	★ Second, Minute
Timer value	Set WDT Timer value seconds/minutes	★ 20, 1-255 (Minute), 10-255 (Second)

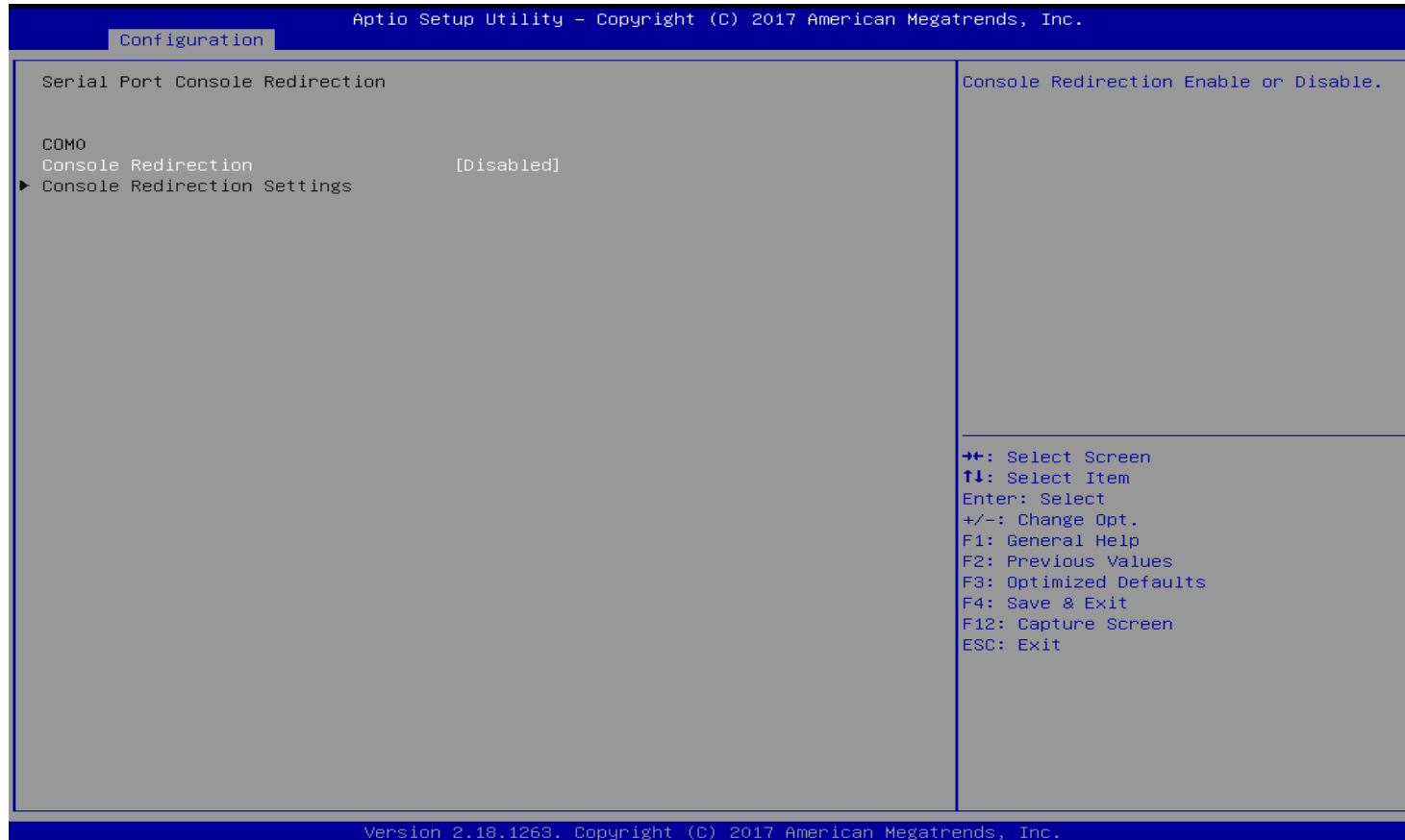
H/W Monitor Configuration (Show only)

Monitor hardware status



Serial Port Console Redirection

Serial Port Console Redirection



Feature	Description	Options
Console Redirection	Console Redirection Enable or Disable.	★Disabled, Enabled

Console Redirection Settings (COM0)

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both Computers should have the same or compatible settings.



Feature	Description	Options
Terminal Type	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.	★ANSI, VT100, VT100+, VT-UTF8
Bits per second	Select serial port transmission speed. The speed must be matched on other side. Long or noisy lines may require lower speeds.	★115200, 9600, 19200, 38400, 57600
Data bits	Data bits	★8, 7
Parity	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.	★None, Even, Odd, Mark, Space
Stop Bits	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.	★1,2
Flow Control	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.	★None, Hardware RTS/CTS

VT-UTF8 Combo Key Support	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals	★Enabled, Disabled
Recorder Mode	With this mode enabled only text will be sent. This is to capture Terminal data.	★Disabled, Enabled
Resolution 100x31	Enables or disables extended terminal resolution	★Disabled, Enabled
Legacy OS Redirection Resolution	On Legacy OS, the Number of Rows and Columns supports redirection	★80x24, 80x25
Putty KeyPad	Select FunctionKey and KeyPad on Putty	★VT100, LINUX,XTERMR6, SCO,ESCN,VT400
Redirection After BIOS POST	When BootLoader is selected, then Legacy console redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.	★Always Enable, BootLoader

Intel(R) I210 Gigabit Network Connection-00:90:FB:5D:BC:38

Configure Gigabit Ethernet device parameters.

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Configuration

► NIC Configuration

Blink LEDs	0
UEFI Driver	Intel(R) PRO/1000 6.3.27 PCI-E
Adapter PBA	000300-000
Device Name	Intel(R) I210 Gigabit Network Connection
Chip Type	Intel i210
PCI Device ID	1533
PCI Address	01:00:00
Link Status	[Disconnected]
MAC Address	00:90:FB:5D:BC:38
Virtual MAC Address	00:90:FB:5D:BC:38

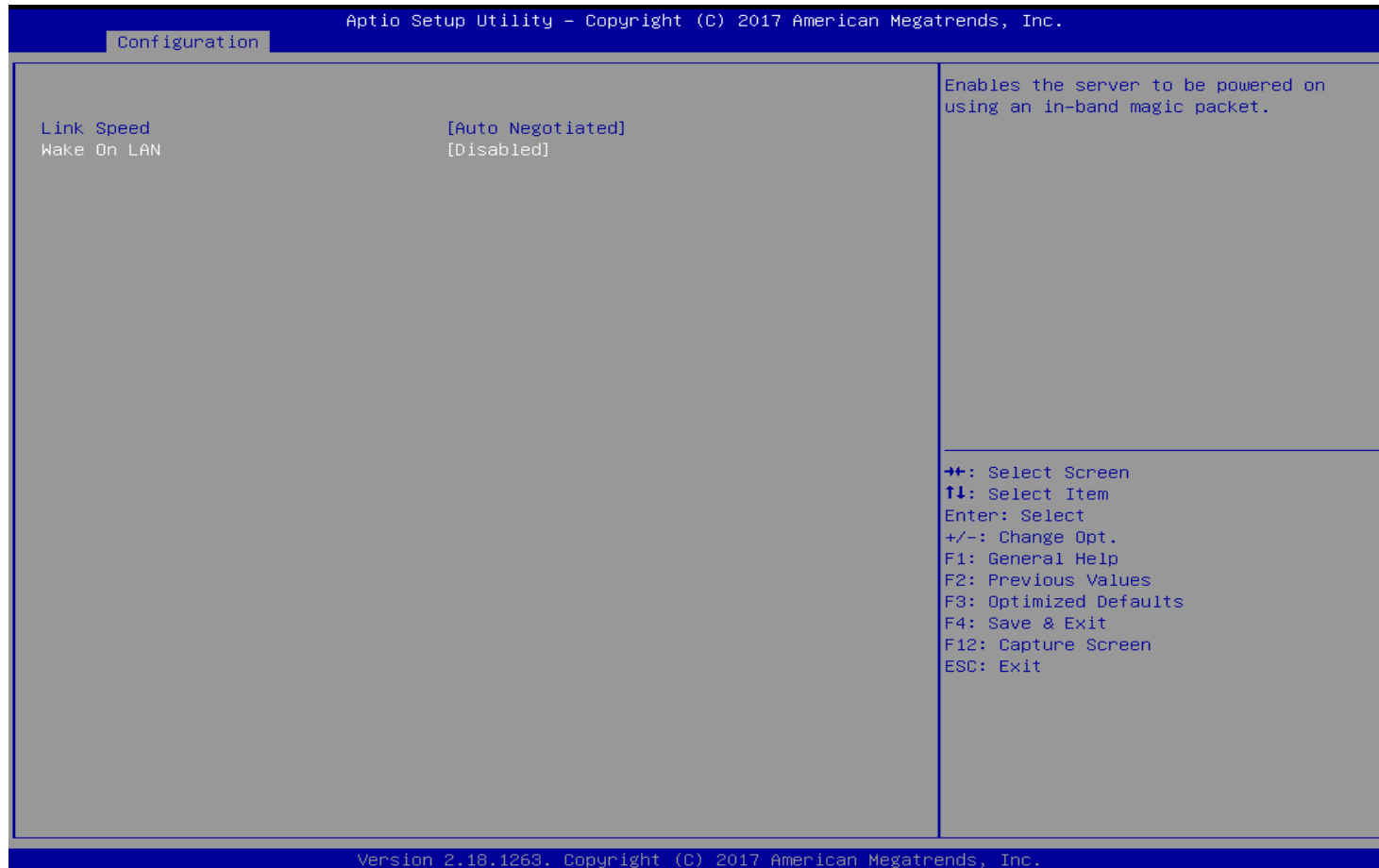
Identify the physical network port by blinking the associated LED.

→+: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
F12: Capture Screen
ESC: Exit

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NIC Configuration

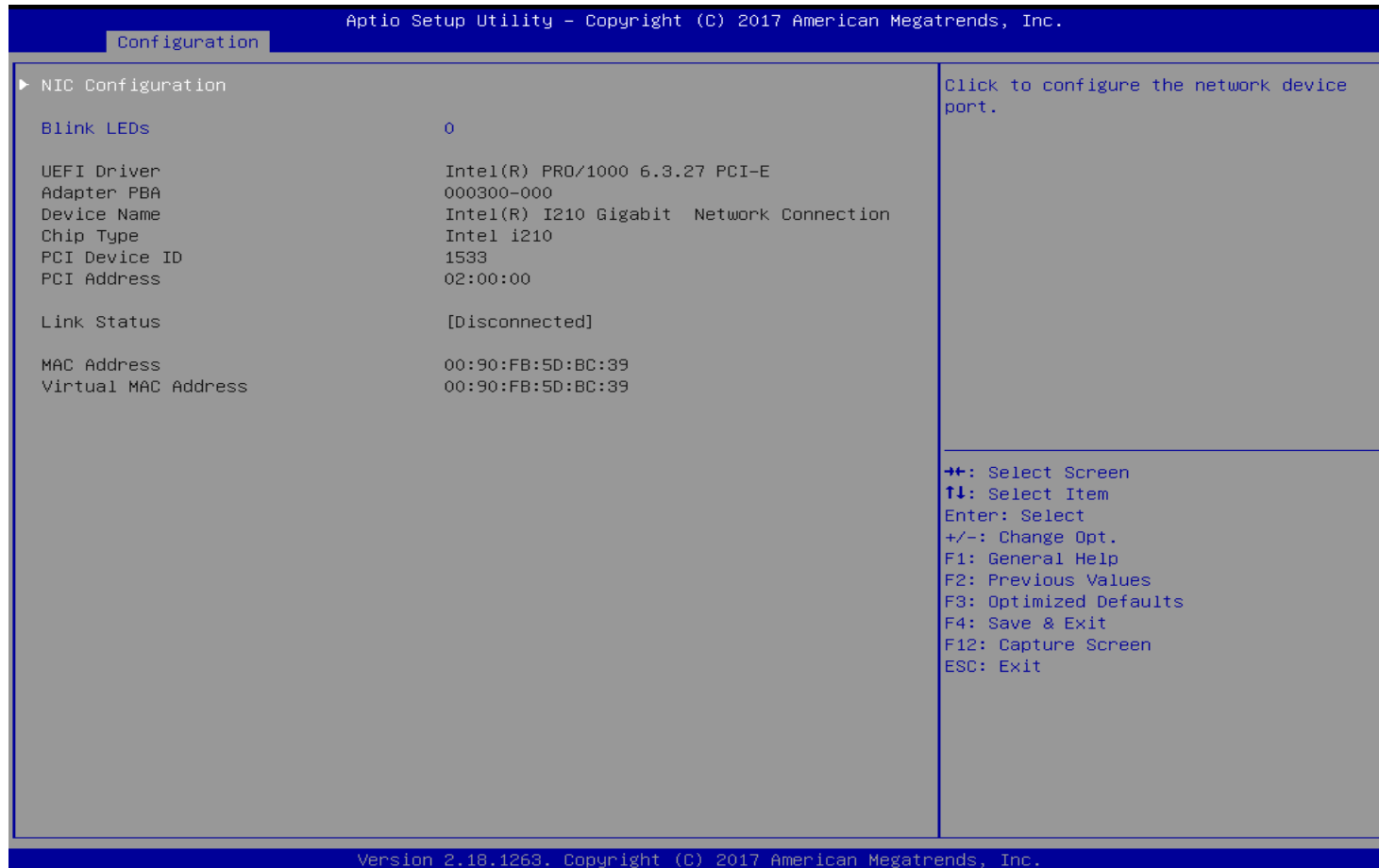
Specifies the port speed used for the selected boot protocol.



Feature	Description	Options
Link Speed	Specifies the port speed used for the selected boot protocol.	★Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full
Wake On LAN	Enables the server to be powered on using an in-band magic packet.	★Disabled, Enabled
Blink LEDs	Identify the physical network port by blinking the associated LED.	★0

Intel(R) I210 Gigabit Network Connection-00:90:FB:5D:BC:39

Configure Gigabit Ethernet device parameters.



NIC Configuration

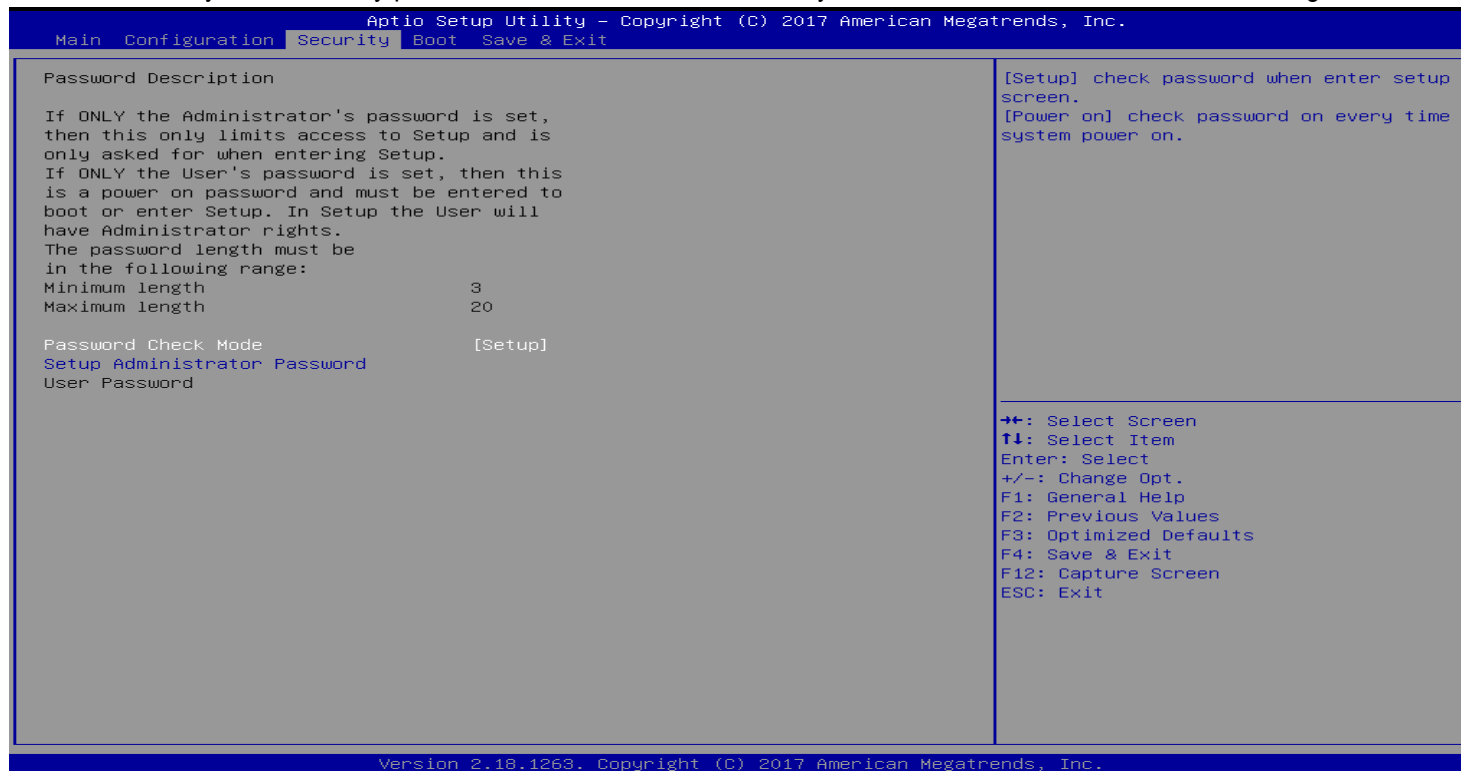
Specifies the port speed used for the selected boot protocol.

Configuration		Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Link Speed	[Auto Negotiated]	Specifies the port speed used for the selected boot protocol.	
Wake On LAN	[Disabled]		
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit	
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.			

Feature	Description	Options
Link Speed	Specifies the port speed used for the selected boot protocol.	★Auto Negotiated, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full
Wake On LAN	Enables the server to be powered on using an in-band magic packet.	★Disabled, Enabled
Blink LEDs	Identify the physical network port by blinking the associated LED.	★0

7.2.3 Security

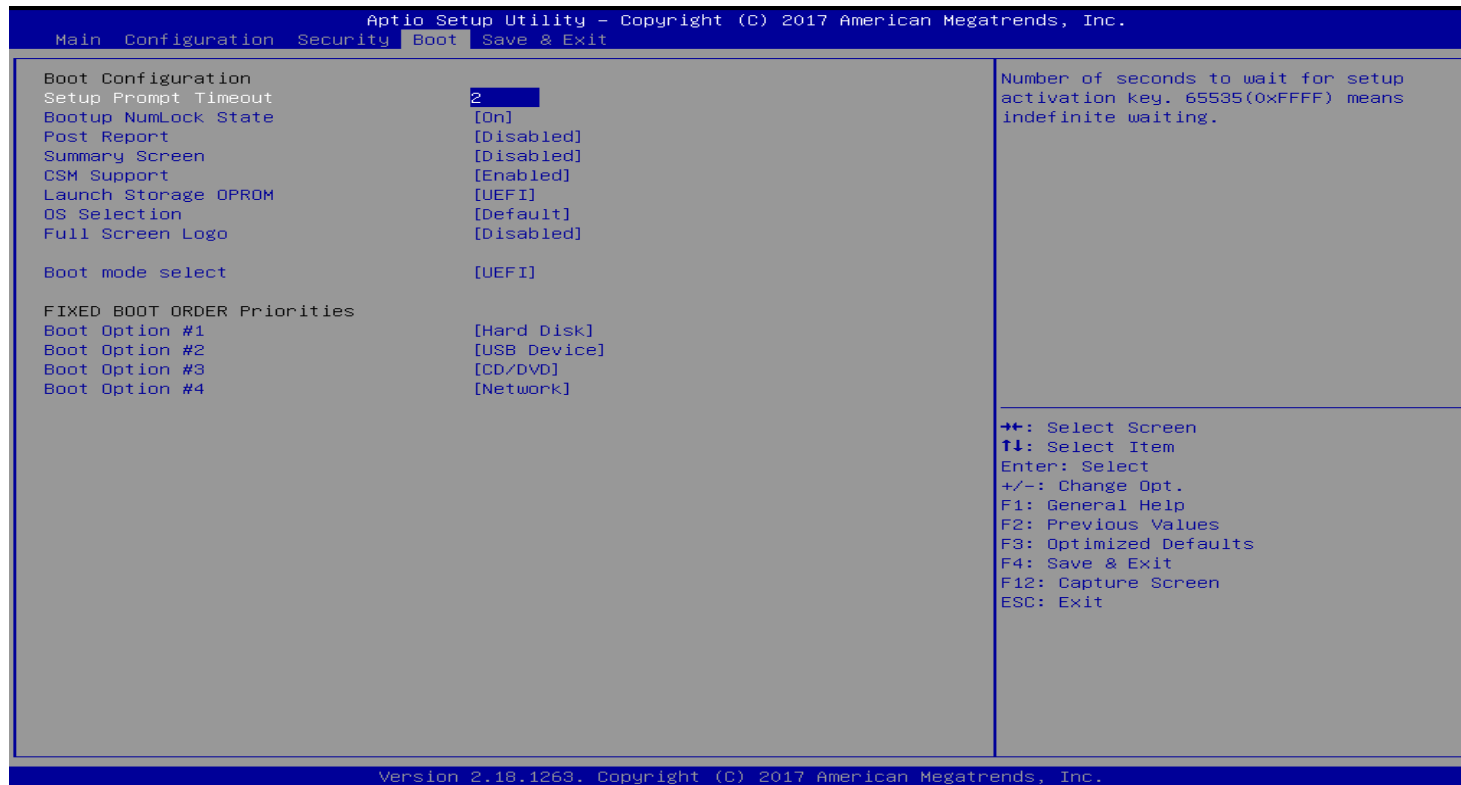
This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program.



Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★Setup, Power on
Setup Administrator Password	Set Setup Administrator Password	★No default setting

7.2.4 Boot

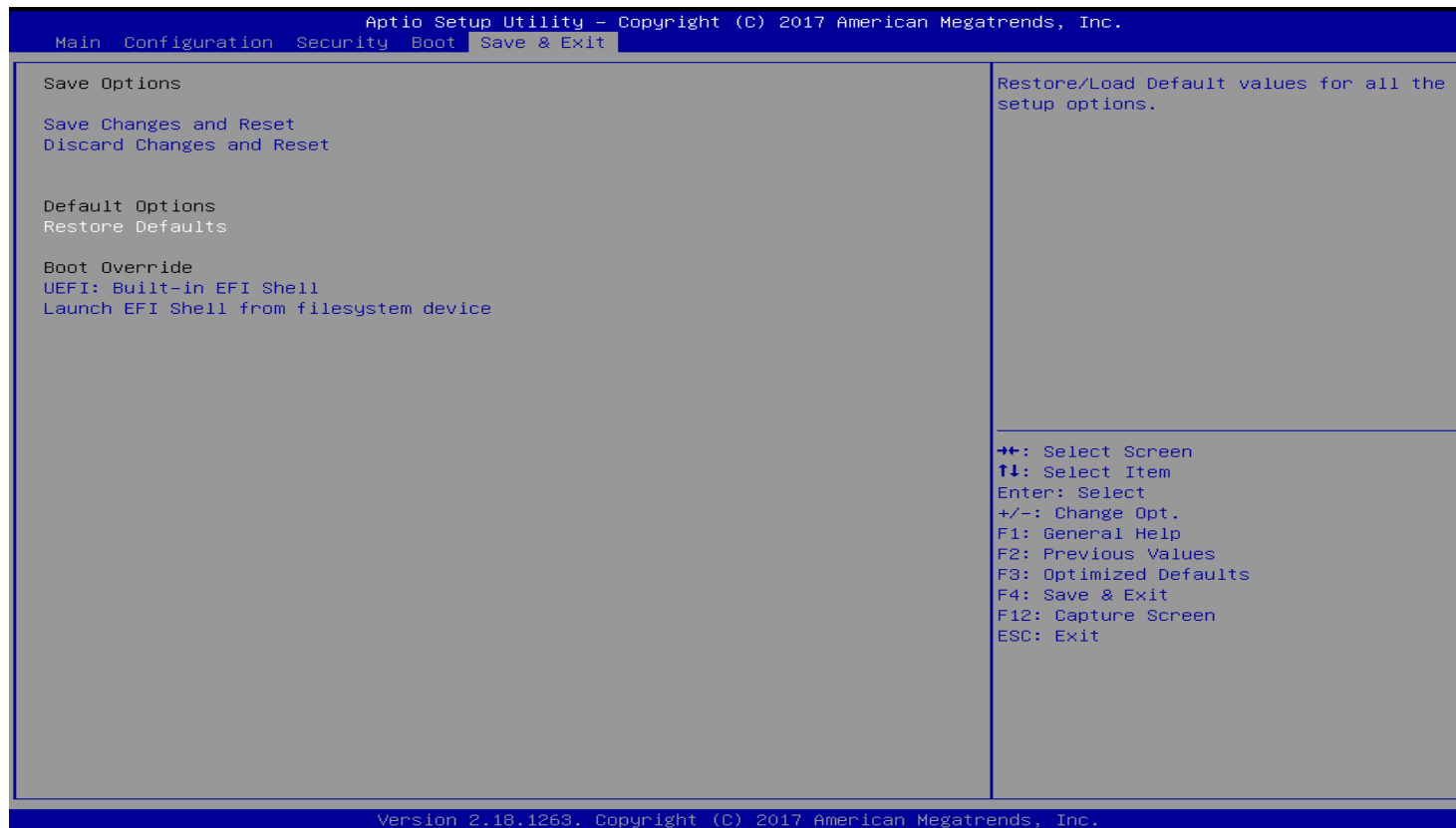
Use this menu to specify the priority of boot devices.



Feature	Description	Options
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0Xffff) means indefinite waiting.	★2, 1-65535
Bootup NumLock State	Select the keyboard NumLock state	★On, Off
Post Report	Post Report Support Enabled/Disabled	★Disabled, Enabled
Summary Screen	Summary Screen Support Enabled/Disabled	★Disabled, Enabled
CSM Support	Enable/Disable CSM Support	★Disabled, Enabled
CSM Support [Enabled]		
Launch Storage OPROM	Controls the execution of UEFI and Legacy Storage OpROM	★UEFI, Do not launch, Legacy
OS Selection	[Default] To Win8/8.1/10; [Other] Android / Linux; [Legacy System] Win7 / DOS; This item setting will effect LPSS & XHCI Hand-off item setting.	★Default, Others, Legacy System, Intel Linux
Full screen Logo	Enables or disables Quiet Boot option and Full screen Logo.	★Disabled, Enabled
Boot mode select	Select Boot mode LEGACY/UEFI	★UEFI, Legacy
FIXED BOOT ORDER Priorities		
Boot Option #1	Sets the system boot order	★Hard Disk, USB Device, CD/DVD, Network, Disabled
Boot Option #2	Sets the system boot order	★USB Device, Hard Disk, CD/DVD, Network, Disabled
Boot Option #3	Sets the system boot order	★CD/DVD, USB Device, Hard Disk, Network, Disabled

Boot Option #4	Sets the system boot order	★Network, CD/DVD, USB Device, Hard Disk, Disabled
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7.2.5 Save & Exit



Feature	Description	Options
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.	
UEFI: Built-in EFI Shell (Boot option filter: UEFI only)	Reset the system after saving the changes.	
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.	

8 Troubleshooting

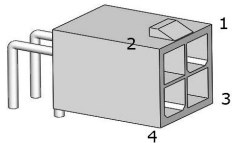
This chapter provides a few useful tips to quickly get NANO-6062 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

8.1 Hardware Quick Installation

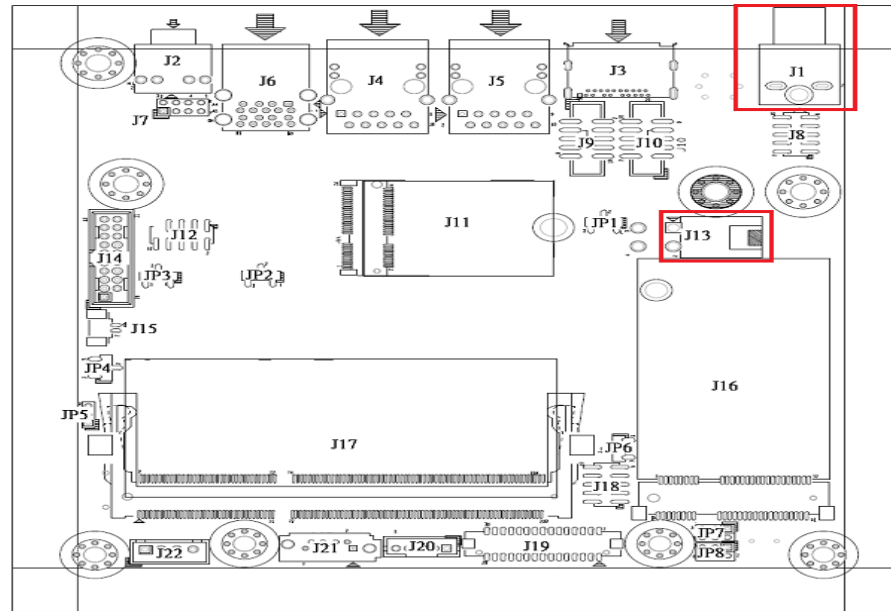
ATX Power Setting

There are two methods to connect the power of NANO-6062 which are 12V DC Jack (J1) & 4 Pins 12V DC input (J13). It's able to be chosen either one for NANO-6062.

J13: ATX 4 Pin Connector

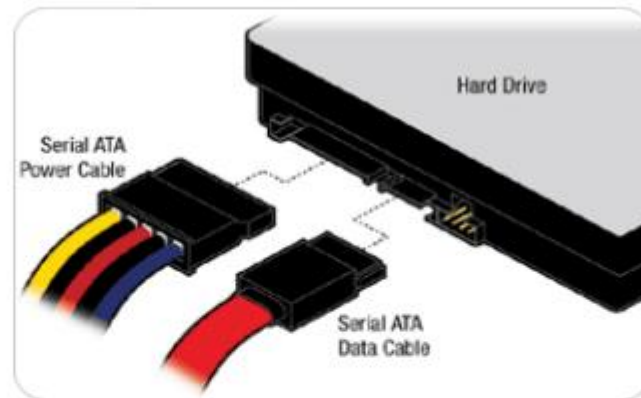


PIN No.	Signal Description
1	+12V
2	+12V
3	Ground
4	Ground



Serial ATA

Serial ATA Hard Disk Setting for SATA Speed Selection



System BIOS Main Menu

```
├── Configuration
│   └── SATA Configuration ..... [Press enter]
│       └──
```

SATA Speed Selection [Auto, Gen1, Gen2, Gen3]

8.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power.

204-pin DDR3L 1333/1600/1866 MHz SO-DIMM Memory, keyboard, mouse, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with NANO-6062, it is recommended, when going with the boot-up sequence, to hit “F2” key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to “**Restore Defaults**”, press “**Enter**” and select “**Yes**” to load default optimal BIOS setup. This will force your BIOS setting back to the initial factory configurations. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting at any time when system appears to be unstable in boot up sequence.

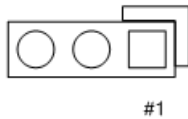
8.3 FAQ

Information & Support

Question: I forgot my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the JP3 on the NANO-6062 to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

JP3 : CMOS Clear



PIN No.	Signal Description
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents

Question: How to update the BIOS file of NANO-6062?

Answer: 1. Please visit web site of **Portwell download center** as below hyperlink
http://www.portwell.com.tw/support/download_center.php

Registering an account in advance is a must. **(The E-Mail box should be an existing Company email address that you check regularly.)**
<http://www.portwell.com.tw/member/newmember.php>

2. Type in your User name and password and log in the download center.
3. Select **“Search download”** and type the keyword **“NANO-6062”**.
4. Find the **“BIOS”** page and download the ROM file and flash utility.
5. Unzip file to bootable USB flash drive which can boot to shell mode. Then execute the **“update.efi”**. It will start to update BIOS.
6. When you see the **“FPT Operation Passed”** message, which means the BIOS update processes finished. Please cut the AC power off and **wait for 10 seconds** before powering on.

http://www.portwell.com.tw/support/download_center.php

If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.

http://www.portwell.com.tw/support/problem_report.php

We will do our best to provide a suggestion or solution for you.

Thanks

9 Portwell Software Service

Portwell Evaluation Tool (PET)

The Portwell Evaluation Tool (PET) is an API which Portwell's customers can access the GPIO, I2C, SMBus, etc under Windows and Linux OS. For more information please contact Portwell.

Portwell EC Auto Test Tool (PECAT)

The Portwell EC Auto Test Tool (PECAT) is a brand new utility which innovated by Portwell. PECAT now is available for Portwell's premiere customers, who are able to [Test Embedded Controller Function](#) in UEFI Mode. Please contact Portwell for more information.

10 Industry Specifications

The list below provides links to industry specifications that apply to Portwell modules.

Low Pin Count Interface Specification, Revision 1.0 (LPC) <http://www.intel.com/design/chipsets/industry/lpc.htm>

Universal Serial Bus (USB) Specification, Revision 2.0 <http://www.usb.org/home>

PCI Specification, Revision 2.3 <https://www.pcisig.com/specifications>

Serial ATA Specification, Revision 3.0 <http://www.serialata.org/>

PCI Express Base Specification, Revision 2.0 <https://www.pcisig.com/specifications>