ASRock Industrial

Technical Document

Generally Asked Questions

Version: V1.0

Release Date: 2020/07/17

Chapter 1: General

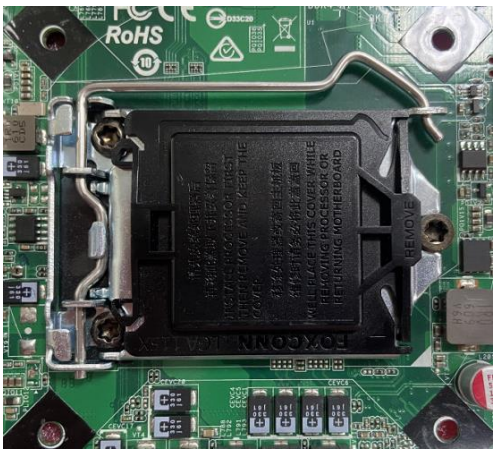
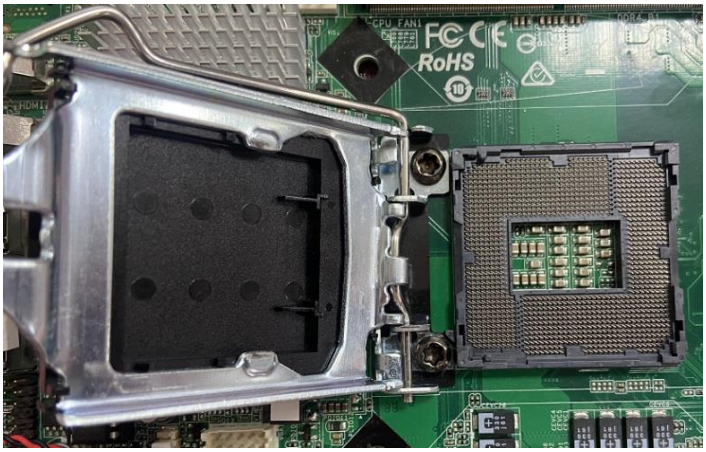
Topic 1.How to install CPU on my motherboard?

There are two different type of CPU protection cover, please check your CPU protection cover type first then follow below SOP to install CPU.

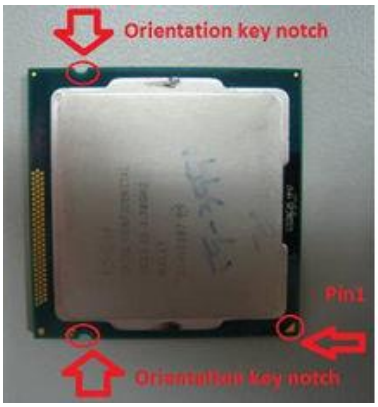
Type A: CPU protection cover on the top of CPU socket.

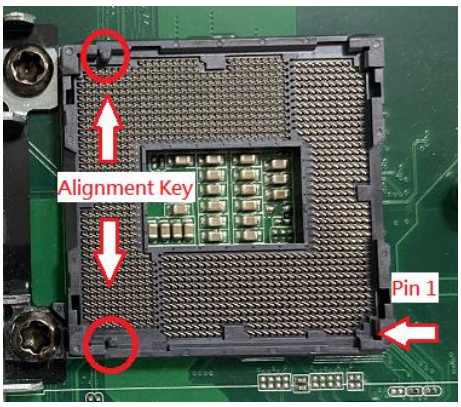
Operating Steps:

1. Open the CPU socket without remove CPU protection cover: Disengage the lever by pressing it down and sliding it out of the hook. At this time, you do not have to remove the protection cover.

2. Insert the CPU: Make sure locate Pin1 and the two orientation key notches, then carefully place CPU into the socket.



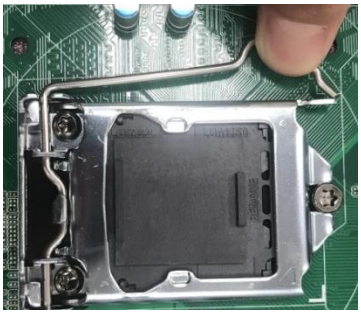


3. Close the socket: Press down the load lever, and secure it with the load plate tab under the retention tab. The protection cover will automatically come off by itself.

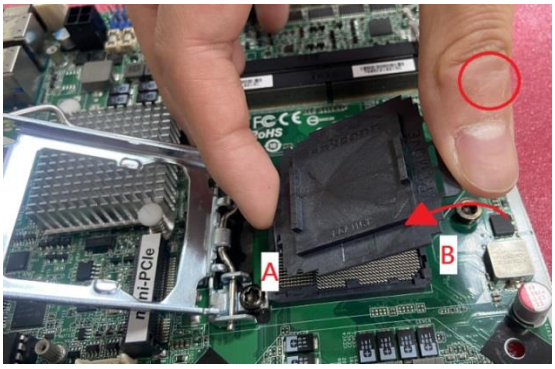
Type B: CPU protection cover in CPU socket

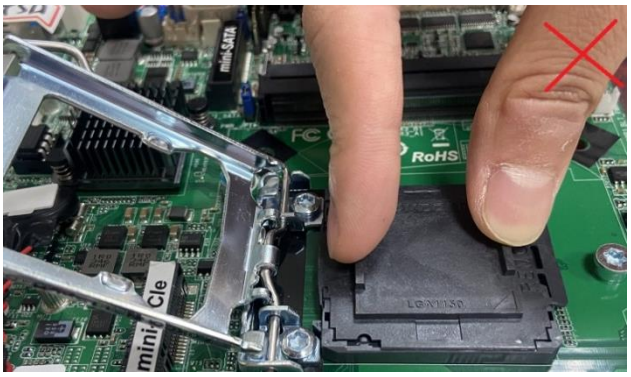
Operating Steps:

1. Open the CPU socket: Disengage the lever by pressing it down and sliding it out of the hook.



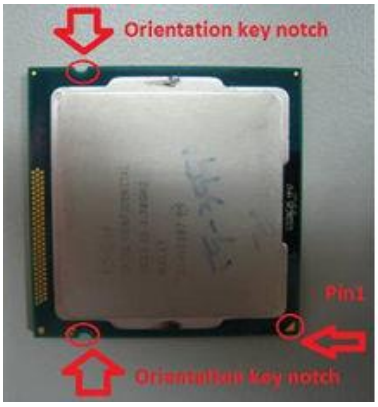

2. Remove CPU protection cover: Attach your index finger to the upper edge of the PnP Cap. Use your thumb to remove PnP Cap (Pick and Place Cap) from the CPU socket by lifting the cap tab.

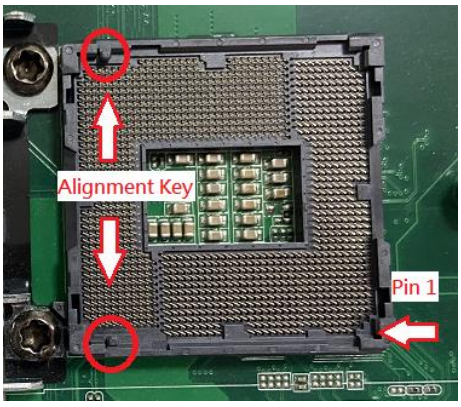


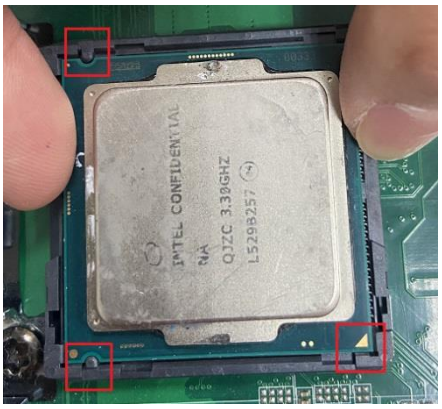


NEVER remove PnP Cap as pictured on the above. Incorrect removal of the PnP cap may cause damage to the CPU socket contacts.

3. Insert the CPU: Make sure locate Pin1 and the two orientation key notches, then carefully place CPU into the socket.







4. Close the socket: Press down the load lever, and secure it with the load plate tab under the retention tab.

Topic 2.How to install RAM on my motherboard?

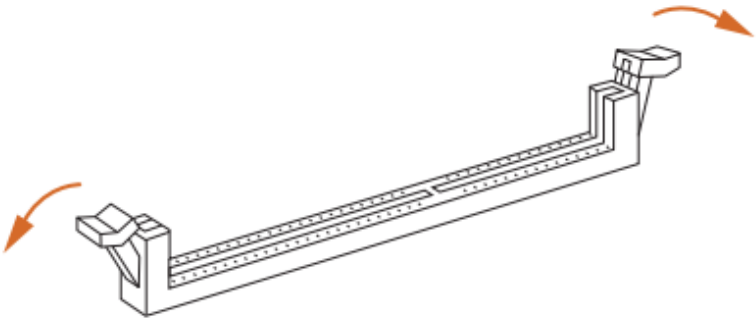
Depending on different form factor of motherboard, there are different installation methods below.

Type A: Form factor: ATX, Micro ATX

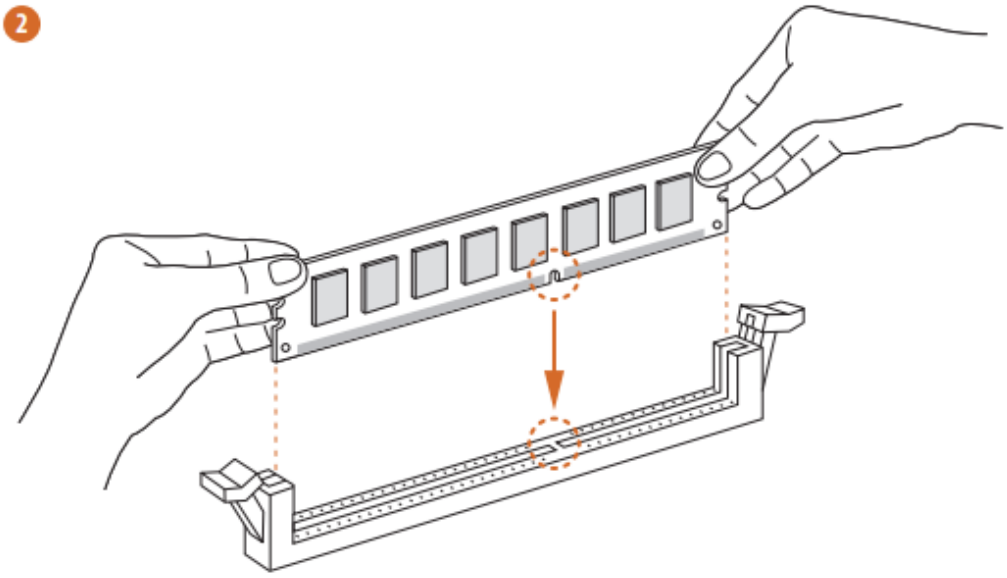
These type motherboards provide **240-pin DDR3** or **288-pin DDR4** DIMM slots.

Operating Steps:

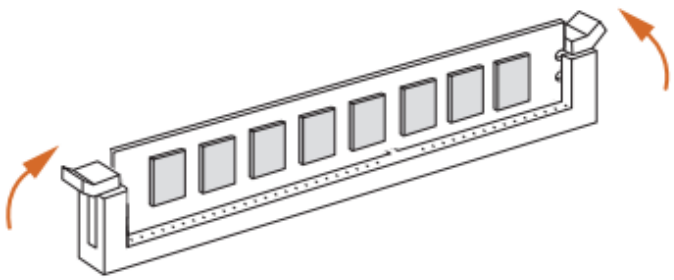
1



2



3

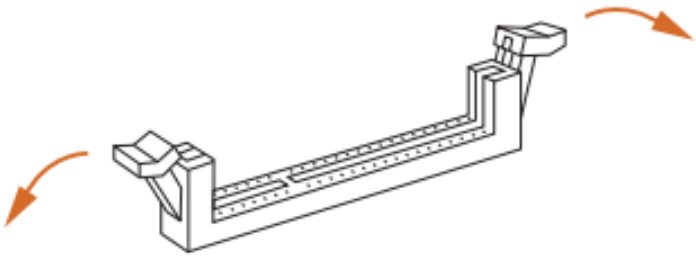


Type B: Form factor: Mini-ITX (High profile I/O)

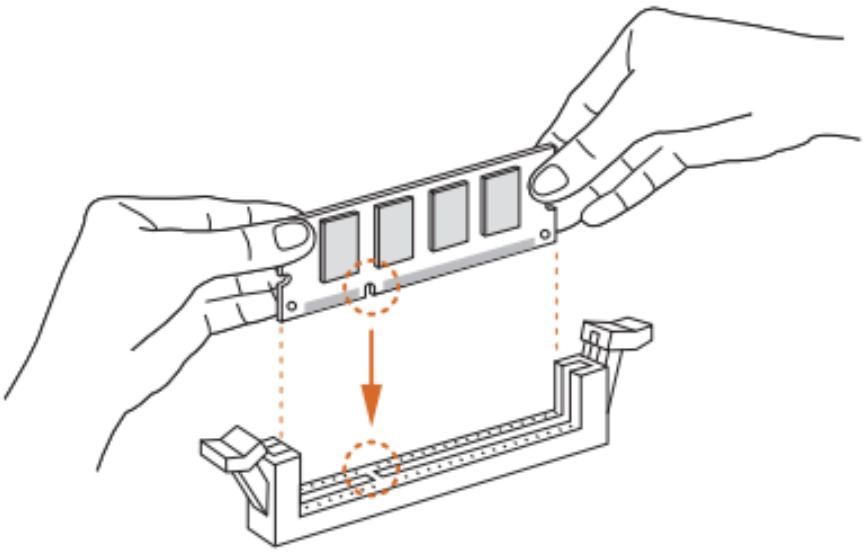
This type motherboard provides **204-pin DDR3/DDR3L** or **260-pin DDR4** SO-DIMM slots.

Operating Steps:

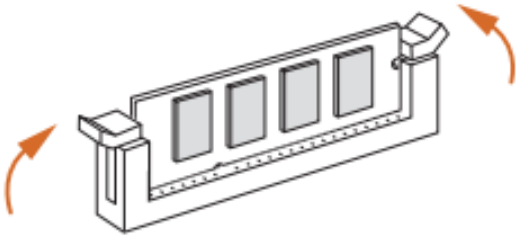
1



2



3

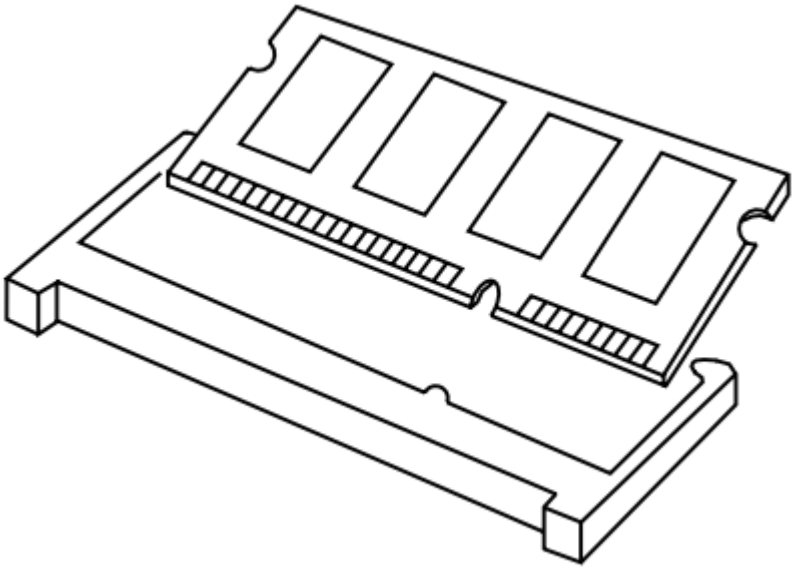


Type C: Form factor: Mini-ITX (Low profile I/O), Micro-STX, Mini-STX, 3.5 inch SBC, UTX, 4x4 series, NUC series, PICO-ITX, COM Express, Network MB, Industrial Computer System

These type motherboards provide **204-pin DDR3/DDR3L** or **260-pin DDR4** SO-DIMM slots.

Operating Steps:

1. Align a SO-DIMM on the slot such that the notch on the SO-DIMM matches the break on the slot.



2. Firmly insert the SO-DIMM into the slot until the retaining clips at both ends fully snap back in place and the SO-DIMM is properly seated.

Note:

1. It is not allowed to install a DDR or DDR2 memory module into a DDR3 or DDR4 slot; otherwise, the motherboard and DIMM may be damaged.
2. DDR3 memory module isn't compatible with DDR4 slot, and DDR4 memory module is also not compatible with DDR3 slot.
3. The DIMM only **fits in one correct orientation**. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.
4. Please make sure to disconnect the power supply before adding or removing DIMMs/SO-DIMMs or the system components.
5. If you only install one memory module on **Bay Trail/Braswell platform**, please install it on DDR3_A1.

Topic 3.How to check the serial number of my motherboard?

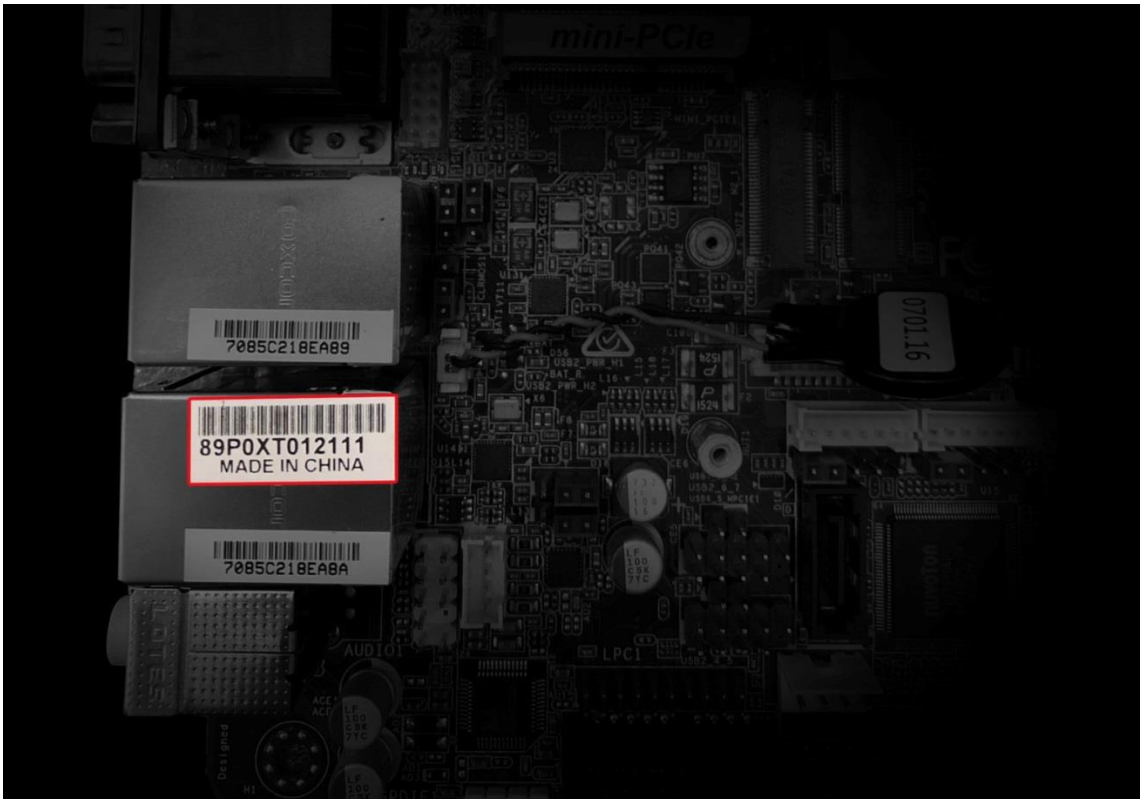
There are two methods for checking the serial number on motherboard.

Method A:

Check the motherboard gift box, you may find the Serial No. on the motherboard S/N sticker.

Method B:

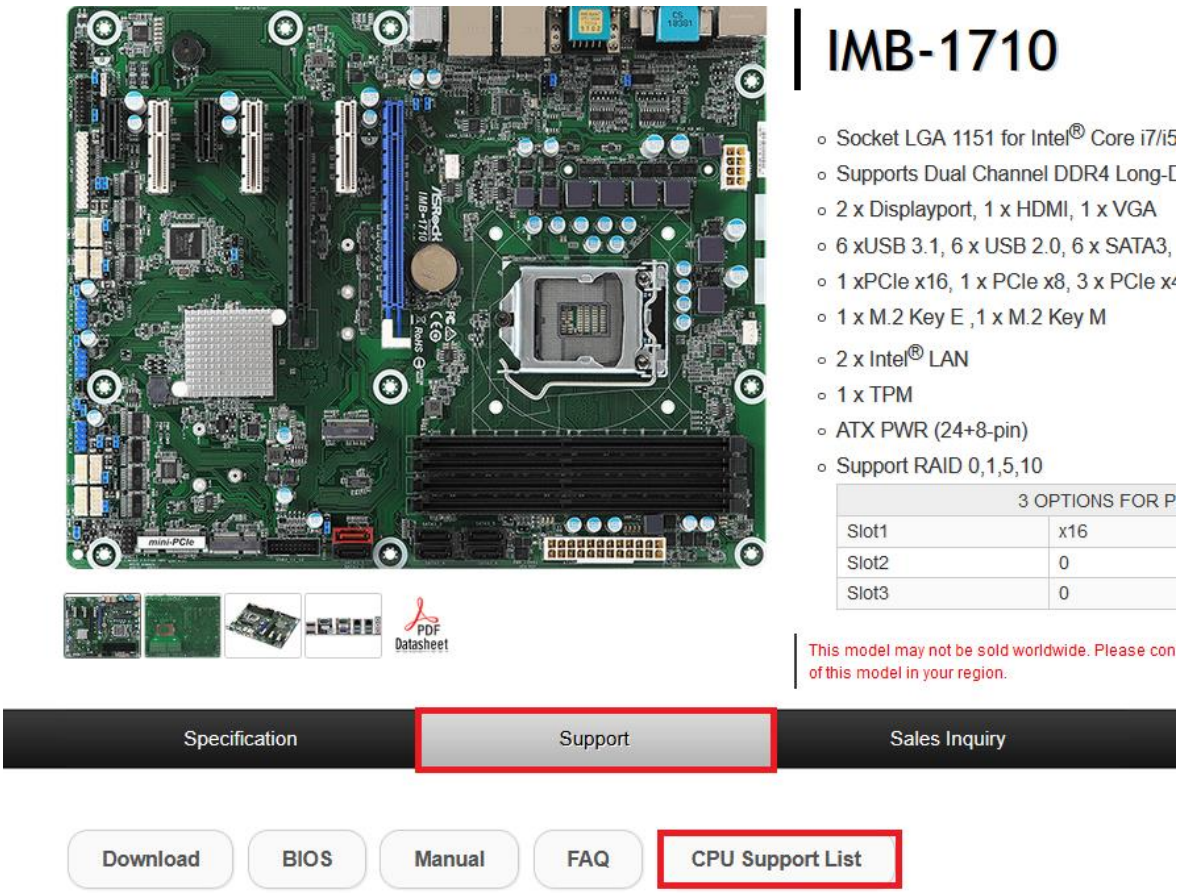
You may find the S/N sticker on the motherboard too. The S/N sticker is a white or gray color sticker, usually stick to somewhere near I/O back panel, like the LAN port.



Topic 4.I am choosing the suitable CPU for my motherboard. Where can I find the reference information or do you have any suggestion?

If you would like to choose the suitable CPU for ASRock Industrial motherboards, please refer to our CPU support list table from ASRockind official website.
(Location: Motherboard Product Specification Page> Support >CPU Support List Table)
We noted the CPU support information and compatible BIOS version in this table list.

The example of CPU Support List location:



Topic 5.When I turn on the motherboard, I hear 3 beeps sound and monitor has no display. How do I fix it?

The motherboard will beep 3 times if it doesn't detect memory correctly.
Please follow the steps below and then check again.

1. Re-install your memory correctly.
2. Only install 1 pcs memory on each DIMM slot to verify.
3. Remove your CPU and check if there's any pin bent on CPU socket.
   (If your system is SoC, please ignore this step.)
4. Please replace another CPU or memory respectively and then check if system can boot up properly.
   If you tried the steps above and the symptom still happens, please contact with your local distributor for further assistance.

Topic 6.When I turn on the motherboard, I only see the FAN spin, but no display output from monitor. How do I fix it?

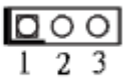
Please follow the steps below to check firstly.

1. Refer to the FAQ no. 20050123 or User Manual to clear CMOS.
2. Please remove unnecessary devices and only install CPU, one memory, monitor, and PSU to check.
3. Please remove CPU and check if there's any pin bent on CPU socket.
   (If your system is SoC, please ignore this step.)
4. Re-install your memory correctly.
5. Only install 1 pcs memory on each DIMM slot to verify.
6. Please change another M/B, CPU, memory, PSU respectively.
   If you tried the steps above and the symptom still happens, please contact with your local distributor for further assistance.

Topic 7. How do I clear CMOS?

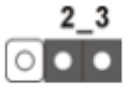
There is a Clear CMOS Header (CLRCMOS1) on motherboard and it allows you to clear CMOS.

Clear CMOS Header
1-2: Normal
2-3: Clear CMOS



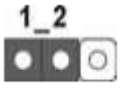
Please follow the steps below to clear CMOS.

1. Please **turn off the computer** and **unplug the power cord from the power supply**.
2. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds.



Clear CMOS

3. Switch the jumper back to pin1 and pin2 on CLRCMOS1 and then plug the power cord back into the power supply.



Default

Note:

1. Do not clear CMOS before unplugging the power cord from the power supply
2. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action.

Chapter 2: BIOS

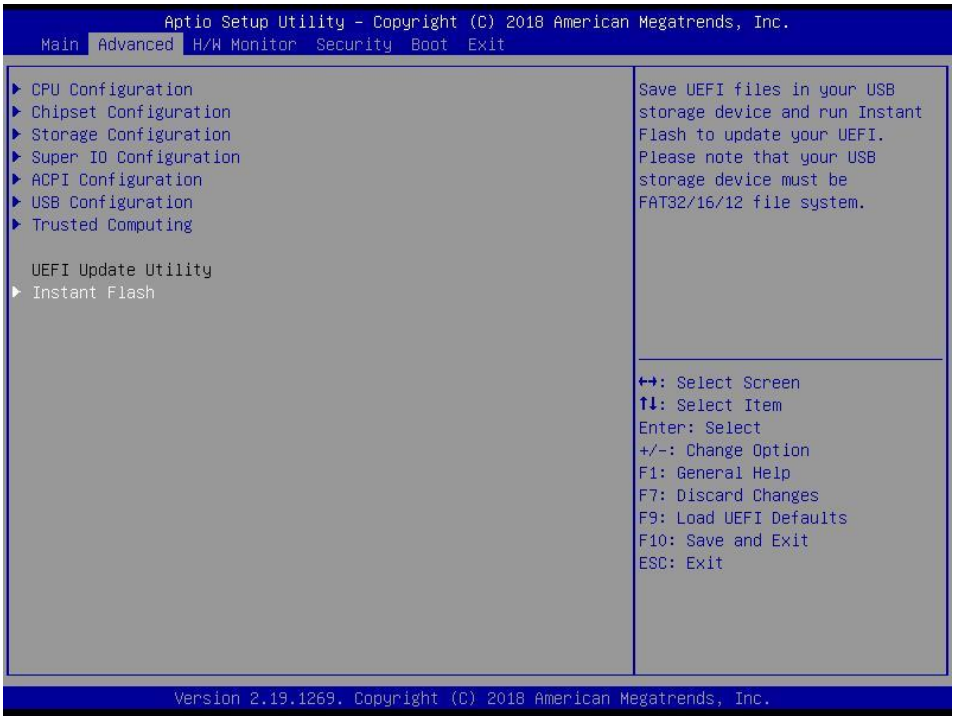
Topic 1.How to update BIOS on my motherboard under BIOS?

There are two methods for updating the BIOS using Instant Flash.

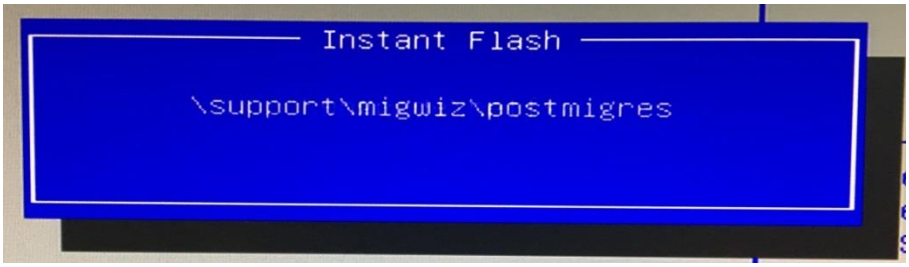
Method A:

Please refer to the following steps to flash BIOS under BIOS setup.

1. Extract the BIOS ROM file and save into FAT32 format USB stick.
2. Boot up system and press “F2” or “DEL” into BIOS setup page
3. Select “Instant Flash“ option in Advanced page.

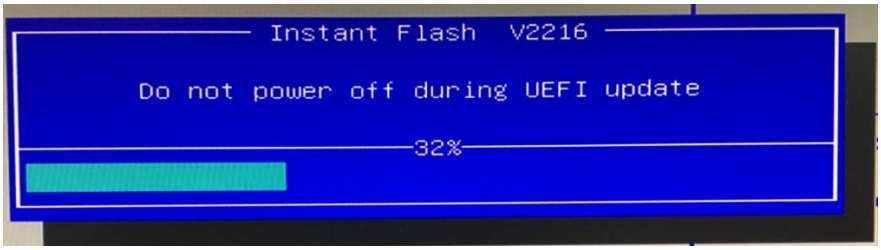


Then the system will start searching proper file and list them all.

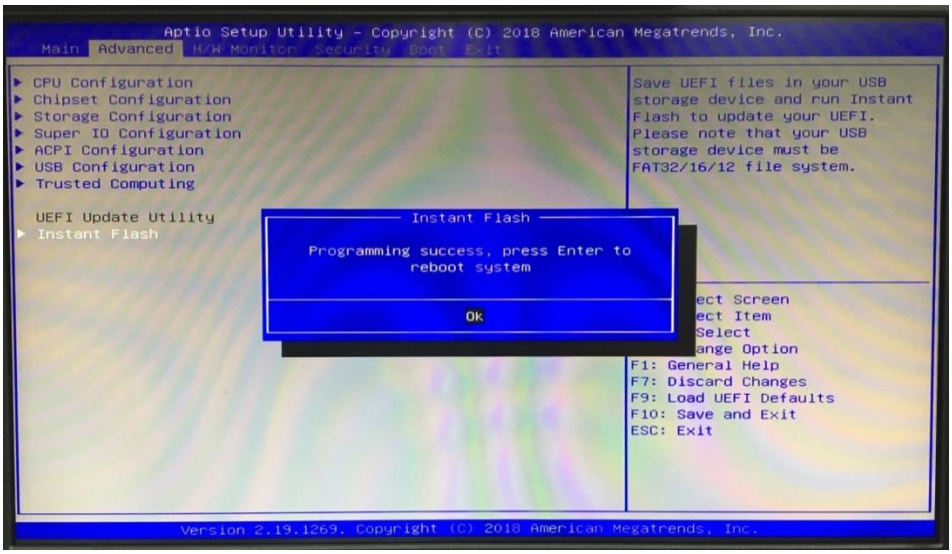


4. Please choose the BIOS file to begin updating process.

You will see BIOS is updating as below picture.



5. Press Enter after the procedure is done and reboot system.



6. The BIOS update successfully after system reboot.

Method B:

Please refer to the following steps press hotkey to execute Instant Flash at post screen.

1. Extract the BIOS ROM file and save into FAT32 format USB stick.
2. Boot up system and press [F6] when you see this boot logo page.

3. Please choose the BIOS file to begin updating process.

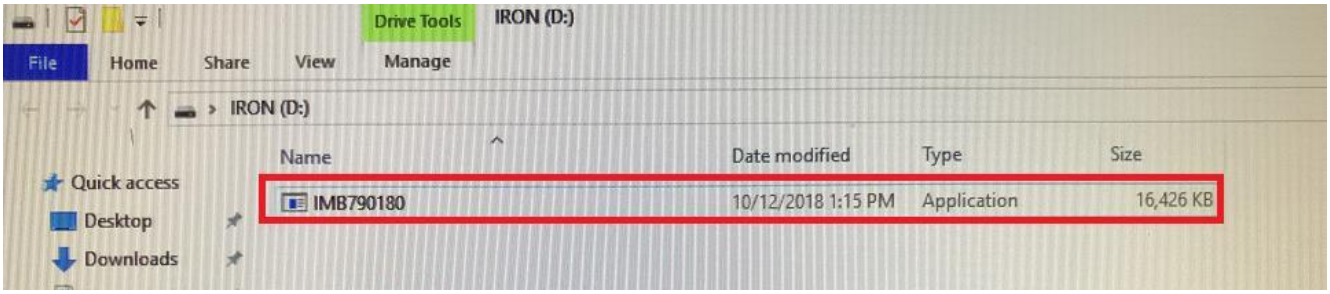
4. Press Enter after the procedure is done and reboot system.
5. The BIOS update successfully after system reboot.

Topic 2.How to update BIOS on my motherboard under DOS?

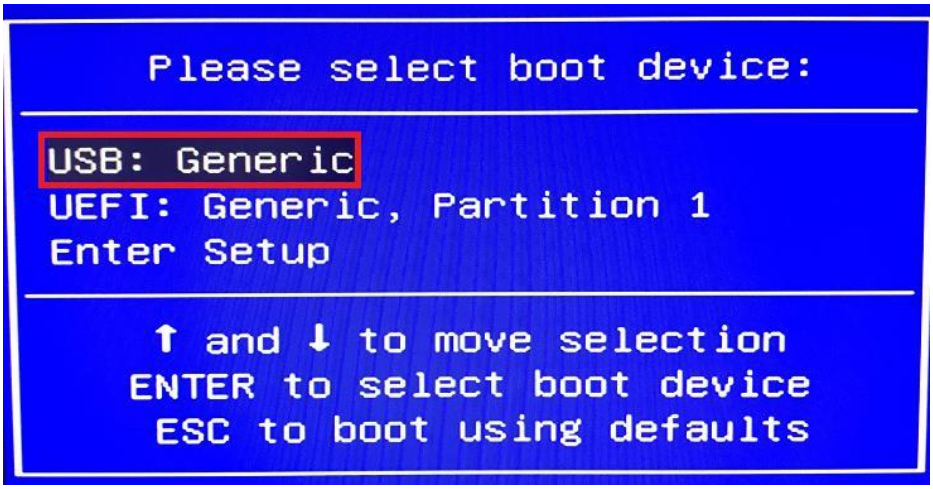
1. Download BIOS file (Select “DOS” as below red frame) from ASRockind website.

Version	Date	Update BIOS Under / How to Update	Size	Description	Download	
1.80	2018/10/22	BIOS	6.90MB	Improve memory compatibility.	Global	China
1.80	2018/10/22	DOS	6.95MB	Improve memory compatibility.	Global	China
1.80	2018/10/22	Windows	7.51MB	Improve memory compatibility.	Global	China

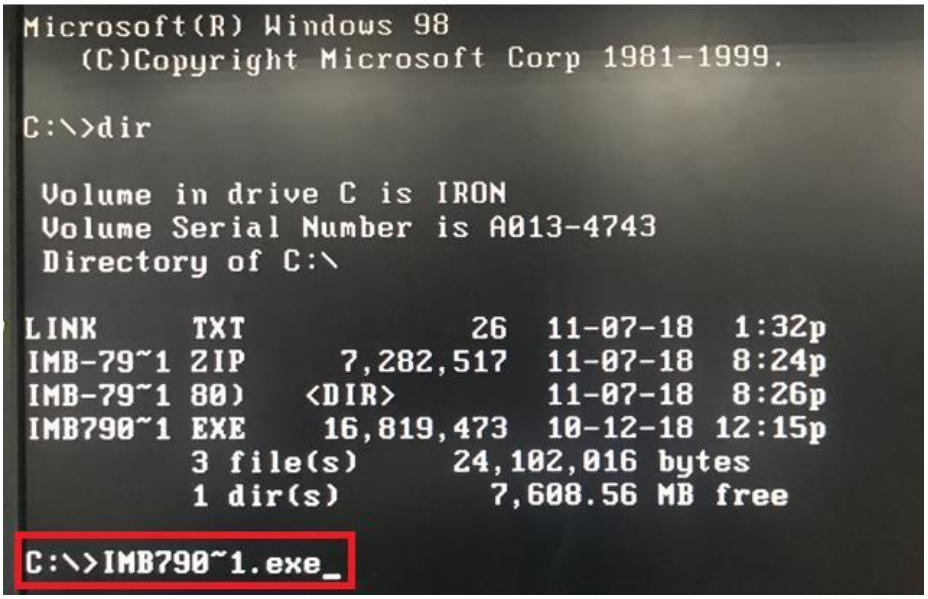
2. Extract the download file and save the BIOSfile.exe to FAT32 format bootable USB drive as below picture.



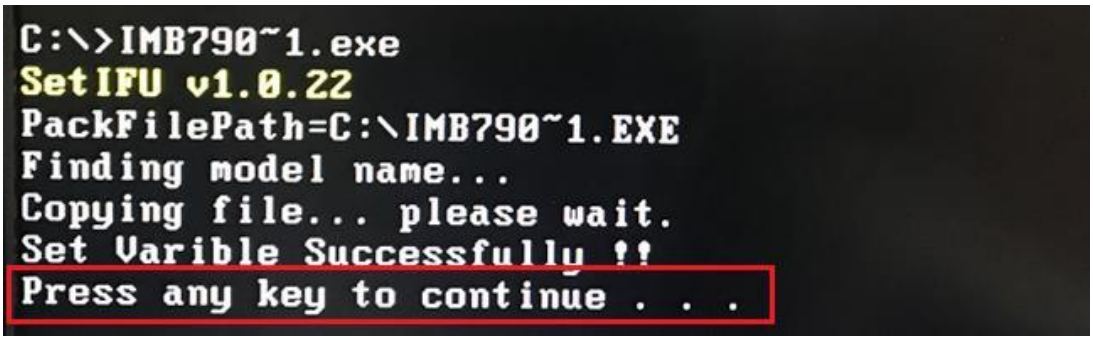
3. Plug USB drive into the system and Boot up system and press “F11” to enter into BIOS boot menu.
4. Select your USB type device (not UEFI type) to enter DOS environment as below picture.



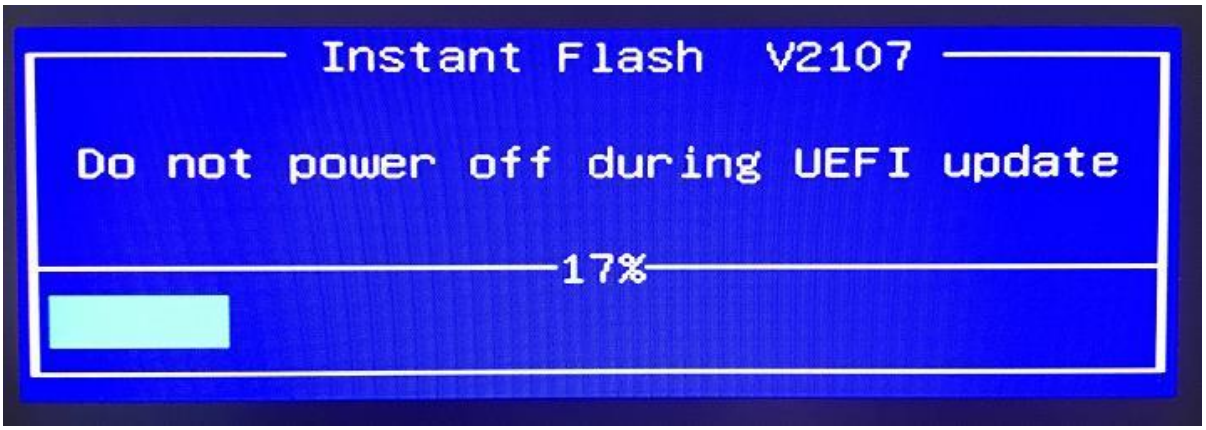
5. Under the DOS environment, please type BIOSfile.exe and then press [Enter].
   For example: C:\>IMB790~1.exe ->[Enter] as below **picture1**, and then you will see program is finding model name. As below **picture2**, after it finishes, please press any key to reboot.
   <Picture1>



<Picture2>

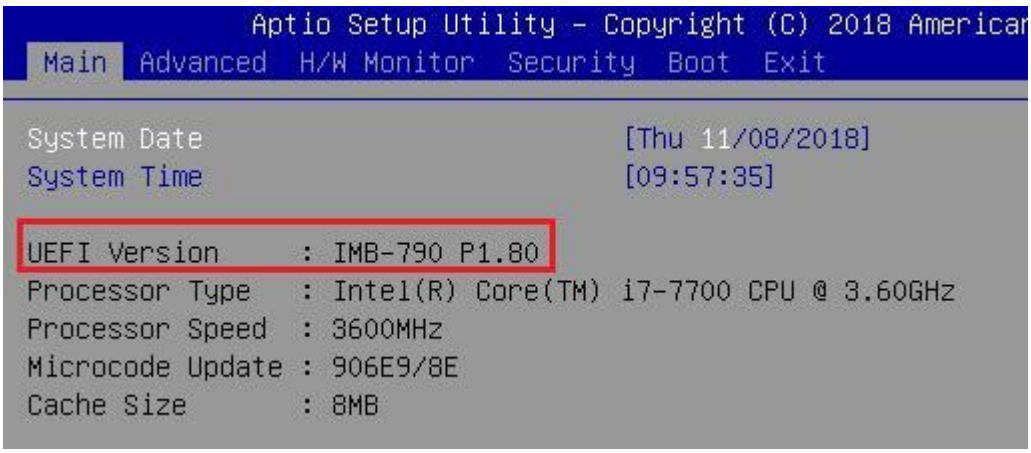


6. After the system reboots, it will start to update BIOS automatically, please don't power off the system during UEFI update.



7. After finishing BIOS update, please press enter to reboot the system.

8. After the system reboots, please press "F2" or "Del" to enter into BIOS setup page.
   You could see the new BIOS version and the BIOS update is successful.

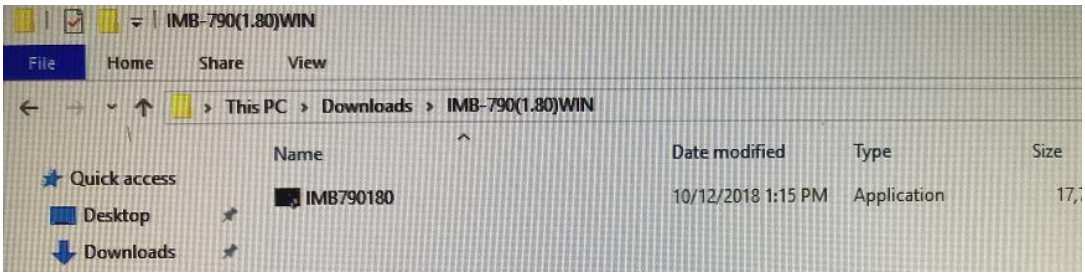


Topic 3.How to update BIOS on my motherboard under Windows?

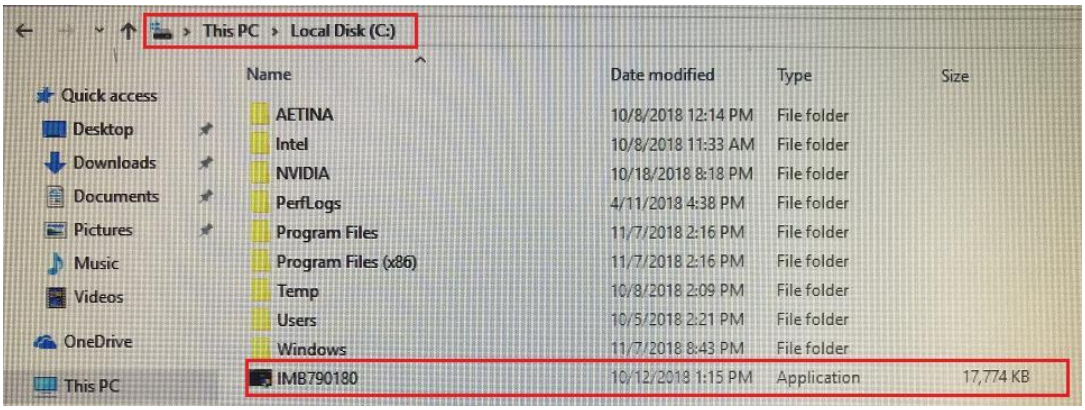
1. Download BIOS file (Select “DOS” as below red frame) from ASRockind website.

1.80	2018/10/22	BIOS	6.90MB	Improve memory compatibility.	Global
1.80	2018/10/22	DOS	6.95MB	Improve memory compatibility.	Global
1.80	2018/10/22	Windows	7.51MB	Improve memory compatibility.	Global

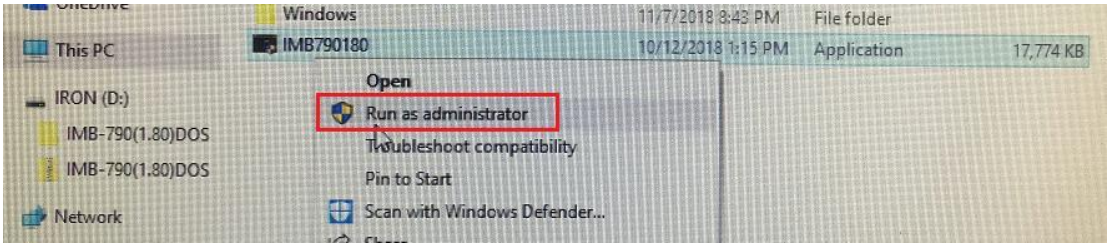
2. Extract the download file and you should see the BIOSfilename.EXE on the unzipped folder as below.



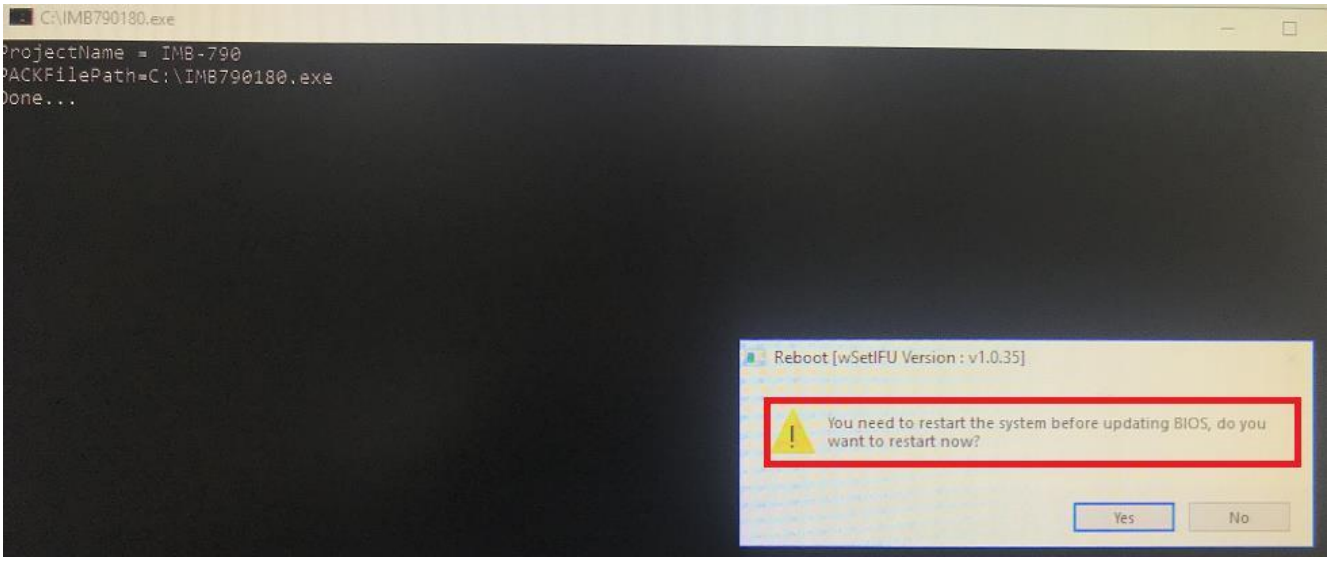
3. Please put BIOSfilename.EXE on the root directory of Local disk (C:) on host system as following picture.



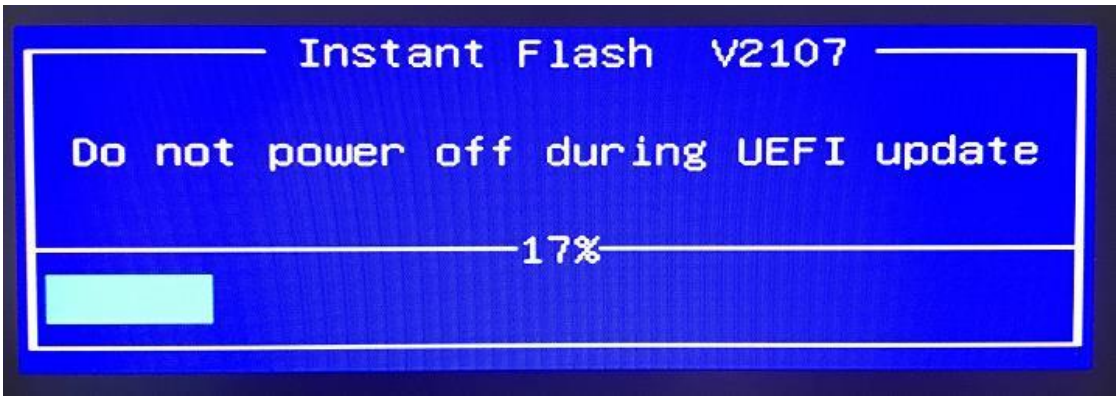
4. Click BIOSfilename.exe via "Run as administrator"



5. It shows a dialog icon to remind that "You need to restart the system before updating BIOS, do you want to restart now". Click "Yes".

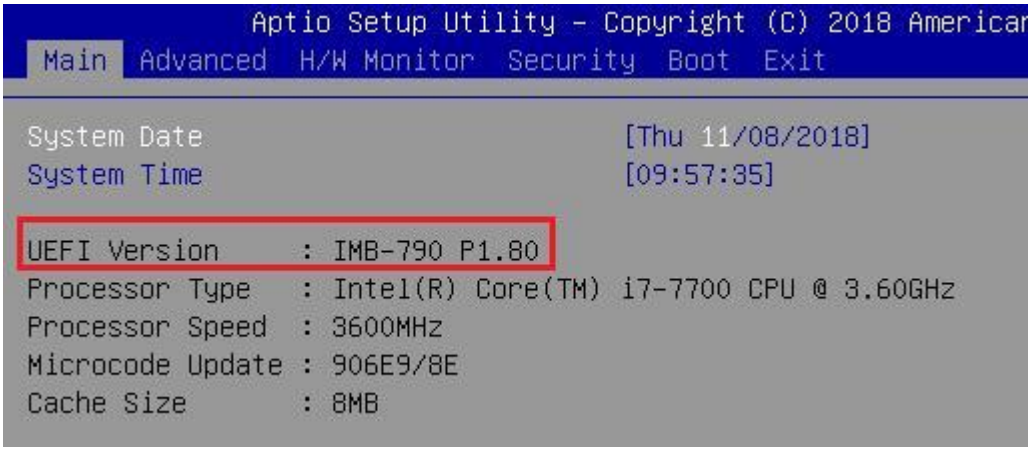


6. After the system reboots, it will start to update BIOS automatically, please don’t power off the system during UEFI update.



7. After finishing BIOS update, please press enter to reboot the system.

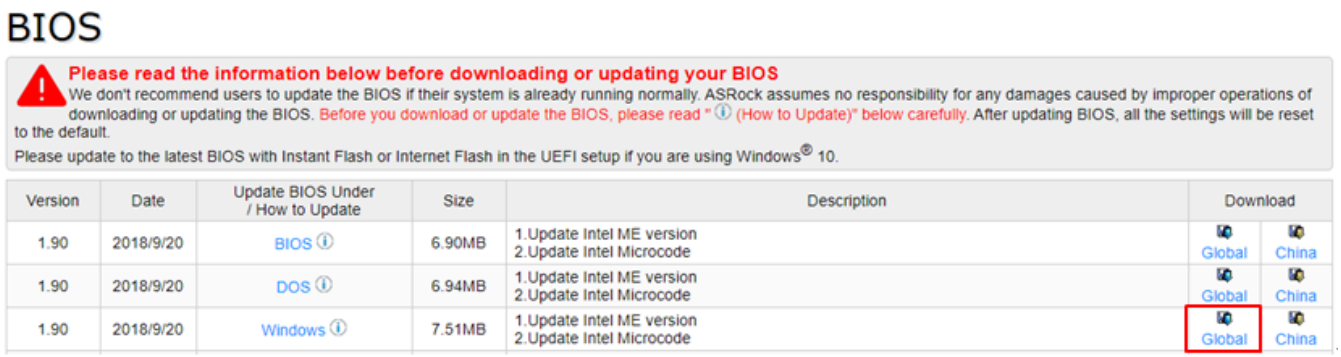
8. After the system reboots, please press “F2” or “Del” to enter into BIOS setup page. You could see the new BIOS version and the BIOS update is successful.



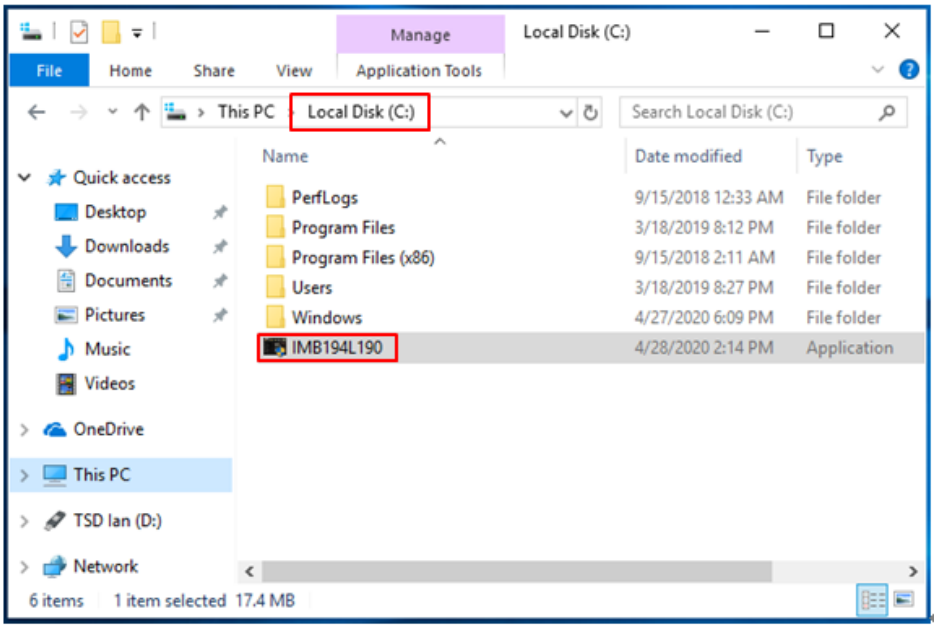
Topic 4. How to do the BIOS update by the silent mode under Windows?

Please follow the steps below to do the BIOS update via silent mode under Windows:

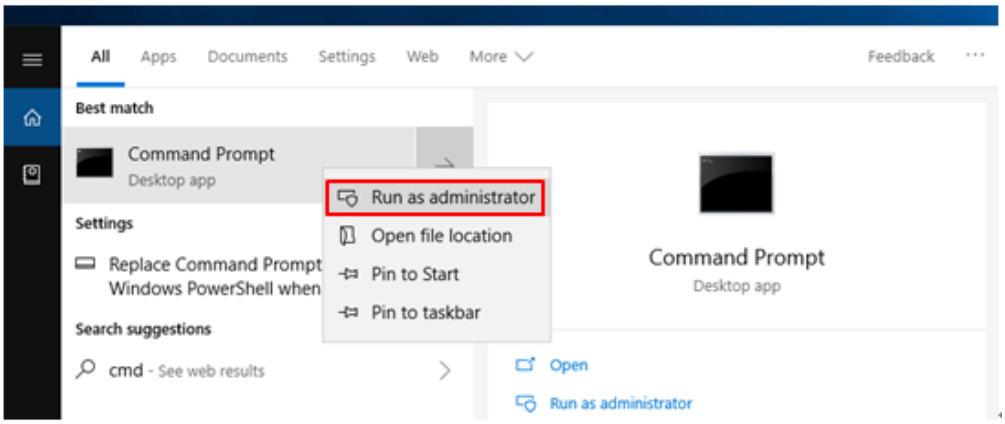
1. Download the BIOS file of Windows version from ASRockind website.



2. Extract the download file and save the BIOSfilename.EXE on the root directory of Local disk (C:) on host system.

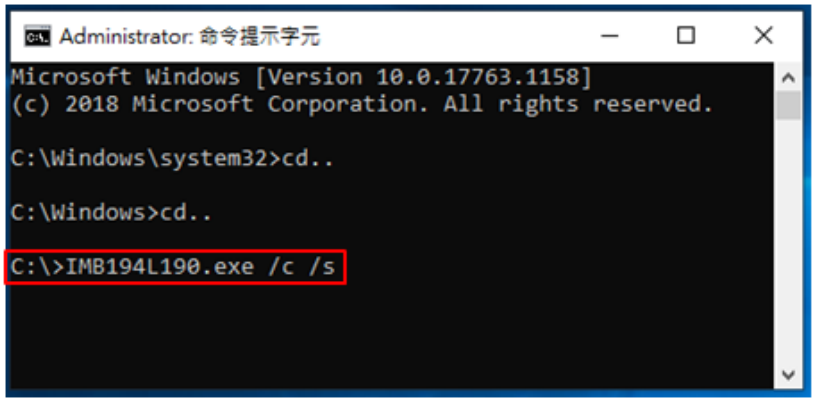


3. Execute Command Prompt and run as administrator.

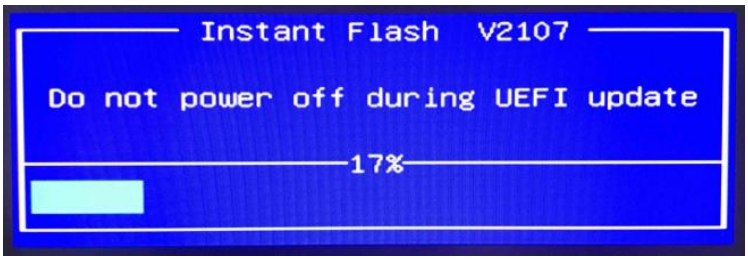


4. Key in the command “BIOSfile.exe /c /s” then press enter, system will start the BIOS updating process automatically.

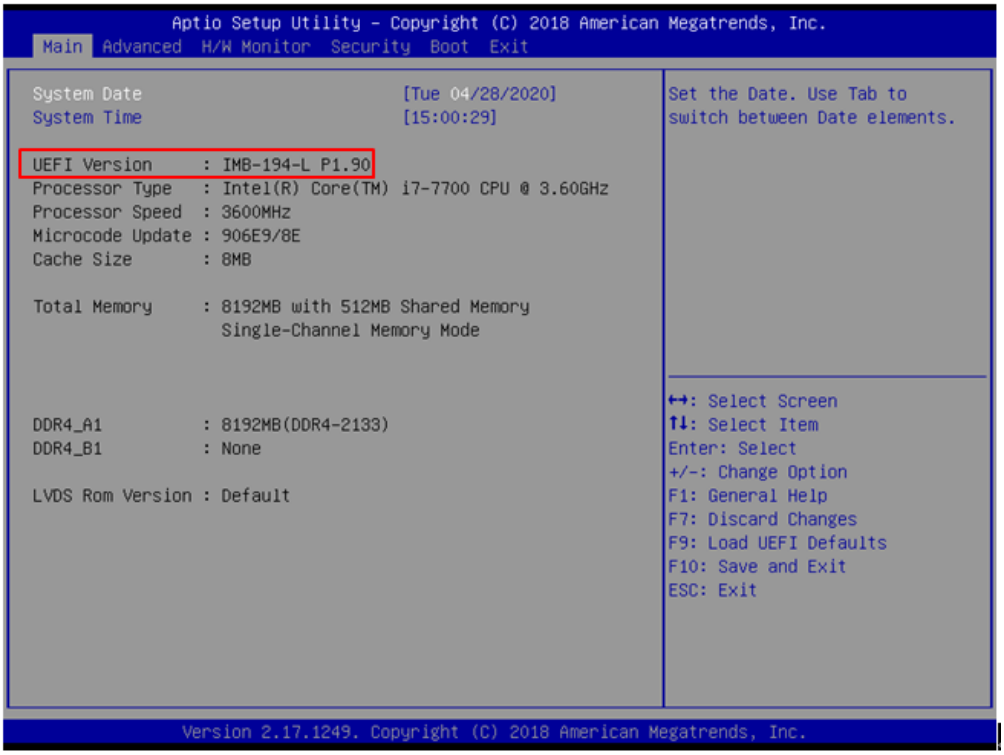
   For example: IMB194L190.exe /c /s



5. After BIOS update process finished, system will boot into OS automatically.



Please reboot the system and press Delete or F2 to check the UEFI version under BIOS main page.



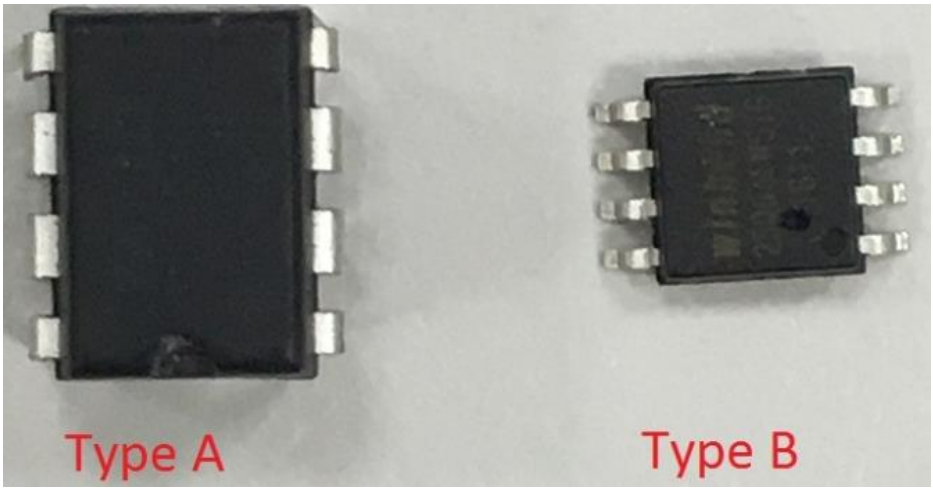
Topic 5.During the UEFI update, the system suddenly shut down and it couldn't boot up anymore. How do I fix it?

The model of ASRock industrial designed the [Crashless] function for failure during BIOS updating process. Please refer the step below to recovery the system.

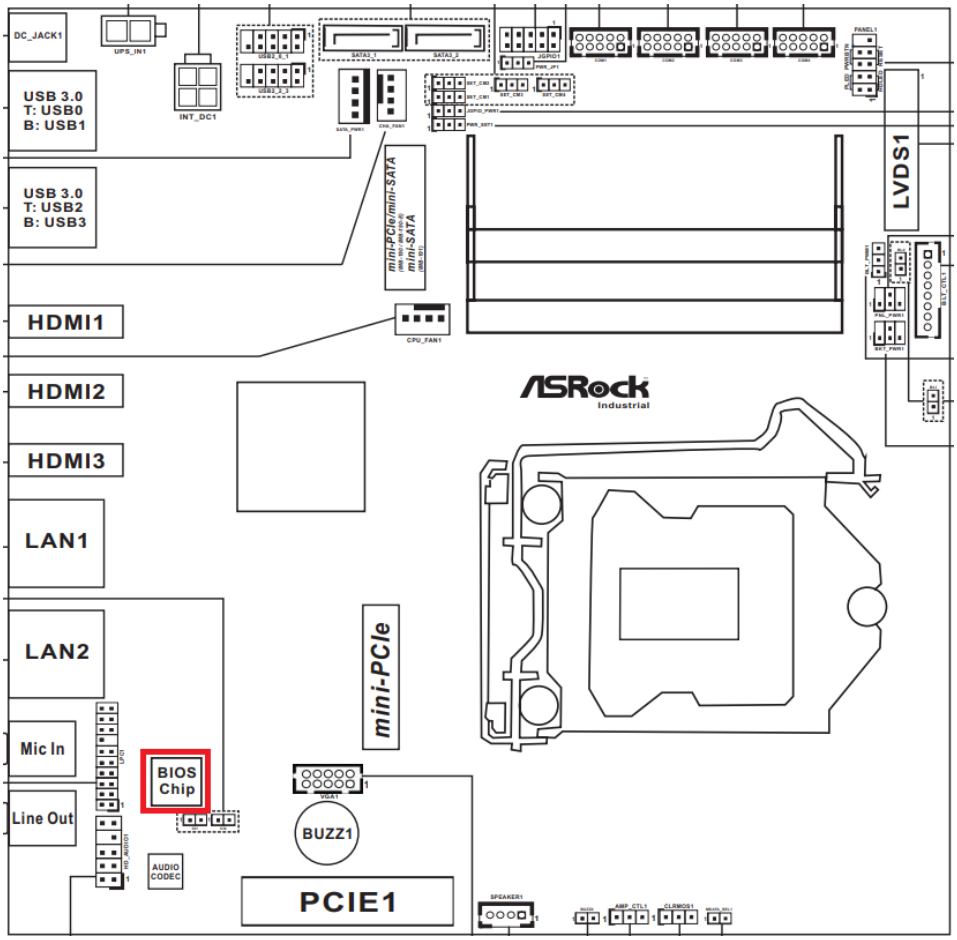
1. Save the BIOS files to the bootable USB stick and plug it into USB port on the M/B.
2. Boot up the system and it will recovery the BIOS by [Crashless] function automatically.
3. After the process finished, the system will boot up automatically

Topic 6.How do I replace the BIOS SPI ROM from my motherboard?

There are two types of BIOS ROM chip.



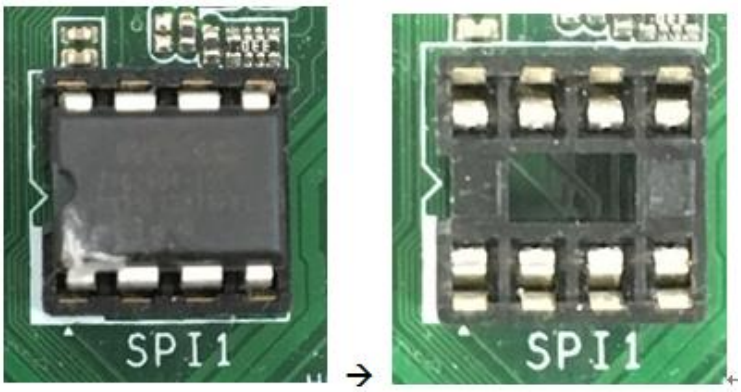
Please check the location of BIOS ROM socket (as the logo below) on M/B in the Jumpers and Headers Setting Guide firstly, take example for IMB-790. (http://download.asrock.com/IPC/Manual/Jumper/IMB-790.pdf)



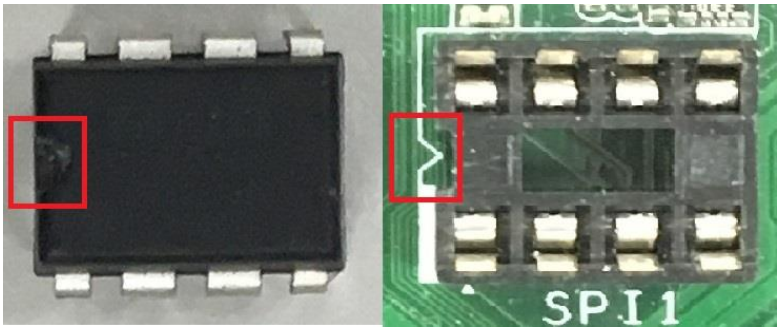
Type A ROM chip:

Please follow the steps below to replace BIOS ROM.

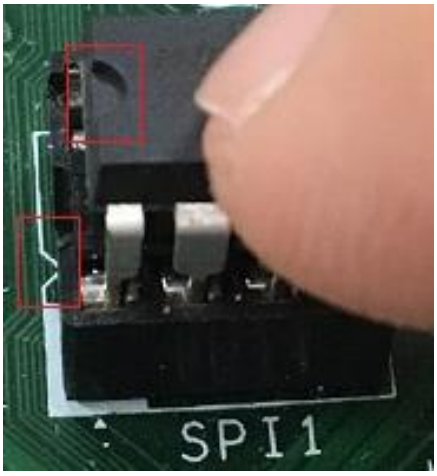
1. Please find the BIOS ROM chip on the M/B and then remove it.



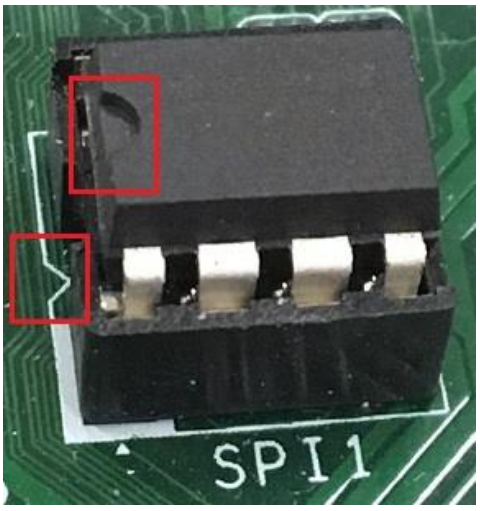
2. Please refer to the following picture and check the notch on BIOS ROM chip and ROM socket.



3. Please install the new chip on the ROM socket with the same notch side.



4. The replacement of Type A ROM chip is completed.



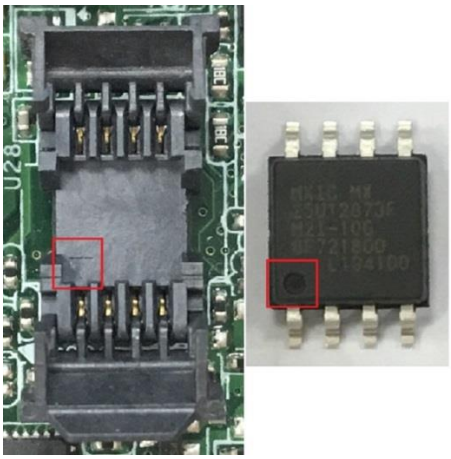
Type B ROM chip:

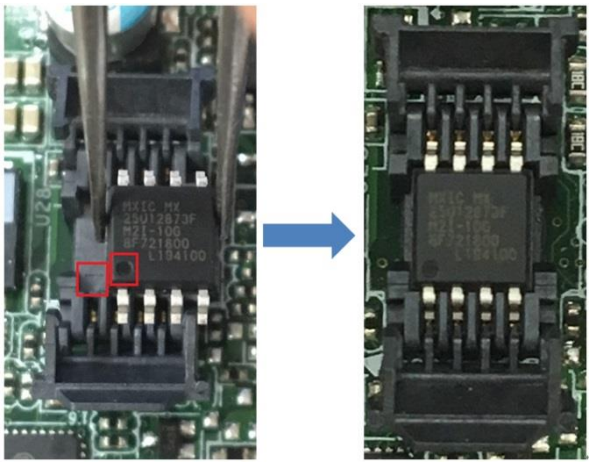
Please follow the steps below to replace BIOS ROM.

1. Please open the ROM socket and then remove the BIOS ROM chip.

2. Please install the new chip on ROM socket.

   Note: There's a triangle on the ROM socket and there's a dot on the ROM chip. Please install ROM chip to the corresponding position.





3. Please close the ROM socket and the replacement is finished.

Chapter 3: LVDS

Topic 1.After I connect LVDS to my motherboard, LVDS still has no display. How do I do?

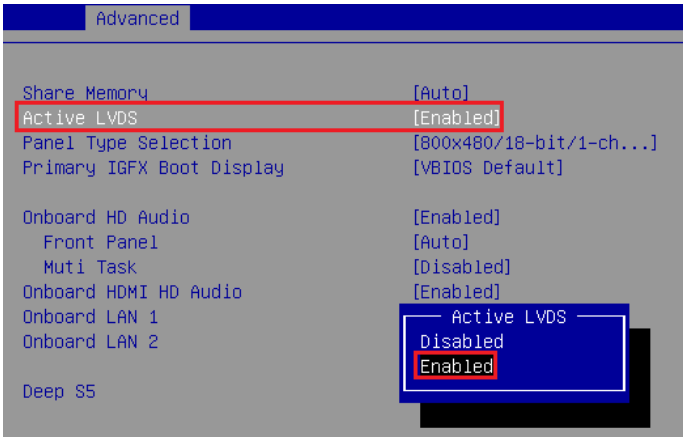
Please follow the suggestions below to check if your LVDS panel can light up or not.

1. Check the headers of PNL_PWR1 and BKT_PWR1 are set at correct voltage level the same as LVDS panel datasheet.
2. Enter into BIOS and check if “Active LVDS” is set to [Enabled] and "Panel Type Selection” is set at corresponding resolution.
3. Check pin mapping of the LVDS cable is connected correctly by referring to the LVDS pin define of M/B side and panel side.
4. Please replace another M/B, LVDS panel, LVDS cable respectively and check if LVDS panel can light up.
5. If all the resolutions under BIOS aren’t the same as your LVDS panel, please contact with local distributor or ASRockind Technical support team for customized LVDS Chrontel firmware.

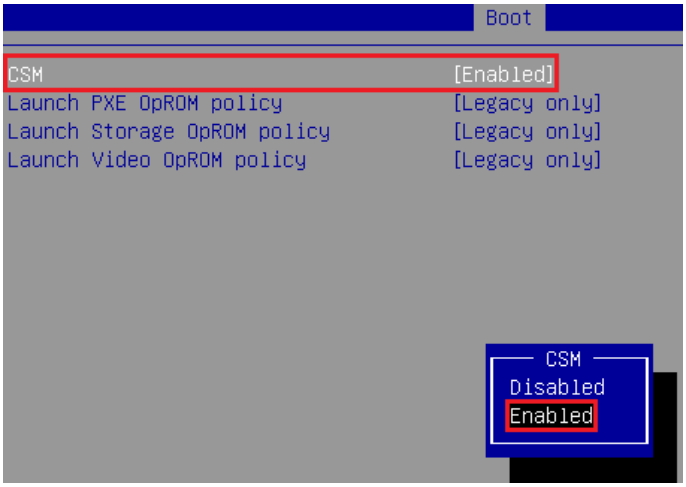
Topic 2.How do I update the LVDS Chrontel firmware?

Please follow the steps below to update the LVDS Chrontel firmware.

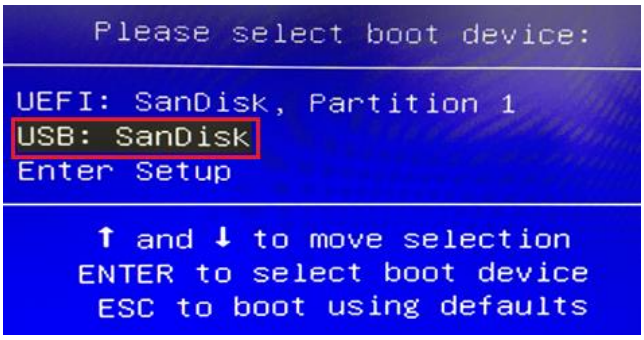
1. Extract the Chrontel firmware file and save to the root directory of bootable DOS USB drive.
2. Under the BIOS, please adjust “Active LVDS” and “CSM” to [Enabled], and then press F10 to save and exit.
   (Path: BIOS > Advanced > Chipset Configuration > Active LVDS [Enabled])



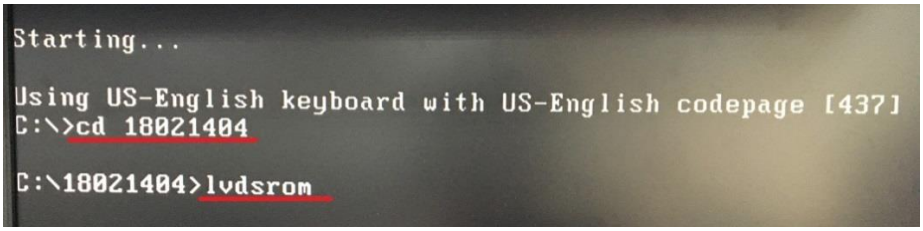
(Path: BIOS > Boot > CSM (Compatibility Support Module) > CSM [Enabled])



3. When booting up system, press “F11” to enter into BIOS boot menu.
4. Select your USB type device to enter DOS environment.

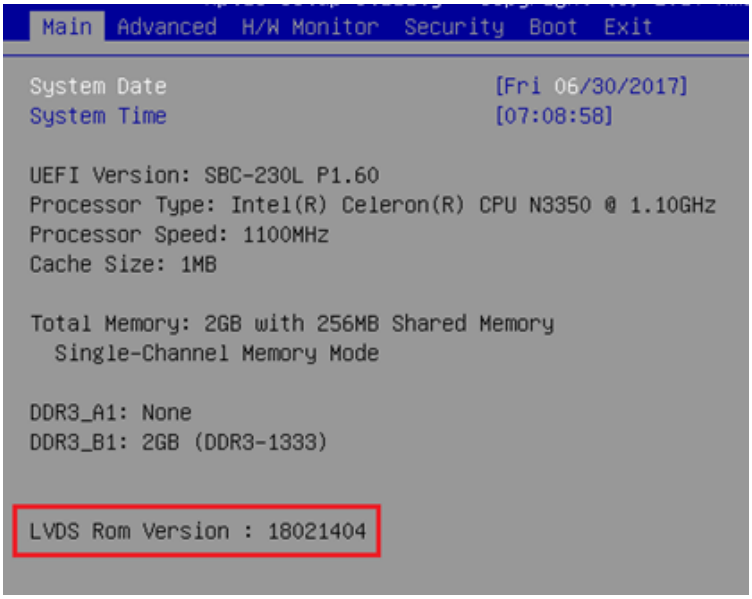


5. Under the DOS environment, please type “cd [folder name]” to enter into the folder, and then key in “lvdsrom” to execute Chrontel ROM flash.



6. After finishing the Chrontel ROM flash, you will see the following message: **CH7511B image flash finished**.

7. Reboot system and check if the LVDS Chrontel firmware is updated correctly on BIOS main screen.



Topic 3.How do I adjust the LVDS brightness?

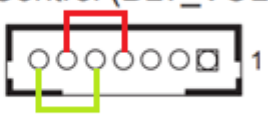
Please refer to Jumpers and headers setting guide and find Backlight Volume Control (BLT_VOL1) connector or BLT_CTL1 connector as follows firstly.

Short **LVDS1_BLUP** or **GPIO_BLT_UP** to GND for adjusting LVDS brightness up

Short **LVDS1_BLDW** or **GPIO_BLT_DW** to GND for adjusting LVDS brightness down

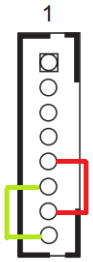
9 : Backlight Volume Control (BLT_VOL1)

PIN	Signal Name
1	GPIO_VOL_UP
2	GPIO_VOL_DW
3	PWRDN
4	LVDS1_BLUP
5	LVDS1_BLDW
6	GND
7	GND



17 : BLT_CTL1

PIN	Signal Name
1	CON_LBKLT_EN
2	CON_LBKLT_CTL
3	LCD_BLT_VCC
4	LCD_BLT_VCC
5	GND
6	GND
7	GPIO_BLT_UP
8	GPIO_BLT_DW



Chapter 4: Ethernet

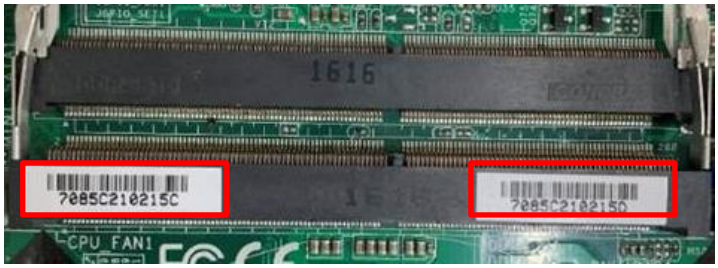
Topic 1. How to check the MAC address of my board?

There are two methods to check the MAC address.

Method A:

Confirm the MAC address by the sticker on the LAN port, DIMM slot or the edge of motherboard.

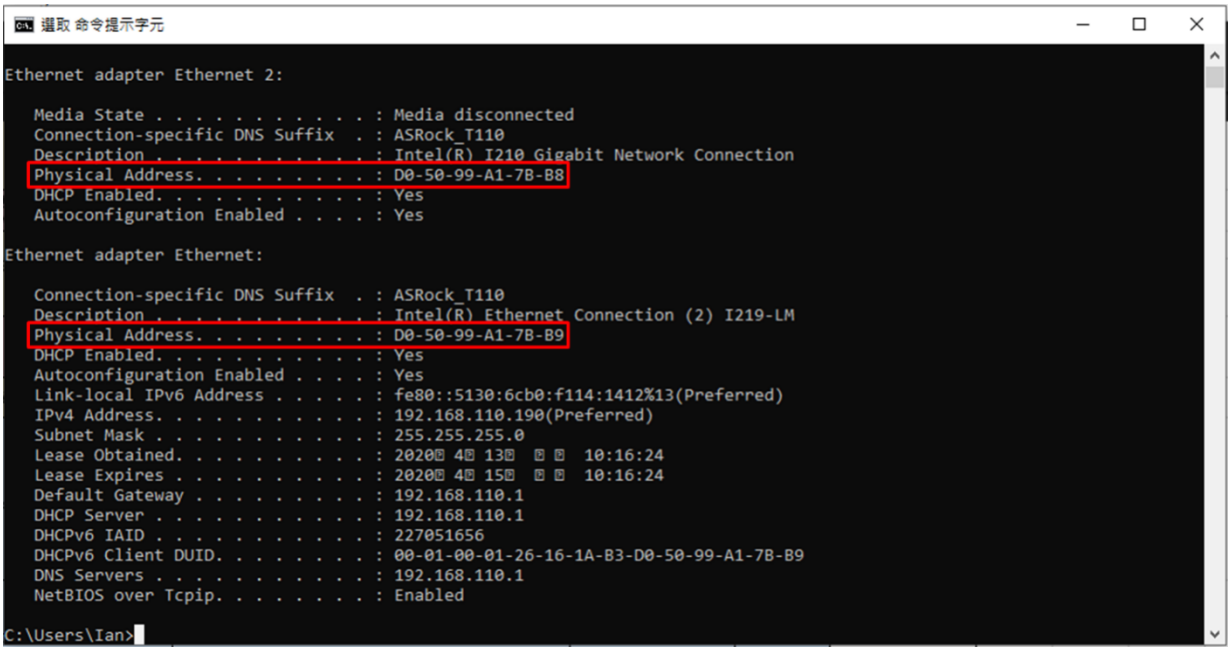
The MAC address is a 12-digit number. Here is the sample for your reference.



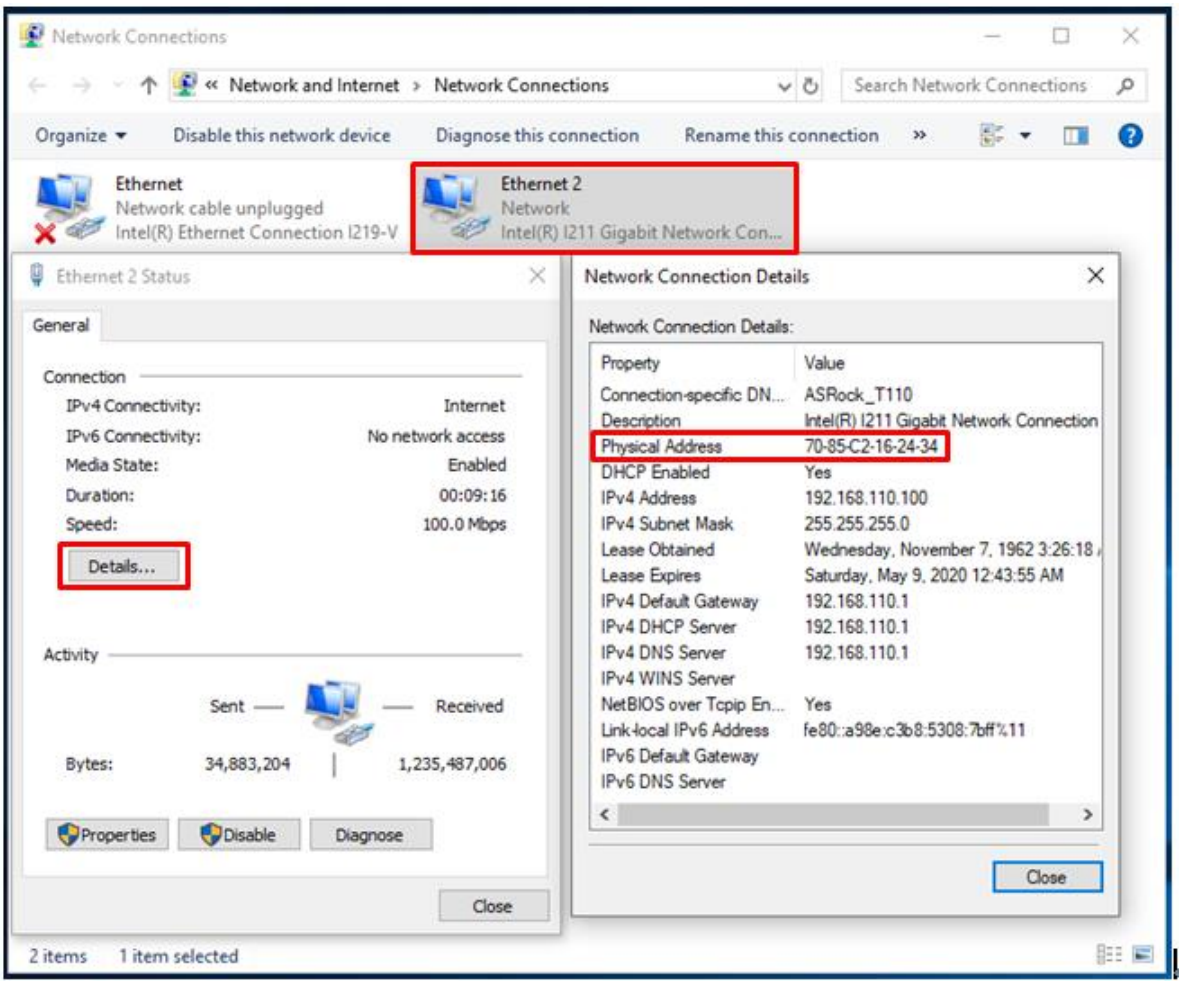
Method B:

Confirm the MAC address under OS.

1. Execute CMD and key in command “ipconfig /all”, and check the physical address below.



2. You could also confirm the MAC address from Network Connections. Double click the corresponding Ethernet and press “Details” to check the Physical Address below.



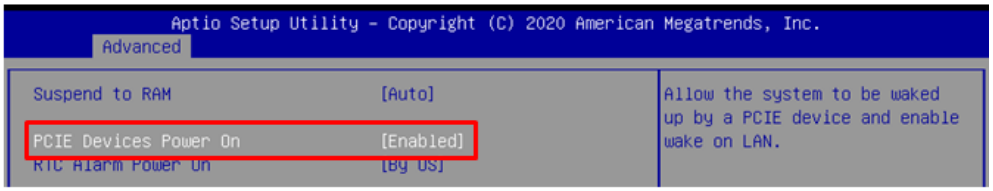
Topic 2. How to test Wake on LAN function?

Please follow the steps below to setup wake on LAN function.

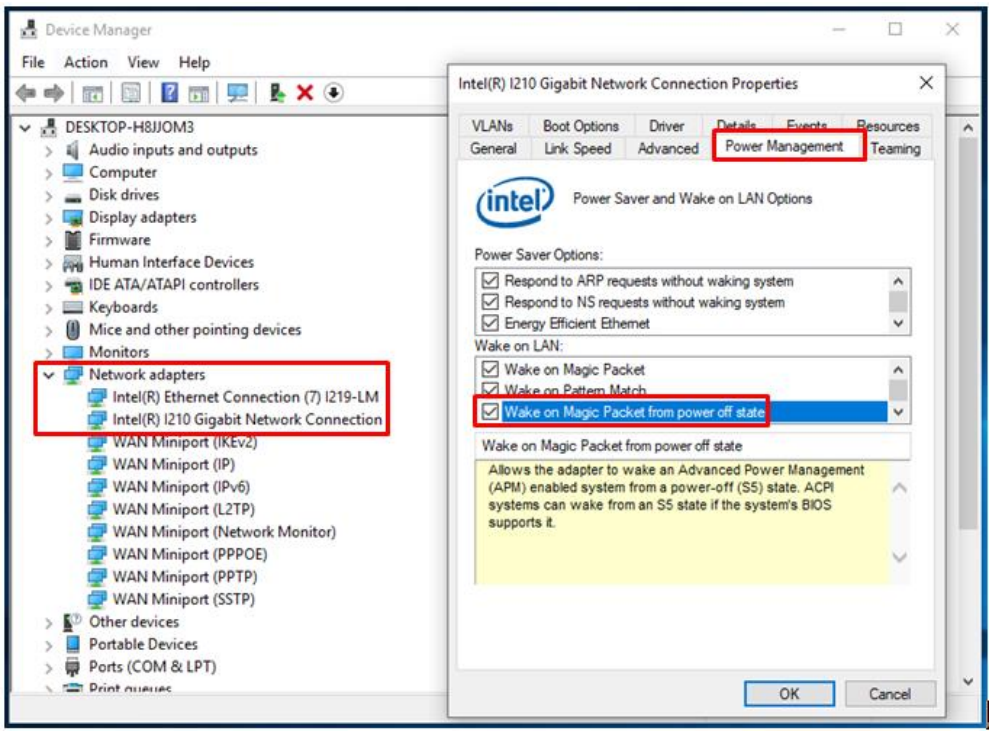
1. Connect the LAN cables from server system to client system.

< Step 2 to Step 5 setting for Client system >

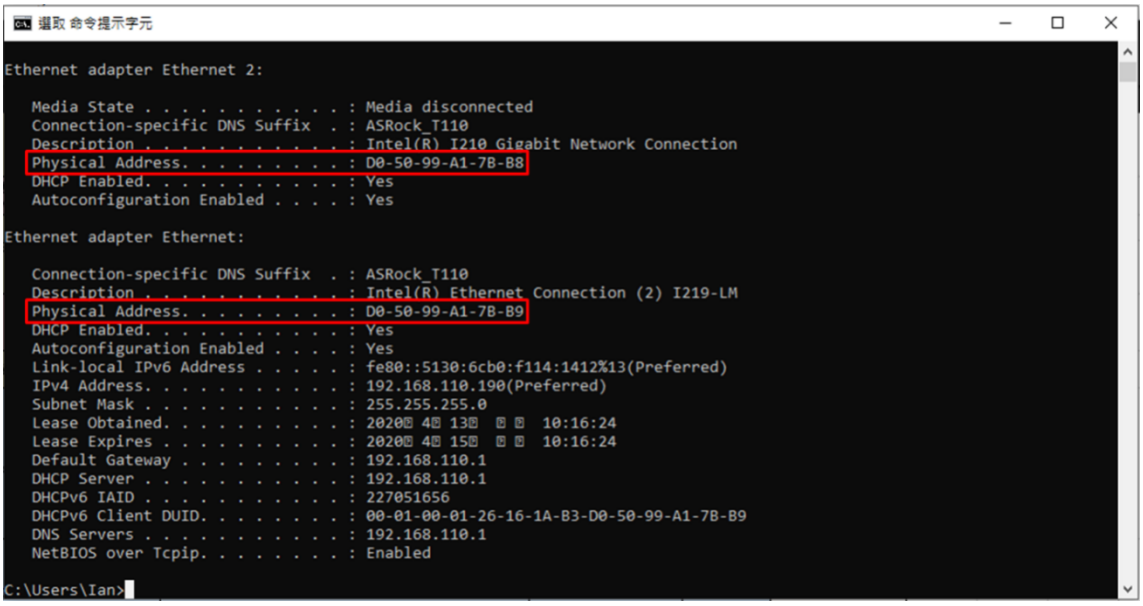
2. Enabled “PCIE Device Power On” under BIOS.
   (Path: BIOS > Advanced > ACPI Configuration > PCIE Device Power On)



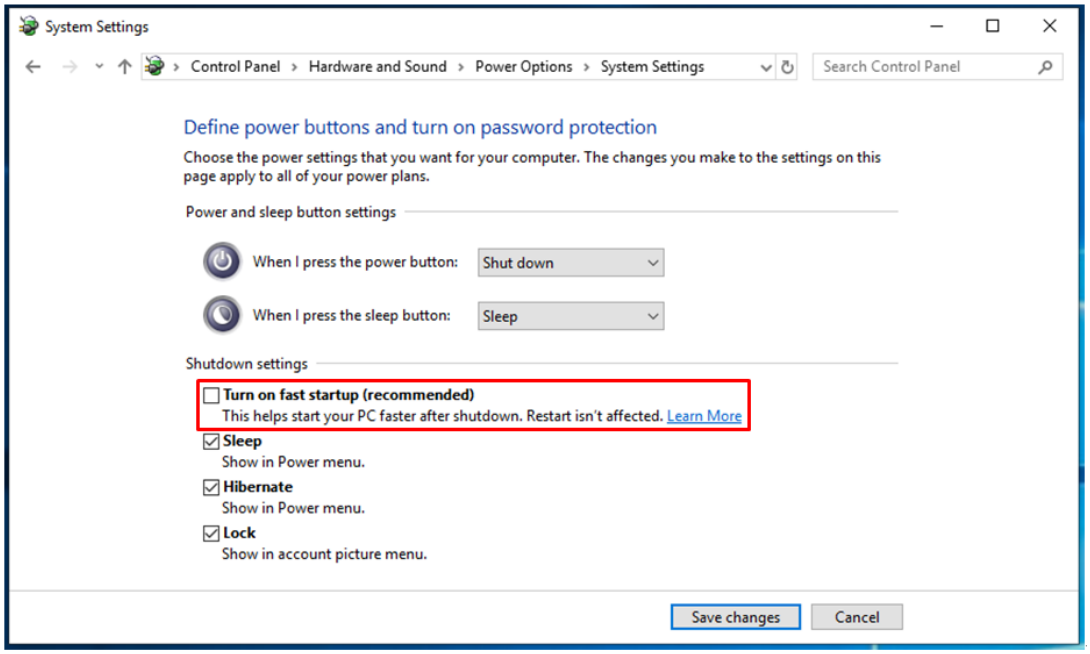
3. Enter to OS and enabled “Wake on Magic Packet from power off state” under device manager.
   (Path: Device Manager > Network adapters > Intel LAN controller > Power Management)



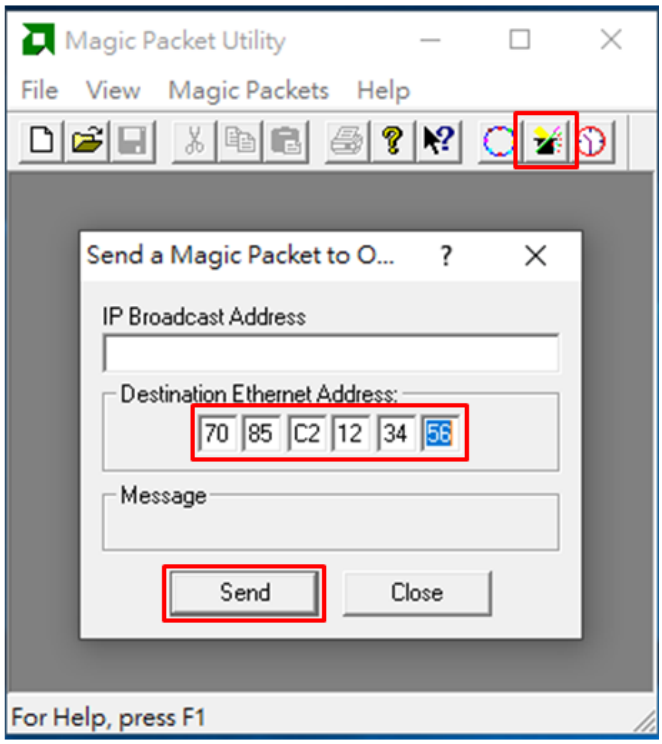
4. Execute Command Prompt and key in “ipconfig /all” to check the MAC address as following picture.



5. Disable Turn on fast startup and turn off the system.
   (Path: Control Panel > Hardware and Sound > Power Options > System Settings)



6. On server system, execute Magic Packet Utility and key in the MAC address (client), and press [Send] to wake up the client system.

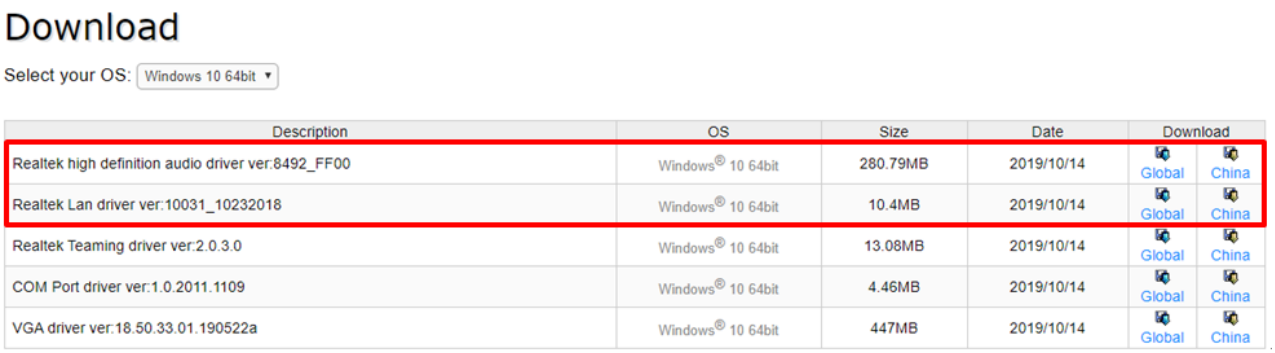


Topic 3. The Realtek LAN teaming function doesn't work under Window 10 successfully. How do I do?

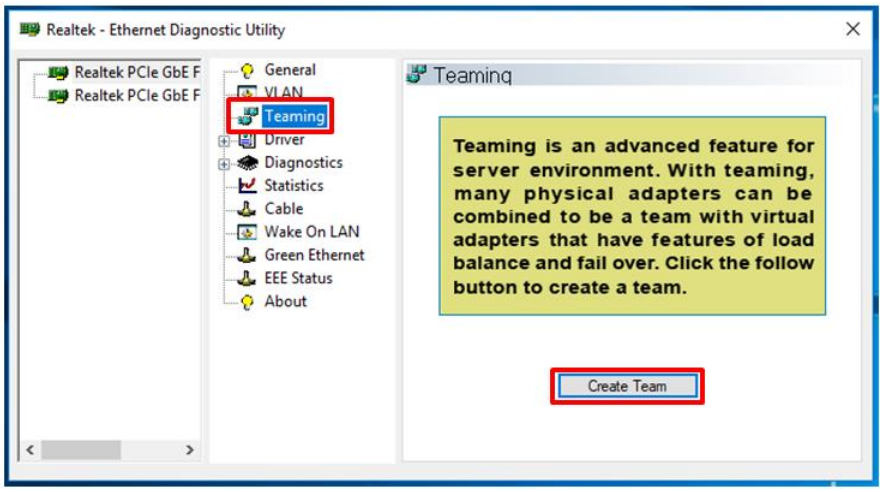
To support Realtek LAN teaming function, please confirm your motherboard support 2 Realtek LAN controller.

Please follow the steps below to setup the Realtek LAN teaming function.

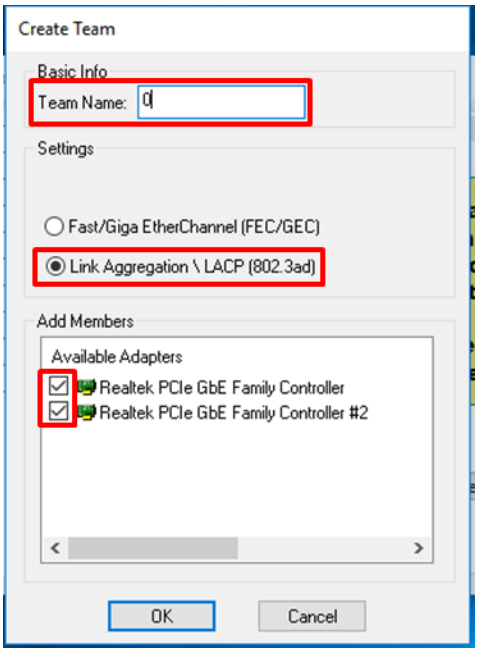
1. Install the corresponding Realtek LAN driver and Realtek Teaming driver from ASRockind website.



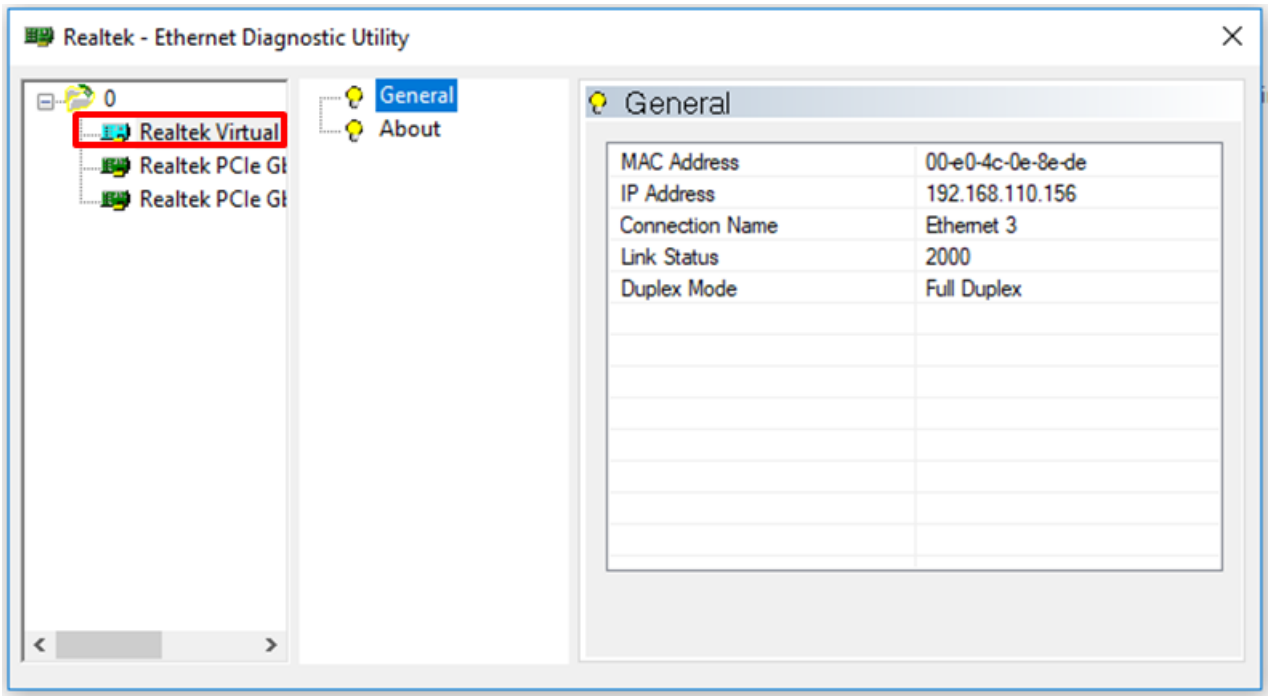
2. Execute “Realtek Ethernet Diagnostic Utility”, and press “Create Team” on Teaming page.



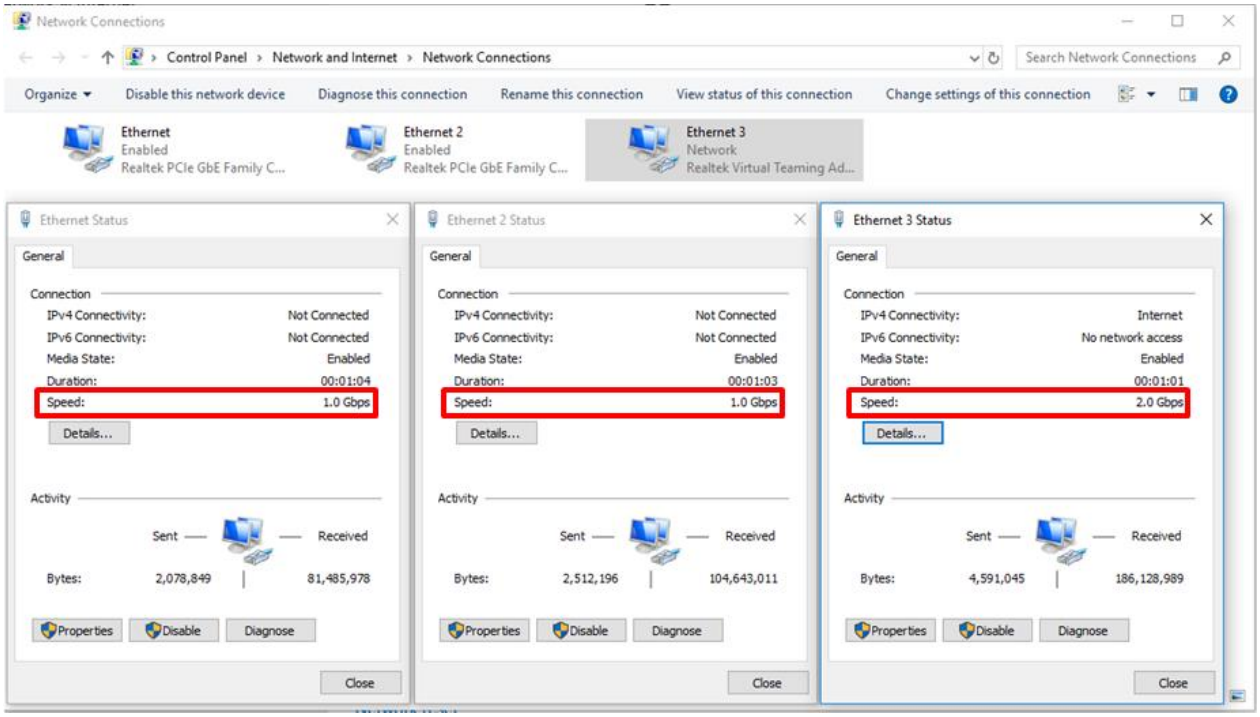
3. Key in the Team Name, select “Link Aggregation \ LACP (802.3ad)” and choose both of Realtek controllers, then press OK.



4. Realtek Virtual Teaming Adapter will show on catalog once teaming process is completed.

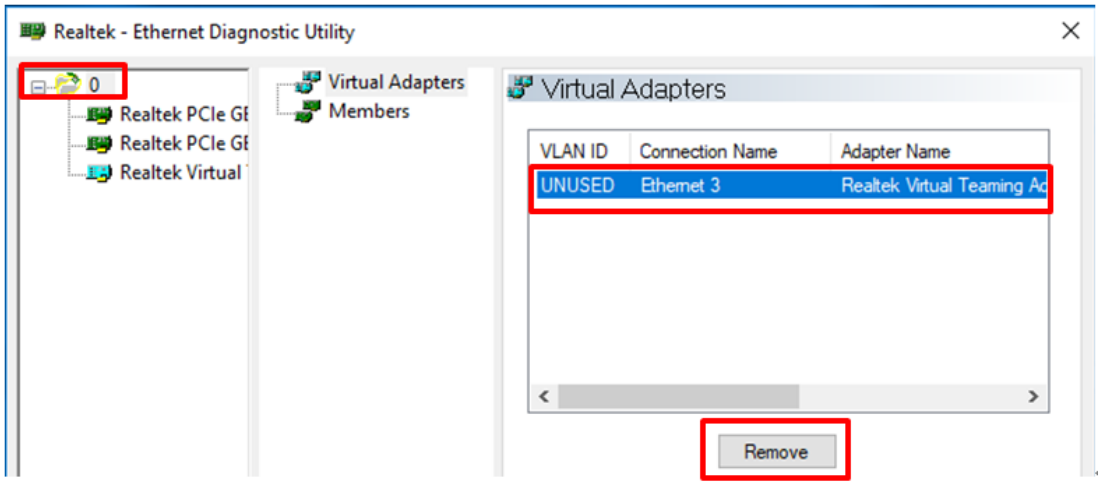


5. To check the Link Aggregation function works, the Ethernet 3 speed will be the sum of Ethernet and Ethernet 2 (1.0 Gbps + 1.0 Gbps = 2.0 Gbps).

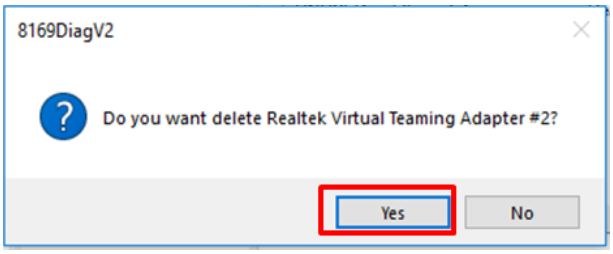


If you would like to remove the teaming function, please refer to the following steps.

1. Execute “Realtek Ethernet Diagnostic Utility”.
2. Select the Ethernet 3 under your teaming folder, and press “Remove”.



3. Press “Yes” to remove the teaming adapter.



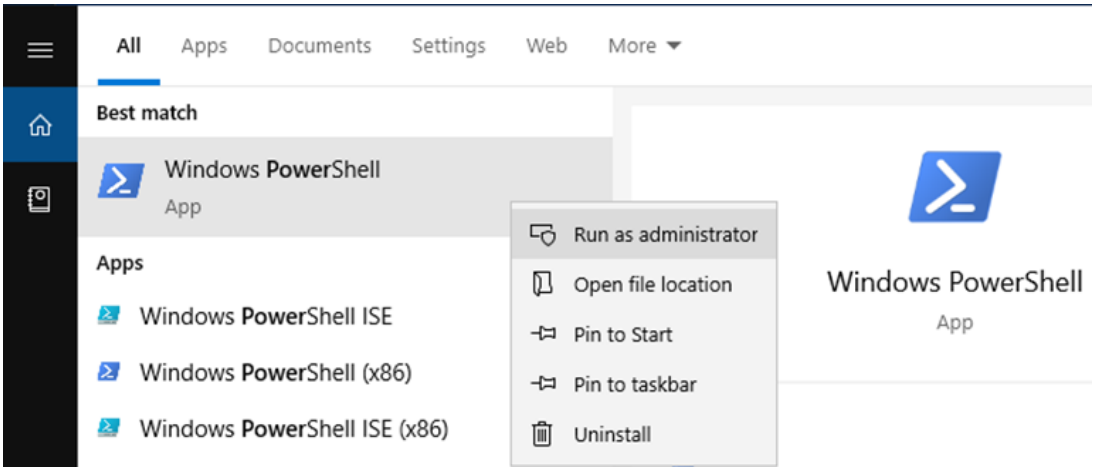
Topic 4. The Intel LAN teaming function doesn't work under Window 10 successfully. How do I do?

To support Intel LAN teaming function, please confirm your motherboard support 2 Intel LAN controller. Please follow the steps below to setup the Intel LAN teaming function.

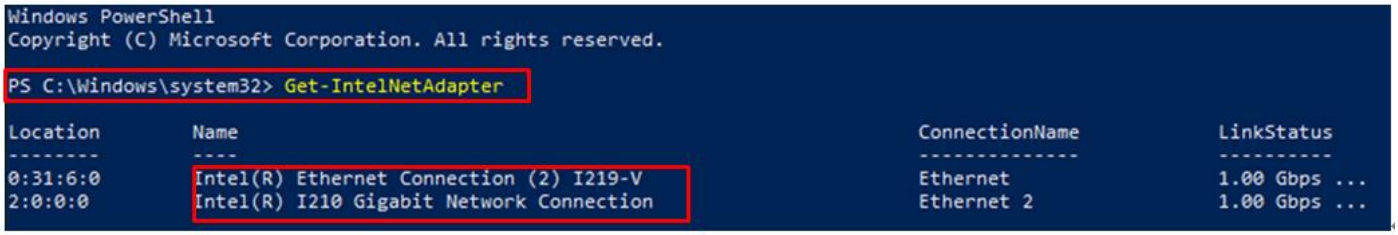
1. Please refer to the table below to install the corresponding Intel LAN driver from Intel official website. https://downloadcenter.intel.com/download/25016/Ethernet-Intel-Network-Adapter-Driver-for-Windows-10

Windows Version	LAN driver version
RS1	v22.1 or newer
RS2	v22.3 or newer
RS3	v23.2 or newer
RS4	v23.4 or newer
RS5	v23.5.2 or newer

2. Under OS environment, run Windows PowerShell as administrator.



3. Key in “Get-IntelNetAdapter” to confirm the name of the Intel Ethernet Adapter.

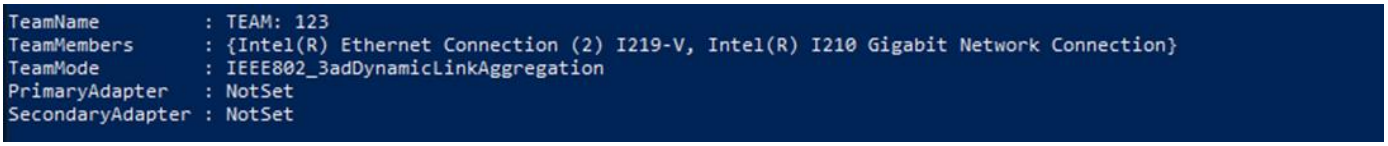


4. Key in “New-IntelNetTeam” to build teaming function.
5. Key in the name of Intel Ethernet Adapter which you would like to build the teaming function in TeamMemberNames.
6. Key in the teaming type you want to build in TeamMode. Here is the list of teaming type.

- AdapterFaultTolerance
- IEEE802_3adDynamicLinkAggregation
- AdaptiveLoadBalancing
- StaticLinkAggregation
- SwitchFaultTolerance
- VirtualMachhineLoadBalancing

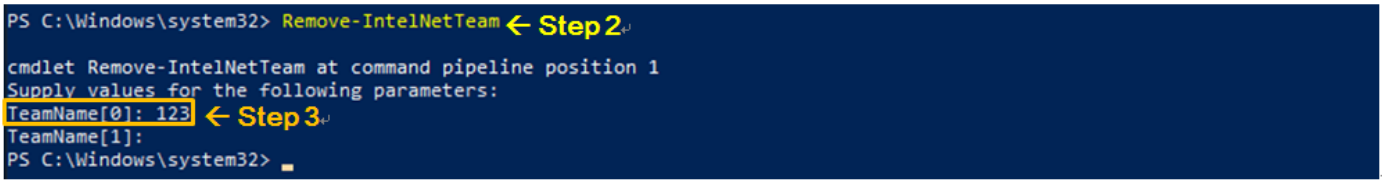
7. Key in the name of teaming in TeamName.

8. Once you see the information below, teaming process completed.



If you would like to remove the teaming function, please refer to the following steps.

1. Under OS environment, and run Windows PowerShell as administrator.
2. Key in “Remove-IntelNetTeam”.
3. Key in the name of teaming in TeamName.
4. Once you see the information below, teaming removing process completed.



Chapter 5: USB

Overview

USB(Universal Serial Bus) is an industry standard that establishes specifications for cables, connectors, protocols for connection, communication and power supply between computers and external device, peripherals or other computers.

The transmission interfaces of most external device are different on early period.
For example: the printer only connects to computer via LPT port; Keyboard and mouse only connect to computer via PS/2 port.

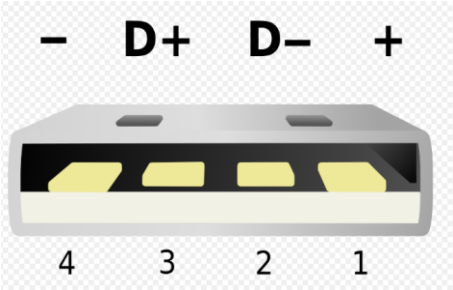
Therefore, USB was designed to standardize the connection of peripherals to personal computers. It has largely replaced interfaces such as serial ports and parallel ports, and has become popular on a wide range of devices. Examples of peripherals that are connected via USB include computer keyboards, mouse, video cameras and printer.

Specification

USB version			USB icon	Transfer rate
Current official version		Original name		
USB 2.0	Low Speed	USB 1.0		1.5Mbps
	Full Speed	USB 1.1		12Mbps
	Hi Speed	USB 2.0		480Mbps
USB 3.2	Gen 1 SuperSpeed USB	USB 3.0		5Gbps
	Gen 2x1 SuperSpeed USB+	USB 3.1		10Gbps
	Gen 2x2 SuperSpeed USB++	USB 3.2		20Gbps

Pin Definition and Assignment

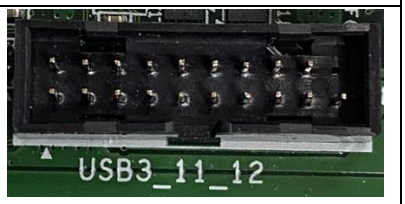
Two for power (+5V and Ground) and two for differential data signals (Data+ and Data-).



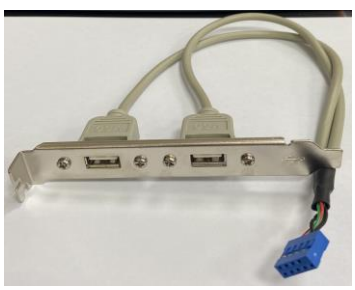
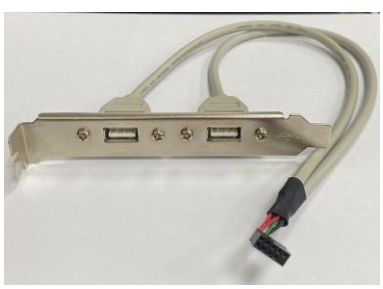
Pin 1	Vcc (+5V)
Pin 2	Data–
Pin 3	Data+
Pin 4	Ground

USB Types Supported by ASRockind

Connector type

Standard USB ports (Rear I/O)	Internal USB 2.0 headers (2.54mm)	Internal USB 3.0 Header
		
	Internal USB 2.0 headers (2.00mm)	
		

Cable

USB cable for USB 2.0 headers (2.54mm)	USB cable for USB 2.0 headers (2.00mm)	USB cable for USB 3.0 headers
		

Topic 1.What is the difference between the +5V and +5VSB (Standby) power output provided via the USB port?

If the USB port on the motherboard uses +5V output, the USB port will not reserve any power output for external device after system shutdown. However, USB +5VSB (Standby) power can provide USB device power after system power off.

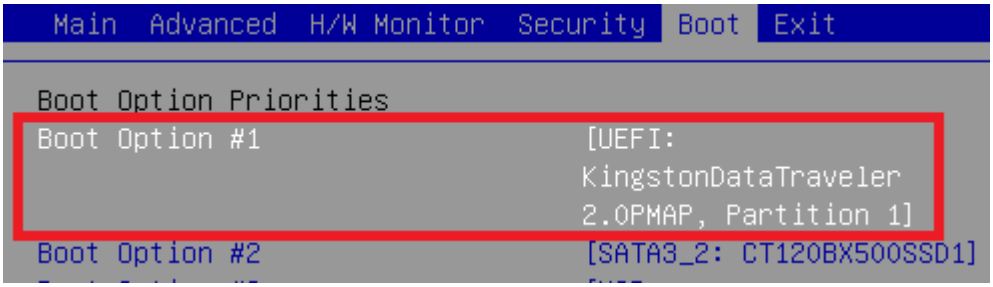
If you would like to disable USB standby power, please refer to Topic 3 in this chapter to achieve it.

Topic 2. How to let the system boot from the USB device?

All ASRockind products support boot from the USB device function.

Please refer following steps to do the settings:

1. After plugged your USB bootable device and boot up the M/B, press Del / F2 to enter to BIOS setup menu.
2. Select boot page to adjust CSM option to enable for Legacy device, or disable for UEFI device.
3. Set your USB device at the first boot priority on Boot page below:



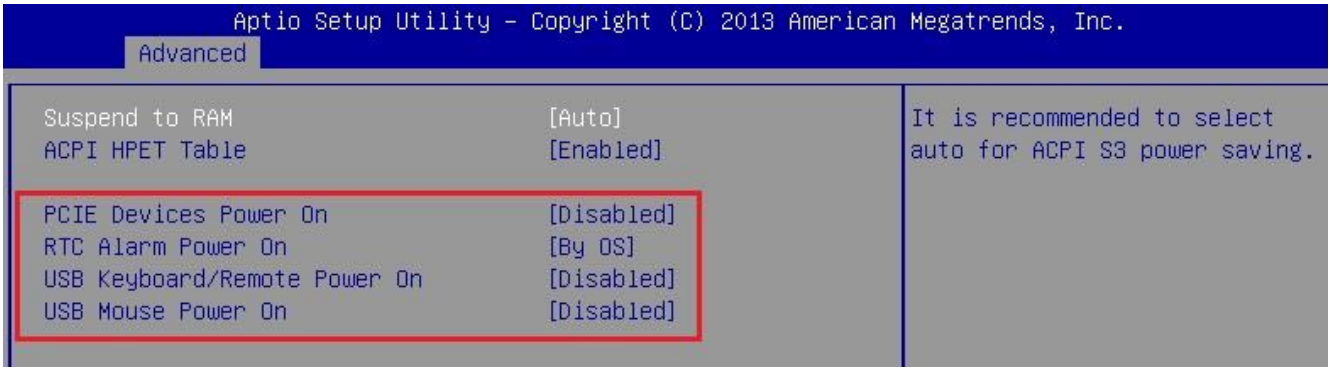
4. Press F10 to save and exit the BIOS setup menu.
5. System will boot up via this USB bootable device after reboot.

Topic 3. How do I cut off the power of USB port after I shut down my system?

Please refer the following steps to disable USB standby power.

1. Boot up the system and press Del or F2 to enter BIOS.
2. Adjust Deep Sleep to [Enable]
   (Path: BIOS> Advanced> Chipset configuration)

Note: To disable USB standby power, ACPI power on settings must be disabled.
(Path: BIOS> Advanced> ACPI Configuration)

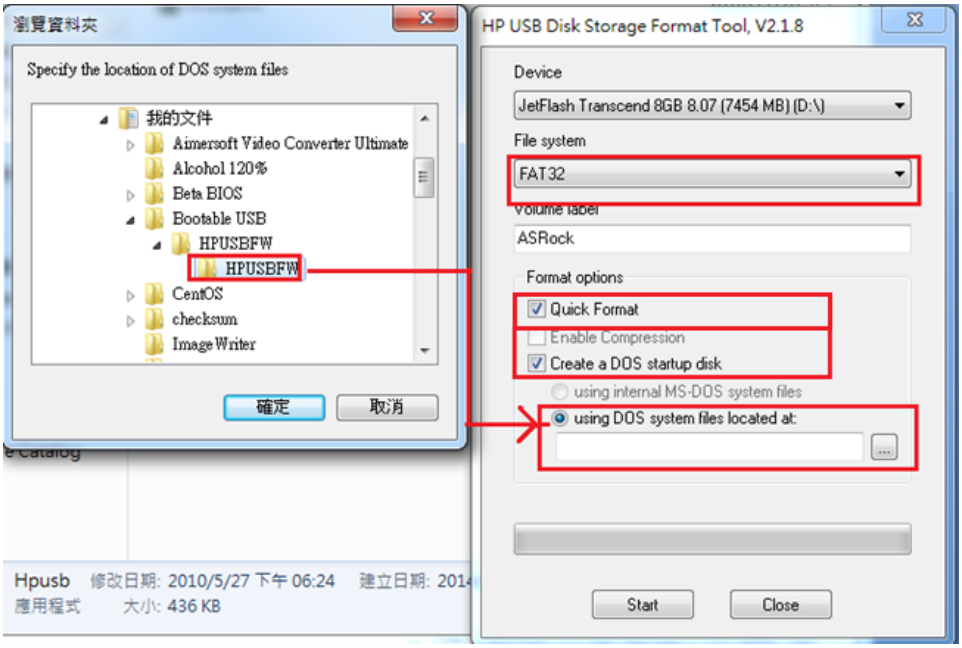


Chapter 6: Storage

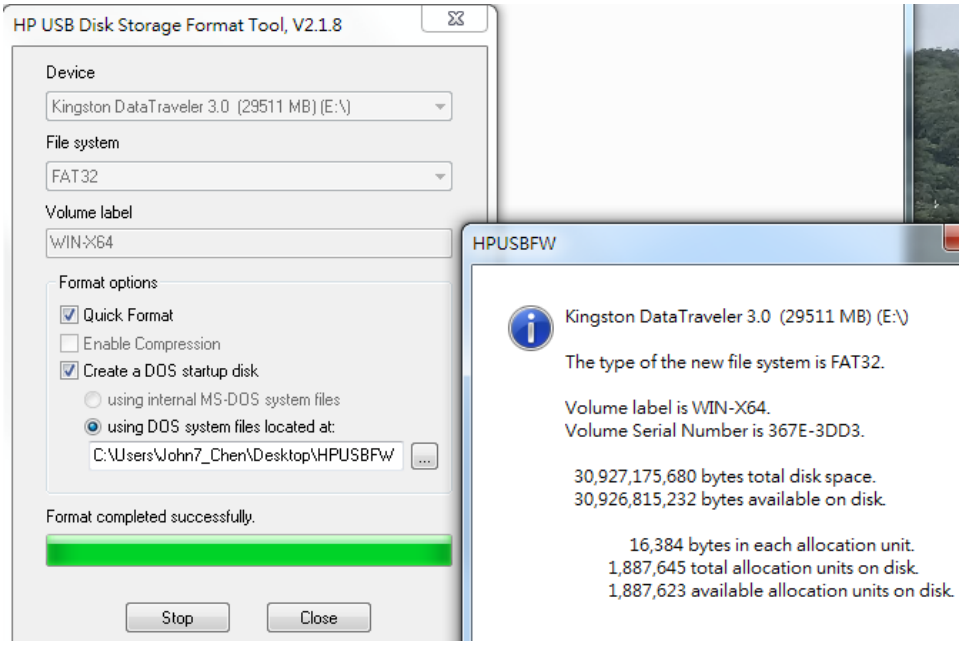
Topic 1.How do I make a DOS bootable USB stick via HP USB Disk Storage Format Tool?

Please follow the steps below to make a bootable USB stick.

1. Prepare a USB stick.
2. Download “HPUSBFW” and “Hpusb” file from following link and extract the each file.
   https://download.asrock.com/TSD/FAQ/Hpusb.rar
   https://download.asrock.com/TSD/FAQ/HPUSBFW.zip
3. Execute “Hpusb.exe” by administrator.
4. Select your USB device and do the setting below.
   - Select “FAT32” type in File system
   - Enable “Quick Format” and “Create a DOS startup disk” in Format options
   - Click “using DOS system files located at:” and choose HPUSBFW folder.



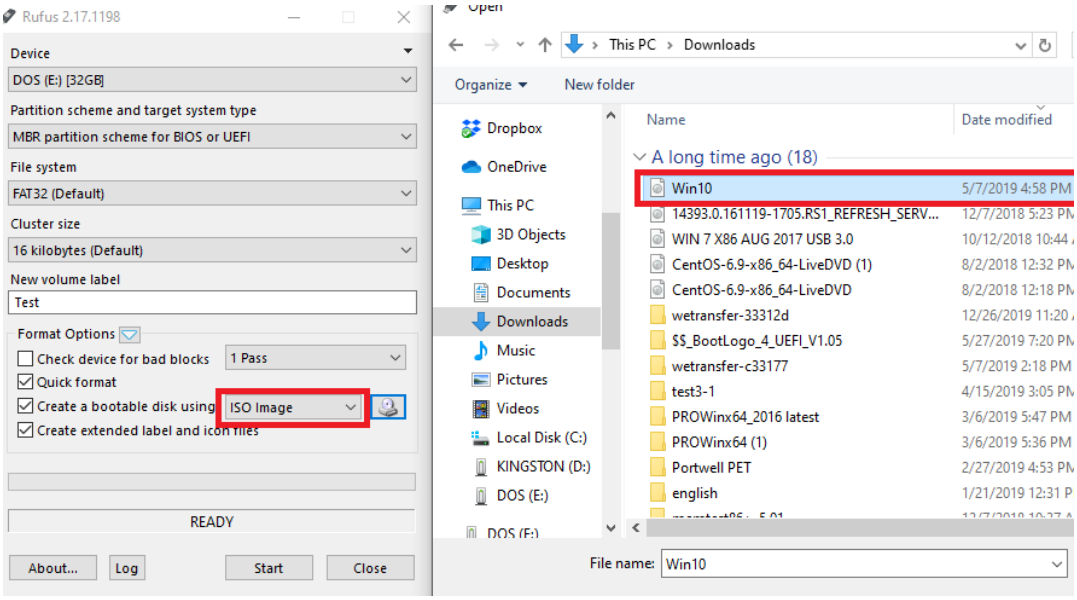
5. Please press “Start” to execute it.
   When you see the following screen, the bootable USB stick has been done successfully.



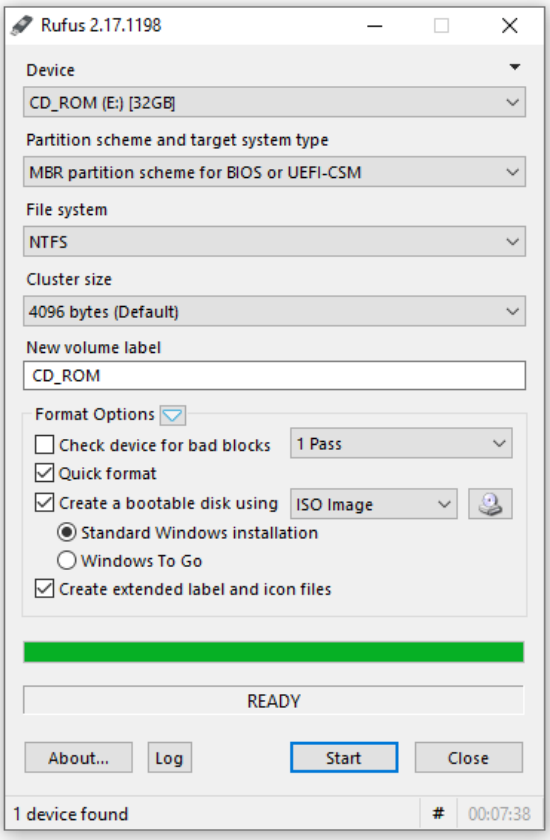
Topic 2.How to make an installation OS USB stick?

Please follow the steps below to make an installation OS USB stick.

1. Prepare a USB stick.
2. Download “rufus” tool from following link and extract it.
   https://download.asrock.com/TSD/FAQ/rufus-2.17.zip
3. Execute “rufus.exe” by administrator.
4. Please select your USB device and do the setting below.
   - Click “Create a bootable disk using”
   - Select “ISO image” and choose OS image file.
   - Press “Start” to execute it.



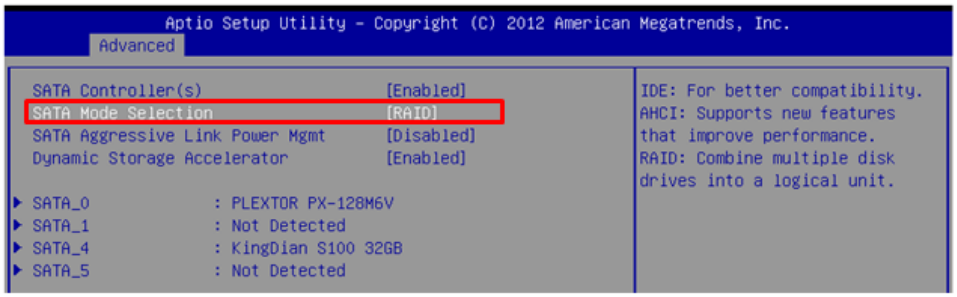
When you see the following screen, the OS USB stick has been done successfully.



Topic 3. Configuring SATA Hard Drive(s) for RAID

Please follow the steps below to setup RAID.

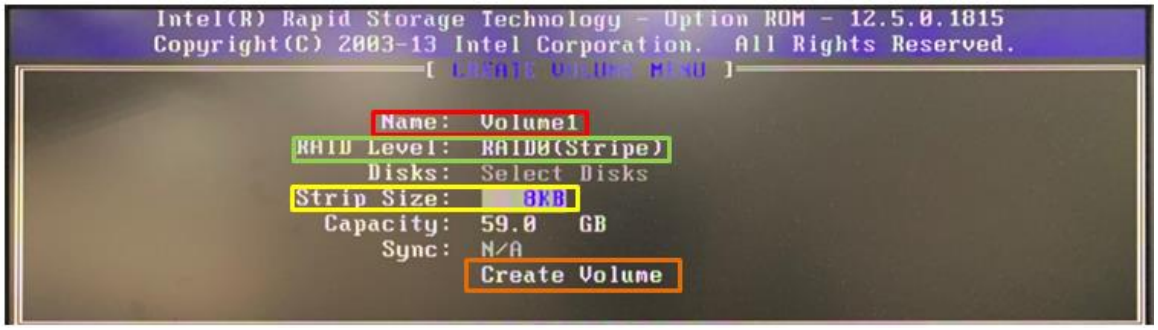
1. Prepare at least 2 HDD and install on the motherboard.
2. Boot up the system and press F2 or Delete to enter BIOS setup.
3. Set the SATA Mode Selection at [RAID] and press F10 to save and reboot the system.
   (Path: BIOS > Advanced > Storage Configuration > SATA Mode Selection)



4. Press <Ctrl + I> to enter into RAID option ROM setup.
5. Choose [Create RAID Volume] and setup the following items :

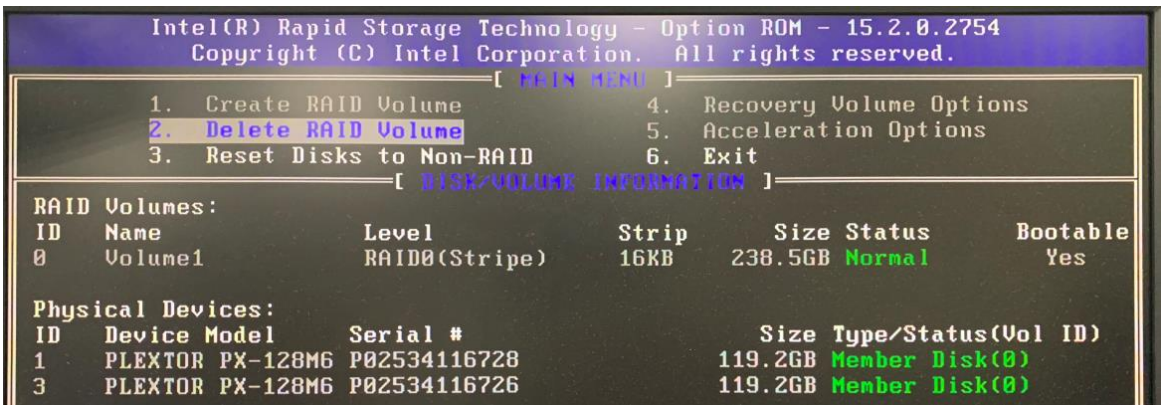
- Name : key-in a unique name with 1-16 letters for your RAID volume
- RAID Level : select your desired RAID Level
- Strip size : If you configure SATA HDD for RAID0 (Stripe), select the RAID0 array.

After you finish typing the above items, press “Create Volume”.



The utility will prompt a confirmation message as below, press Y to setup RAID.

6. After the completion, you will see the detailed information about the RAID that you setup.



Chapter 7: OS

Overview

An operating system (OS) is system software that manages computer hardware and software resources and provides common services for computer programs. The operating system is a component of the system software in a computer system. Application programs usually require an operating system to function.

Topic 1.How to make a Windows 7 install USB drive for Braswell and Skylake platform

We provide ASRock USB Patcher for customer to pack the USB driver into ISO image.
Please kindly refer to following link to achieve it.
https://www.asrock.com.tw/microsite/Win7Install/index.html

Topic 2.Why I cannot install VGA driver on the Skylake platform under Windows 7?

Intel stops its support for Windows7 since 7th Gen KabyLake CPU.
7th Gen KabyLake CPU only supports Window10 officially by Intel.
Please install Windows10 on your system or choose 6th Gen SkyLake CPU for Windows7.

Topic 3.I install 4GB memory on Intel Skylake platform, but the usable memory size is only 2GB under Windows 7 32-bit OS. How do I increase the usable memory size?

Due to the limitation of Windows 7 32-bit operating systems, the maximum of usable memory size is less than 4GB natively. To increase usable memory under Windows 7 32-bit OS on Intel Skylake based systems, please adjust [Top Of Lower Usable Dram] to [3.5GB] and then check the usable memory size again.
(Path: BIOS/ Advanced/ Chipset configuration/ Top Of Lower Usable Dram)

Topic 4.Suggest Linux OS for each platform

Linux is a family of open source Unix-like operating systems based on the Linux kernel, and it was assembled under the model of free and open-source software development and distribution.
If you would like to install Linux OS on your M/B, please refer to the table below to choose the suitable Linux kernel version.

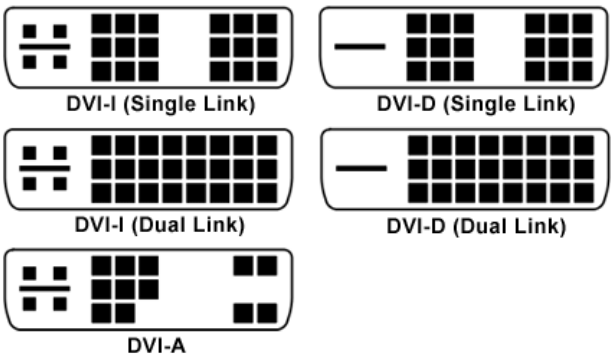
Platform	Suggested Linux kernel version
Bay trail	3.12 or later version
Braswell	3.14 or later version
Apollo lake	4.6 or later version
Gemini lake	4.11 or later version
Ivy Bridge	3.1 or later version
Haswell	3.x or later version
Skylake	4.3 or later version
Kabylake	4.8 or later version
Coffee lake	4.14 or later version
Whiskey lake	4.18.0 or later version
AMD Ryzen™ Embedded	4.19.0 or later version

Chapter 8: Display

VGA (D-sub)

A Video Graphics Array (VGA) connector is a three-row 15-pin DE-15 connector. The 15-pin VGA connector was provided on many video cards, computer monitors, laptop computers.
VGA connectors and cables carry analog component RGBHV (red, green, blue, horizontal sync, vertical sync) video signals, but it could not carry audio channels.

DVI

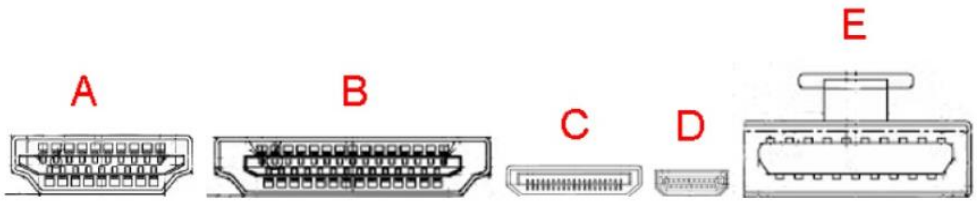


Digital Visual Interface (DVI) is a video display interface developed by the Digital Display Working Group (DDWG). This interface is designed to transmit uncompressed digital video and it supports multiple modes, such as DVI-A (analog only), DVI-D (digital only) or DVI-I (digital and analog).

HDMI

HDMI (High-Definition Multimedia Interface) is designed for audio/video interface in order to transmit uncompressed video data and compressed or uncompressed digital audio data from an HDMI-compliant source device, such as a computer monitor or digital television.

There are five HDMI connector types as following pictures.
Type A (**most common**) and Type B are defined in the HDMI 1.0 specification.
Type C (mini HDMI) is defined in the HDMI 1.3 specification
Type D (micro HDMI) and type E (general for Automotive Connection System) are defined in the HDMI 1.4 specification.



Display Port (DP)

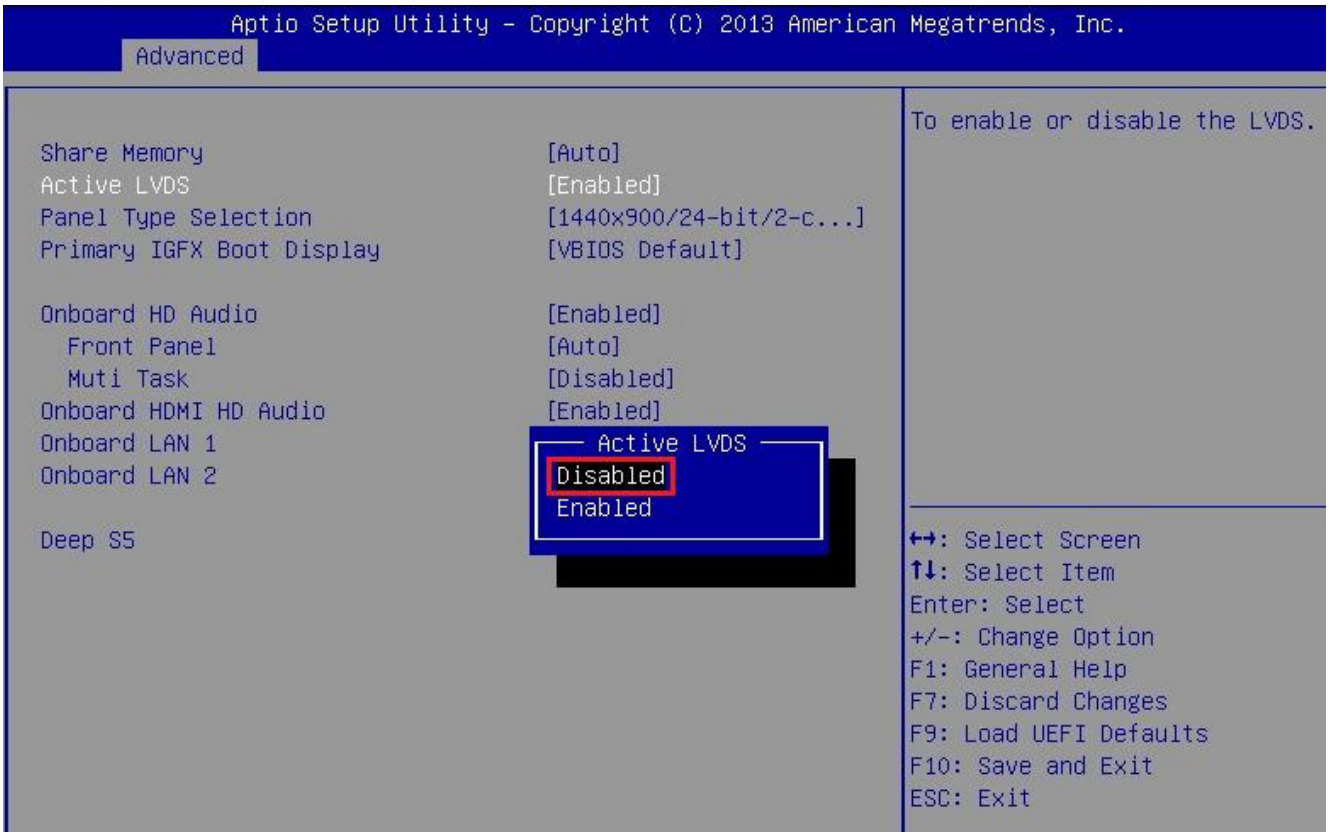
DisplayPort (DP) is a digital display interface and it is standardized by the Video Electronics Standards Association (VESA). The interface is mainly used for connecting a video source to a display device such as a computer monitor, and it can also support the transmission of audio data.

Topic 1.I connect one monitor via VGA port, and it only outputs under BIOS, but not DOS environment. How do I fix it?

Under DOS environment, it only supports one display output.

Because the first output priority is LVDS as BIOS default setting, please set “Active LVDS” to [disabled] on BIOS.

(Path: BIOS > Advanced > Chipset Configuration > Active LVDS)



After pressing F10 to [Save and Exit], the monitor can output properly under DOS environment.

Chapter 9: Application

Topic 1.I'd like to set the system to automatically boot up when switching AC power on. Should I set jumper at [AT mode] and Restore from AC power loss at [Power on] at the same time?

No, please choose only one of the methods at a time.

There are two methods to achieve it: one is set H/W jumper at [AT mode], and the other is to set Restore from AC power loss at [Power on] in BIOS setup.

[AT mode] is controlled by H/W circuit design, and [Restore from AC power loss] is controlled by chipset register. Please do not use them at the same time; otherwise, unexpected errors may occur.

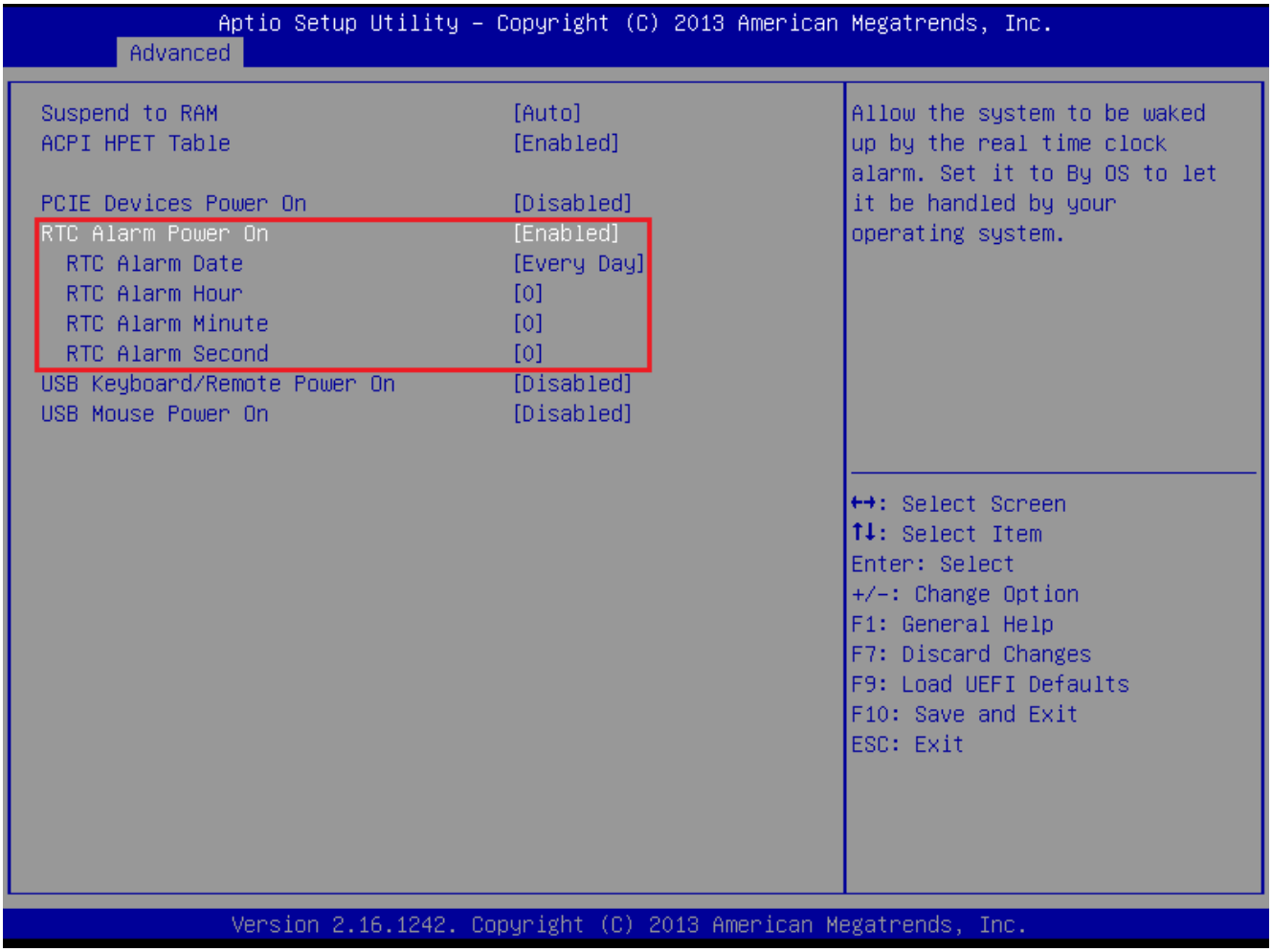
Topic 2.Is it possible to wake up motherboard regularly at specific time? How do I adjust?

The BIOS of ASRock industrial motherboard is able to setup the [RTC Alarm Power On].

Please enable [RTC Alarm Power On] under BIOS to set the regular wake up time.

(Path: BIOS > Advanced > ACPI Configuration > RTC Alarm Power On)

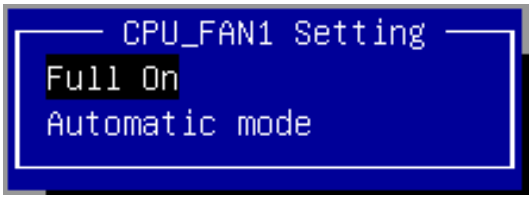
After enabling the BIOS option, you can setup the specific time to wake up the M/B.



Topic 3.I would like to adjust the CPU/CHA fan speed. How do I do?

Please follow the steps below to adjust the fan speed.

1. Please boot up the system and press F2 or Delete to enter BIOS setup.
2. Please enter to H/W Monitor page to set CPU_FAN1 Setting, there are two modes for you to choose: (Path: BIOS > H/W Monitor > CPU_FAN1 Setting)

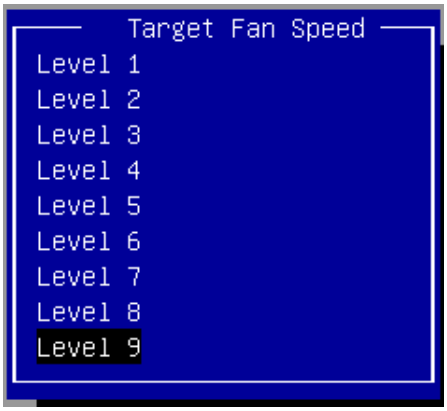


Automatic Mode:

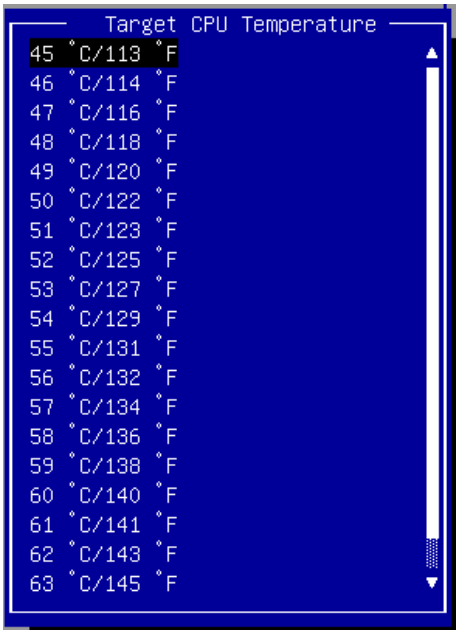
You can adjust the “Target CPU Temperature” and “Target Fan Speed” manually.

Target Fan Speed: There are Level 1~9 options with corresponding fan speed.

(Level 1 is lowest fan speed, level 9 is highest fan speed.)



Target CPU Temperature: Set a target CPU temperature between 45~65℃.

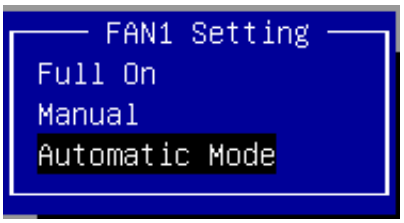


If CPU temp is lower than target temp, the fan will run at target fan speed.
If CPU temp is higher than target temp, the fan will run at maximum fan speed.

For example, if set Target CPU temperature at 65℃ and Target Fan Speed at Level 5, the CPU fan run at level 5 fan speed before CPU temperature reaches to 65℃. Once CPU temperature is over 65℃, the CPU fan speed will run at maximum fan speed.

Full On:
The fan on motherboard always runs at maximum fan speed.

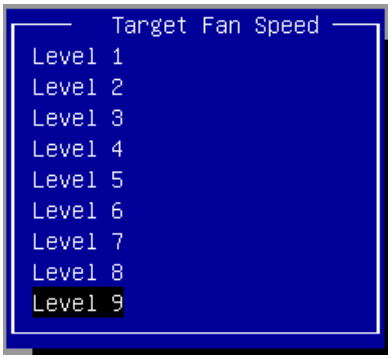
However, if your model is 4x4 R1000, 4x4 V1000, NUC-8265U, NUC-8365U, there are three modes for you to choose:



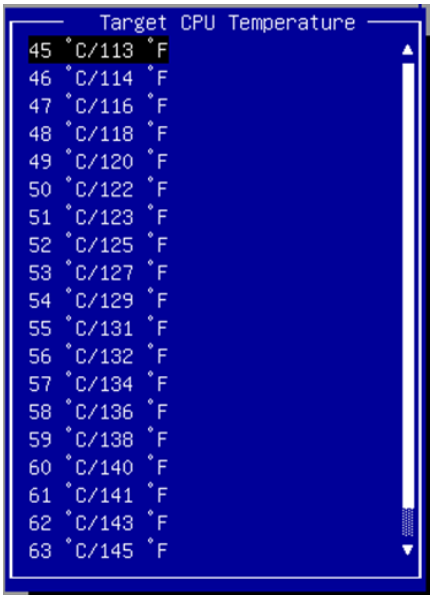
Automatic Mode:
The fan will adjust the fan speed based on the CPU temperature automatically.
If CPU temp < 50℃, the fan will run at lower fan speed.
If CPU temp = 50~80℃, the fan will adjust speed by CPU temperature automatically.
If CPU temp > 80℃, the fan will run at maximum fan speed.
Note: The actual setting value of CPU temp and fan speed depend on each model and BIOS version.

Manual:
You can adjust the “Target CPU Temperature” and “Target Fan Speed” manually.

Target Fan Speed: There are Level 1~9 options with corresponding fan speed.
(Level 1 is lowest fan speed, level 9 is highest fan speed.)



Target CPU Temperature: Set a target CPU temperature between 45~65℃.



If CPU temp is lower than target temp, the fan will run at target fan speed.
If CPU temp is higher than target temp, the fan will run at maximum fan speed.

For example, if you set Target CPU temperature at 65℃ and Target Fan Speed at Level 5, the CPU fan runs at level 5 fan speed before CPU temperature reaches to 65℃.
Once CPU temperature is over 65℃, the CPU fan speed will run at maximum fan speed.

Full On:
The fan on motherboard always runs at maximum fan speed.

Chapter 10: COM (Serial) port

Overview

COM port (serial port) is a serial communication interface through which information transfers in or out sequentially one bit at a time. On the contrary, the parallel port communicates multiple bits simultaneously in parallel. Examples of peripherals that are connected via COM port include Dial-up modems, Barcode scanners, Printers.

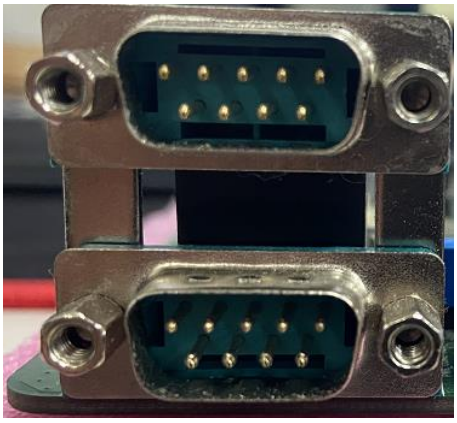
The term serial port usually identifies hardware compliant to the RS-232 standard and it intended to interface with a modem or with a similar communication device. It can also refer to hardware compliant to other standards, such as RS-485 and RS-422 which are often used in industrial settings

Pin Definition

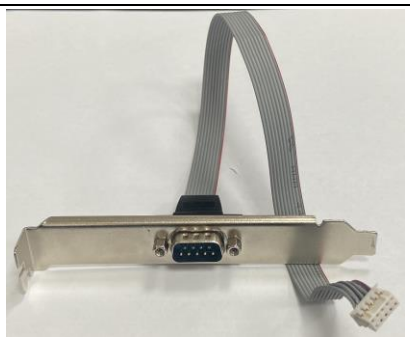
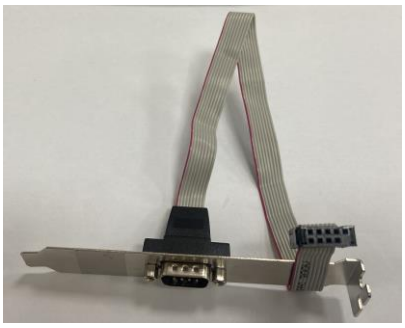
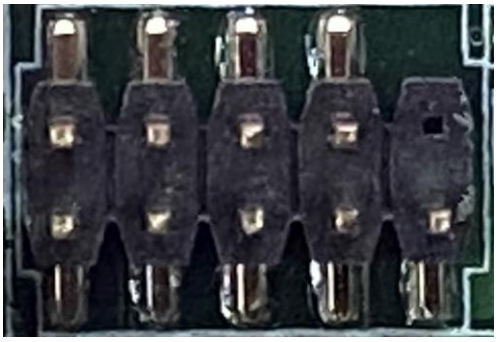
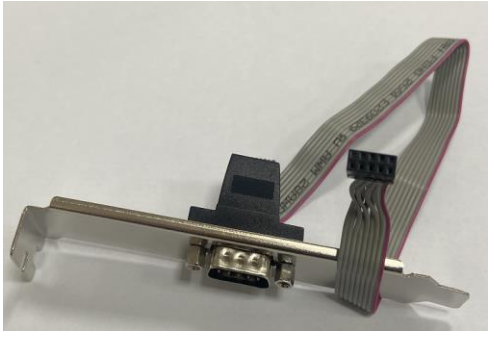
PIN	RS232	RS422	RS485
1	DCD, Data Carrier Detect	TX-	RTX-
2	RXD, Receive Data	RX+	N/A
3	TXD, Transmit Data	TX+	RTX+
4	DTR, Data Terminal Ready	RX-	N/A
5	GND	GND	GND
6	DSR, Data Set Ready	N/A	N/A
7	RTS, Request To Send	N/A	N/A
8	CTS, Clear To Send	N/A	N/A
9	No Power or 5V or 12V (Depend on model design)	PWR or N/A (Depend on model design)	PWR or N/A (Depend on model design)

COM (Serial) port Types Supported by ASRockind

Rear I/O Connector type

Standard COM ports (Rear I/O)


COM port header type and cable

Internal COM port headers (2.00mm)	COM port cable (2.00mm)
	
Internal COM port headers (2.54mm)	COM port cable (2.54mm)
	
Internal COM port headers (2.00mm) for following model: IMB-1210-D, IMB-1210-L, IMB-1211-D, IMB-1211-L, IMB-1212, IMB-1213	COM port cable (2.00mm) for following model: IMB-1210-D, IMB-1210-L, IMB-1211-D, IMB-1211-L, IMB-1212, IMB-1213
	

Topic 1. How do I know which COM port on my motherboard support RS422 and RS485, and how do I change the COM port mode?

Please follow the steps below and check which COM port support RS422 and RS485.

1. Find ASRockind official website and search your model.
   Take IMB-150 for example, you can check Rear I/O and Internal Connector, and there's only rear I/O COM port that supports RS422 and RS485.

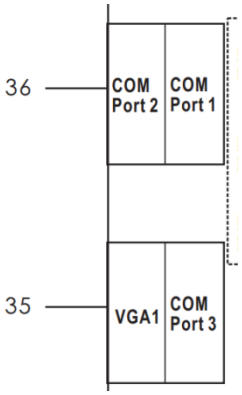
Rear I/O

VGA	- 1
DVI	- N/A
HDMI	- 1
DisplayPort	- 0
Ethernet	- 2
USB	- 2 x USB 3.0, 2 x USB 2.0
Audio	- 2 (Mic-in, Line-out)
Serial	- 3 x COM (RS-232/422/485)
PS2	- 2

Internal Connector

USB	- 2 x USB 3.0, 4 x USB 2.0
LVDS / inverter	- 1
VGA	- N/A
Serial	- 2 x COM (RS-232)
Parallel	- 1
GPIO	- 4 x GPI + 4 x GPO
SATA PWR Output	- 1
Speaker Header	- 1

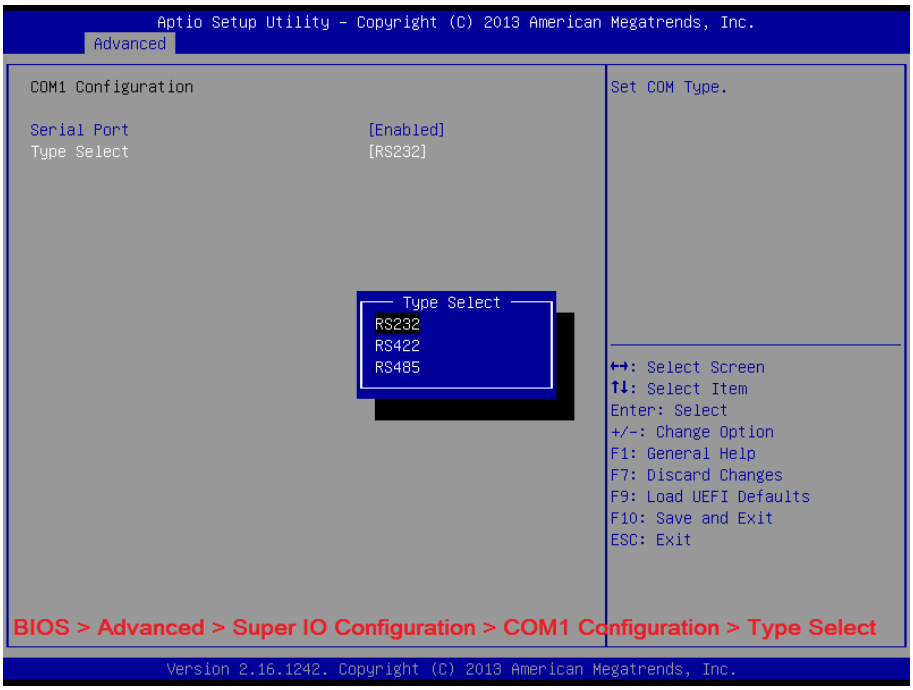
2. Check the corresponding position in Jumpers and headers setting guide.



35 : Top: COM Port 3 (RS232/422/485)*
Bottom: VGA/D-Sub Port
36 : Top: COM Port 1 (RS232/422/485)*
Bottom: COM Port 2 (RS232/422/485)*

* This motherboard supports RS232/422/485 on COM1~3 ports. Please refer to below table for the pin definition. In addition, COM1~3 ports (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

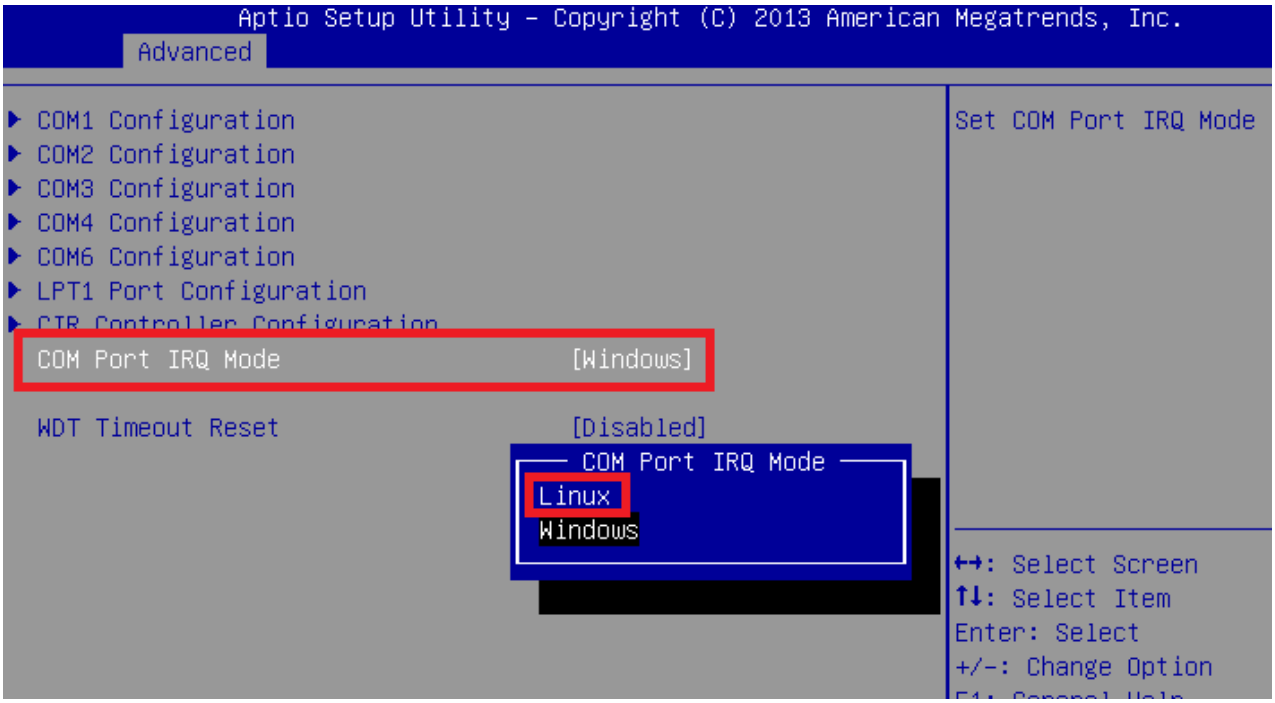
3. Enter into BIOS and adjust COM port to RS422 or RS485 according to your application and then press F10 to save and exit.
   (Path: BIOS > Advanced > Super IO Configuration > COM1 Configuration > Type Select)



Topic 2. The COM port function doesn't work under Linux OS. How do I fix it?

If you would like to use COM port function under Linux OS, please boot into BIOS to set COM Port IRQ Mode to [Linux].

(Path: BIOS > Advanced > Super IO Configuration > COM Port IRQ Mode [Linux])



Chapter 11: Audio

Topic 1. What is the difference between AC97 and HD audio device?

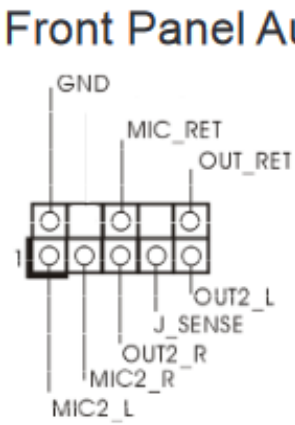
HD Audio (Intel High Definition Audio) has better sound quality and it supports more feature below.

1. Jack-detection:
   HD Audio has presence pin, when your plug audio device, it can detect the connection of audio jack.
2. Jack-Re-tasking:
   Supports redefine audio jack connection
3. Multi-Streaming:
   Supports front audio & rear audio to play different sound media simultaneously.
4. HD Audio supports up to 7.1 channel, and AC'97 supports up to 5.1 channel.

Topic 2. How do I connect the AC97 audio device to motherboard?

If you would like to use AC'97 front audio panel, please follow the steps below to connect the front panel to HD audio header.

1. Connect Mic_IN (MIC) to MIC2_L.
2. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L.
3. Connect Ground (GND) to Ground (GND).
4. MIC_RET and OUT_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
5. Enter BIOS Setup to adjust Front Panel Control option to [AC97]
   (Path: BIOS > Chipset Configuration > Front Panel Control option)



HD Audio:

Pin No.	Definition
1	MIC2_L
2	GND
3	MIC2_R
4	-ACZ_DET
5	LINE2_R
6	FSENSE1
7	FAUDIO_JD
8	No Pin
9	LINE2_L
10	FSENSE2

AC'97 Audio:

Pin No.	Definition
1	MIC
2	GND
3	MIC Power
4	NC
5	Line Out (R)
6	NC
7	NC
8	No Pin
9	Line Out (L)
10	NC

Chapter 12: GPIO

Topic 1. I would like to configure the GPIO pin define. Could you provide the related information to me?

If you would like to check the pin define, please refer to the Jumpers and headers setting guide from ASRockind official website. There are two pin define in Digital Input / Output Pin Header for your reference.

Manual

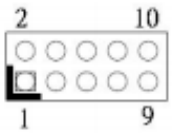
The format of our documents are in PDF files. If you have not installed Adobe Acrobat Reader, please get it from Adobe.

Description	Language	Download	
User Manual	English	Global	China
Jumpers and headers setting guide	English	Global	China

Type A: Digital Input / Output Pin Header (take SBC-210 for example below)

15 : Digital Input / Output Pin Header

PIN	Signal Name	PIN	Signal Name
1	SIO_GP24	2	SIO_GP20
3	SIO_GP25	4	SIO_GP21
5	SIO_GP26	6	SIO_GP22
7	SIO_GP27	8	SIO_GP23
9	JGPIO_PWR	10	GND

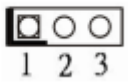


Parameter	Range
GPI/O input Low Voltage	Max. 0.8V
GPI/O input High Voltage	Min. 2.0V
GPI/O output Low Voltage	Max. 0.4V
GPI/O output High Voltage	Min. 2.4V
Note : Max. load per GPI/O pin : 12mA Current Max. 1A per power pin.	

You could adjust the pin 9 output voltage by adjusting the jumper on Digital Input / Output Power Select header.

16 : Digital Input / Output Power select

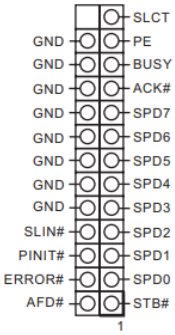
1-2 : +12V
2-3 : +5V



Type B: Digital Input / Output Pin Header (take IMB-156 for example below)

14 : Printer Port / GPIO Header (LPT_GPIO1)

Printer Port:



GPIO:

PIN	Signal Name	PIN	Signal Name
26	NC	25	NA
24	GND	23	SIO_GP30
22	GND	21	SIO_GP31
20	GND	19	SIO_GP32
18	GND	17	SIO_GP33
16	GND	15	SIO_GP34
14	GND	13	SIO_GP35
12	JGPIOPWR	11	SIO_GP36
10	JGPIOPWR	9	SIO_GP37
8	SIO_GP43	7	SIO_GP40
6	SIO_GP44	5	SIO_GP41
4	SIO_GP45	3	SIO_GP42
2	SIO_GP46	1	SIO_GP47

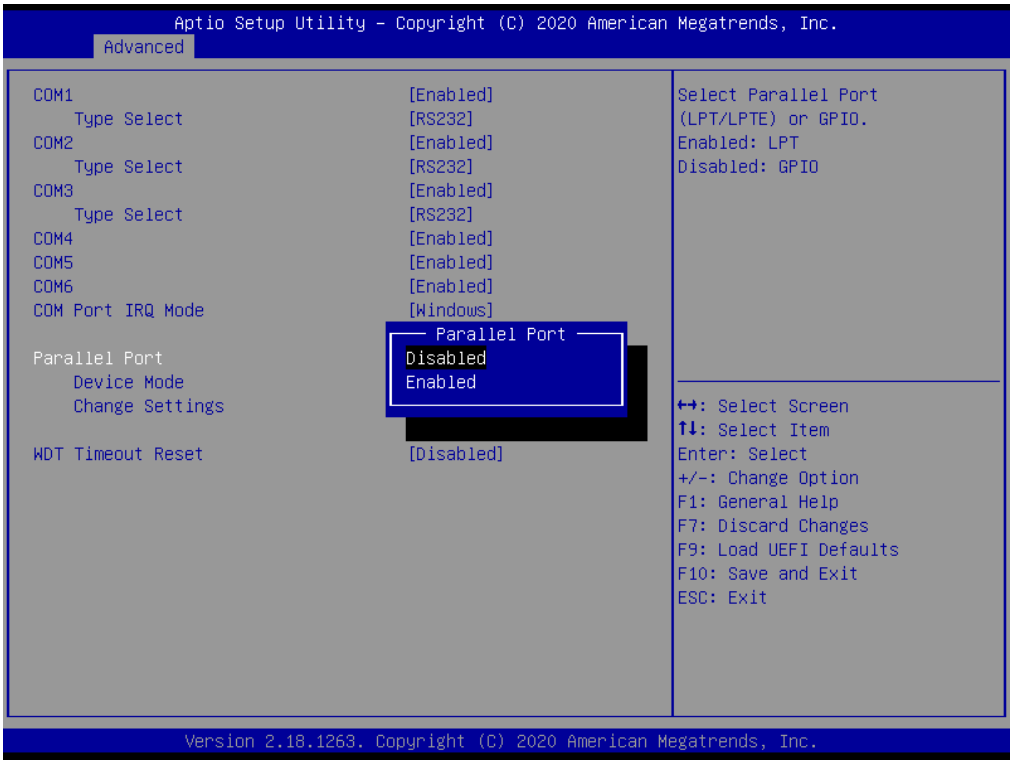
Parameter	Range
GPI/O input Low Voltage	Max. 0.8V
GPI/O input High Voltage	Min. 2.0V
GPI/O output Low Voltage	Max. 0.4V
GPI/O output High Voltage	Min. 2.4V
Note : Max. load per GPI/O pin : 12mA Current Max. 1A per power pin.	

For this type of header, you could select LPT or GPIO function for this header under BIOS environsetting.

Set the Parallel Port at [Disabled] → GPIO

Set the Parallel Port at [Enabled] → LPT

(Path : BIOS > Advanced > Super IO Configuration > Parallel Port)



You could adjust the output voltage of pin 10, 12 by adjusting the jumper on Digital Input / Output Power Select header. If you want to use the printer port function, please short pin4 and pin5 on Digital Input / Output Power Select header.

17 : Digital Input / Output Power Select (JGPIOPWR) (JGPIO_PWR1)

1-2 : +12V
2-3 : +5V
3-4 : +5V
4-5: GND