TECHNICAL MANUAL

Of

Intel H310/H370 Express Chipset

Based Mini-ITX M/B

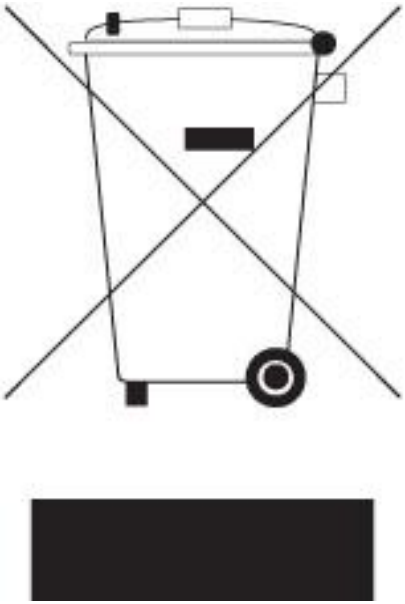
NO. G03-NF893-F

Revision: 4.0

Release date: December 15, 2020

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.



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Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- 0 to 40 centigrade is the suitable temperature. (The temperature comes from the request of the chassis and thermal solution)

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
4.0	Fourth Edition	December 15, 2020

Item Checklist

☑ Motherboard

☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

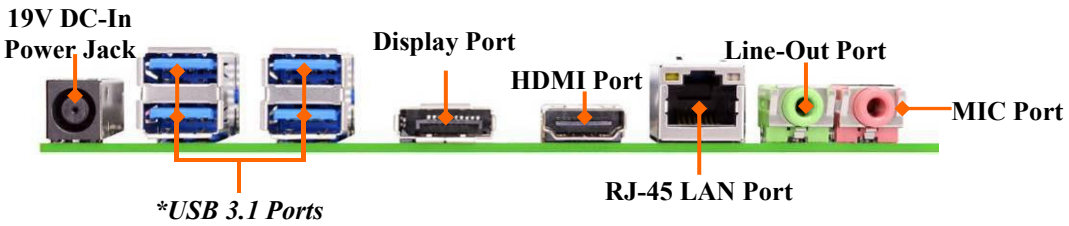
- Intel® H310/H370 express chipset
- LGA 1151 CPU socket supports Intel® Coffee Lake-S series processor (TDP ≤65 W).
- Support 2* DDR4 2400MHz SO-DIMM up to 64GB and dual channel function
- Support 1 * Intel i219-V Gigabit Ethernet LAN chip
- Support USB 3.1 data transport demand
- Support 2 * SATAIII (6Gb/s) ports
- Support 1* PCIE x1 slot, 1* M.2 E-key 2230 PCIe slot and 1* M.2 M-key 2242/2260/2280 slot
- Support 1 * HDMI + 1 * DP + 1* LVDS (option with eDP)
- Support 1 * COM, optional 4/6 * USB 3.1 & 4 * USB 2.0 for rich IO expansion
- Support Smart FAN function
- Supports ACPI S3 Function
- Compliance with ErP Standard
- Support Watchdog Timer Technology

1-2 Specification

Spec	Description
Design	● Thin mini-ITX form factor; PCB size: 17.0x17.0cm
Chipset	● Intel H310/H370 Express Chipset
CPU Socket	● Intel® LGA 1151 Socket for Coffee Lake-S series processors **Note: for detailed CPU support information please visit our website*
Memory Slot	● 2*DDR4 SO-DIMM slot ● Support DDR4 2400/2666 MHz SO-DIMM up to 64GB ● Support dual channel function **Memory frequency range also depends on CPU support*
Expansion Slot	● 1* PCIE x1 slot (**PCI-E**) ● 1* M.2 PCIE slot (**M2E**,2230 E-key PCIE interface)
Storage	● 2* SATAIII 6G/s port **(SATA1/2)** ● 1* M.2 M-key slot, type-2242/2260/2280 with SATA interface (***M2M, *SATA/PCIE interface)*** **Note: **PCIE** signal is supported by NF893-H370 series only.*
LAN Chip	● Integrated with 1* Intel i219-V Gigabit PCI-E LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek ALC662-VD 4-channel Audio Codec integrated ● Audio driver and utility included
BIOS	● AMI Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 1*19V DC-in Power Jack ● *4* USB 3.1 (Gen.1) port (Optional for **NF893-H310 Series**)* ● *4* USB 3.1 (Gen.2) port (Optional for **NF893-H370 Series**)* ● 1* HDMI port ● 1* DP port ● 1* RJ-45 LAN port ● 1* Line-out port ● 1* MIC port ***Internal I/O Connectors & Headers:*** ● 1 *2-pin 19V internal power connector ● 1* CPUFAN connector & 1* SYSFAN connector ● 1* SATA Power-out connector

	● 1* MON_SW connector ● 1* Front panel header ● 1* PS/2 keyboard & mouse header ● 1* Serial port header ● 1* GPIO header ● 2* 9-Pin USB 2.0 header for 4* USB 2.0 ports ● 1* 19-Pin USB 3.1 (Gen.2) header for 2* USB 3.1 (Gen.2) ports*(Optional for **NF893-H370 Series**)* ● 1*Front panel audio header ● 1* DMIC_CON digital microphone header ● 1* Speaker header ● 1* PN_LED header (for LAN activity LED/ Blue tooth activity LED/ WIFI activity LED) ● 1* LVDS connector (Default) or 1* EDP connector (Optional by order) ● 1*Inverter header

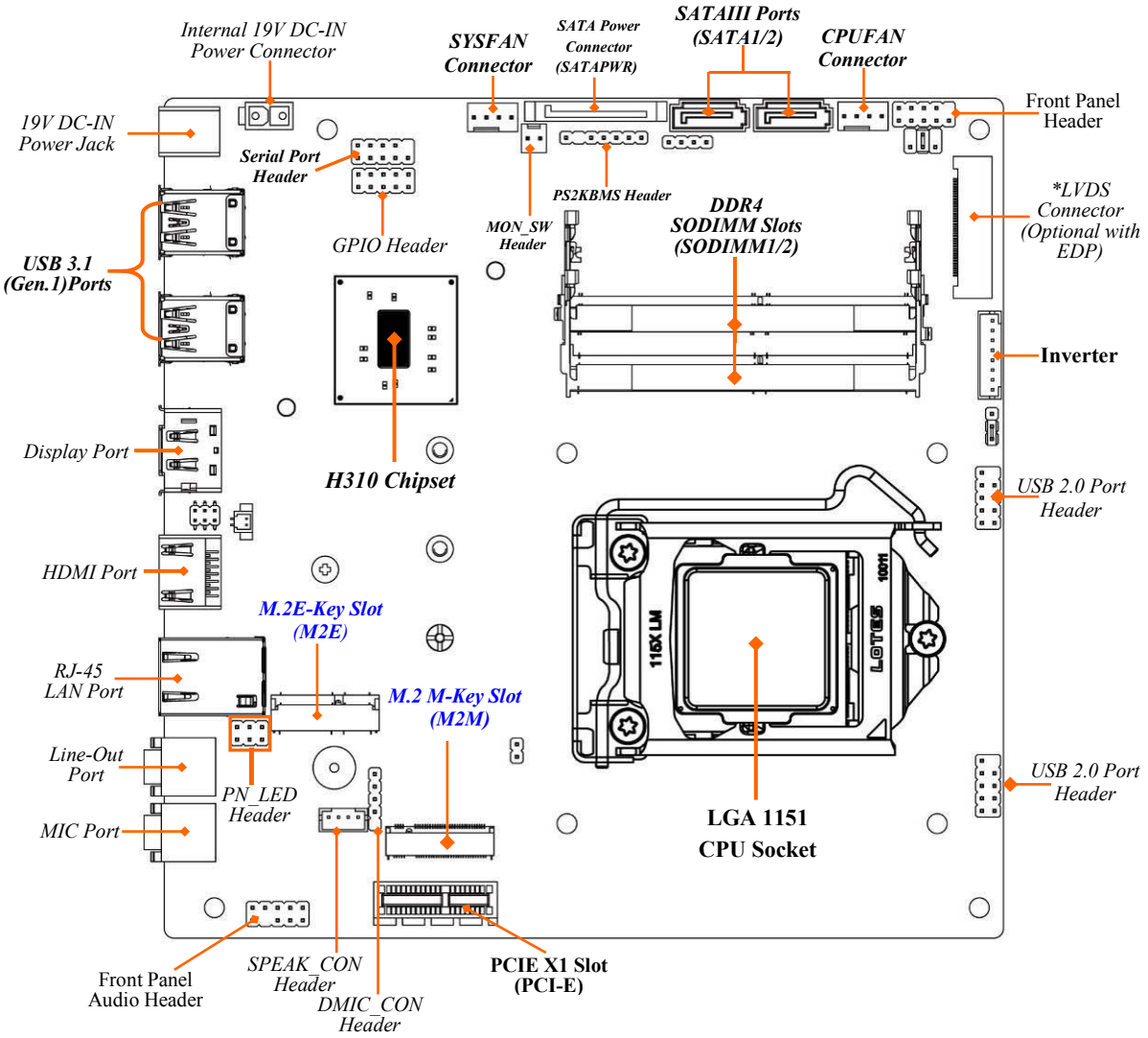
1-3 Layout Diagram
Rear IO Diagram



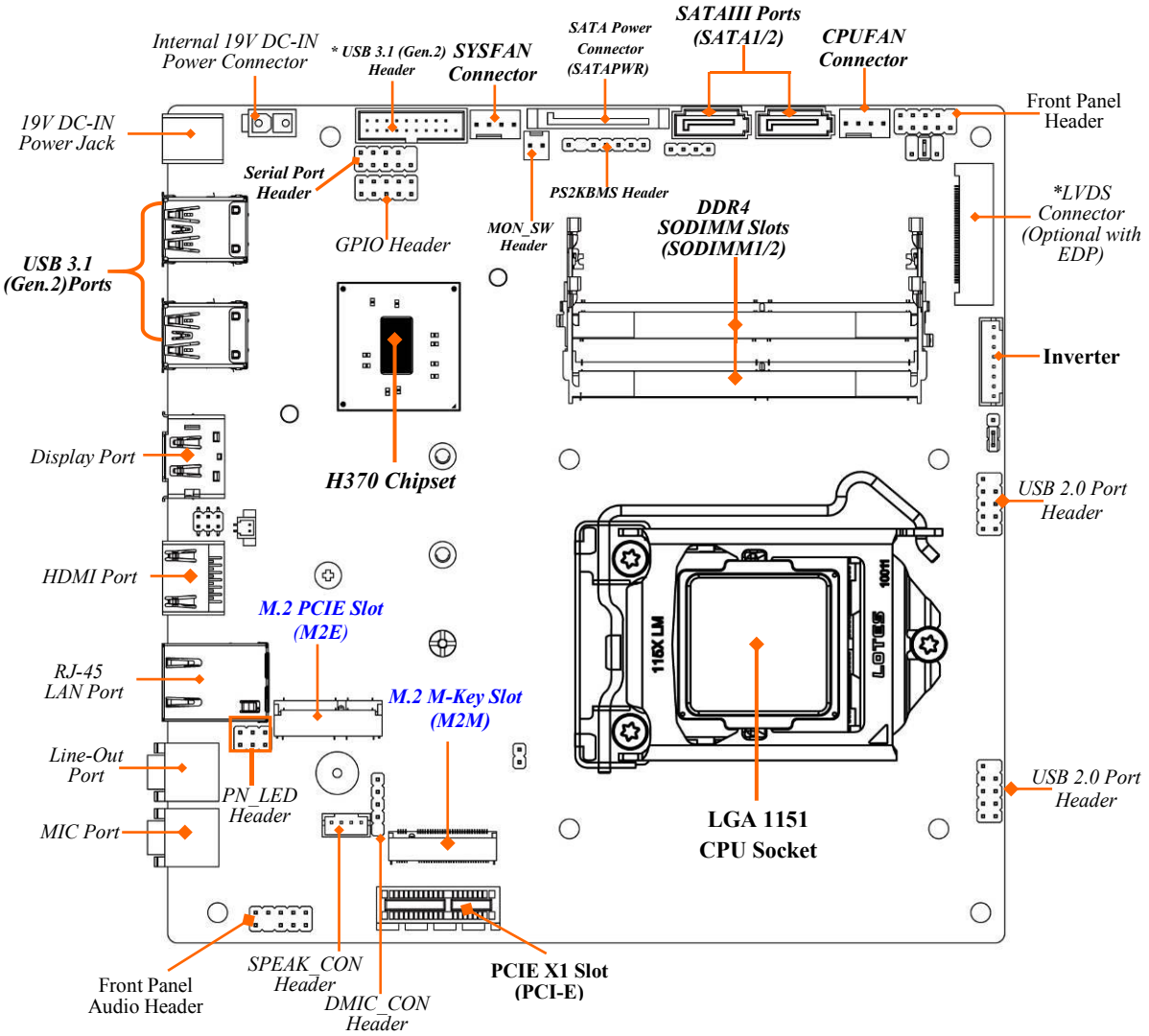
***Note:** **NF893-H310** series come with **4* USB 3.1 (Gen.1)** ports which supports 5Gps data transfer rate; **NF893-H370** series come with **4* USB 3.1 (Gen.2)** ports which supports 10Gps data transfer rate*

Motherboard Internal Diagram-Front

NF893-H310 Series:

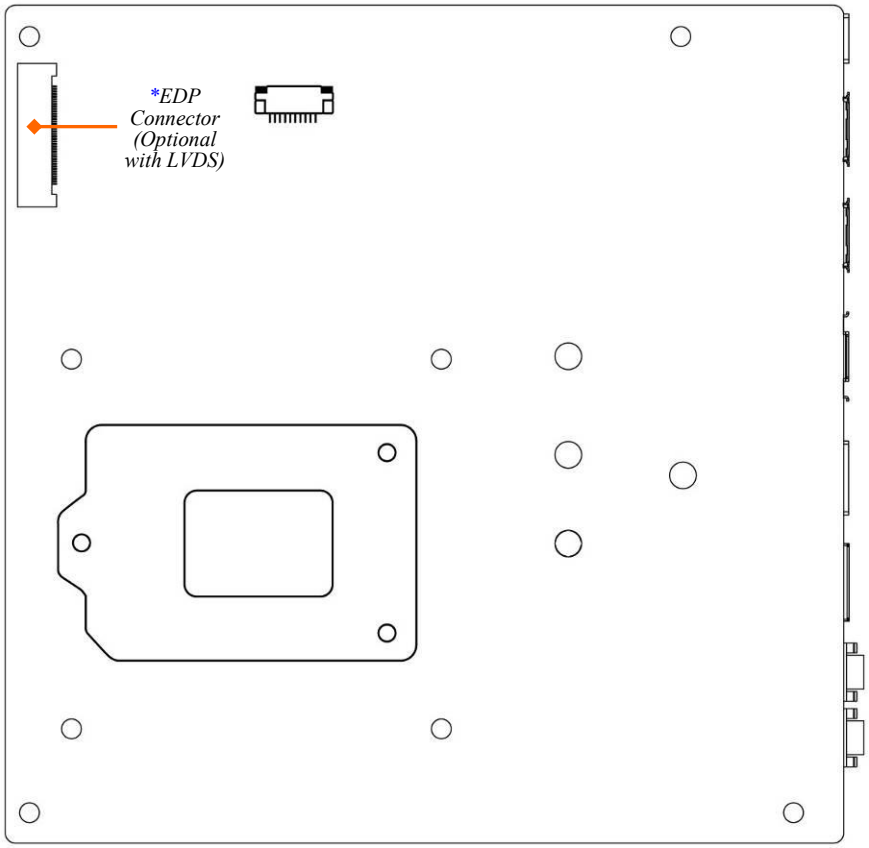


NF893-H370 Series:



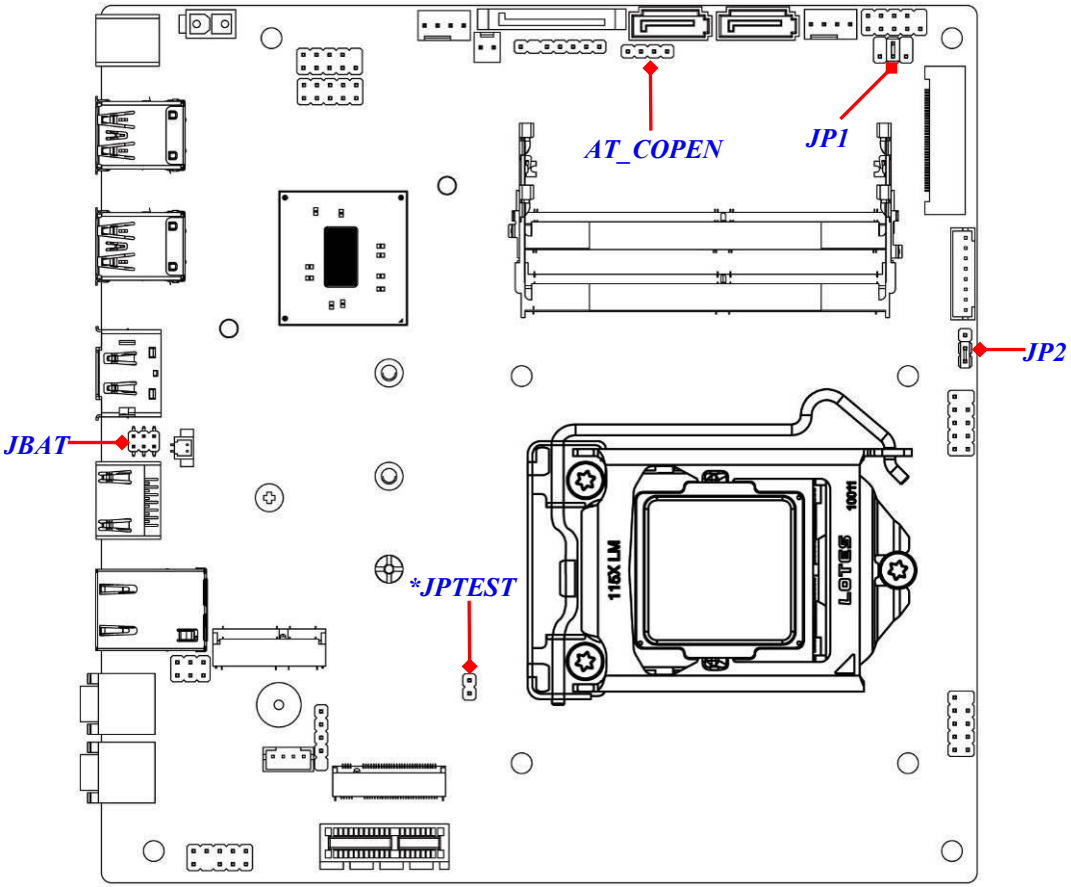
***Note:** The product diagrams are for illustration purpose only and mostly come from **Model NF893-H370**, unless otherwise noted.*

Motherboard Internal Diagram-Back



***Note:** **The default board comes with LVDS connecoter.EDP connector** is only optional by order. Only one of them comes with a board.*

Motherboard Jumper Position:



***Note*: 1.** *JPTEST is for manufacture usage only;*
2. *The product diagram above is from Model* ***NF893-H310.***

Connectors

P/N	Name
DCIN	19V DC-IN Power Jack
USB1/USB2 ***(For NF893-H310)***	USB 3.1 (Gen.1) Port Connector X4
USB1/USB2 ***(For NF893-H370)***	USB 3.1 (Gen.2) Port Connector X4
DP	Display Port Connector
HDMI	HDMI Port Connector
LAN	RJ-45 LAN Connector
FP_HP	Audio Line-out Connector
FP_MIC	Audio MIC Connector
ATX2P	Internal 19V Power Connector
SYSFAN	System Fan Connector
CPUFAN	CPUFAN Connector
SATA1/SATA2	SATAIII Connector X 2
SATAPWR	SATA Power-out Connector
SPEAK_CON	3W Amplifier Connector
MON_SW	Monitor Switch Connector
LVDS	LVDS Port Connector
EDP(Optional)	EDP Port Connector
INVERTER	Flat Panel Backlight Inverter

Headers & Wafer

P/N	Name	Description
JW_FP	Front Panel Header(PWR LED/ HD LED/Power Button /Reset)	9-pin Block
PS2KBMS	PS2 Keyboard & Mouse Header	6-pin Block
COM	Serial Port Header	9-pin Block
GPIO	GPIO Port Header	10-pin Block
FP_USB3 ***(For NF893-H370)***	USB 3.1 (Gen.2) Port Header	19-pin Block
FP_USB1/ FP_USB2	USB 2.0 Port Header	9-pin Block
FP_AUDIO	Front Panel Audio Header	9-pin Block

DMIC_CON	Digital Microphone Header	4-pin Block
PN_LED	Connectivity LED Header (LAN/Bluetooth/WIFI Activity LED)	6-pin Block

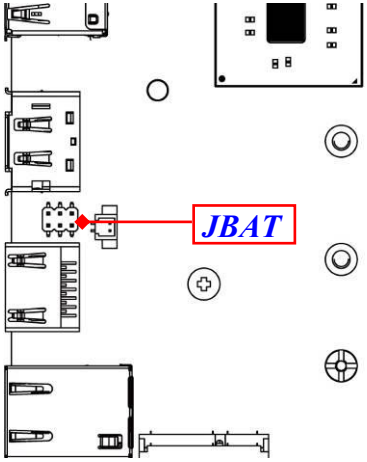
Jumper

P/N	Name	Description
JBAT	***Pin (1-2):*** Clear CMOS RAM Settings ***Pin (3-4):*** Flash Descriptor Override ***Pin (5-6):*** PWROK Override	6-pin Block
AT_ COPEN	***Pin (1-2):*** AT Mode Select ***Pin (3-4):*** Case Open Display Select	4-pin Block
JP1	LCD Panel VCC Select	4-pin Block
JP2	LCD Backlight Select	4-pin Block

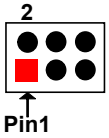
Chapter 2
Hardware Installation

2-1 Jumper Setting

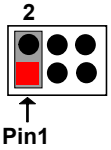
Pin 1&2 of JBAT (6-pin): Clear CMOS RAM Setting



Pin 1&2 of JBAT→Clear CMOS

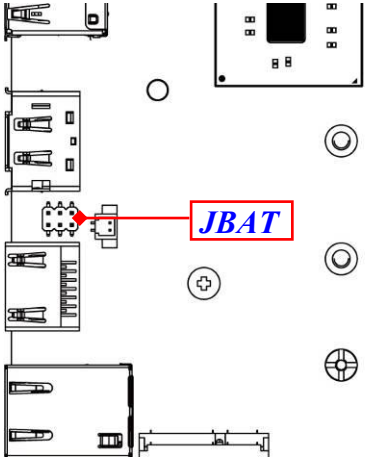


1-2 Open: Normal(Default);

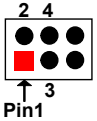


1-2 Closed: Clear CMOS(One Touch).

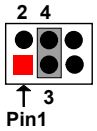
Pin 3&4 of JBAT (6-pin): Flash Descriptor Override Select



Pin 3&4 of JBAT→
Flash Descriptor Override

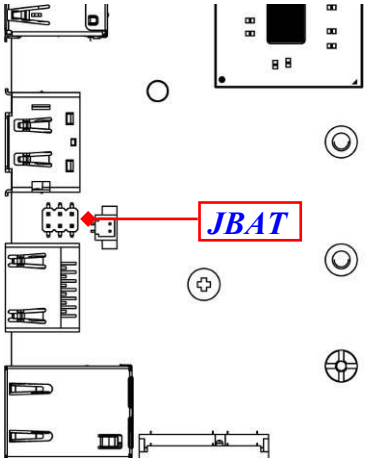


3-4 Open: Normal(Default);

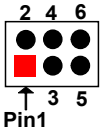


3-4 Closed: Disable Flash Descriptor Security (override).

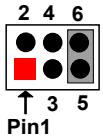
Pin 5&6 of JBAT (6-pin): PWROK Override Select



Pin 5&6 of JBAT→PWROK Override



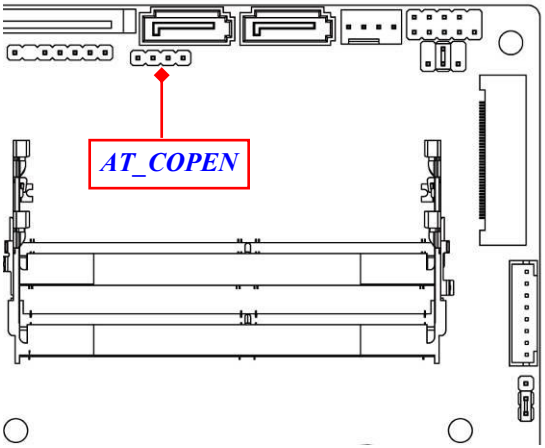
5-6 Open: Normal(Default);



5-6 Closed: PWROK Override.

**** Note:* PWROK override** *is for manufacturing test only.*

Pin 1&2 of AT_COPEN (4-pin): **AT Mode Select**



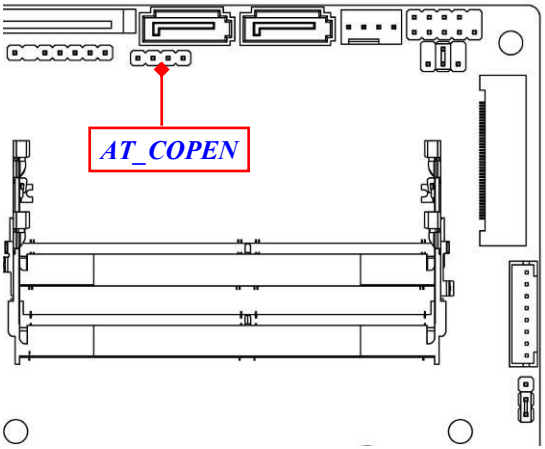
Pin 1&2 of AT_COPEN
→ AT Mode Select

1-2 Open: ATX Mode Selected(Default);

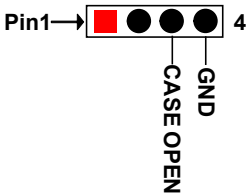
1-2 Closed: AT Mode Selected.

****ATX Mode Selected**: Press power button to power on after power input ready;*
***AT Mode Selected:** Directly power on as power input ready.*

Pin 3&4 of AT_COPEN (4-pin): Case Open Message Display Function Select

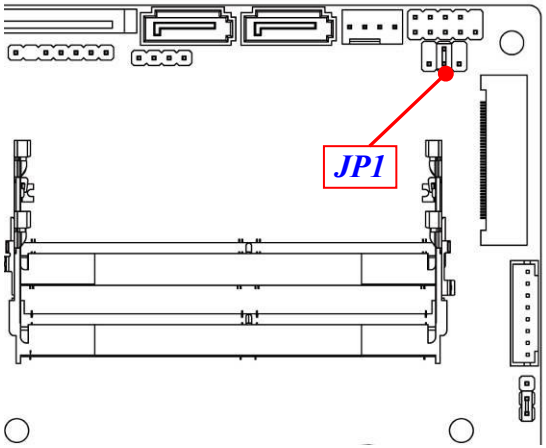


Pin 3&4 of AT_COPEN
→ Case Open Detection

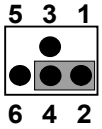


Pin (3&4) short: *When Case open function pin short to GND, the Case open function was detected. When used, needs to enter BIOS and enable 'Case Open Detect' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of this.*

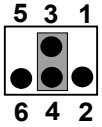
JP1 (4-pin): LCD Panel VCC Select



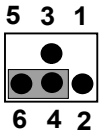
JP1→LCD VCC Select



2-4 Closed:
VCC=3.3V;

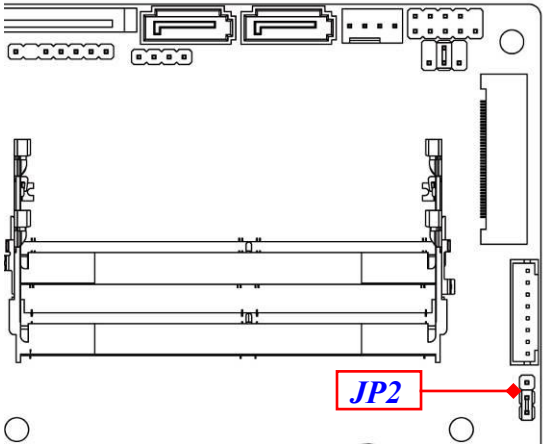


3-4 Closed:
VCC=5V;

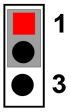


4-6 Closed:
VCC=12V.

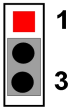
JP2 (3-pin): LCD Inverter Backlight VCC Select



JP2→INVERTER Backlight VCC



1-2 Closed: Inverter backlight VCC= 12V;



2-3 Closed: Inverter backlight VCC=19V.

2-2 Connectors, Headers and Wafers

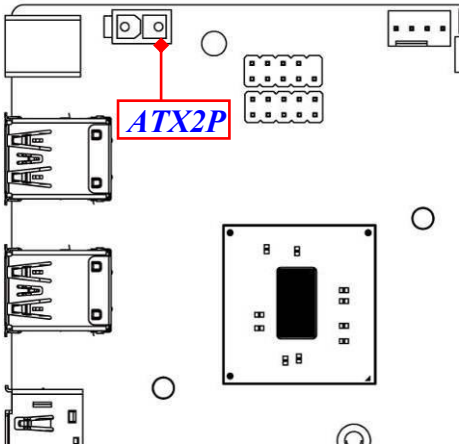
2-2-1 Connectors

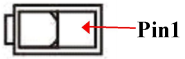
(1) Rear Panel Connectors

Refer to Page-3 Rear IO Diagram.

Icon	*Name*	*Function*
	**19V DC-in Power Connector**	For user to connect compatible power adapter to provide power supply for the system.
	***NF893-H310 Series:*** **USB 3.1(Gen.1)Port**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.1 (Gen.1) ports supports up to 5Gbps data transfer rate.
	***NF893-H370 Series:*** **USB 3.1(Gen.2)Port**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.1 (Gen.2) ports supports up to 10Gbps data transfer rate.
	**Display Port**	To the system to corresponding display device with compatible display port cable.
	**HDMI Port**	To connect display device that support HDMI specification.
	**RJ-45 LAN Port**	This connector is standard RJ-45 LAN jack for Network connection.
	**Line-Out Connector**	For user to connect external speaker, earphones, etc to transfer system audio output.
	**MIC Connector**	User can connect microphone device to this port.

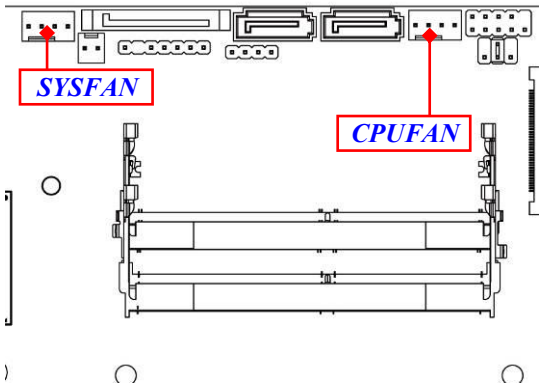
(2) ATX2P (2-pin block): Internal 19V power connector

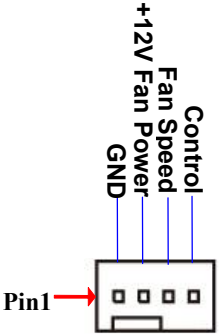




Pin No.	Definition
1	GND
2	+19V

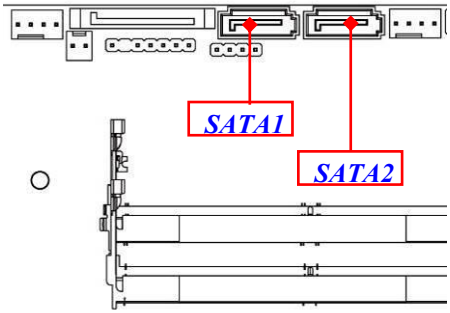
(3) CPUFAN/SYSFAN (4-pin): Fan Connector





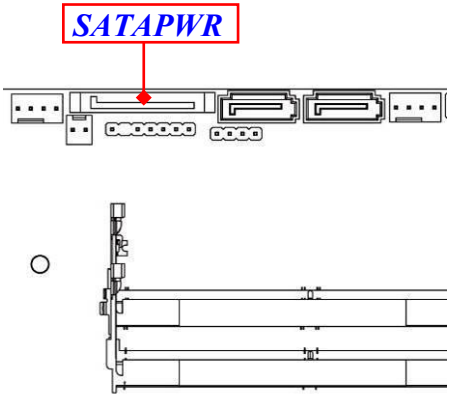
(4) SATA1/SATA2 (7-pin): SATA III Port connector

SATA1&SATA2 are high-speed SATAIII port that supports 6 GB/s transfer rate.



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

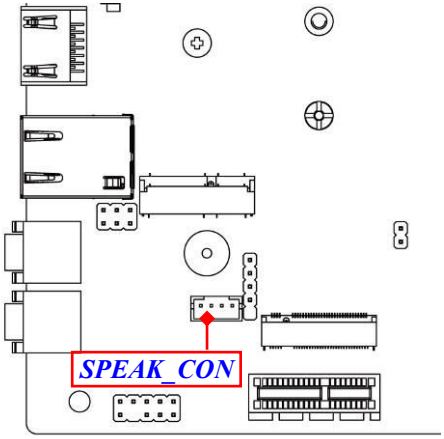
(5) SATAPWR (15-pin block): SATA power connector

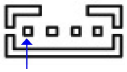


SATA Power Connector

Pin NO.	Definition
Pin 1	NC
Pin 2	NC
Pin 3	NC
Pin 4	GND
Pin 5	GND
Pin 6	GND
Pin 7	+5V
Pin 8	+5V
Pin 9	+5V
Pin 10	GND
Pin 11	NC
Pin 12	GND
Pin 13	+12V
Pin 14	+12V
Pin 15	+12V

(6) SPEAK_CON (4-pin block): Speaker Connector

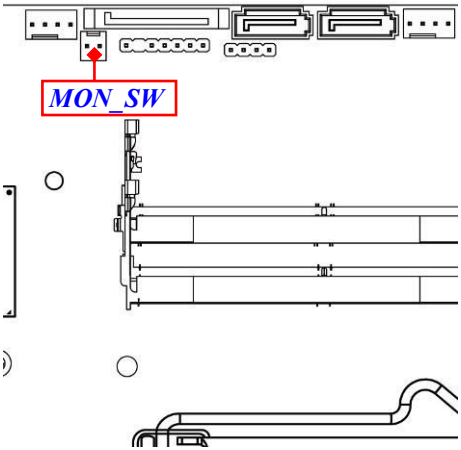


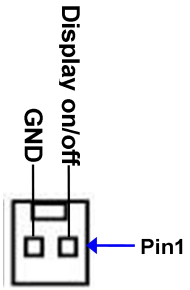


Pin No.	Definition
1	L-
2	L+
3	R+
4	R-

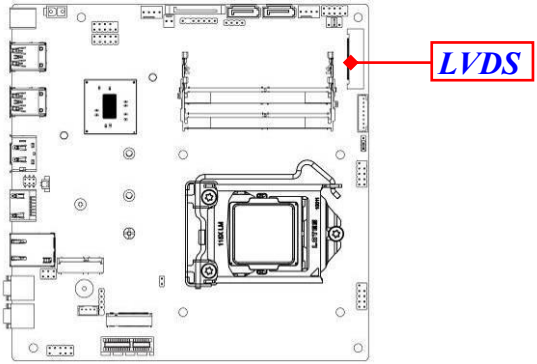
(7) MON_SW (2-Pin): Monitor Switch Connector

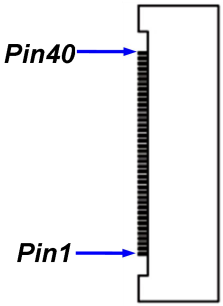
Mon_SW is for LVDS or EDP display switch.





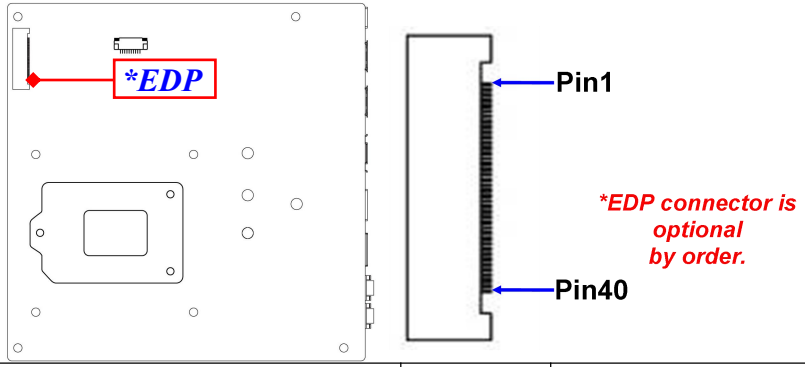
(8) LVDS(40-pin): 48-bit LVDS Connector





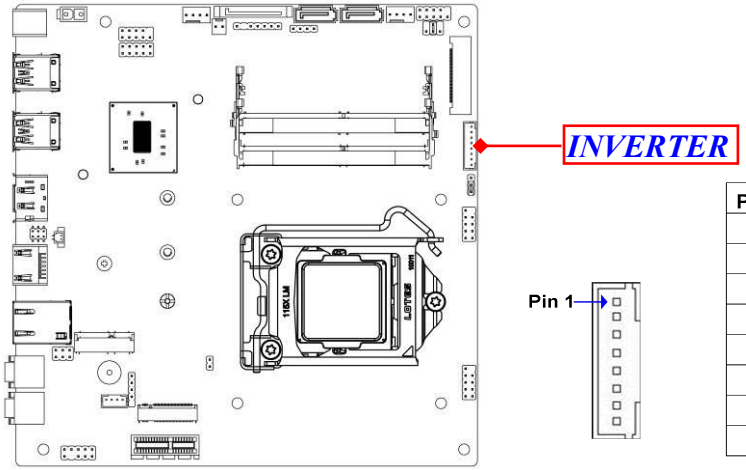
Pin No.	Pin Define	Pin No.	Pin Define
Pin 1	LVDSA_DATAP3	Pin 2	LVDSA_DATAN3
Pin 3	LVDSA_DATAP2	Pin 4	LVDSA_DATAN2
Pin 5	LVDSA_DATAP1	Pin 6	LVDSA_DATAN1
Pin 7	LVDSA_DATAP0	Pin 8	LVDSA_DATAN0
Pin 9	LVDSB_DATAP3	Pin 10	LVDSB _DATAN3
Pin 11	LVDSB_DATAP2	Pin 12	LVDSB _DATAN2
Pin 13	LVDSB_DATAP1	Pin 14	LVDSB _DATAN1
Pin 15	LVDSB_DATAP0	Pin 16	LVDSB _DATAN0
Pin 17	GND	Pin 18	LCD_VCC
Pin 19	LCD_VCC	Pin 20	LCD_VCC
Pin 21	NC	Pin 22	EDID_3V3 Option
Pin 23	GND	Pin 24	GND
Pin 25	GND	Pin 26	LVDS_CLKAP
Pin 27	LVDS_CLKAN	Pin 28	GND
Pin 29	GND	Pin 30	GND
Pin 31	LVDS_DDC_CLK	Pin 32	LCD_BKLT_EN
Pin 33	LCD_BKLT_PWM	Pin 34	LVDS_CLKBP
Pin 35	LVDS_CLKBN	Pin 36	LVDS_BKLT_PWR option
Pin 37	LVDS_BKLT_PWR option	Pin 38	LVDS_BKLT_PWR option
Pin 39	NC	Pin 40	LVDS_DDC_DATA

(9) EDP(40-pin): EDP Connector



Pin No.	Pin Define	Pin No.	Pin Define
Pin 1	NC	Pin 2	GND
Pin 3	EDP_DATA3N	Pin 4	EDP_DATA3P
Pin 5	GND	Pin 6	EDP_DATA2N
Pin 7	EDP_DATA2P	Pin 8	GND
Pin 9	EDP_DATA1N	Pin 10	EDP_DATA1P
Pin 11	GND	Pin 12	EDP_DATA0N
Pin 13	EDP_DATA0P	Pin 14	GND
Pin 15	EDP_AUXP	Pin 16	EDP_AUXN
Pin 17	GND	Pin 18	LCD_VCC
Pin 19	LCD_VCC	Pin 20	LCD_VCC
Pin 21	LCD_VCC	Pin 22	NC
Pin 23	GND	Pin 24	GND
Pin 25	GND	Pin 26	GND
Pin 27	EDP_HPD	Pin 28	GND
Pin 29	GND	Pin 30	GND
Pin 31	GND	Pin 32	LCD_BKLT_EN
Pin 33	LCD_BKLT_PWM	Pin 34	NC
Pin 35	NC	Pin 36	LVDS_BKLT_PWR Option
Pin 37	LVDS_BKLT_PWR Option	Pin 38	LVDS_BKLT_PWR Option
Pin 39	LVDS_BKLT_PWR Option	Pin 40	NC

(10) INVERTER (8-pin): LVDS Inverter Connector

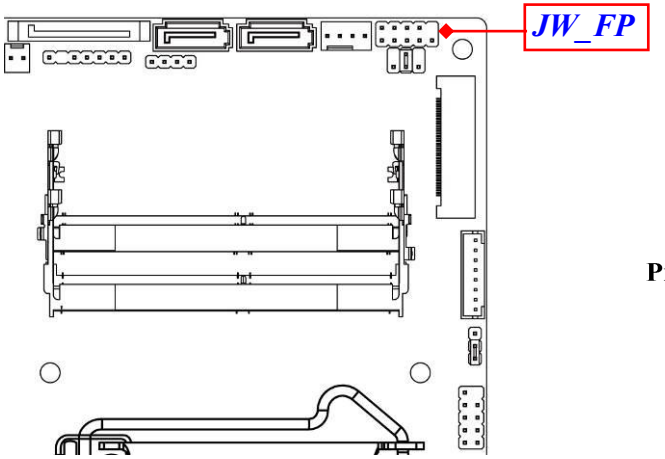


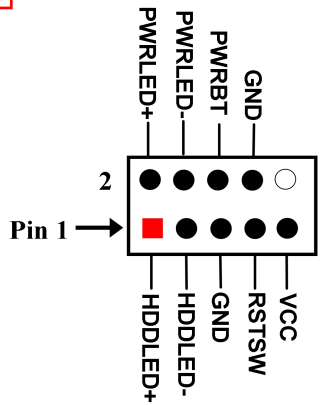
Pin No.	Definition
1	Backlight Enable
2	Backlight Duty
3	PVCC
4	PVCC
5	GND
6	GND
7	Brightness up
8	Brightness down

Warning! *Find Pin-1 location of the inverter and make sure that the installation direction is correct! Otherwise serious harm will occur to the board/display panel!!*

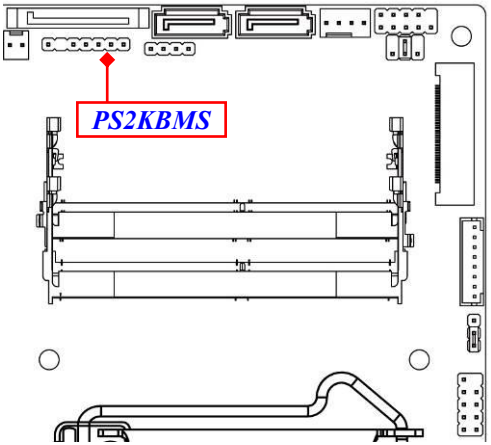
2-2-2 Headers & Wafers

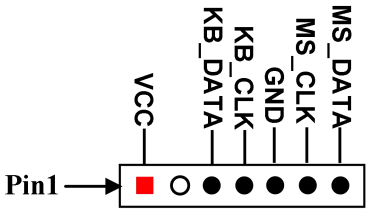
(1) JW_FP (9-pin): Front Panel Header



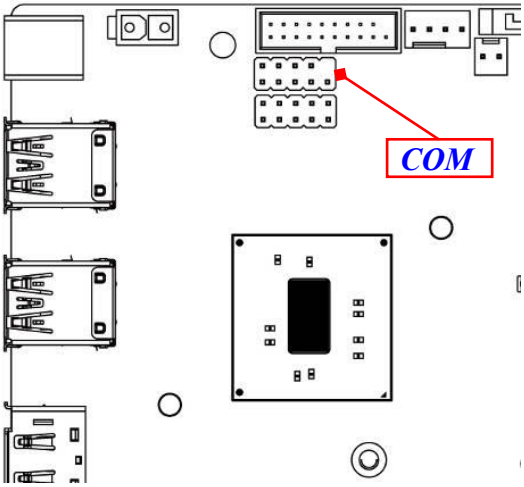


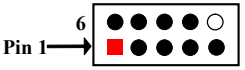
(2) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header





(3) COM (9-Pin): RS232/RS422/RS485 Serial Port Header

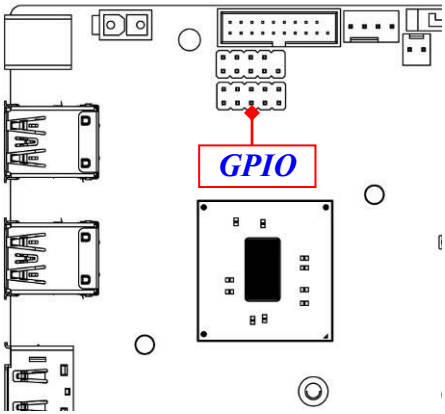


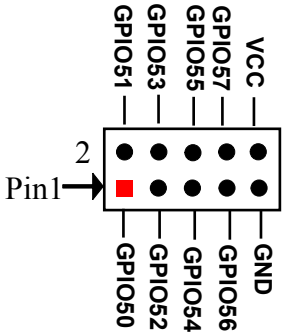


Pin NO.	RS232	*RS422 (optional)	*RS485 (optional)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

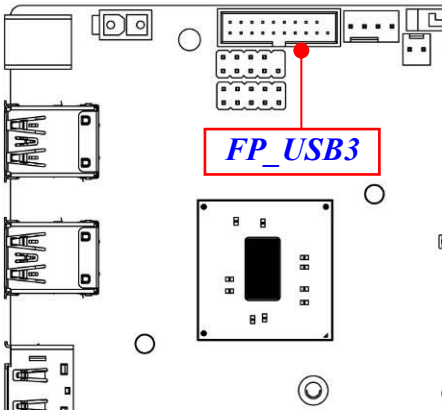
***Notice: COM header can function as RS232/422/485 port header.** In normal settings COMfunctions as RS232 header. With compatible COM cable COM can function as RS422 or RS 485 header. User also needs to go to BIOS to set '**Transmission Mode Select**' (refer to Page-**33**) at first, before using specialized cable to connect different pins of this port.*

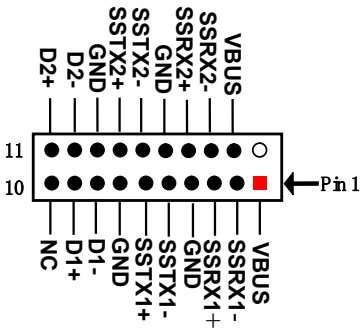
(4) GPIO (10-pin): GPIO Header





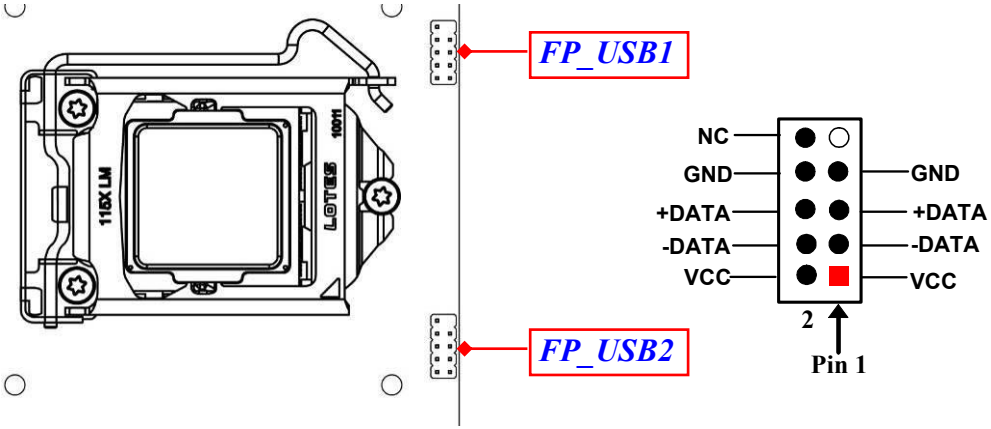
(5) FP_USB3(19-pin): USB 3.1 (Gen.2) Port Wafer





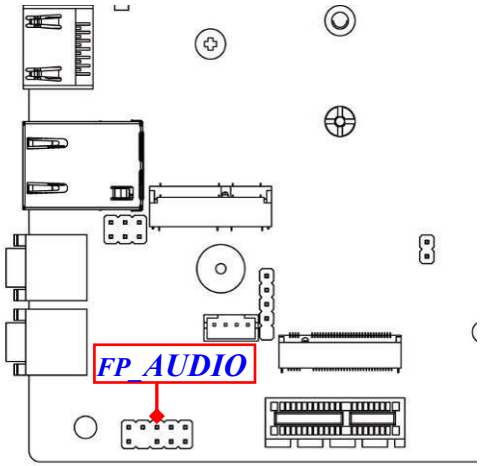
Note*: ***FP_USB3* *header is optional for Model* ***NF893-H370***.

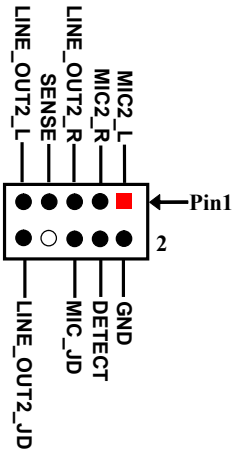
(6) FP_USB1/FP_USB2 (9-pin): USB 2.0 Port Header



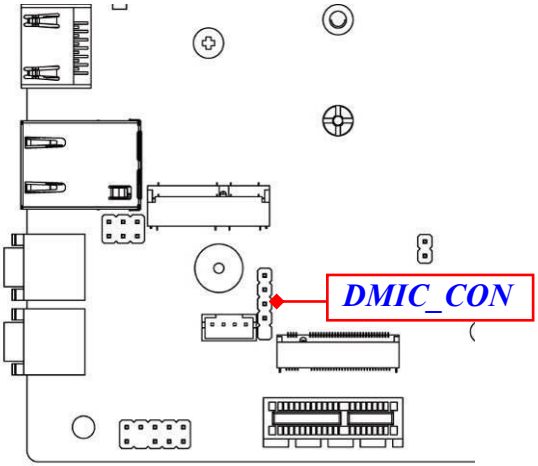
(7) FP_AUDIO (9-pin): Line-Out, MIC-In Header

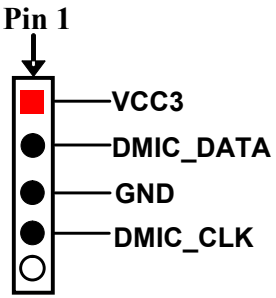
This header connects to Front Panel Line-out, MIC-In connector with cable.



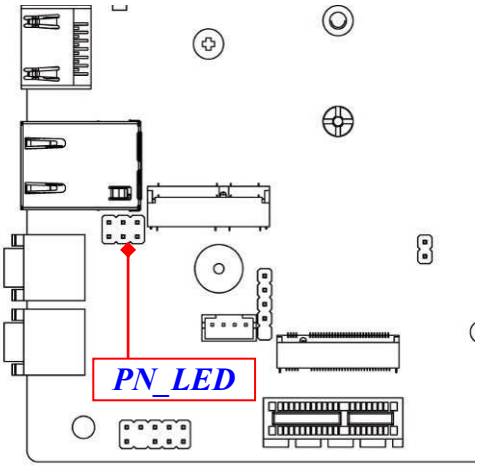


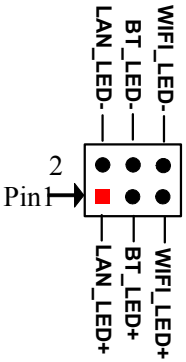
(8) DMIC_CON (4-Pin): Digital Microphone Header





(9) PN_LED (6-pin): LED Header





Chapter 3
Introducing BIOS

Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

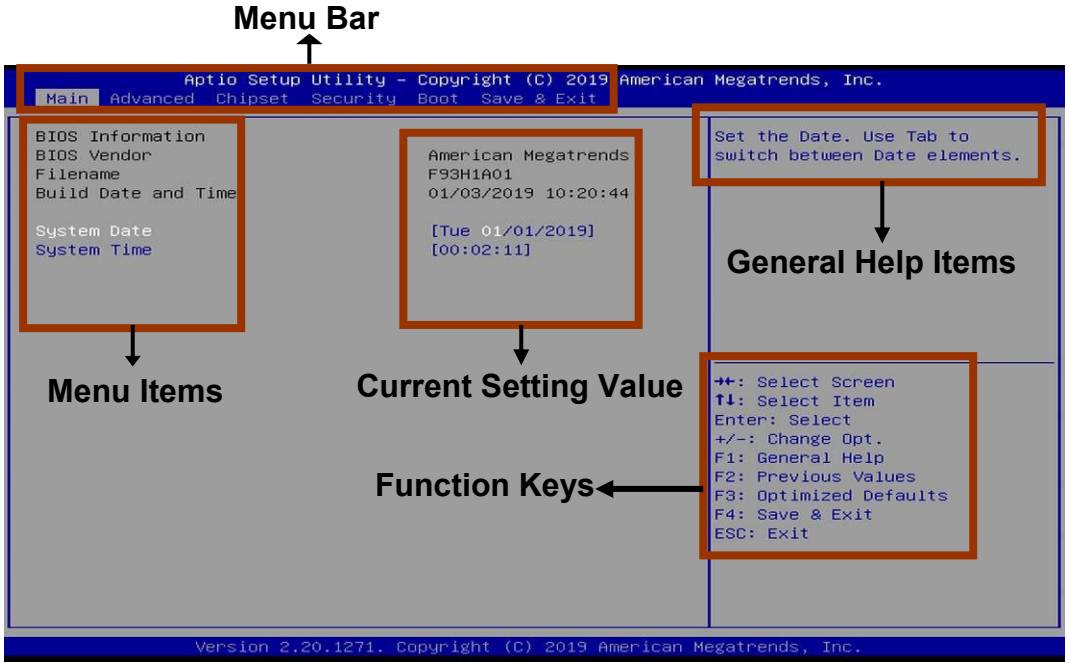
3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



BIOS Menu Screen

3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press←→ (left, right) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.

- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- **[F1]:** General help.
- **[F2]:** Previous values.
- **[F3]:** Optimized defaults.
- **[F4]:** Save & Exit.
- Press **<Esc>** to exit from BIOS Setup.

3-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press **[F1]** to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <**Esc**>.

3-5 Menu Bars

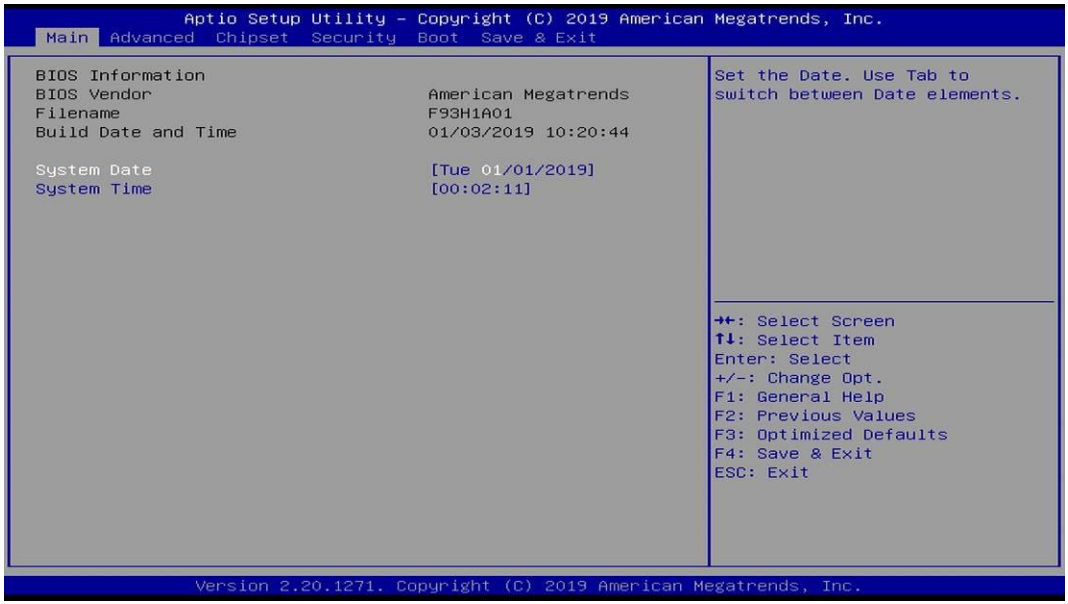
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.



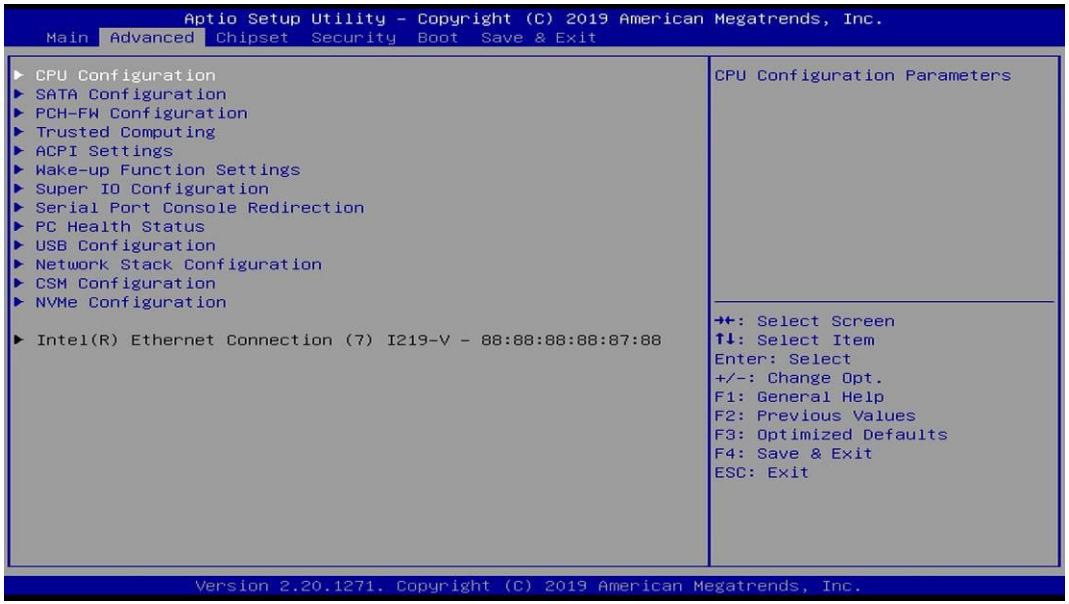
System Date

Set the date. Please use [Tab] to switch between data elements.

System Time

Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



- **CPU Configuration**

  Press [Enter] to view current CPU configuration and make settings for the following sub-items:

  Hyper-Threading

  The optional settings: [Disabled]; [Enabled].

  When set as [Disabled] only one thread per enabled core is enabled.

  [Enabled]: for Windows and Linux (OS optimized for Hyper-Threading Technology).

  [Disabled]: for other OS (OS optimized not for Hyper-Threading Technology).

  Note: 'Hyper-Threading**' item may or may not show up, depending on different CPU.*

  Intel (VMX) Virtualization Technology

  The optional settings: [Enabled]; [Disabled].

  When set as [Enabled], a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Intel(R) SpeedStep(tm)
This item allows more than two frequency ranges to be supported.
The optional settings: [Disabled]; [Enabled].
C states
Use this item to enable or disable CPU power management.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], it allows CPU to go to C states when it is not 100% utilized.
Turbo Mode
Use this item to enable or disable Turbo Mode.
**Note:* *This item might not be available depending on configuration.*

- **SATA Configuration**

Press [Enter] to make settings for the following sub-items:
SATA Configuration
SATA Controller(s)
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], user can make further settings in the following items:
SATA Mode Selection
For **NF893-H310** series: the optional setting is: [AHCI].
For **NF893-H370** series: the optional settings are: [AHCI], [RAID].
M.2 (M2M)
Port
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable M2M port.
SATA1/SATA2
Port
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable device connected respective port.
Hot Plug
The optional settings: [Disabled]; [Enabled].

- **PCH-FW Configuration**

Press [Enter] to view ME information and make settings in the following sub-item:

- **Firmware Update Configuration**

Use this item to configure Management Engine Technology parameters.
Press [Enter] to make settings for '**ME FW Image RE-Flash**'.

ME FW Image Re-Flash

Use this item to enable or disable ME FW Image Re-Flash function.
The optional settings: [Disabled]; [Enabled].

** In the case that user needs to update ME firmware, user should set **'ME FW Image Re-Flash**' as [**Enabled**], save the settings and exit. The system will turn off and reboot after 4 seconds. If the user goes to BIOS screen again will find this item is set again as [**Disabled**], but user can still re-flash to update firmware next time.*

- **Trusted Computing**

Press [Enter] to enable or disable '**Security Device Support**'.

Security Device Support

Use this item to enable or disable BIOS support for security device.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled], user can make further settings in the following items:*

Pending Operation

Use this item to schedule an operation for the security device. Your computer will reboot during restart to change state of device.
The optional settings: [None]; [TPM Clear].

TPM2.0 UEFI Spec Version

Use this item to select the TCG2 Spec Version supported.
The optional settings: [TCG_1_2]; [TCG_2].

- **ACPI Settings**

Press [Enter] to make settings for the following sub-items:

ACPI Settings

ACPI Sleep State

Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.
The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].

- **Wake-up Function Settings**

Press [Enter] to make settings for the following sub-items:

Wake-up System with Fixed Time
Use this item to enable or disable system wake on alarm event.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will wake on the hour/min/sec specified.
Wake-up System with Dynamic Time
Use this item to enable or disable system wake on alarm event.
System will wake on the current time + Increase minute(s).
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will wake on the current time + increased minute(s).
PS2 KB/MS Wake-up
Use this item to enable or disable PS2 KB/MS wake-up from S3/S4/S5.
The optional settings: [Enabled]; [Disabled].
Note: This function is supported when 'ERP Support**' is set as [Disabled].*
USB S3/S4 Wake-up
Use this item to enable or disable USB S3/S4 wakeup. This function is only supported when ERP function is disabled.
The optional settings: [Enabled]; [Disabled].
Note: This function is supported when 'ERP Support**' is set as [Disabled].*
USB S5 Power
Use this item to enable or disable USB power after power shutdown.
The optional settings: [Enabled]; [Disabled].
Note: This function is supported when 'ERP Support**' is set as [Disabled].*
Internal USB Port S5 Power
Use this item to enable or disable USB power after power shutdown.
The optional settings: [Enabled]; [Disabled].
Note: This function is supported when 'ERP Support**' is set as [Disabled].*

- **Super I/O Configuration**

Press [Enter] to make settings for the following sub-items:
Super IO Configuration

ERP Support
The optional settings: [Disabled]; [Auto].

***Note:** This item should be set as [**Disabled**] if you wish to have all active wake-up functions.*

► **Serial Port 1 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

Change Settings

Use this item to select an optimal setting for super IO device. Changing setting may conflict with system resources.

Transmission Mode Select

The optional settings are: [RS422]; [RS232]; [RS485].

Mode Speed Select

The optional settings are: [RS232/RS422/RS485=250kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

WatchDog Reset Timer

Use this item to enable or disable WDT reset function. When set as [Enabled], the following sub-items shall appear:

WatchDog Reset Timer Value

User can select a value in the range of [10] to [255] seconds when '**WatchDog Reset Timer Unit**' set as [Sec]; or in the range of [1] to [255] minutes when '**WatchDog Reset Timer Unit** ' set as [Min].

WatchDog Reset Timer Unit

The optional settings are: [Sec.]; [Min.].

ATX Power Emulate AT Power

This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first *(refer to **Page 11 , Pin 1&2** of **AT_COPEN** jumper for ATX Mode & AT Mode Select).*

Case Open Detect

Use this item to detect case has already open or not, show message in POST.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], system will detect if COPEN has been short or not *(refer to **Page 11, Pin 3&4** of AT_COPEN jumper for case open detection);* if COPEN is

short, system will show Case Open Message during POST.

- **Serial Port Console Redirection**

COM1

Console Redirection

The optional settings: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

- **Console Redirection Settings**

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.

Press [Enter] to make settings for the following items:

Terminal Type

The optional settings: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

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.

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [38400]; [57600]; [115200].

Data Bits

The optional settings: [7]; [8].

Parity

A parity bit can be sent with the data bits to detect some transmission errors.

The optional settings: [None]; [Even]; [Odd]; [Mark]; [Space].

[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.

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.

The optional settings: [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.

The optional settings: [None]; [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

The optional settings: [Disabled]; [Enabled].

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.

The optional settings: [Disabled]; [Enabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

The optional settings: [Disabled]; [Enabled].

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [Linux]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Legacy Console Redirection

▸ **Legacy Console Redirection Settings**

Press [Enter] to make settings for the following item:

Legacy Console Redirection Settings

Redirection COM Port

For user to select a COM port to display redirection of legacy OS and Legacy OPROM messages.

The optional settings are: [COM1]; [COM1(Pci Bus0, Dev0, Func0) (Disabled)].

Resolution

This item is for user to select the number of Rows and Columns supported redirection.

The optional settings are: [80x24]; [80x25].

Redirect After POST

The optional settings are: [Always Enable]; [Bootloader].

When [**Bootloader**] is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When [**Always Enabled**] is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to [**Always Enabled**].

Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)

Console Redirection

The optional settings: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

- **Console Redirection Settings**

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.

Press [Enter] to make settings for the following items:

Out-of-Band Mgmt Port

The optional settings: [COM1]; [COM1(Pci Bus0, Dec0,Func0) (Disabled)].

Terminal Type

The optional settings: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is [VT100+] and them [VT100]. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [57600]; [115200].

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.

The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Data Bits

The default setting is: [8].

**This item may or may not show up, depending on different configuration.*

Parity

The default setting is: [None].

**This item may or may not show up, depending on different configuration.*

Stop Bits

The default setting is: [1].

**This item may or may not show up, depending on different configuration.*

- **PC Health Status**

Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**' and set value in '**Shutdown Temperature**'.

- **SmartFAN Configuration**

Press [Enter] to make settings for SmartFan Configuration:

SmartFAN Configuration

CPUFAN / SYSFAN Smart Mode

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

CPUFAN / SYSFAN Full-Speed Temperature

Use this item to set CPUFAN/SYSFAN full speed temperature. Fan will run at full speed when above this pre-set temperature.

CPUFAN / SYSFAN Full-Speed Duty

Use this item to set CPUFAN/SYSFAN full-speed duty. Fan will run at full speed when above this pre-set duty.

CPUFAN / SYSFAN Idle-Speed Temperature

Use this item to set CPUFAN /SYSFAN idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

CPUFAN / SYSFAN Idle-Speed Duty

Use this item to set CPUFAN/SYSFAN idle speed duty. Fan will run at idle speed when below this pre-set duty.

Shutdown Temperature

Use this item to select system shutdown temperature.

The optional settings are: [Disabled]; [70°C/158°F]; [75°C/167°F]; [80°C/176°F]; [85°C/185°F]; [90°C/194°F].

- **USB Configuration**

Press [Enter] to make settings for the following sub-items:

USB Configuration

Legacy USB Support

The optional settings are: [Enabled]; [Disabled]; [Auto].

[**Enabled**]: To enable legacy USB support.

[**Disabled]**: to keep USB devices available only for EFI specification,

[**Auto**]: To disable legacy support if no USB devices are connected.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

The optional settings are: [Enabled]; [Disabled].

USB Mass Storage Driver Support

The optional settings are: [Disabled]; [Enabled].

USB hardware delay and time-out:

USB Transfer time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.

The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

Device reset time-out

Use this item to set USB mass storage device start unit command time-out.

The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device power-up delay

Use this item to set 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. The optional settings: [Auto]; [Manual].Select [Manual] you can set value for the following sub-item: **Device Power-up delay in seconds,** the delay range in from 1 to 40 seconds, in one second increments.

- **Network Stack Configuration**

  Press [Enter] to go to '**Network Stack**' screen to make further settings.

  Network Stack

  Use this item to enable or disable UEFI Network Stack.

  The optional settings: [Disabled]; [Enabled].

  When set as [Enabled], the following sub-items shall appear:

  Ipv4 PXE Support

  The optional settings are: [Disabled]; [Enabled].

  Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], Ipv4 boot option will not be created.

  Ipv6 PXE Support

  The optional settings are: [Disabled]; [Enabled].

  Use this item to enable Ipv6 PXE Boot Support. When set as [Disabled], Ipv6 boot optional will not be created.

  PXE boot wait time

  Use this item to set wait time to press [ESC] key to abort the PXE boot.

  Media Detect Count

  Use this item to set number of times presence of media will be checked.

- **CSM Configuration**

  Press [Enter] to make settings for the following sub-items:

  CSM Support

  Use this item to enable or disable CSM Support

  The optional settings are: [Disabled]; [Enabled].

  Option ROM execution

  Network

  This option controls the execution of UEFI and Legacy PXE OpROM.

  The optional settings are: [Do not launch]; [Legacy].

  Storage

  This option controls the execution of UEFI and Legacy Storage OpROM.

  The optional settings are: [Do not launch]; [UEFI]; [Legacy].

  Other PCI devices

  This item is for PCI devices other than Network, Mass storage or video defines which OpROM to launch.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

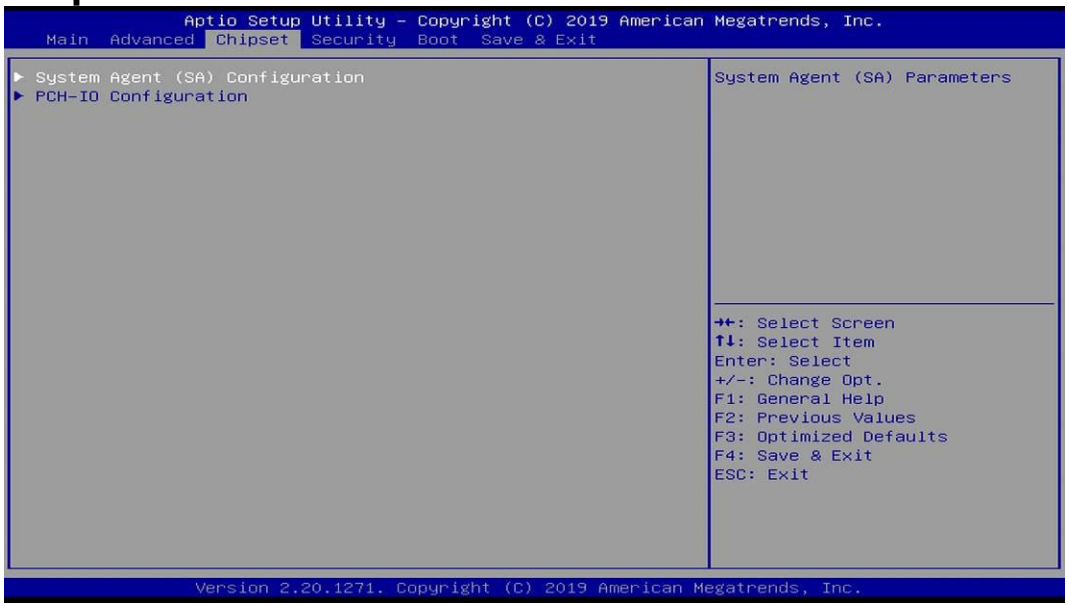
- **NVMe Configuration**

  Press [Enter] to check NVMe controller and driver information.

- **Intel(R) Ethernet Connection (7) I219-V- XX:XX:XX:XX:XX:XX**

  This item shows current network brief information.

3-8 Chipset Menu



- **System Agent (SA) Configuration**

  Press [Enter] to make settings for the following sub-items:

  VT-d

  The optional settings are: [Enabled]; [Disabled].

  - **Memory Configuration**

  Press [Enter] to view brief information for the working memory module.

  - **Graphics Configuration**

  Press [Enter] to make further settings for Graphics Configuration.

  Graphics Configuration

Primary IGFX Boot Display
Use this item to select the video device which will be activated during POST. This has no effect if external graphics present.
The optional settings are: [VBIOS Default]; [DP]; [HDMI]; [LVDS].

***Note:** In the case that the '**Primary IGFX Boot Display'** is select as [DP], [HDMI], or [LVDS], user can make further settings in '**Secondary IGFX Boot Display**':*

Secondary IGFX Boot Display
Use this item to select the secondary Display device.
The optional settings are: [Disabled]; [DP]; [HDMI].

Aperture Size
Use this item to select the Aperture Size. Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.
The optional settings are: [128MB]; [256MB]; [512MB]; [1024MB]; [2048MB].

DVMT Pre-allocated
Use this item to select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
The optional settings are: [32M]; [64M].

DVMT Total Gfx Mem
Use this item to select DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.
The optional settings are: [128M]; [256M]; [MAX].

Backlight Control
Use this item to select Back Light Control settings.
The optional settings are: [PWM Inverted]; [PWM Normal].

***Note:** This function is supported when '**Primary IGFX Boot Display'** is set as [**LVDS**].*

Panel Type
Use this item to manually select LCD panel type.
The optional setting are: [800x 480 18bit Single]; [800x 600 18bit Single]; [800x 600 24bit Single]; [1024 x 600 18bit Single]; [1024 x 768 18bit Single]; [1024 x 768 24bit Single]; [1280 x 768 24bit Single]; [1280 x 800 18bit Single]; [1280 x 800

24bit Single]; [1366 x 768 18bit Single]; [1366 x 768 24bit Single]; [1440 x 900 18bit Dual]; [1440 x 900 24bit Dual]; [1280 x 1024 24bit Dual]; [1680 x 1050 24bit Dual]; [1920 x 1080 24bit Dual].

***Note:** This function is supported when '**Primary IGFX Boot Display**' is set as **[LVDS]**.*

LVDS FW Write Protect

Use this item to enable or disable support LVDS FW update/Protect.

The optional settings are: [Enabled]; [Disabled].

***Note:** This function is available when '**Primary IGFX Boot Display**' is set as **[LVDS]**.*

- **PCH-IO Configuration**

Press [Enter] to make settings for the following sub-items:

PCH-IO Configuration

HD Audio

This item controls detection of the HD-Audio device.

The optional settings are: [Disabled]; [Enabled].

[**Disabled**]: HDA will be unconditionally disabled.

[**Enabled**]: HAD will be unconditionally enabled.

Onboard Lan Controller

Use this item to enable or disable corresponding onboard NIC device or controller.

The optional settings are: [Disabled]; [Enabled].

**When set as [Enabled], the following sub-items shall appear:*

Wake on LAN Enable

Use this item to enable or disable integrated LAN to wake the system.

The optional settings are: [Disabled]; [Enabled].

PCI-E Slot

Use this item to enable or disable PCI-E slot PCI Express root port function.

The optional settings are: [Disabled]; [Enabled].

Speed

Use this item to configure PCIe speed.

The optional settings are: [Auto]; [Gen1]; [Gen2].

M2E Slot

Use this item to enable or disable M2E slot PCI Express root port function.
The optional settings are: [Disabled]; [Enabled].

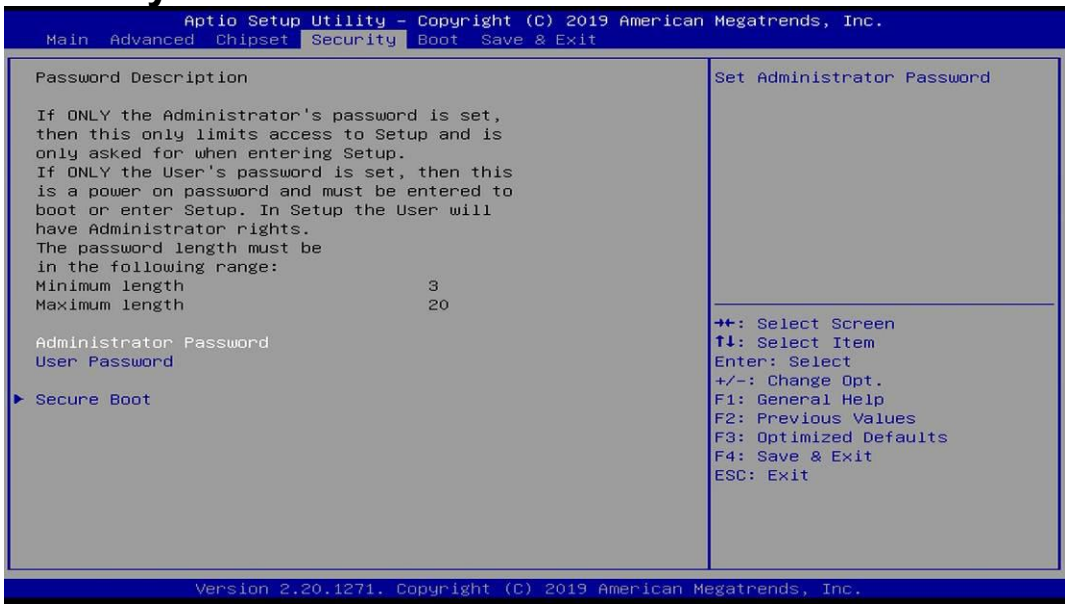
***M2M Slot**

Use this item to enable or disable M2M slot PCI Express root port function.
The optional settings are: [Disabled]; [Enabled].
Note: 'M2M Slot' is only available for **NF893-H370 series.*

State After G3

Use this item to specify what state to go to when power re-applied after a power failure (G3 state).
The optional settings are: [Always On]; [Always Off]; [Former State].

3-9 Security Menu



Security menu allow users to change administrator password and user password settings.

Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to

verify old password then to clear/change password. Press again to confirm the new administrator password.

User Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

- **Secure Boot**

  Press [Enter] to make customized secure settings:

  Secure Boot

  The optional settings are: [Disabled]; [Enabled].

  Secure Boot feature is active if Secure Boot is enabled, Platform Key (PK) is enrolled and the system is in User mode. The mode change requires platform reset.

  Secure Boot Mode

  The optional settings are: [Standard]; [Custom].

  Set UEFI Secure Boot Mode to Standard mode or Custom mode. This change is effective after save. After reset, this mode will return to Standard mode.

  In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

  When set as [Custom**], user can make further settings in the following items that show up:*

  - **Restore Factory Keys**

  Use this item to force system to User Mode, to install factory default Secure Boot key databases.

  - **Reset To Setup Mode**

  Use this item to delete all Secure Boot Key databases from NVRAM.

  - **Key Management**

  This item enables experienced users to modify Secure Boot variables, which includes the following items:

  Factory Key Provision

  This item is for user to install factory default secure boot keys after the platform

reset and while the system is in Setup mode.
The optional settings are: [Disabled]; [Enabled].

- **Restore Factory Keys**

Use this item to force system into User Mode. Install factory default Secure Boot Key databases.

- **Reset to Setup Mode**

Use this item to delete all Secure Boot key databases from NVRAM.

- **Export Secure Boot variables**

Use this item to copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

- **Enroll Efi Image**

This item allows the image to run in Secure Boot Mode.
Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

Device Guard Ready

- **Remove 'UEFI CA' from DB**

Device Guard ready system must not list 'Microsoft EFI CA' Certificate in Authorized Signature database (db).

- **Restore DB defaults**

Use this item to restore DB variable to factory defaults.

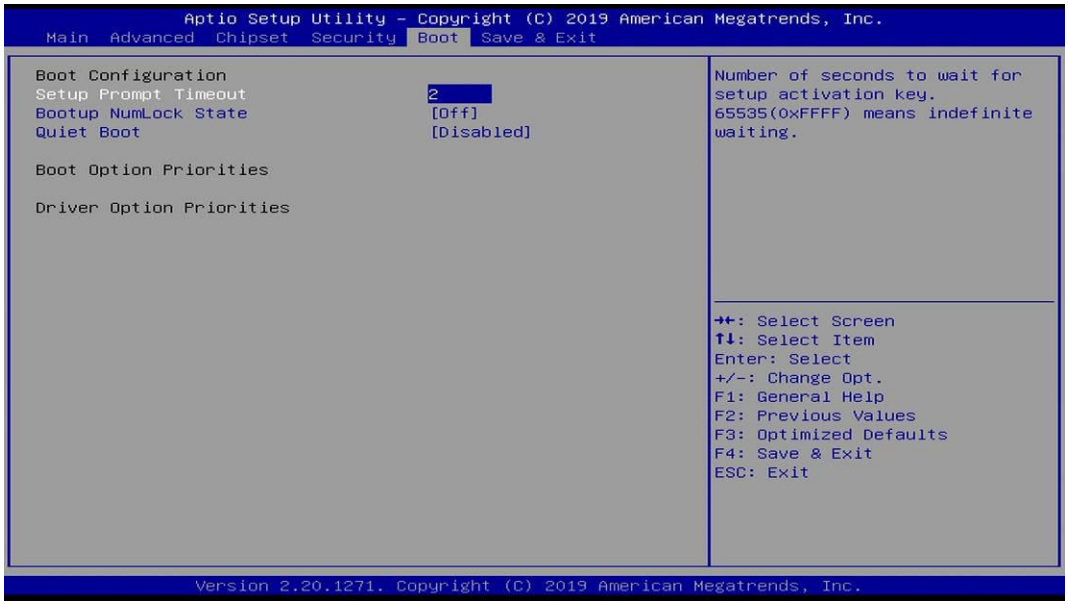
Secure Boot Variable/Size/Keys/Key Source

- **Platform Key (PK)/Key Exchange Keys/Authorized Signature/Forbidden Signature/ Authorized TimeStamps/OS Recovery Signatures**

Use this item to enroll Factory Defaults or load the keys from a file with:
1. Public Key Certificate in:
   a) EFI_SIGNATURE_LIST
   b) EFI_ CERT_X509 (DER encoded)
   c) EFI_ CERT_RSA2048 (bin)
   d) EFI_ CERT_SHAXXX (bin)
2. Authenticated UEFI Variable
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, External, Mixed.

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key.

Bootup Numlock State

Use this item to select keyboard numlock state.

The optional settings are: [On]; [Off].

Quiet Boot

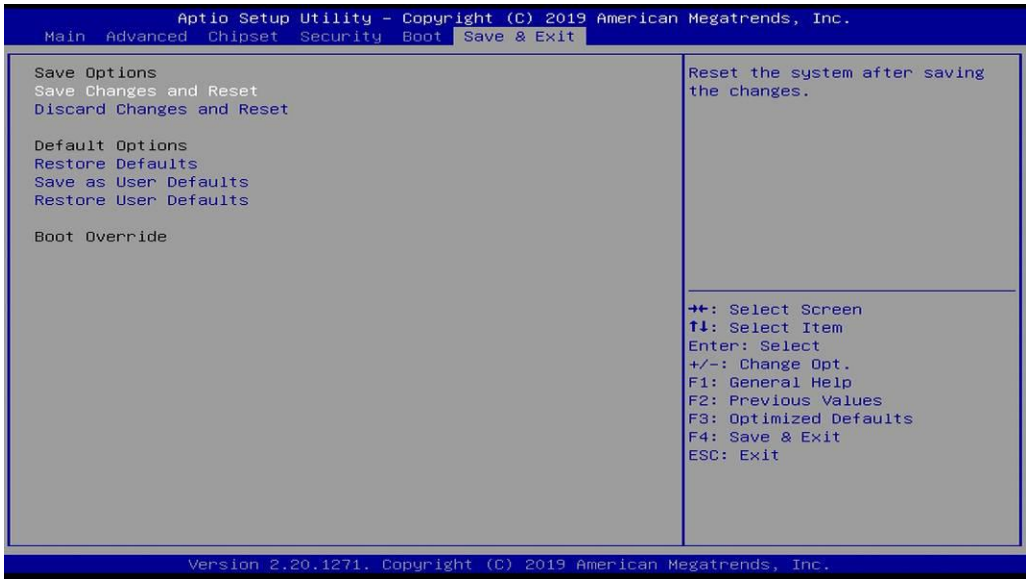
The optional settings are: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1/ Boot Option #2…

Use this item to decide system boot order from available options.

3-11 Save & Exit Menu



Save Options

Save Changes and Reset

This item allows user to reset the system after saving the changes.

Discard Changes and Reset

This item allows user to reset the system without saving any changes.

Default Options

Restore Defaults

Use this item to restore /load default values for all the setup options.

Save as User Defaults

Use this item to save the changes done so far as user defaults.

Restore User Defaults

Use this item to restore the user defaults to all the setup options.

Boot Override

UEFI: Built-in EFI Shell

Press this item and a dialogue box shall appear to ask if user wish to save configuration and reset.