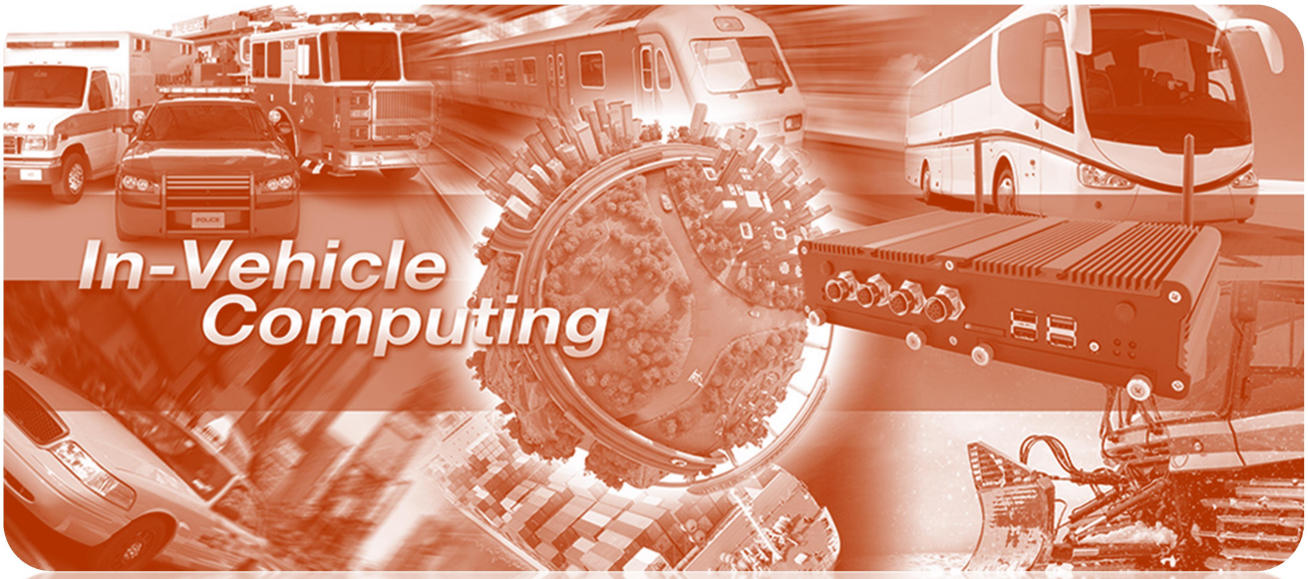

FleetPC-4-D

EMBEDDED / IN-VEHICLE COMPUTING

User's manual

CarTFT.com e.K.

User Manual

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Disclaimer

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CarTFT.com e.K. makes no representation or warranty regarding the content of this manual. Information in this manual had been carefully checked for accuracy; however, no guarantee is given as to the correctness of the contents. For continuing product improvement, CarTFT.com e.K. reserves the right to revise the manual or make changes to the specifications of this product at any time without notice and obligation to any person or entity regarding such change. The information contained in this manual is provided for general use by customers.

This device complies to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must withstand any background interference including those that may cause undesired operation.

Safety Information

Read the following precautions before setting up a CarTFT.com Product.

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

CAUTION

Incorrectly replacing the battery may damage this computer. Replace only with the same or its equivalent as recommended by CarTFT.com e.K. Dispose used battery according to the manufacturer's instructions.

Technical Support

Please do not hesitate to call or e-mail our customer service when you still cannot fix the problems.

Tel : +49-7121-3878264

Fax : +49-7121-3878265

E-mail : sales@cartft.com

Website : www.cartft.com

Content

1. **Introduction** 6
- Specification 6

2. **Illustration (MB/System)** 8
- Mainboard 8
- Power Board 9
- System 10

3. **Architecture** 11

4. **Principal component Specification** 11
- CPU 11

5. **Internal Connector** 12
- VGA Connector 12
- USB Connector 12
- GPIO Connector 13
- UART and GPIO Connector 14
- LED Connector 14
- COM Port Connector 15
- AUDIO Connector 16
- SATA Connector 17
- Mini PCI-E connector 18
- Power Input Connector 19
- SATA Power Connector 19

6. **External connector specification** 20
- USB Connector 20
- LAN connector 21
- DVI-I connector 22
- HDMI connector 22
- AUDIO connector 23

7. **System Introduction** 24

- I/O Panel for FBOX-2300 24
- I/O Panel for FleetPC-4-D 25
- Opening Chassis 26
- Installing Memory 28
- Installing MINI PCIe Expansion Card (MINICARD1) 29
- Installing MINI PCIe Expansion Card (MINICARD2) 30
- Installing Internal Antenna Cable 31

8. **System Resource** 32

9. **BIOS** 36

- Enter The BIOS 36
- Main 38
- Advanced 39
- Chipset 46
- Boot 49
- Security 51
- Exit 52

10. **Packing List** 53

- System 53
- Accessory 53

INTRODUCTION

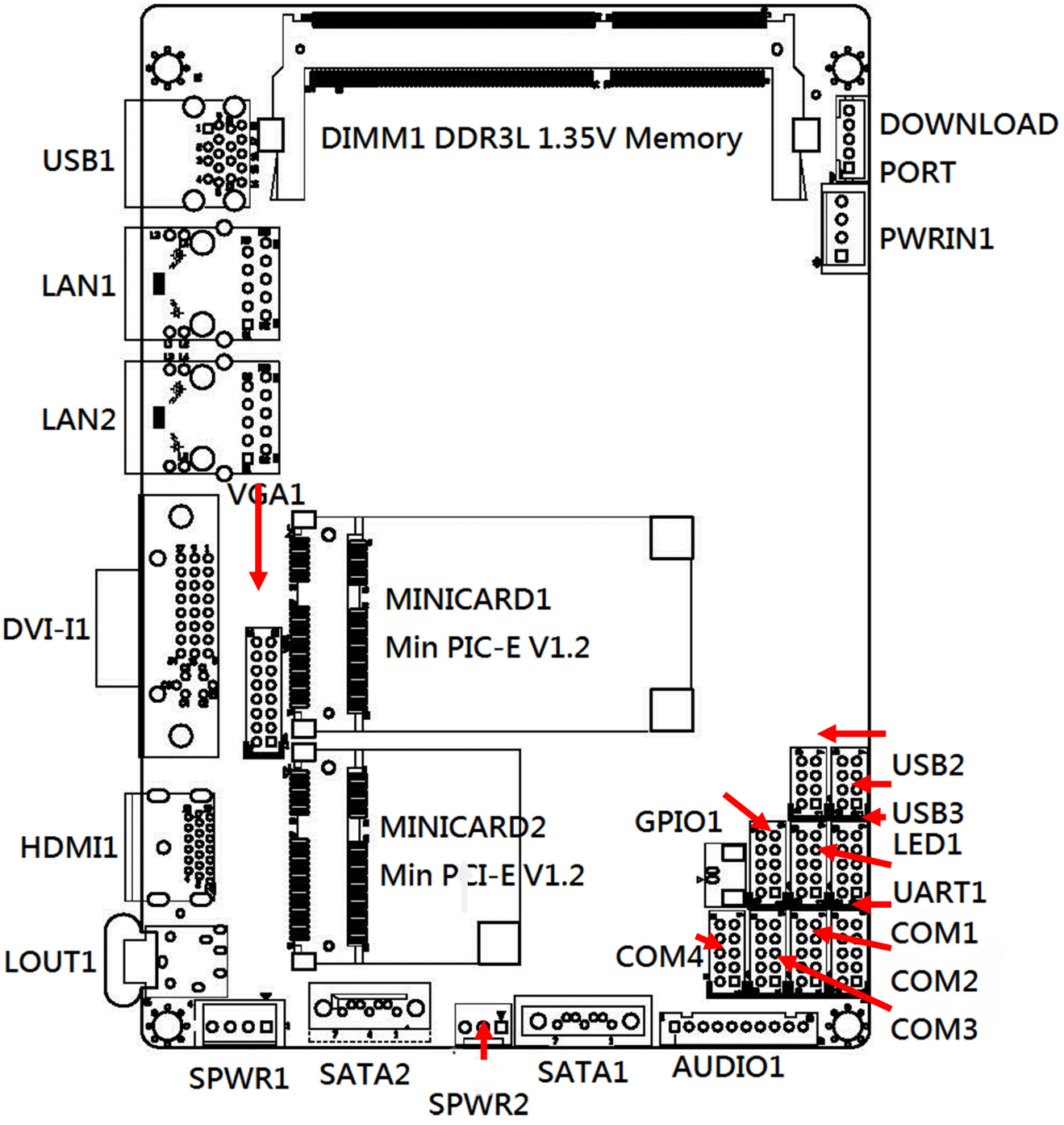
Specification

System	
CPU	Intel N3710 Quad Core CPU up to 2.56HGz Intel N3160 Quad Core CPU up to 2.24HGz Intel N3060 Dual Core CPU up to 2.48HGz
Memory	1 x DDR3L-1600 SO-DIMM up to 8GB
Graphics	Intel HD Graphics
ATA	2 x Serial ATA ports with 6GB/s HDD Transfer Rate
LAN Chipset	2 x Intel i210-AT Gigabit Ethernet
Watchdog	1 ~ 255 Level Reset
I/O	
Serial Port	2 x RS-232 Ports (2 x RS-232/422/485), Optional Max. 4 x RS-232
USB Port	2 x USB 2.0 and 2 x USB 3.0 Ports
LAN	2 x RJ45 ports for GbE
Video Port	HDMI/ DVI/ VGA (Though DVI-I), Max. 3 Display Outputs
DIO Port	4 In and 4 Out GPIO Ports (5V Level)
Audio	Line-out / Mic-in
Expansion Bus	2 x Mini-card Slots
Storage	
Type	1 x 2.5” Drive Bay for SATA Type Hard Disk Drive / SSD 1 x SATA DOM
Software	
Operating system	Windows 7, WES 7, Windows 10, Ubuntu 14.04 above
Qualification	
Certifications	CE, FCC Class A

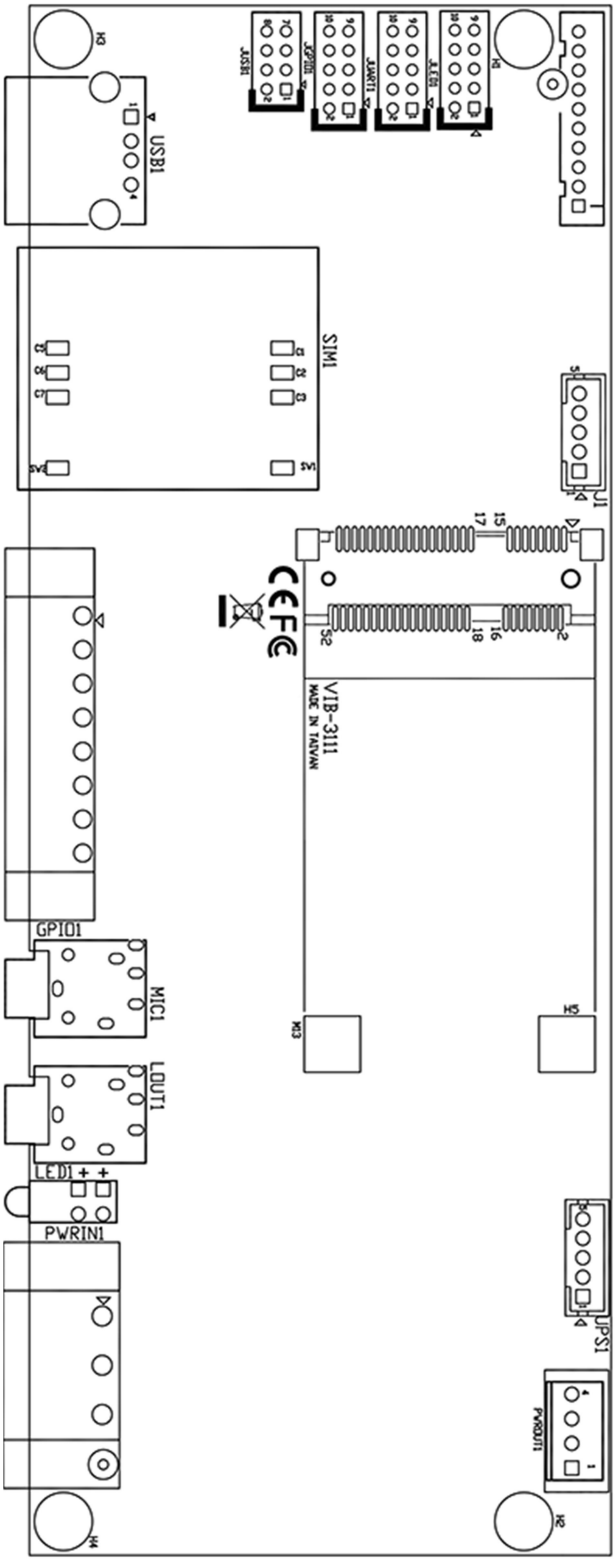
Environment	
Operating Temp.	-30 ~ 60ºC (SSD), ambient w/ air
Storage Temp.	-40 ~ 85ºC
Relative Humidity	10 ~ 95% @ 40ºC (non-condensing)
Vibration (random)	DC 12V Input
Mechanical	
Construction	Aluminum Alloy
Mounting	Wall-mount, VESA-mount, Din Rail Mounting Kit
Weight	1200g (Barebone)
Dimensions	182 x 167.6 x 40 mm

ILLUSTRATION (MB/SYSTEM)

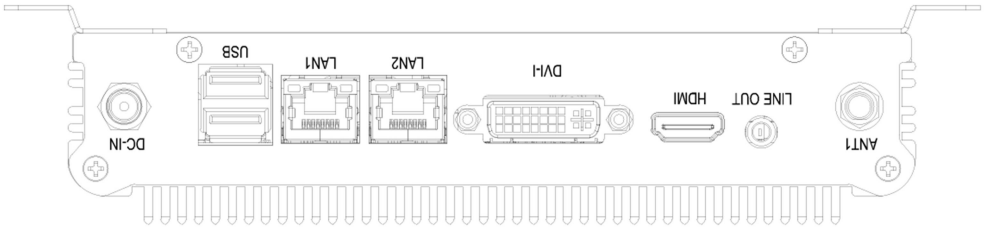
Mainboard

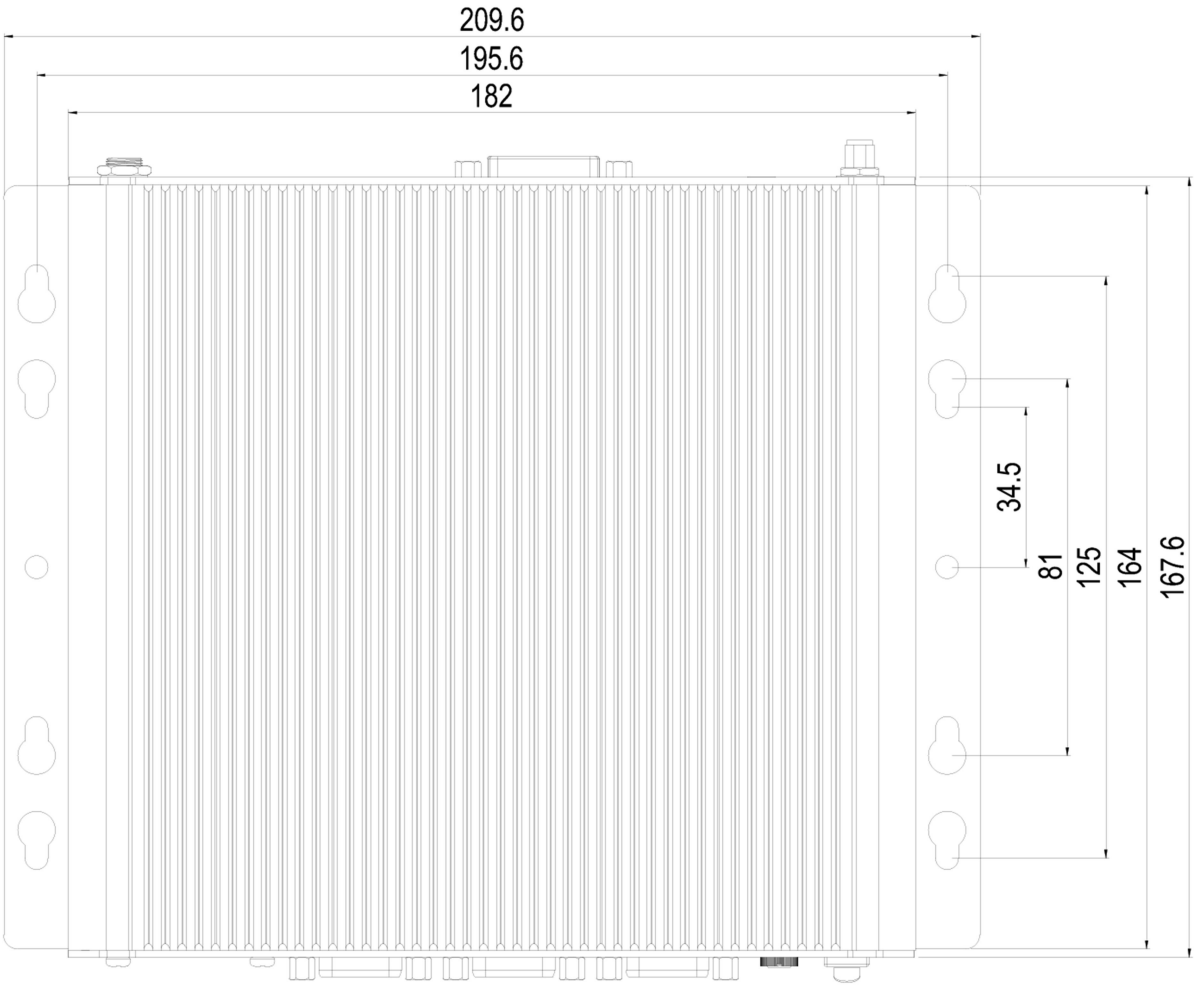


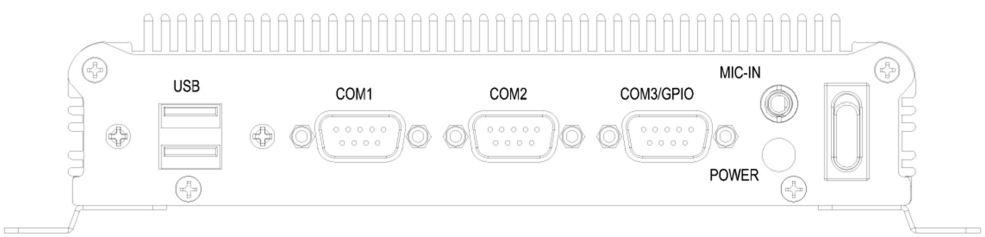
Power Board (FleetPC-4-D only)



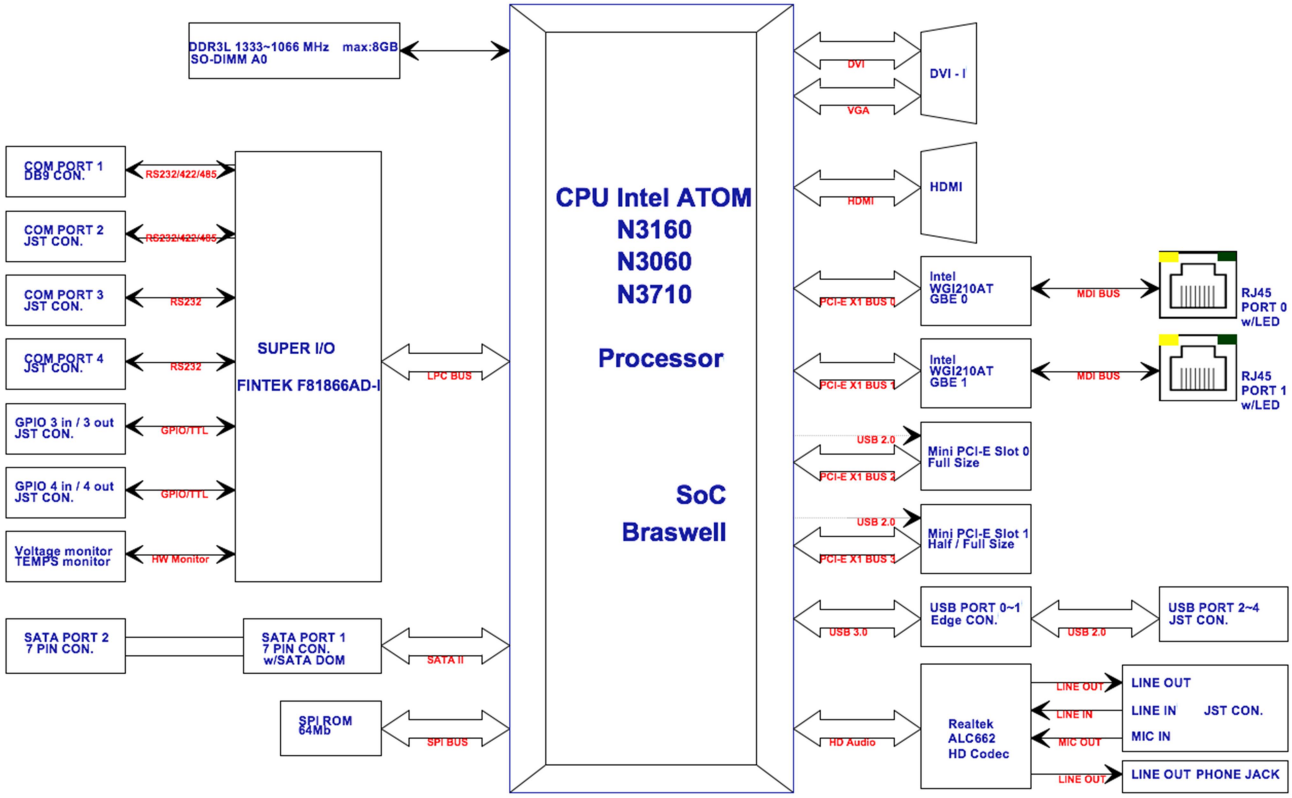
System


USB
LAN1
LAN2
DVI-I
HDMI
LINE OUT
DC-IN
ANT1


209.6
195.6
182
34.5
81
125
164
167.6


USB
COM1
COM2
COM3/GPIO
MIC-IN
POWER

ARCHITECTURE



PRINCIPAL COMPONENT SPECIFICATION

CPU

Chip	Description
Intel	1. Power consumption:

Symbol	Processor Number	Core Frequency/ GHz	Thermal Design Power	Unit	CPU Core	Cache
SOC	N3710	Up to 2.56GHz	6	W	4 Core	2M
	N3160	Up to 2.24GHz	6	W	4 Core	2M
	N3060	Up to 2.48GHz	6	W	2 Core	2M

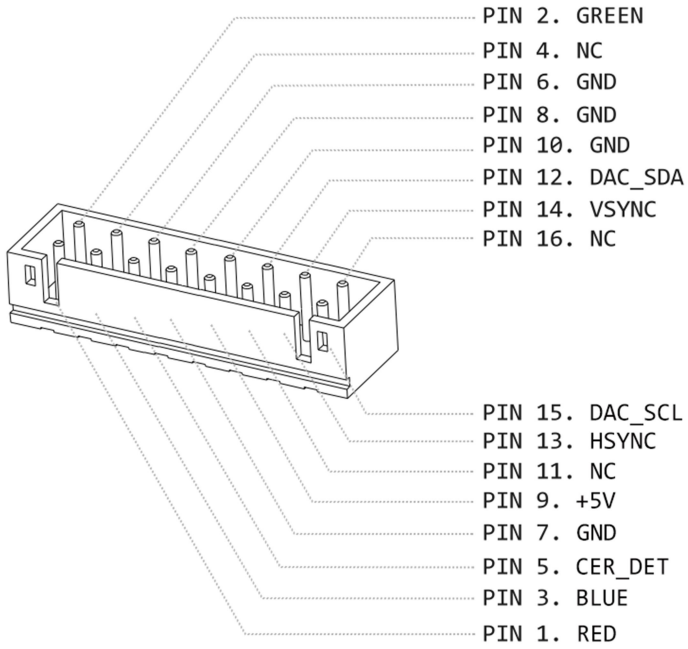
INTERNAL CONNECTOR

VGA Connector

Connector location: **VGA1**

Connector size: 2 X 8 = 16 Pin

Connector type: JST-2.0mm-M-180

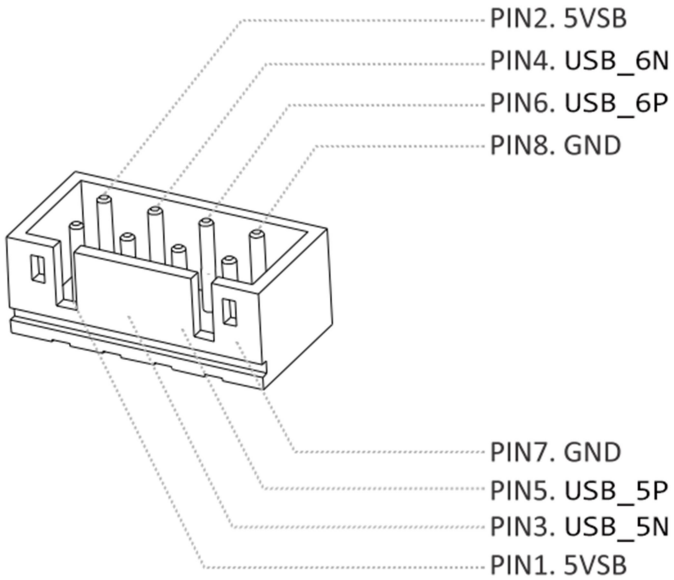


USB Connector

Connector location: **USB2**

Connector size: 2 X 4= 8Pin

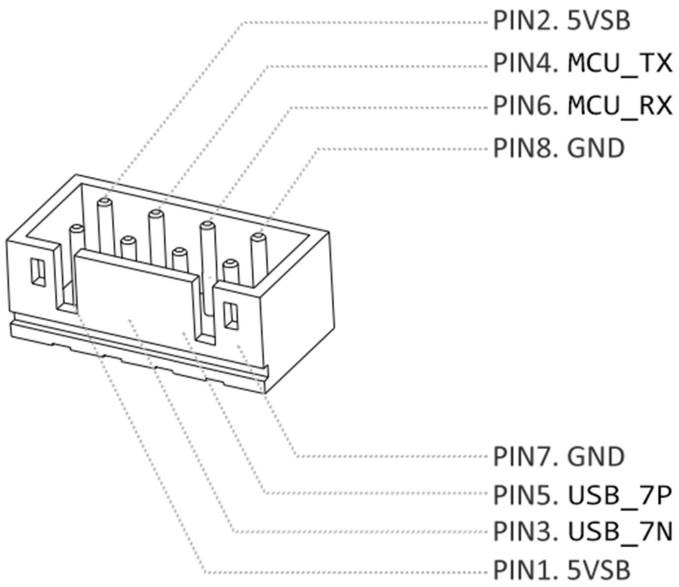
Connector type: JST-2.0mm-M-180



Connector location: **USB3**

Connector size: 2 X 4= 8Pin

Connector type: JST-2.0mm-M-180

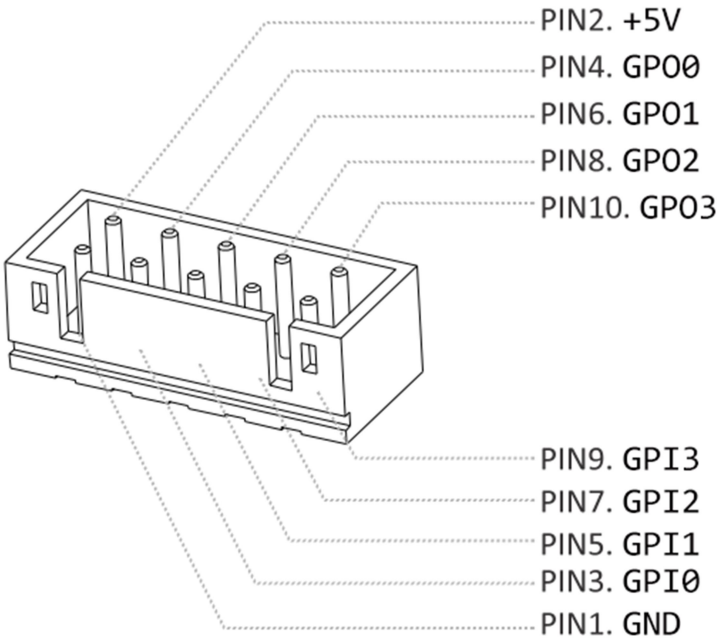


GPIO Connector

Connector location: **GPIO1**

Connector size: 2 X 5 = 10 Pin

Connector type: JST-2.0mm-M-180

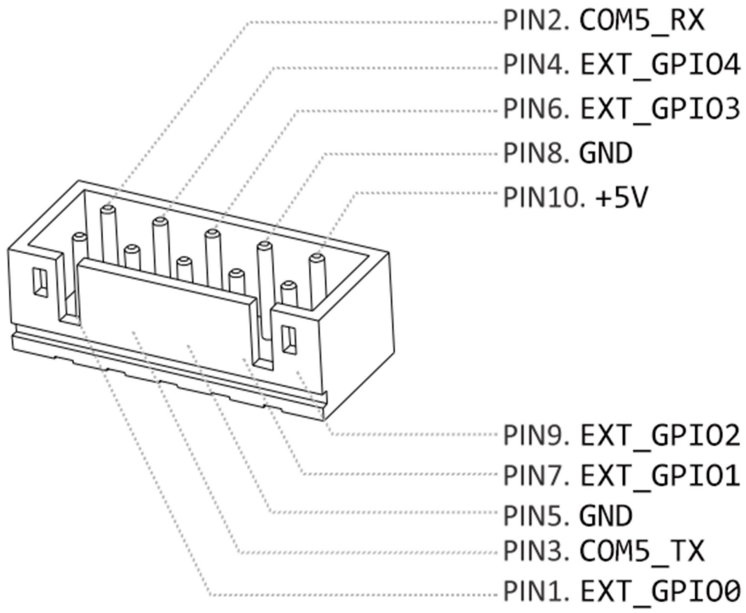


UART and GPIO Connector

Connector location: **UART1**

Connector size: 2 X 5 = 10 Pin

Connector type: JST-2.0mm-M-180

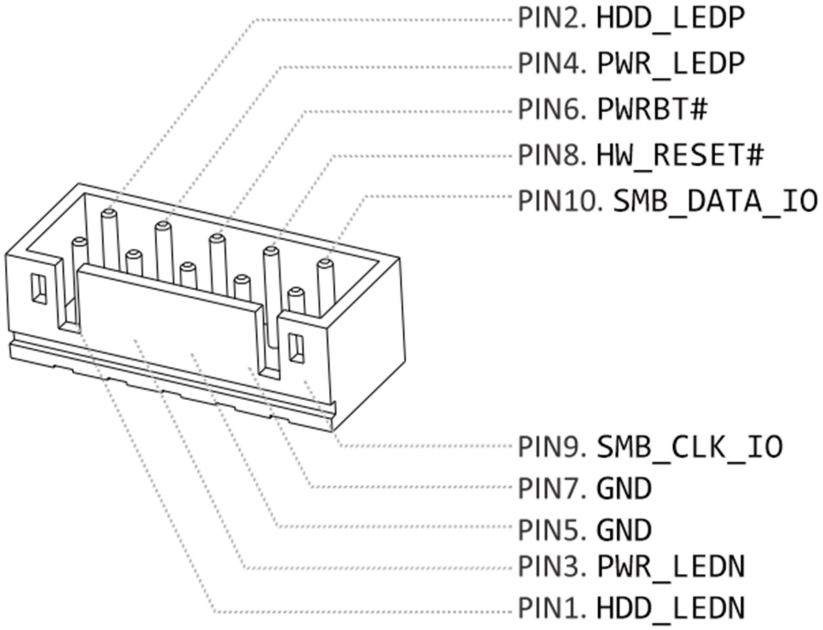


LED Connector

Connector location: **LED1**

Connector size: 2 X 5 = 10 Pin

Connector type: JST-2.0mm-M-180

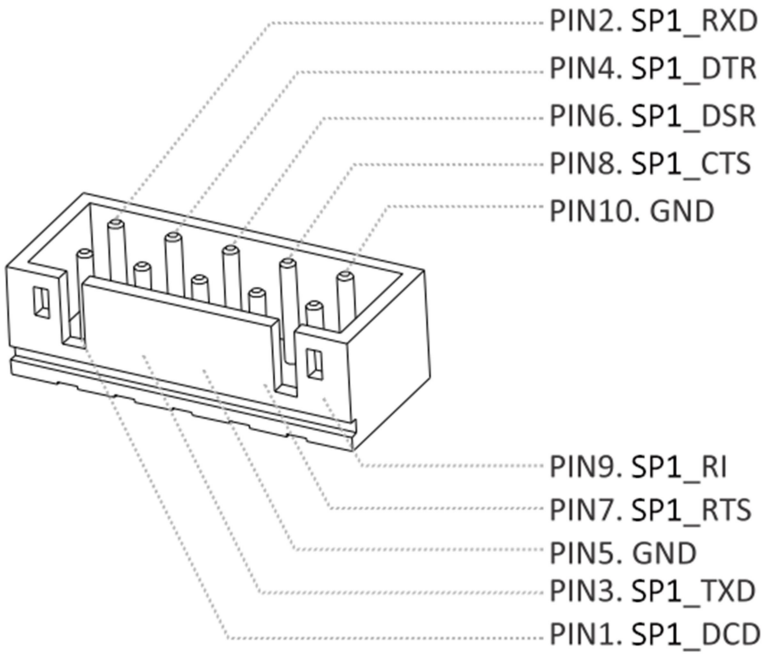


COM Port Connector

Connector location: **COM1**

Connector size: 2 X 5 = 10 Pin

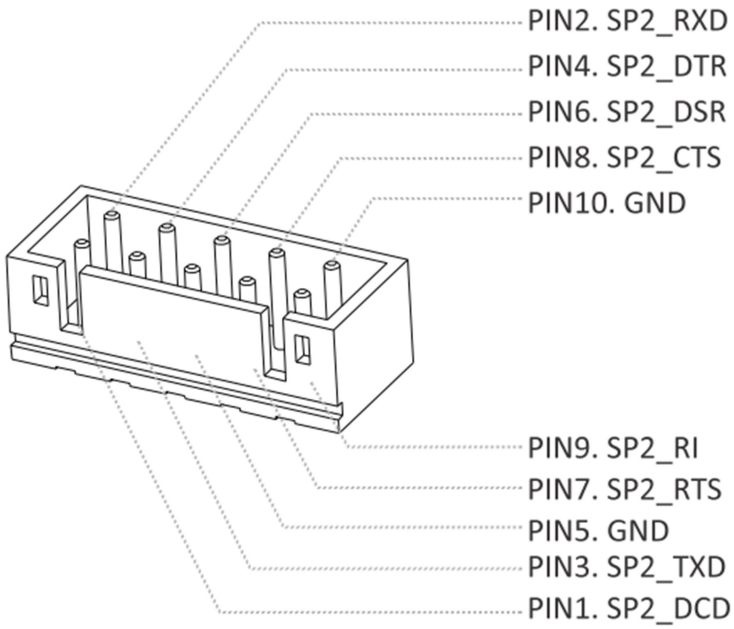
Connector type: JST-2.0mm-M-180



Connector location: **COM2**

Connector size: 2 X 5 = 10 Pin

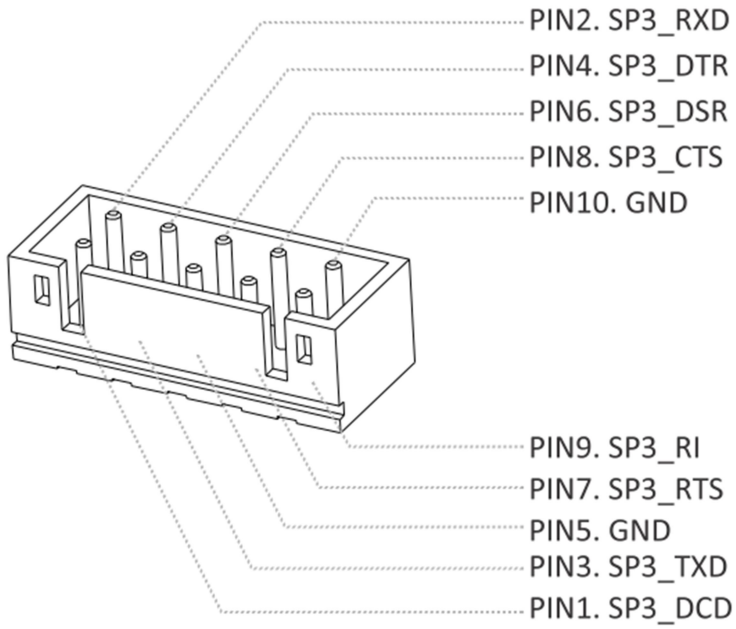
Connector type: JST-2.0mm-M-180



Connector location: **COM3**

Connector size: 2 X 5 = 10 Pin

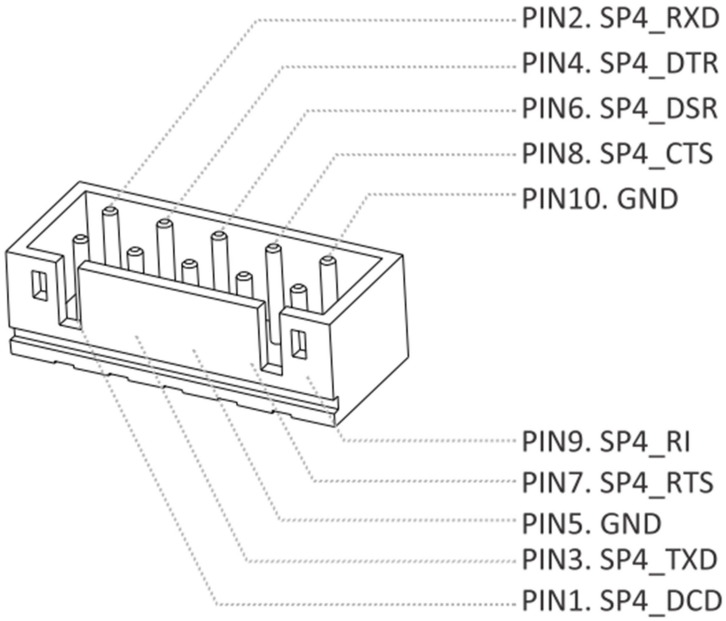
Connector type: JST-2.0mm-M-180



Connector location: **COM4**

Connector size: 2 X 5 = 10 Pin

Connector type: JST-2.0mm-M-180

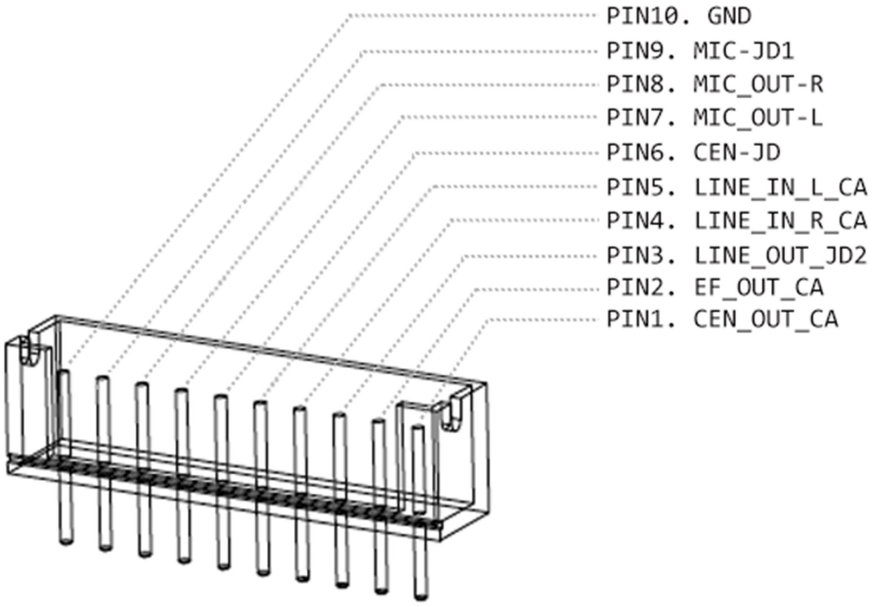


AUDIO Connector

Connector location: **AUDIO1**

Connector size: 1 X 10 = 10Pin

Connector type: JST-2.0mm-M-180

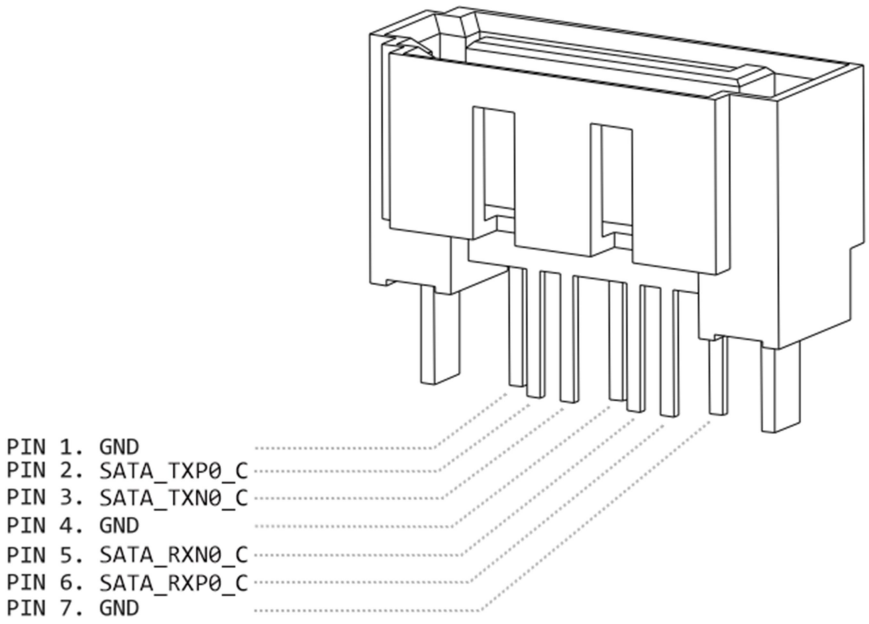


SATA Connector

Connector location: **SATA1**

Connector size: 1 X 7 = 7Pin

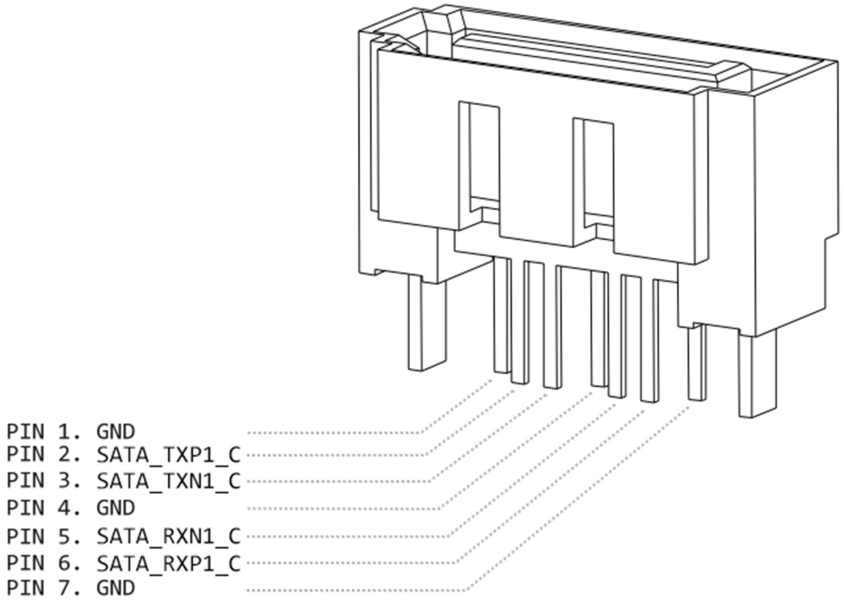
Connector type: SATA 1.27mm-M-180D



Connector location: **SATA2**

Connector size: 1 X 7 = 7Pin

Connector type: SATA 1.27mm-M-180D

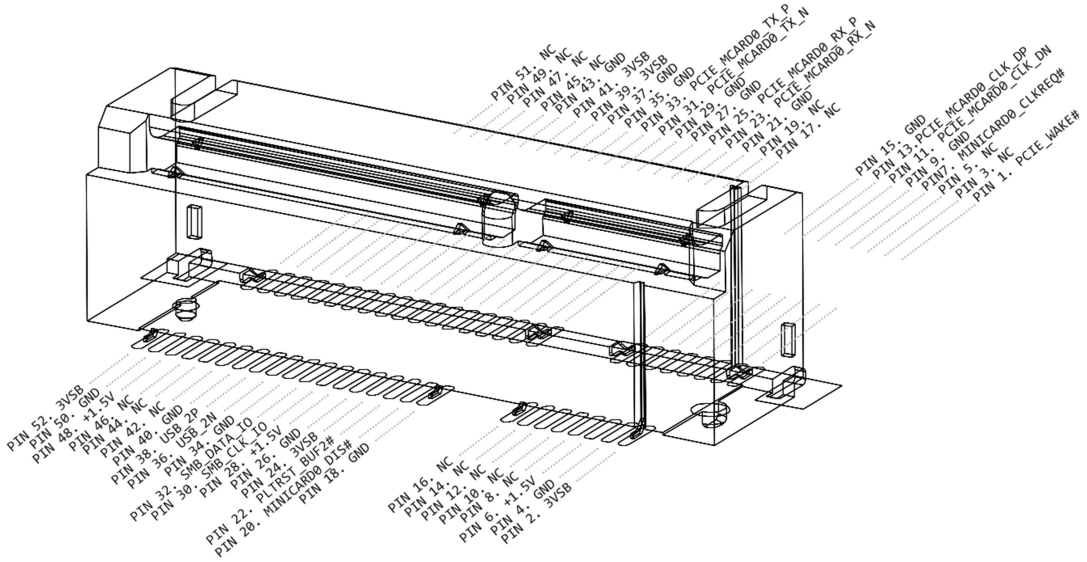


Mini PCI-E connector

Connector location: **MINICARD1**

Connector size: 2 X 26 = 52 Pin

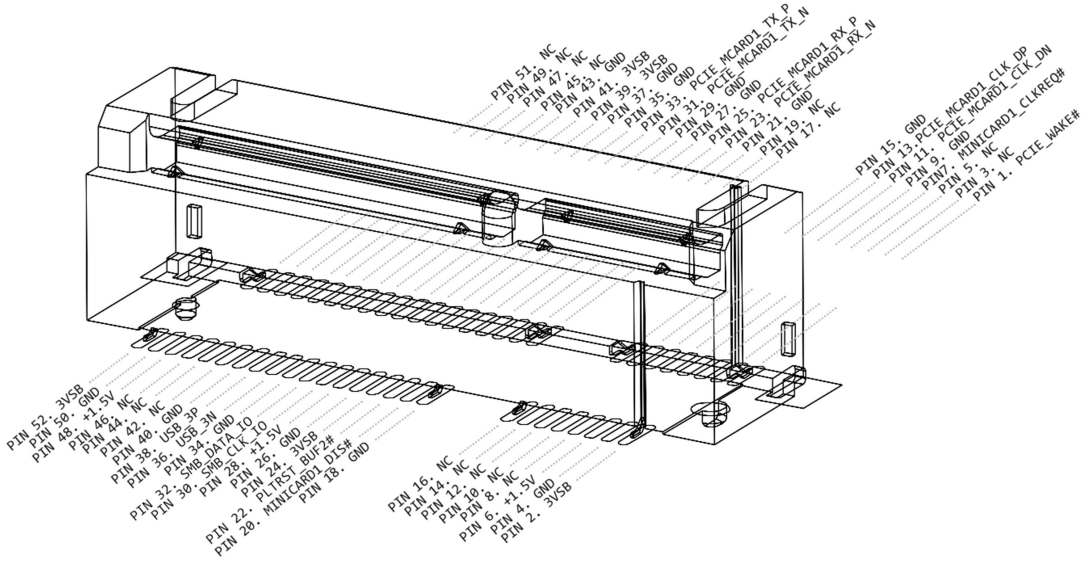
Connector type: MINI PCI-E CON 9.2mmH



Connector location: **MINICARD2**

Connector size: 2 X 26 = 52 Pin

Connector type: MINI PCI-E CON 9.2mmH

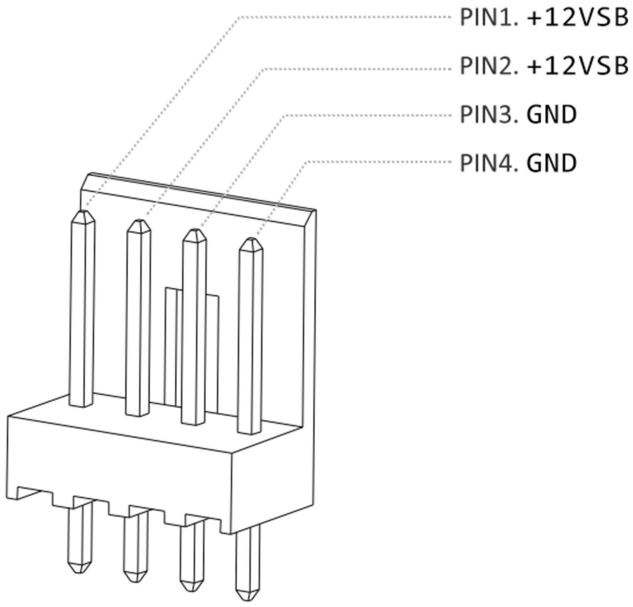


Power Input Connector

Connector location: **SPWR1**

Connector size: 1 X 4 = 4 Pin

Connector type: WAFER 2.54mm-M-180

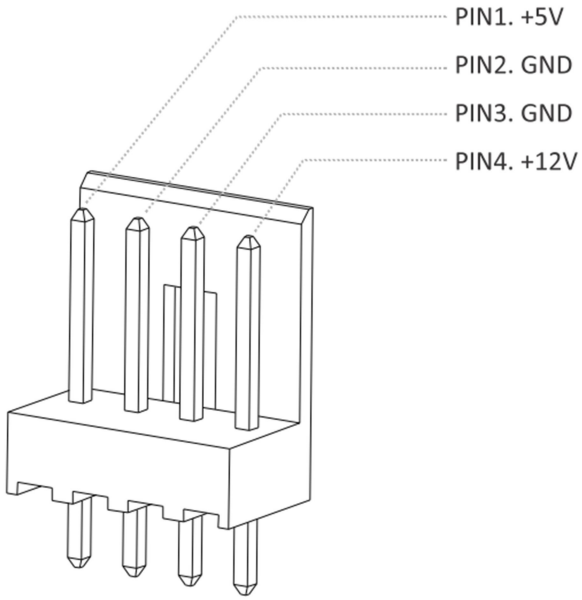


SATA Power Connector

Connector location: **SPWR1**

Connector size: 1 X 4 = 4 Pin

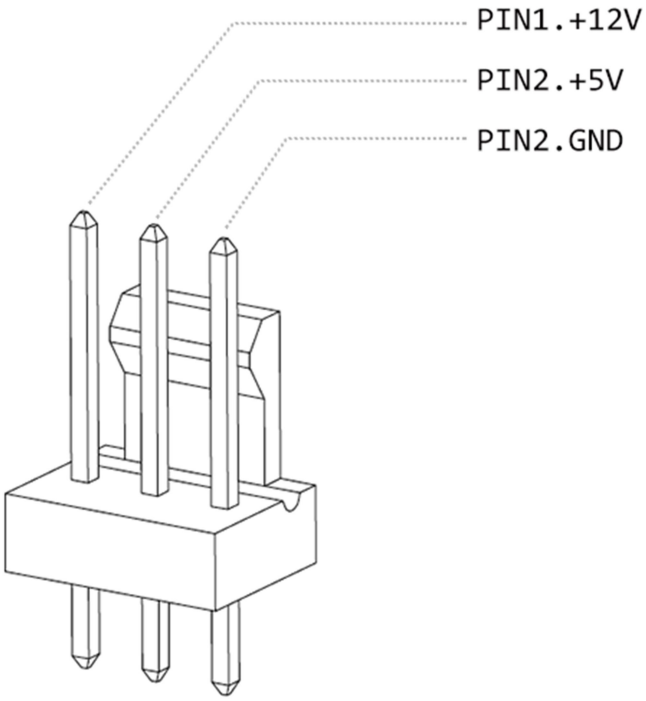
Connector type: WAFER 2.54mm-M-180



Connector location: **SPWR2**

Connector size: 1 X 3 = 3 Pin

Connector type: WAFER 2.54mm-M-180



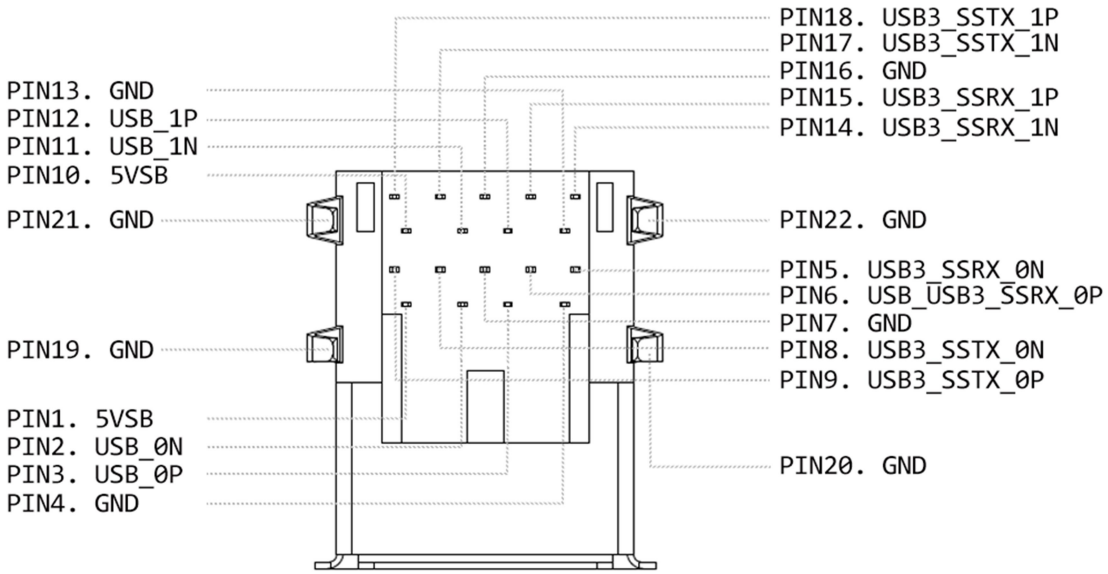
EXTERNAL CONNECTOR SPECIFICATION

USB Connector

Connector location: **USB1**

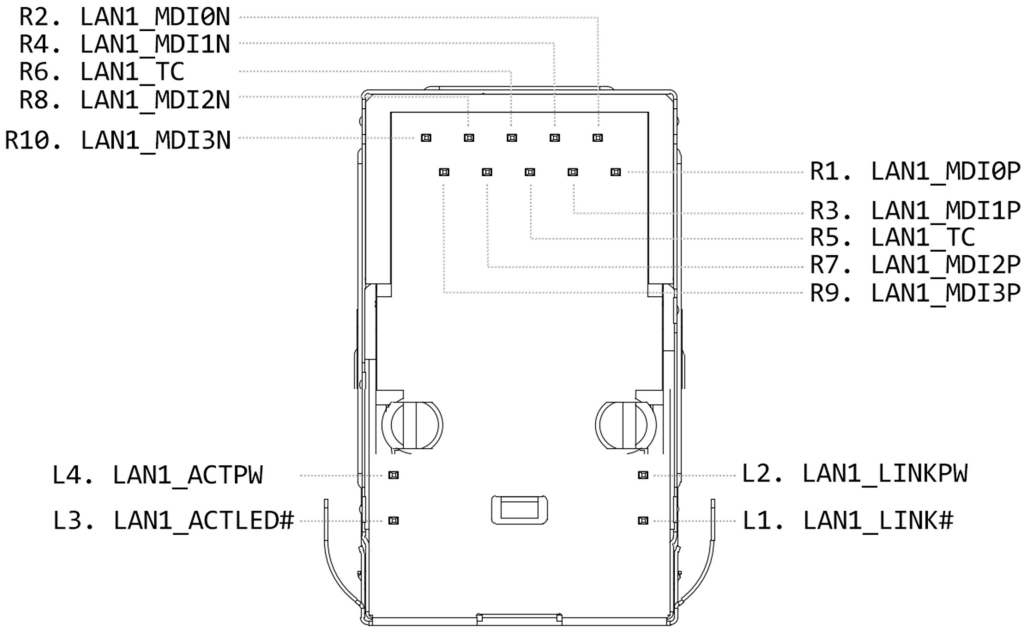
Connector size: 18Pin

Connector type: Type A

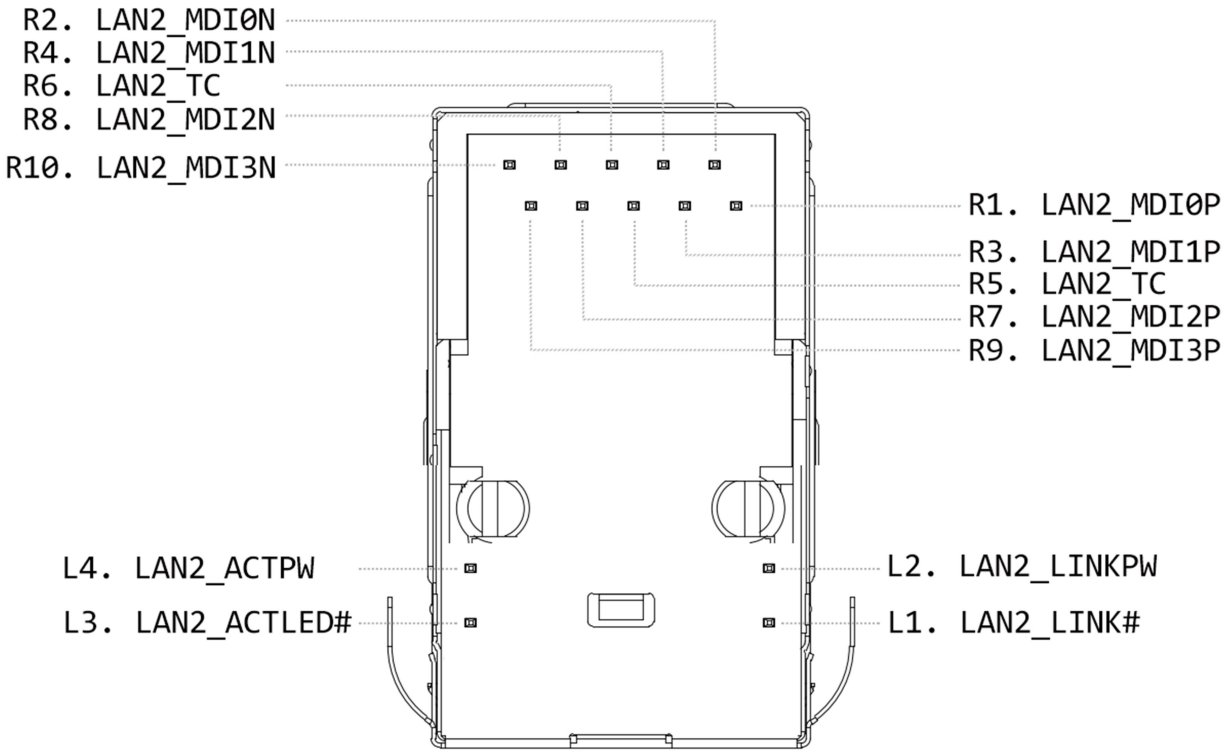


LAN connector

Connector location: **LAN1**
Connector size: 16 Pin
Connector type: RJ45 + LED

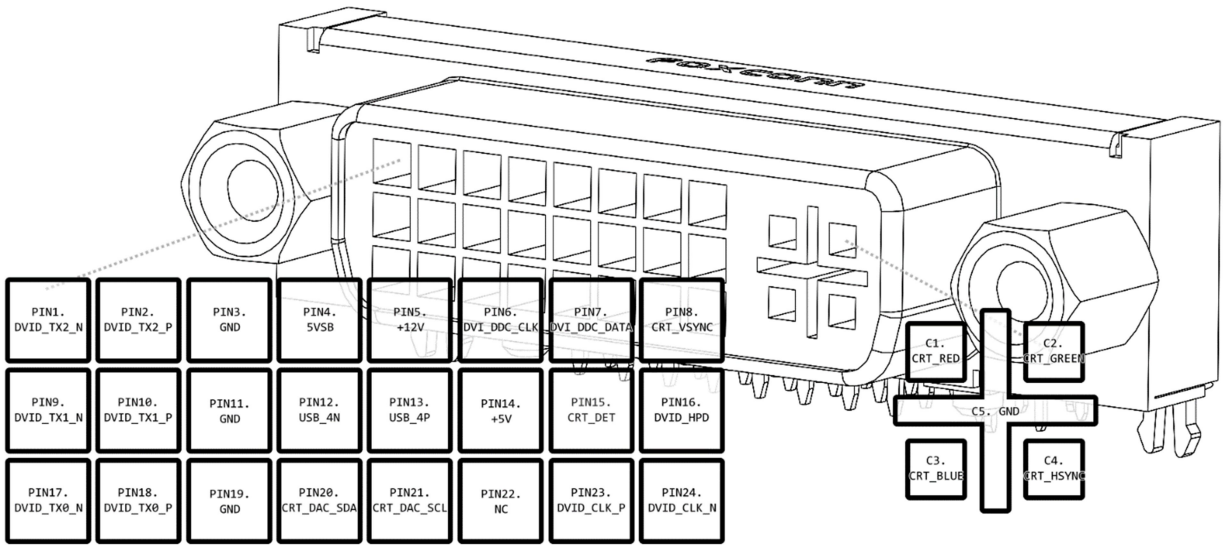


Connector location: **LAN2**
Connector size: 16 Pin
Connector type: RJ45 + LED



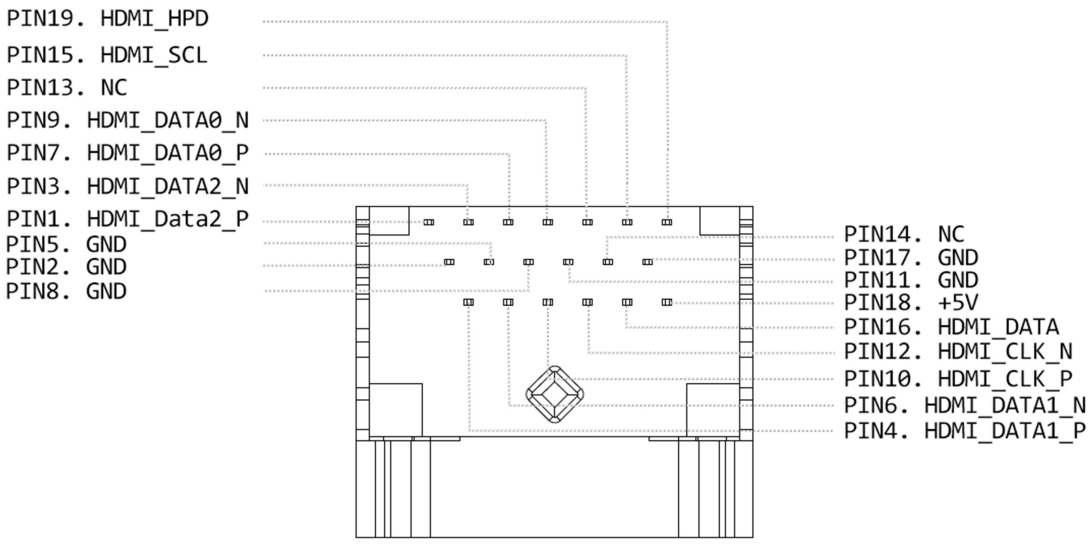
DVI-I connector

Connector location: **DVI-I1**
Connector size: 30 Pin
Connector type: DVI-I



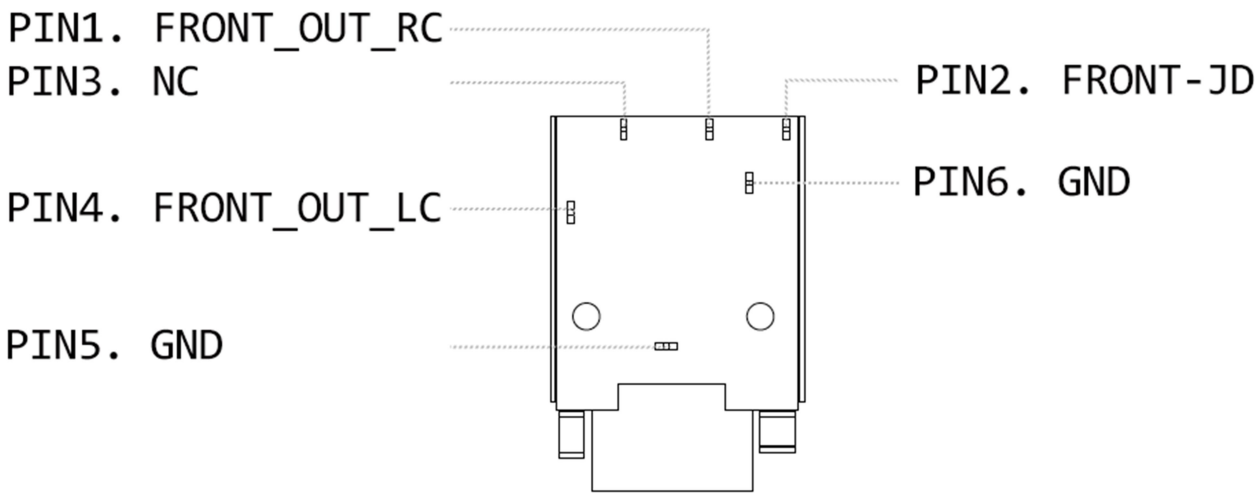
HDMI connector

Connector location: **HDMI1**
Connector size: 19 Pin
Connector type: HDMI



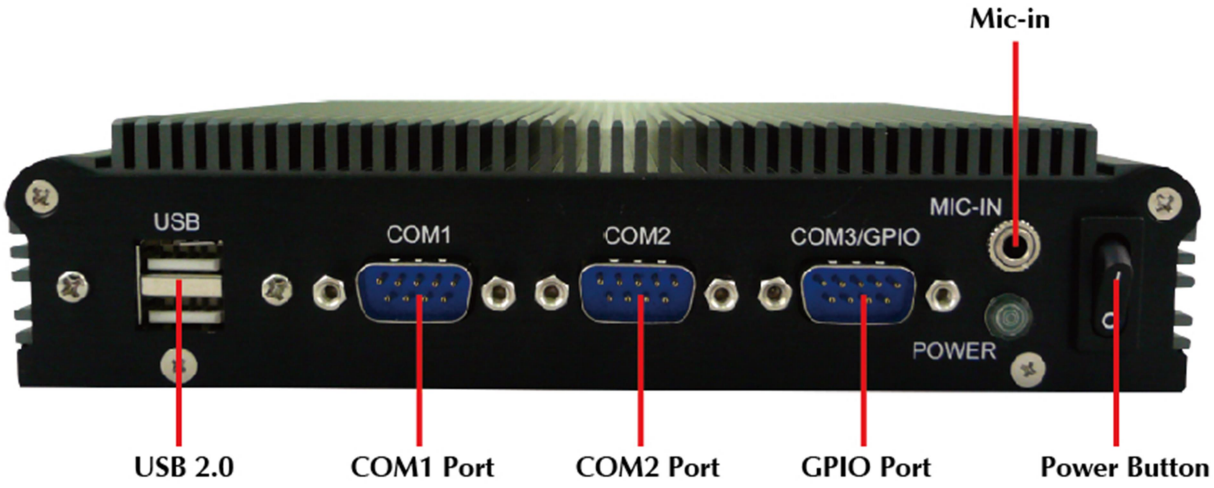
AUDIO connector

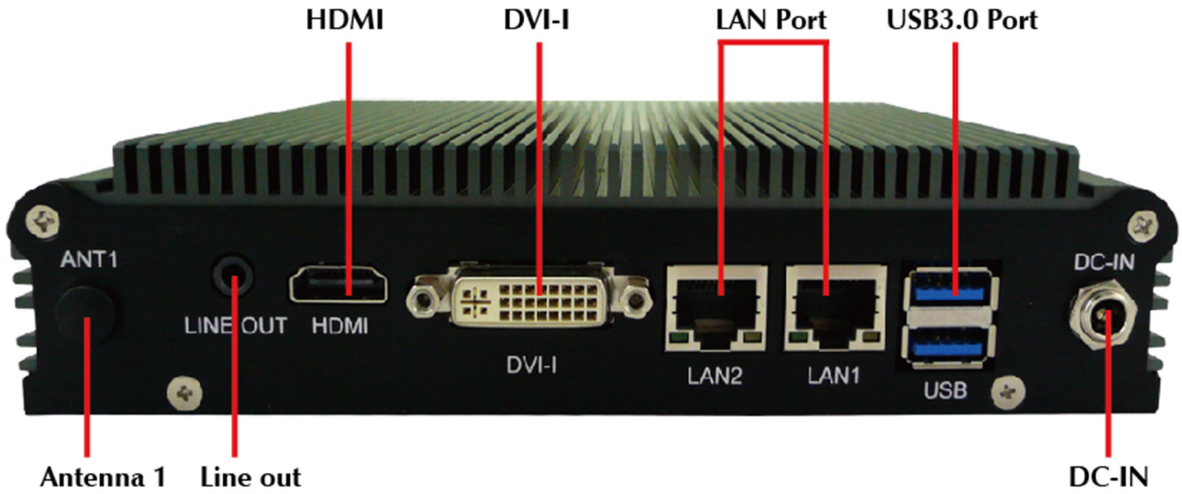
Connector location: **LOUT1**
Connector size: 6Pin
Connector type: PHONE JACK



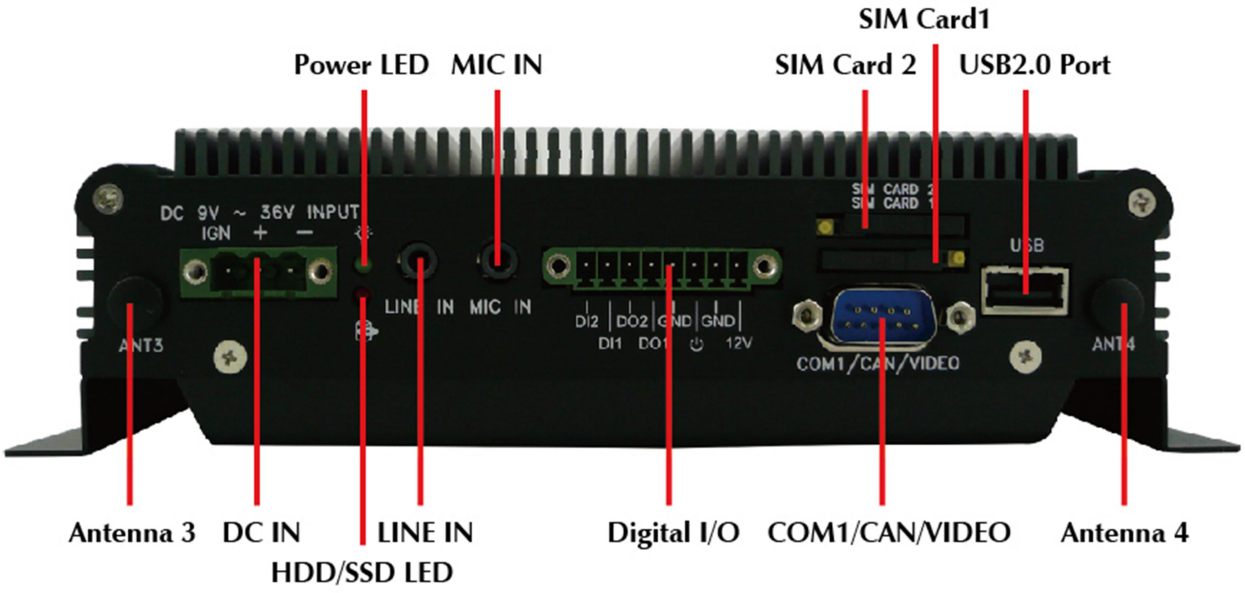
SYSTEM INTRODUCTION

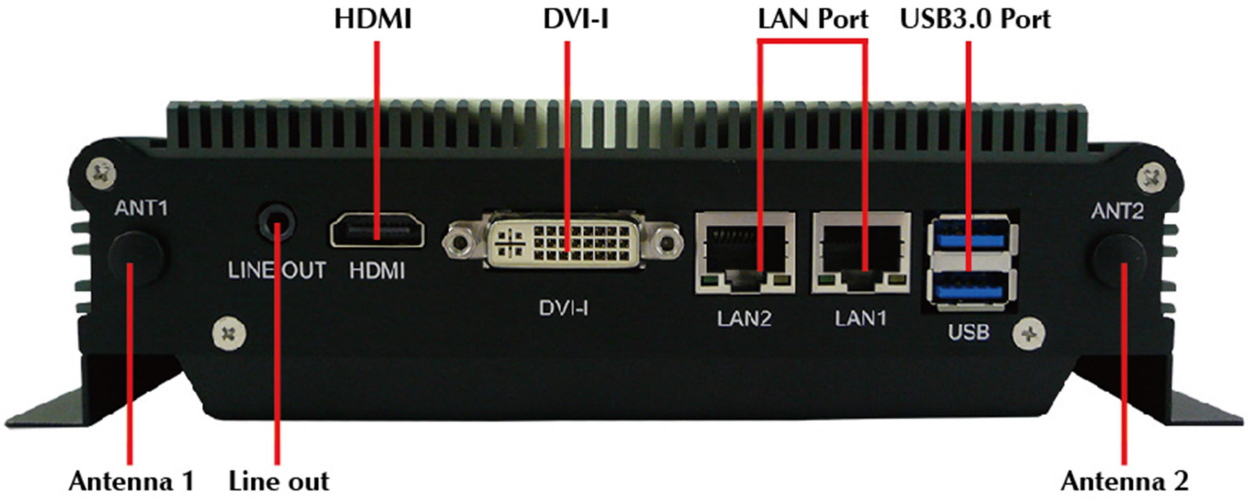
I/O Panel for FBOX-2300





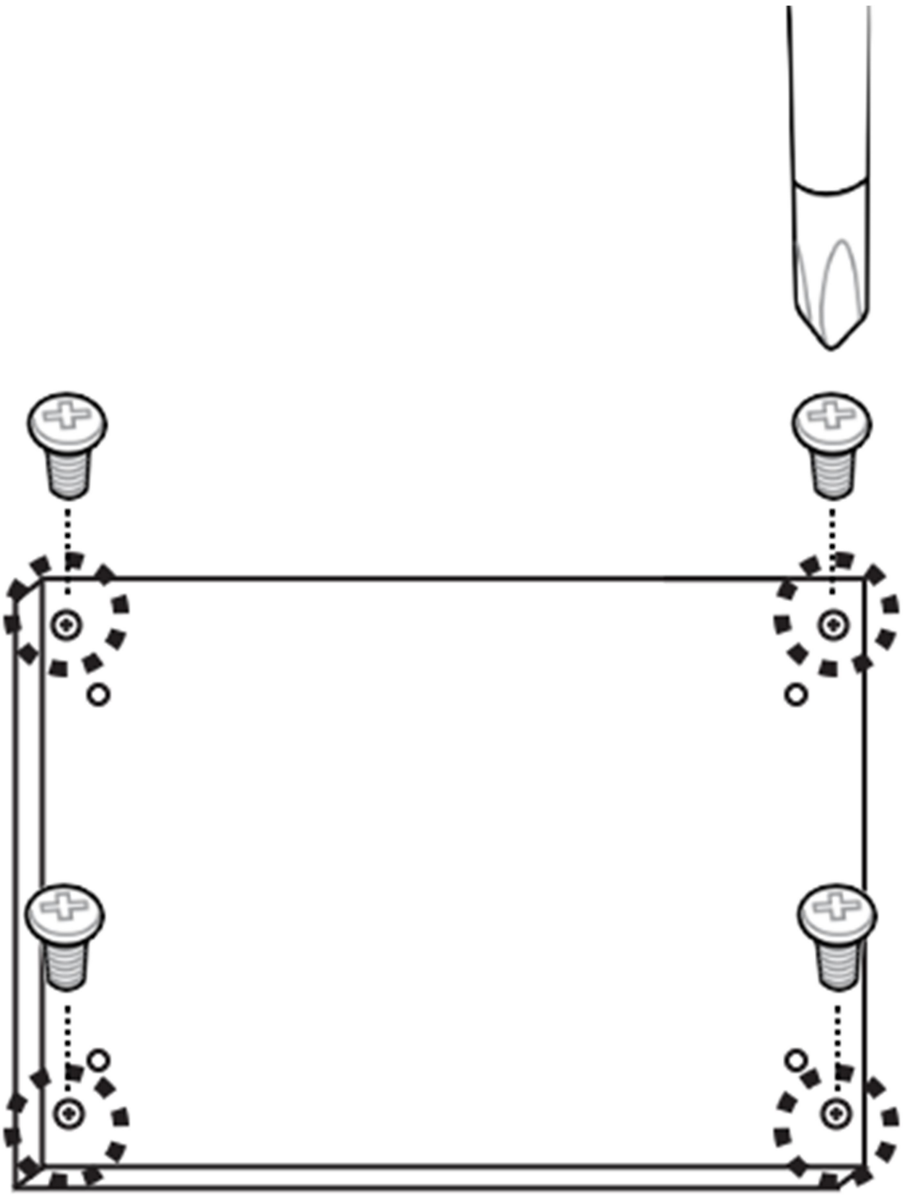
I/O Panel for FleetPC-4-D





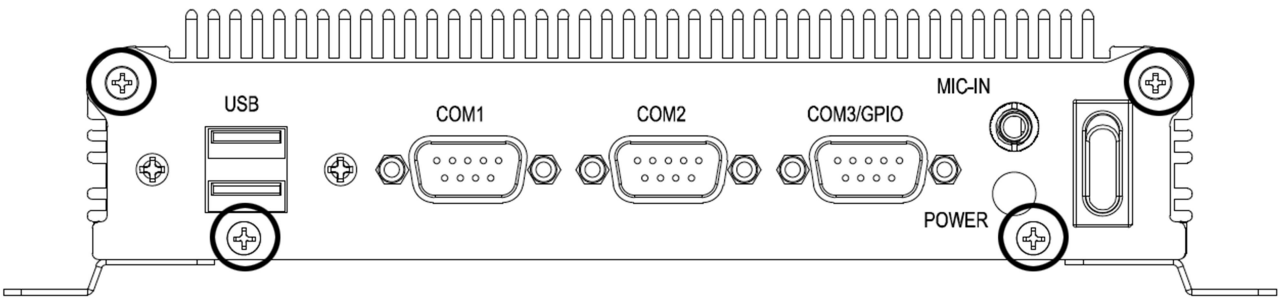
Opening Chassis

1

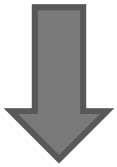


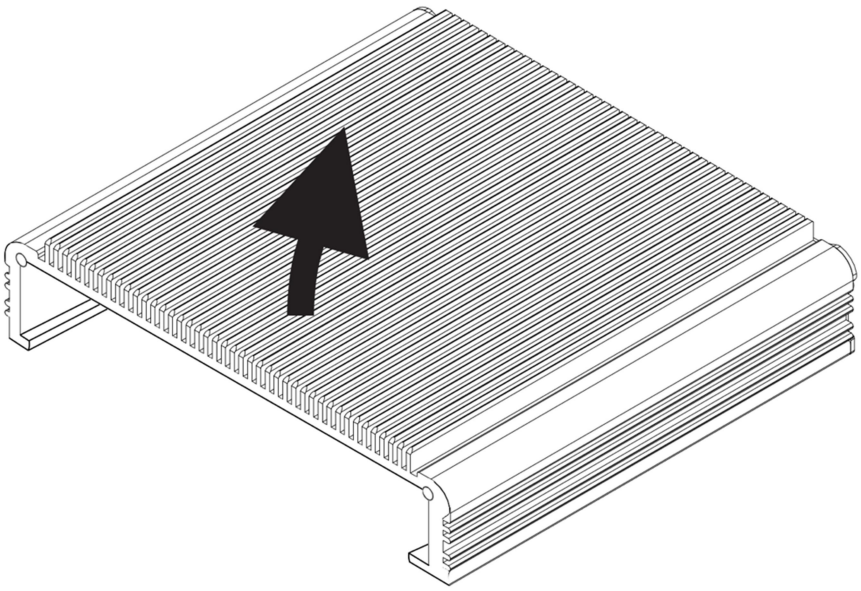
Remove the four screws on the **Back Cover** as figure 1.

2



Front Panel/Rear Panel figure

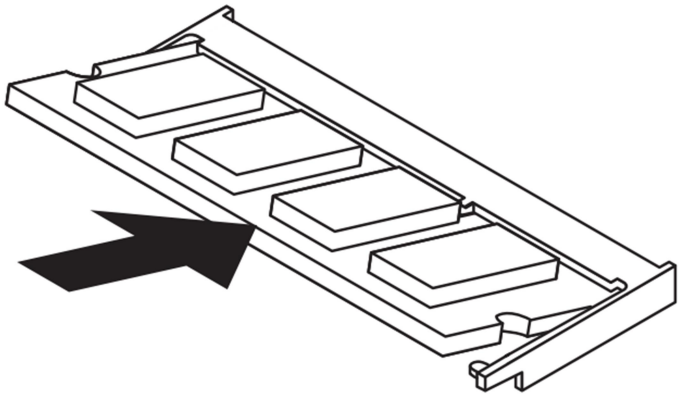




Remove the screws on the **Front Panel** (four screws) and **Rear Panel** (four screws) and open the **Top Cover** as figure 2.

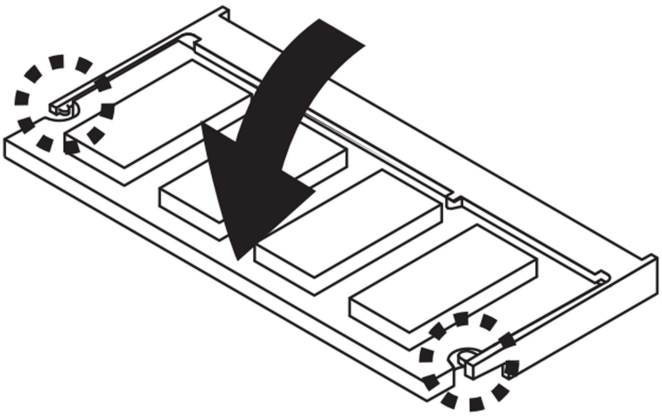
Installing Memory

1



Hold the Memory with its notch aligned with the Memory socket of the board and insert it at a 30-degree angle into the socket as figure 1.

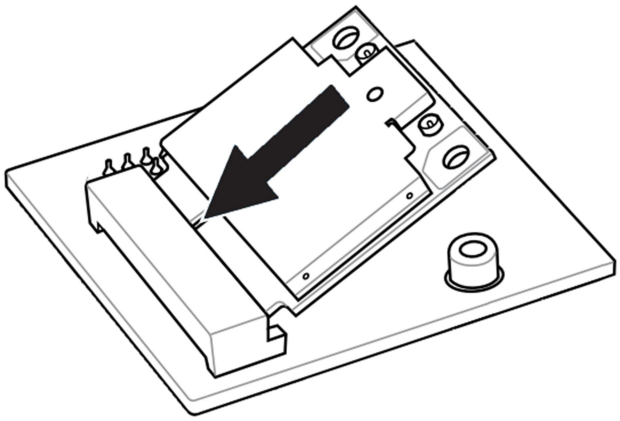
2



Press down on the Memory so that the tabs of the socket lock on both sides of the module as figure 2.

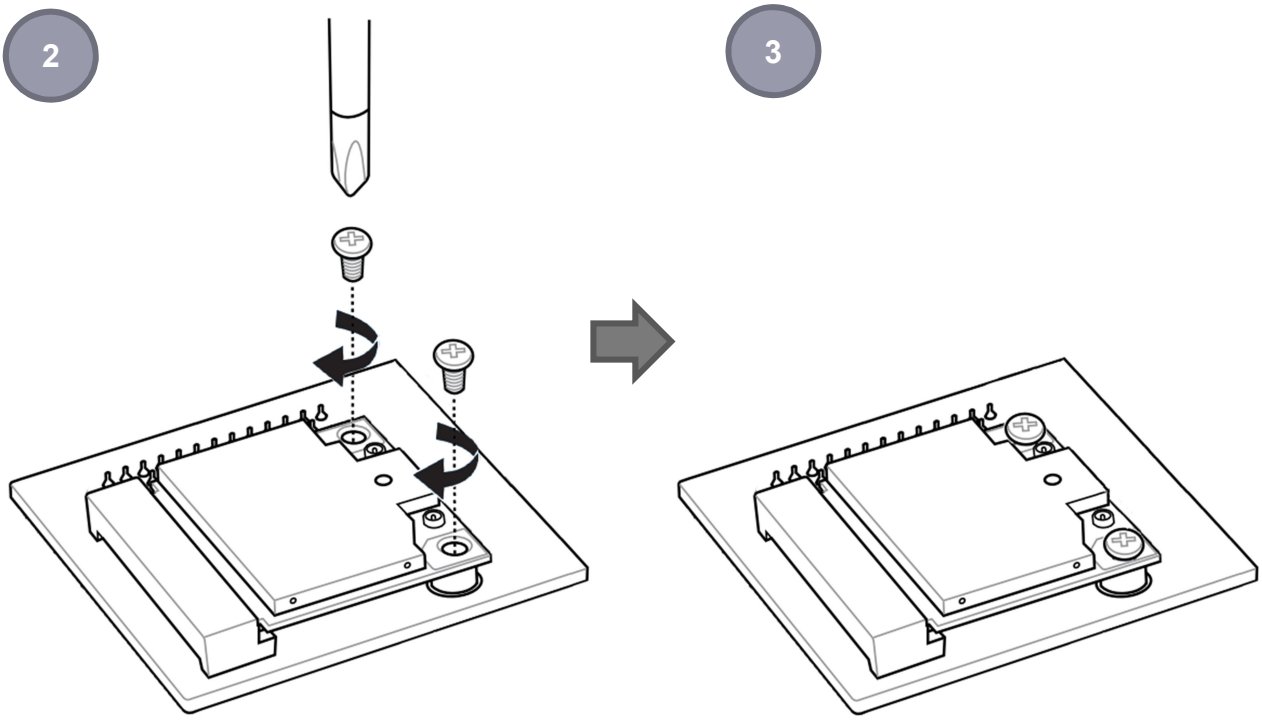
Installing MINI PCIe Expansion Card (MINICARD1)

1



Hold the Module with its notch aligned with the socket of the board and insert it at a 30-degree angle into the socket as shown in the picture.

2

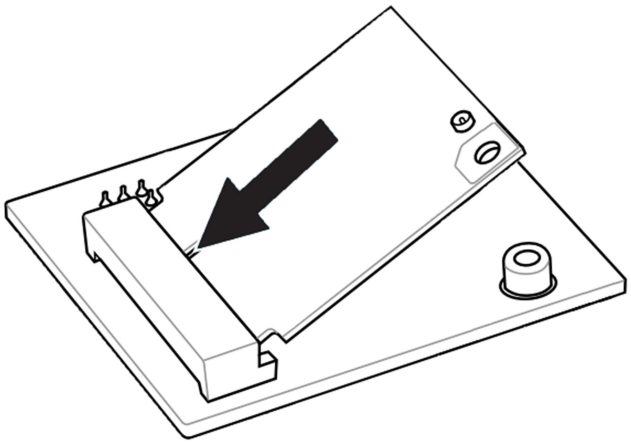


3

Secure the card with screw(s) as figure 2 and finish as figure 3.

Installing MINI PCIe Expansion Card (MINICARD2)

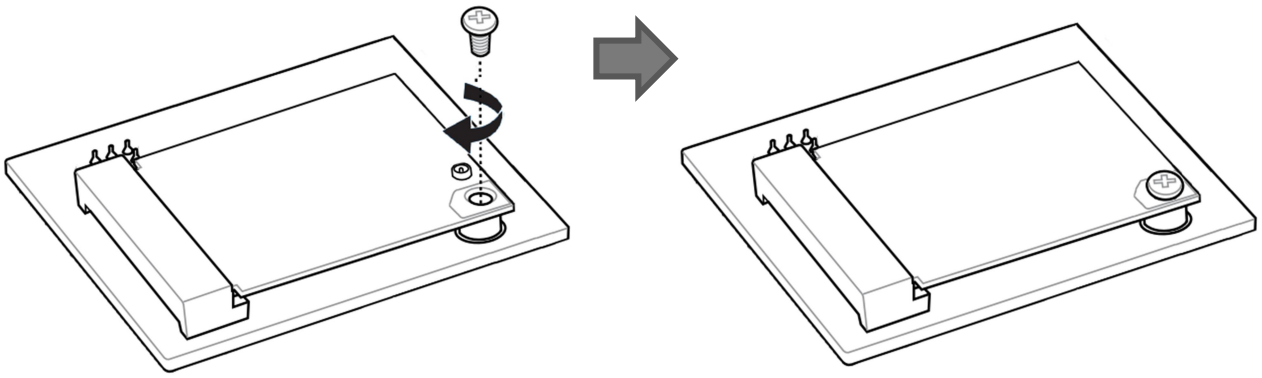
1



Hold the Module with its notch aligned with the socket of the board and insert it at a 30-degree angle into the socket as shown in the picture.

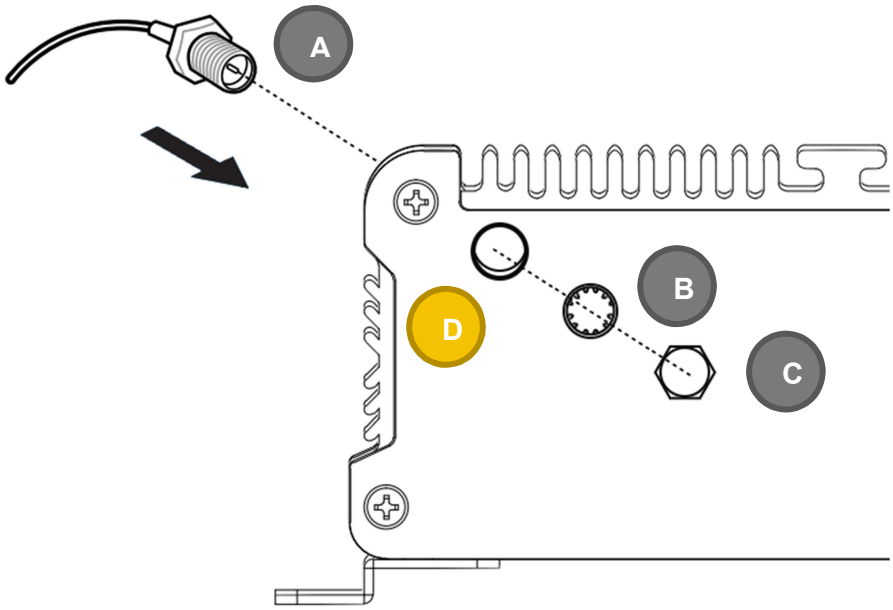
2

3

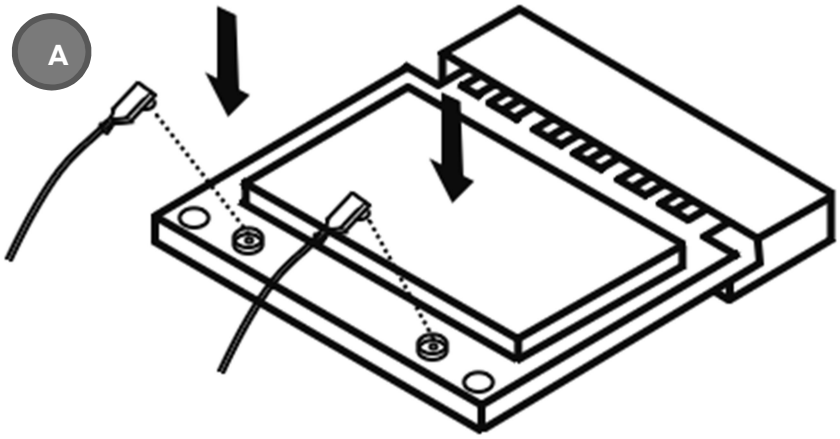


Secure the card with screw(s) as figure 2 and finish as figure 3.

Installing Internal Antenna Cable



Take the **SMA Connector** (A) and plug into **IO Panel** (D). Put the **Washer**(B) into the SMA Connector (A), then put the **O-ring** (C) to SMA Connector (A) and tighten as shown in the picture.



Take the **Ipex Connector** (A) and press on the Wi-Fi module/3G module/ GPS module (GPS, only support passive Antenna)

SYSTEM RESOURCE

GPIO & Delay Time Setting (Delay Time only for FleetPC-4-D)

GPIO and Ignition Control Register

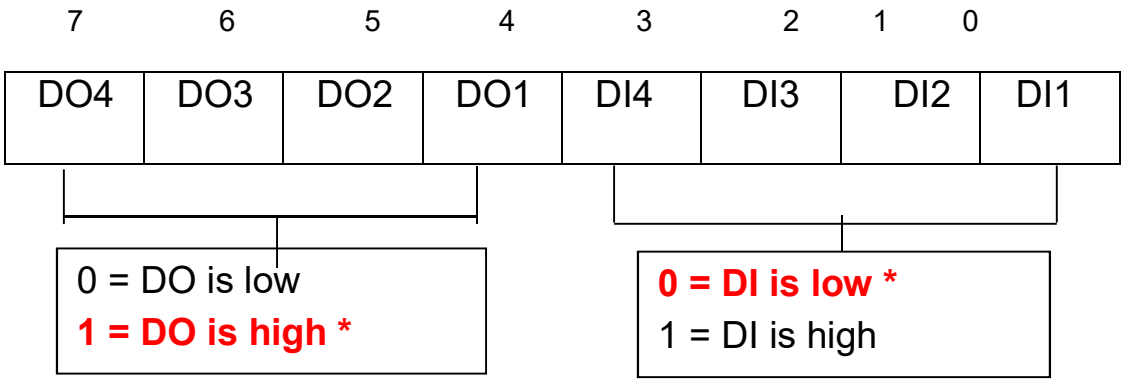
The General Purpose I/O is an interface available on some devices. These can read digital signals from other parts of a circuit, or output to control other devices. At GPIO control register, the GPI is use to receive data, the GPO is set data to send.

I/O port: **0xA30 (base address)** for Control Register (Read 0xA2h / Write 0xA1h)

0xA31 (base address) for Control Data Value

Debug Command Line

- **O A30 A1**
- **O A31 0F // Set Bit 4-7 to Low**



GPIO5 Output Enable Register – Index A0h

Bit	Name	R/W	Default	Description
7	GPIO57_OE	R/W	0	0 : GPIO57 is input 1 : GPIO57 is output
6	GPIO56_OE	R/W	0	0 : GPIO56 is input 1 : GPIO56 is output
5	GPIO55_OE	R/W	0	0 : GPIO55 is input 1 : GPIO55 is output
4	GPIO54_OE	R/W	0	0 : GPIO54 is input 1 : GPIO54 is output
3	GPIO53_OE	R/W	0	0 : GPIO53 is input 1 : GPIO53 is output
2	GPIO52_OE	R/W	0	0 : GPIO52 is input 1 : GPIO52 is output
1	GPIO51_OE	R/W	0	0 : GPIO51 is input 1 : GPIO51 is output
0	GPIO50_OE	R/W	0	0 : GPIO50 is input 1 : GPIO50 is output

GPIO5 Output Data Register – Index A1h

Bit	Name	R/W	Default	Description
7	GPIO57_DATA	R/W	1	GPIO57 output data in output mode.
6	GPIO56_DATA	R/W	1	GPIO56 output data in output mode.
5	GPIO55_DATA	R/W	1	GPIO55 output data in output mode.
4	GPIO54_DATA	R/W	1	GPIO54 output data in output mode.
3	GPIO53_DATA	R/W	1	GPIO53 output data in output mode.
2	GPIO52_DATA	R/W	1	GPIO52 output data in output mode.
1	GPIO51_DATA	R/W	1	GPIO51 output data in output mode.
0	GPIO50_DATA	R/W	1	GPIO50 output data in output mode.

GPIO5 Pin Status Register – Index A2h

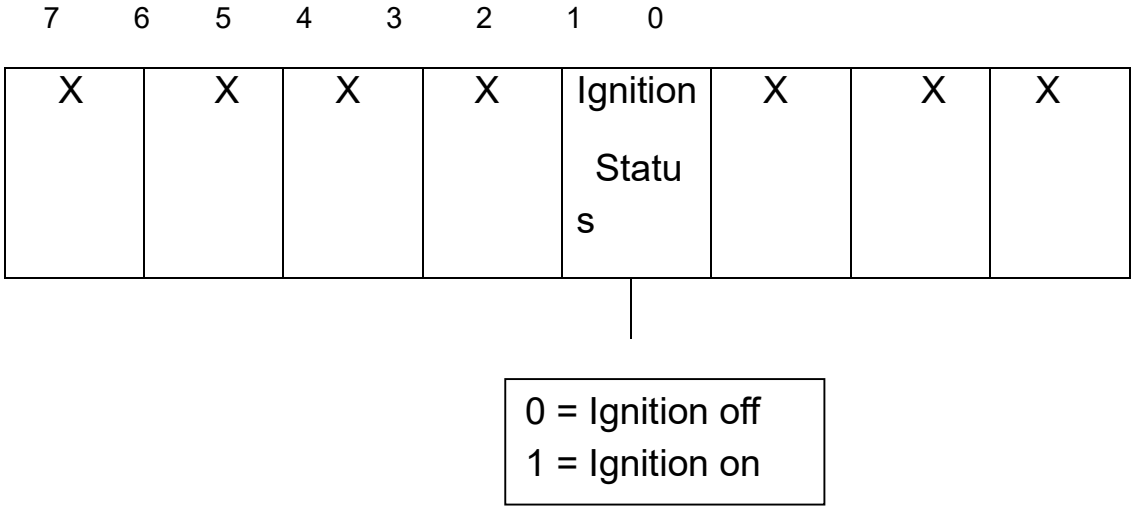
Bit	Name	R/W	Default	Description
7	GPIO57_ST	R	1	GPIO57 pin status.
6	GPIO56_ST	R	1	GPIO56 pin status.
5	GPIO55_ST	R	1	GPIO55 pin status.
4	GPIO54_ST	R	1	GPIO54 pin status.
3	GPIO53_ST	R	1	GPIO53 pin status.
2	GPIO52_ST	R	1	GPIO52 pin status.
1	GPIO51_ST	R	1	GPIO51 pin status.
0	GPIO50_ST	R	1	GPIO50 pin status.

GPIO5 Drive Enable Register – Index A3h

Bit	Name	R/W	Default	Description
7	GPIO57_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO57 is open drain. 1 : GPIO57 is push pull.
6	GPIO56_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO56 is open drain. 1 : GPIO56 is push pull.
5	GPIO55_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO55 is open drain. 1 : GPIO55 is push pull.
4	GPIO54_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO54 is open drain. 1 : GPIO54 is push pull.
3	GPIO53_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO53 is open drain. 1 : GPIO53 is push pull.
2	GPIO52_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO52 is open drain. 1 : GPIO52 is push pull.
1	GPIO51_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO51 is open drain. 1 : GPIO51 is push pull.
0	GPIO50_DRV_ENST	R/W	0	GPIO57 Drive Enable 0 : GPIO50 is open drain. 1 : GPIO50 is push pull.

I/O port: I/O port: 0xA30 (base address) for Control Register (Read 0xF2h bit 3)

0xA31 (base address) for Control Data Value



Debug Command Line

- O A30 F2
- I A31 // Check Bit 3 Status

BIOS

Enter The BIOS

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

- The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
- Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format.

FBOX-2620 Mainboard V1.0 073109 where :

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS was released.

073109 refers to the date this BIOS was released.

Control Keys

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

< ↑ >	Move to the previous item
< ↓ >	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F3>	Load Optimized Defaults
<F4>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

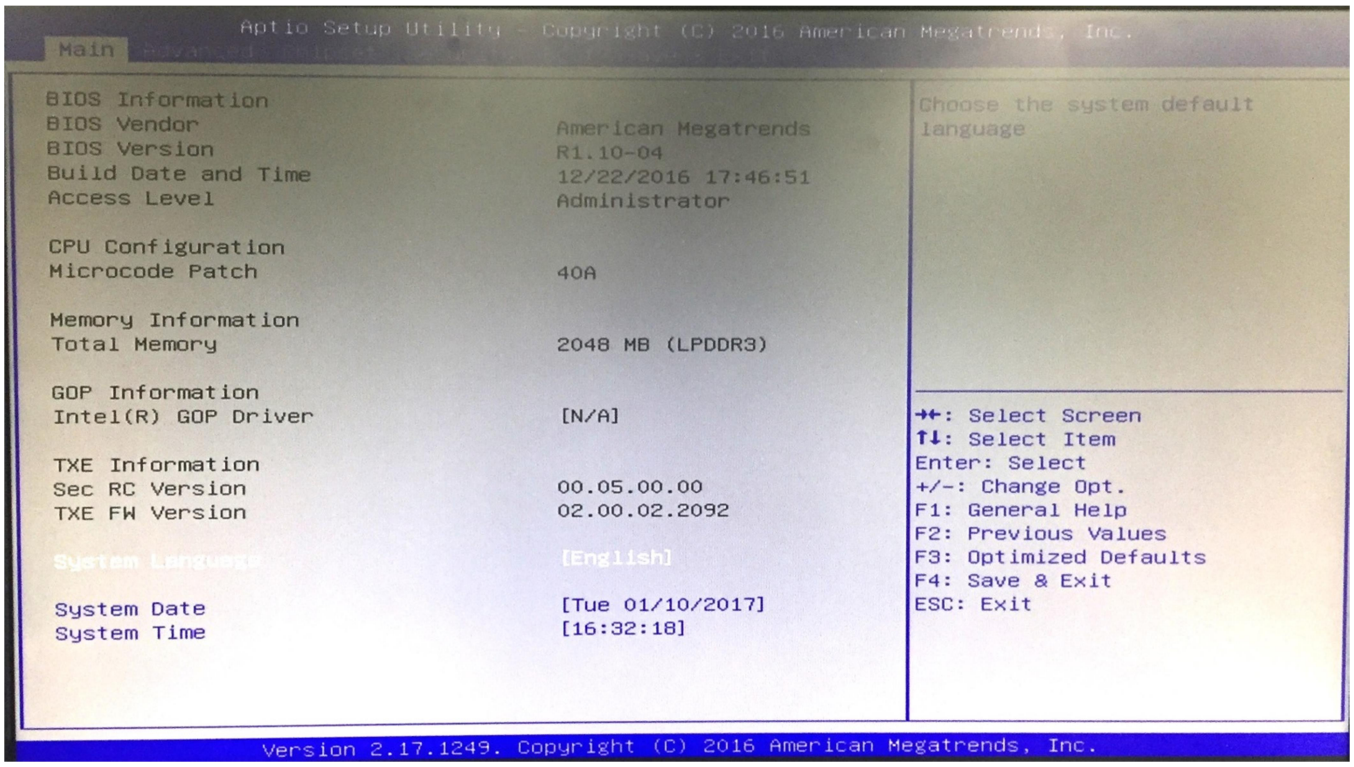
If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field

within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

Main



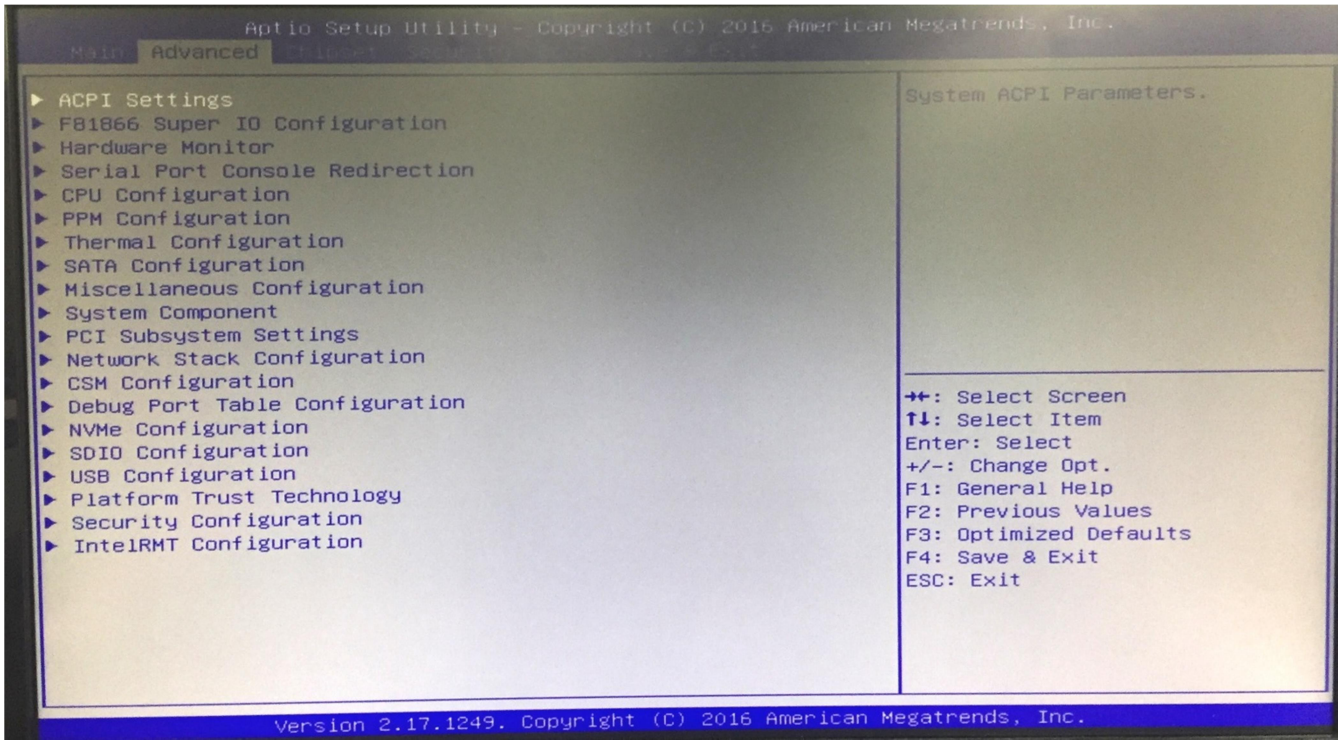
» System Date

This setting allows you to set the system Date. The time format is <Day> <Month> <Date> <Year>.

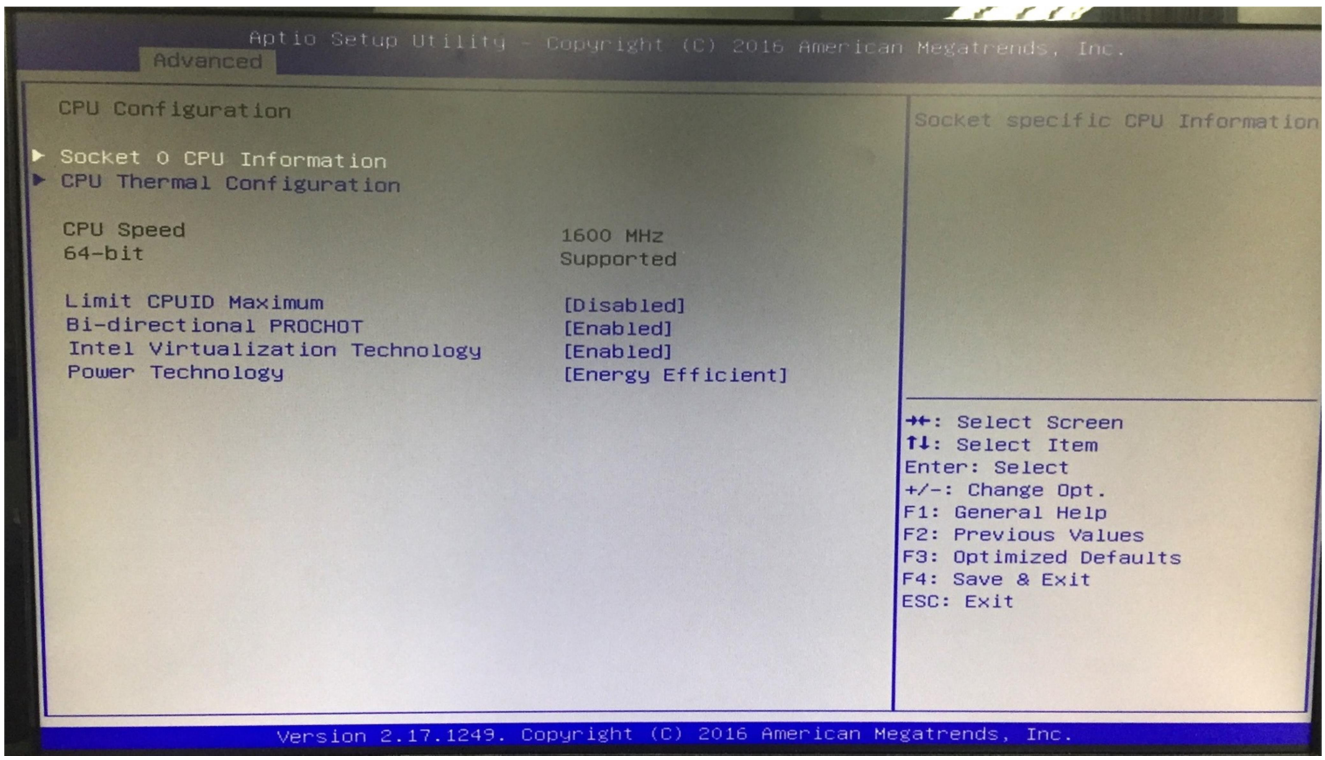
» System Time

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

Advanced



CPU Configuration



» Limit CPUID Maximum

The CPUID instruction of some newer CPUs will return a value greater than 3. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or less than 3.

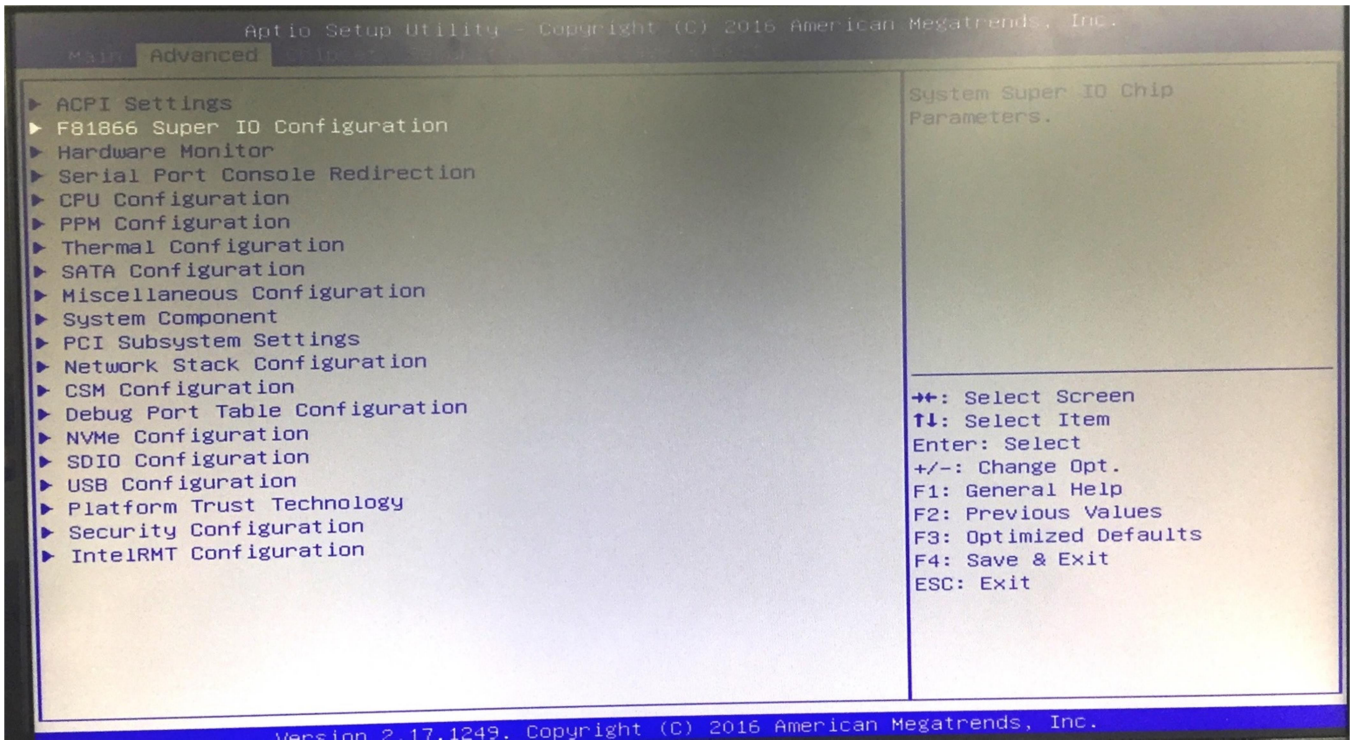
» Intel Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

» EIST

This field is used to enable or disable the Intel Enhanced SpeedStep Technology

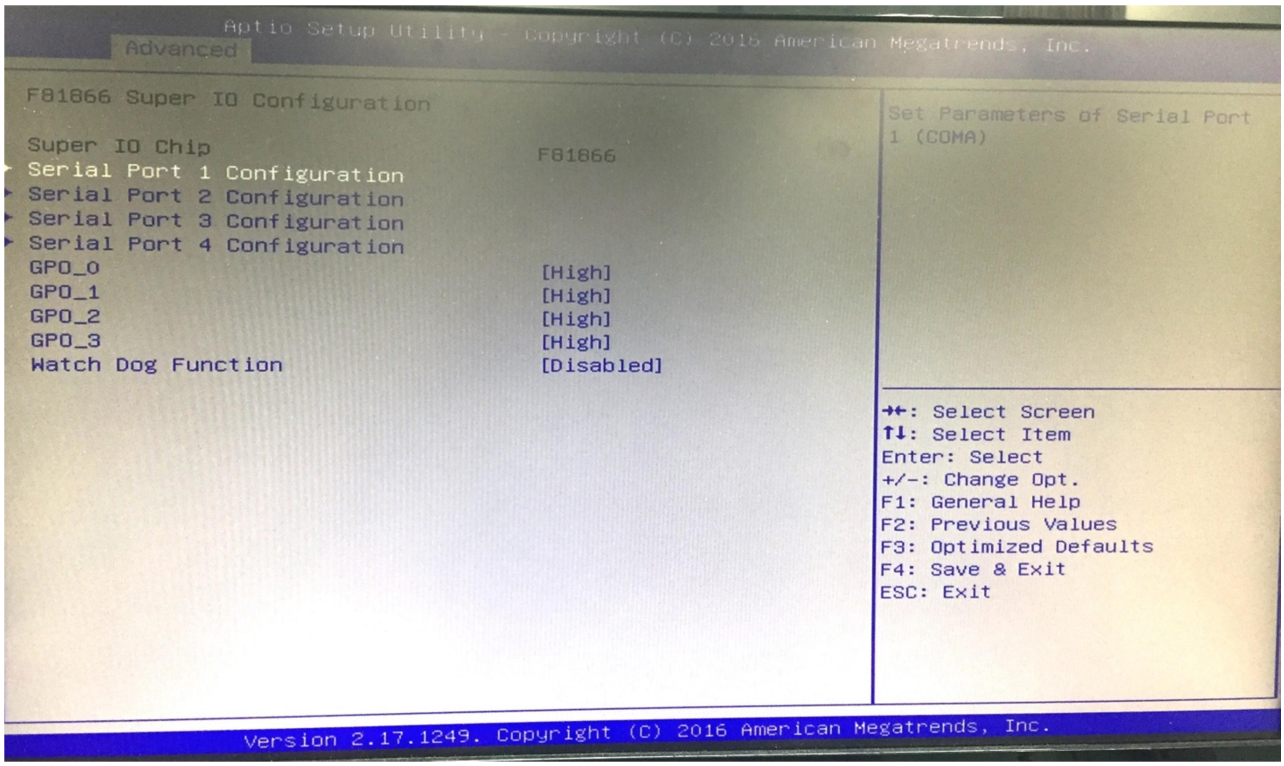
Super IO Configuration

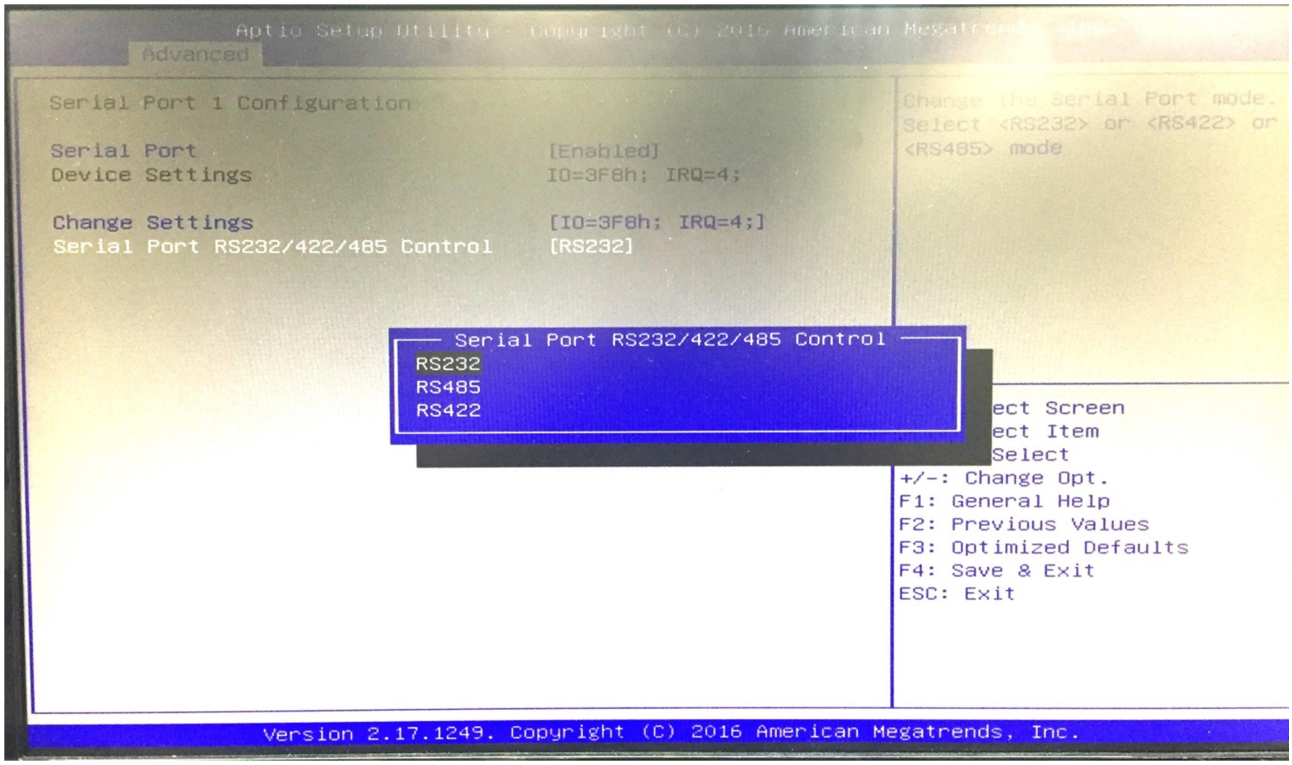


» Serial Port 0/1/2/3 Enable or Disable

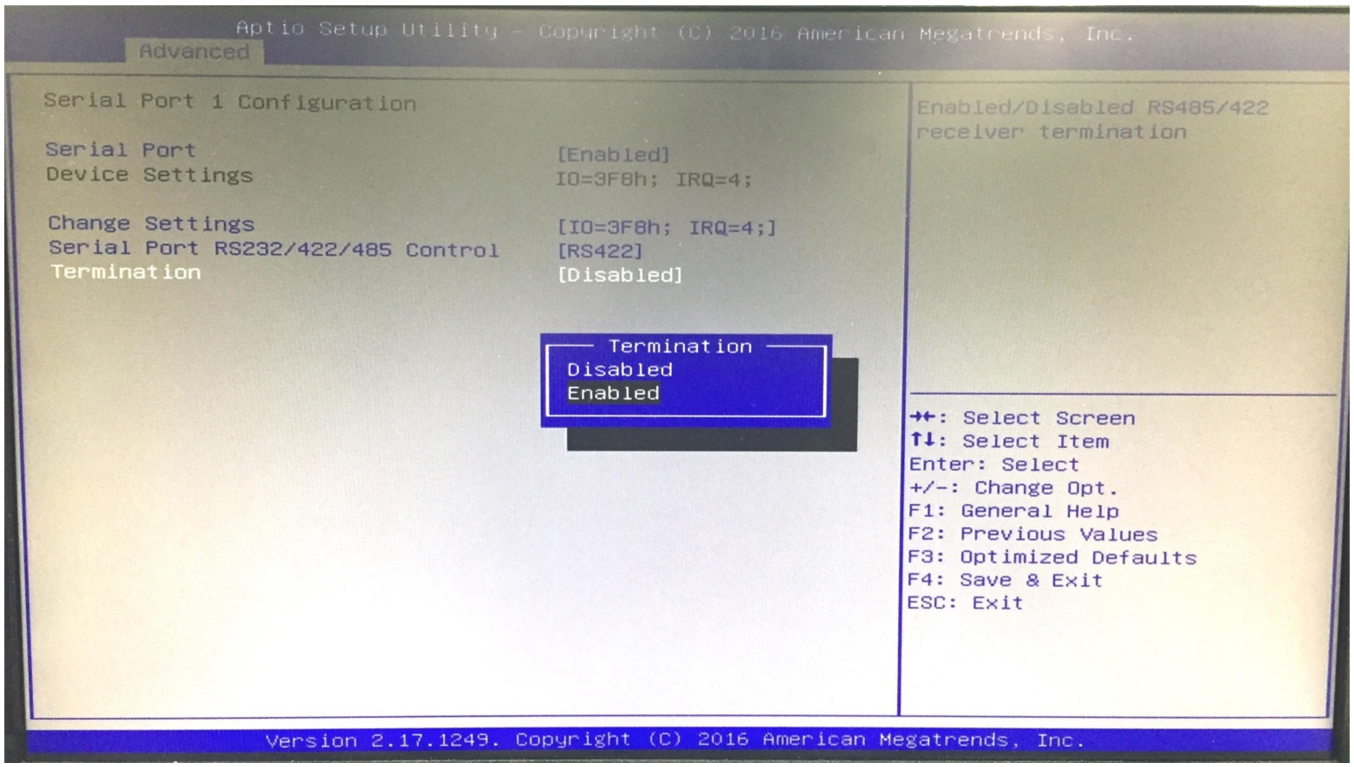
Select an Enable or Disable for the specified serial ports.

» COM1 RS232/422/485 Select

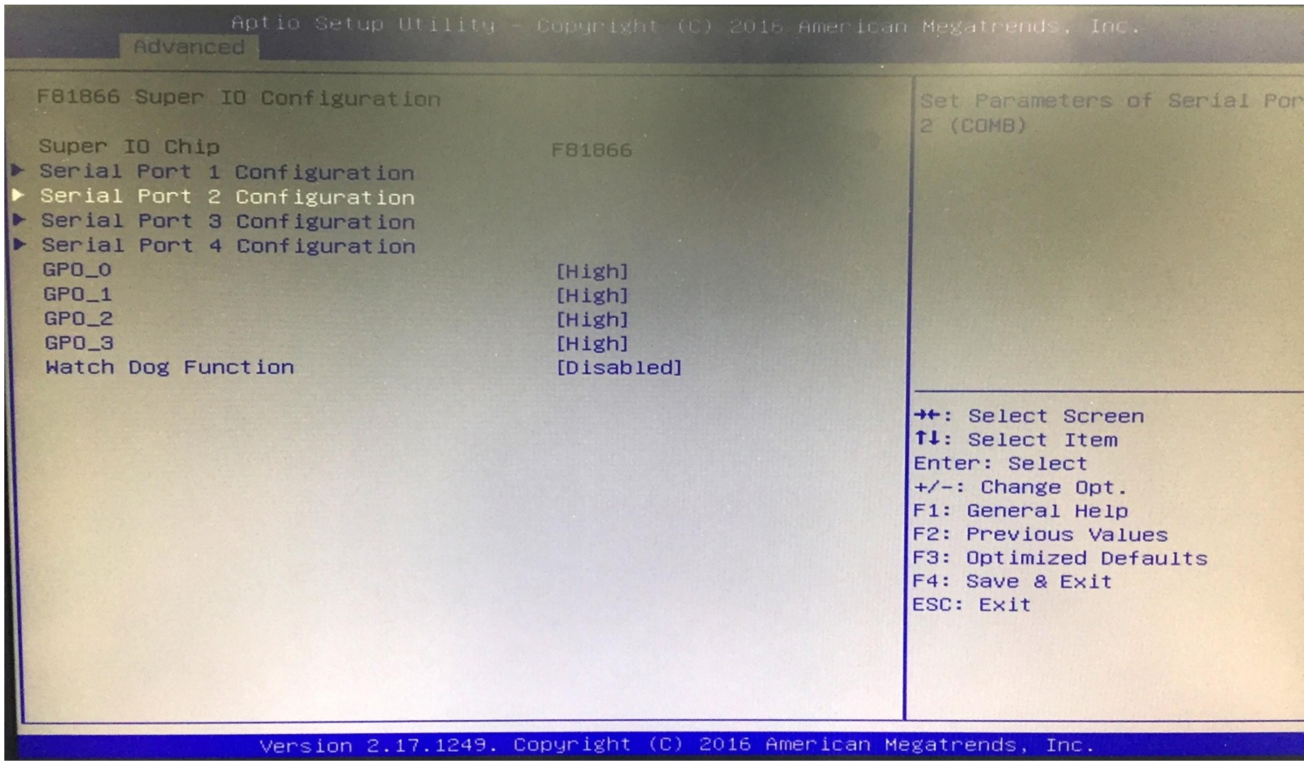


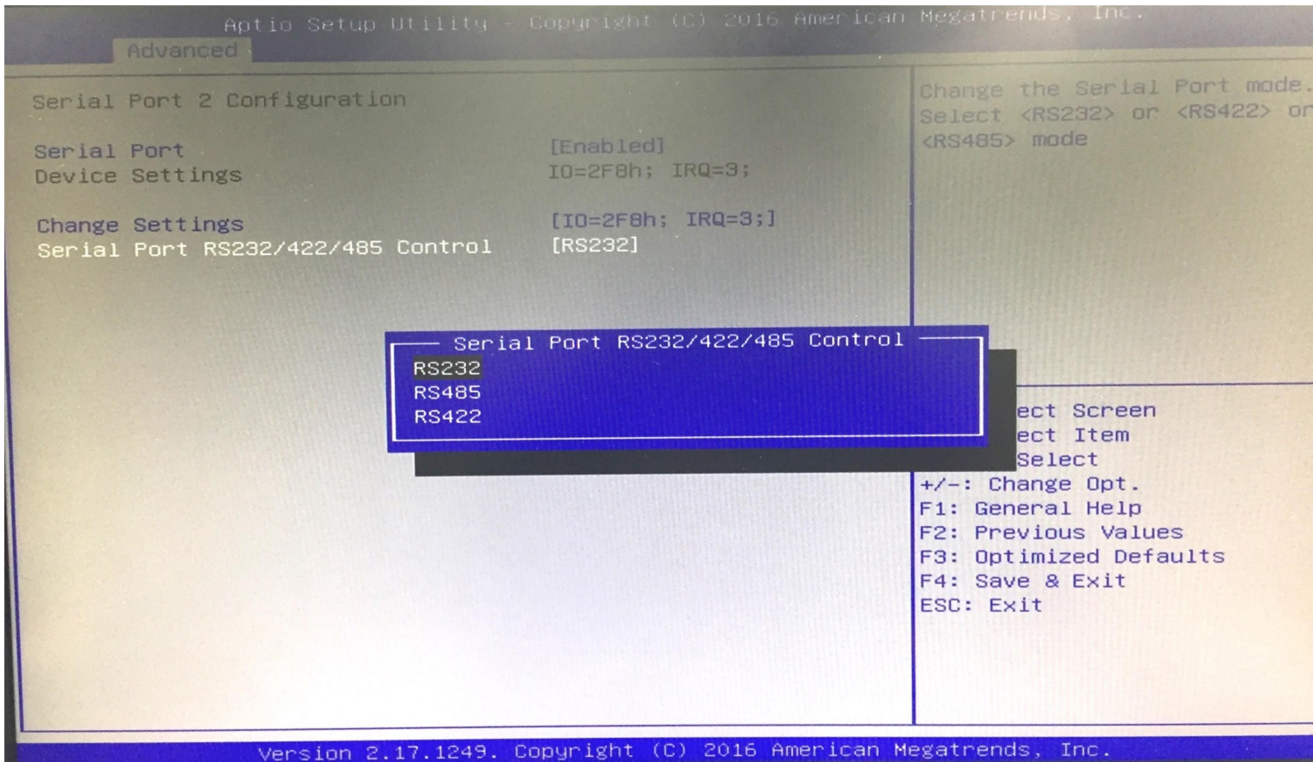


RS422 need to choice Termination and slect Enabled

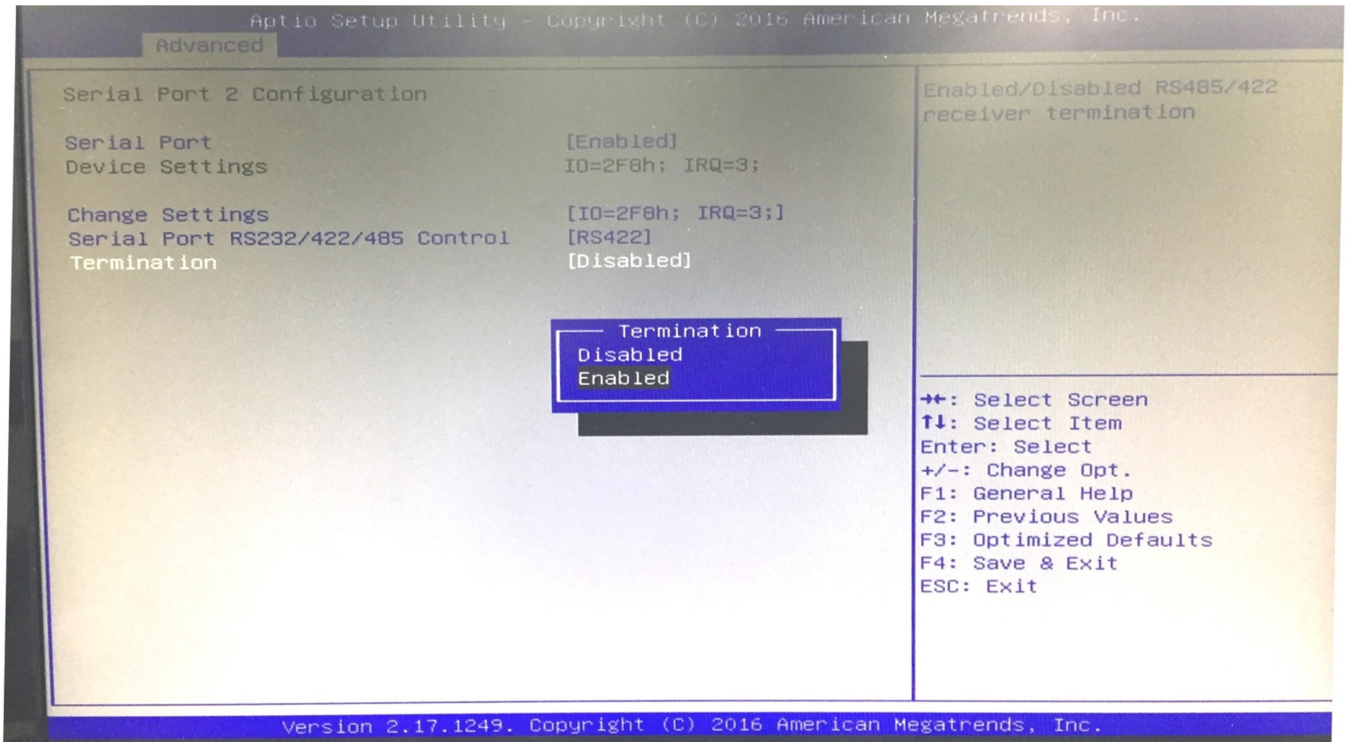


» COM2 RS232/422/485 Select

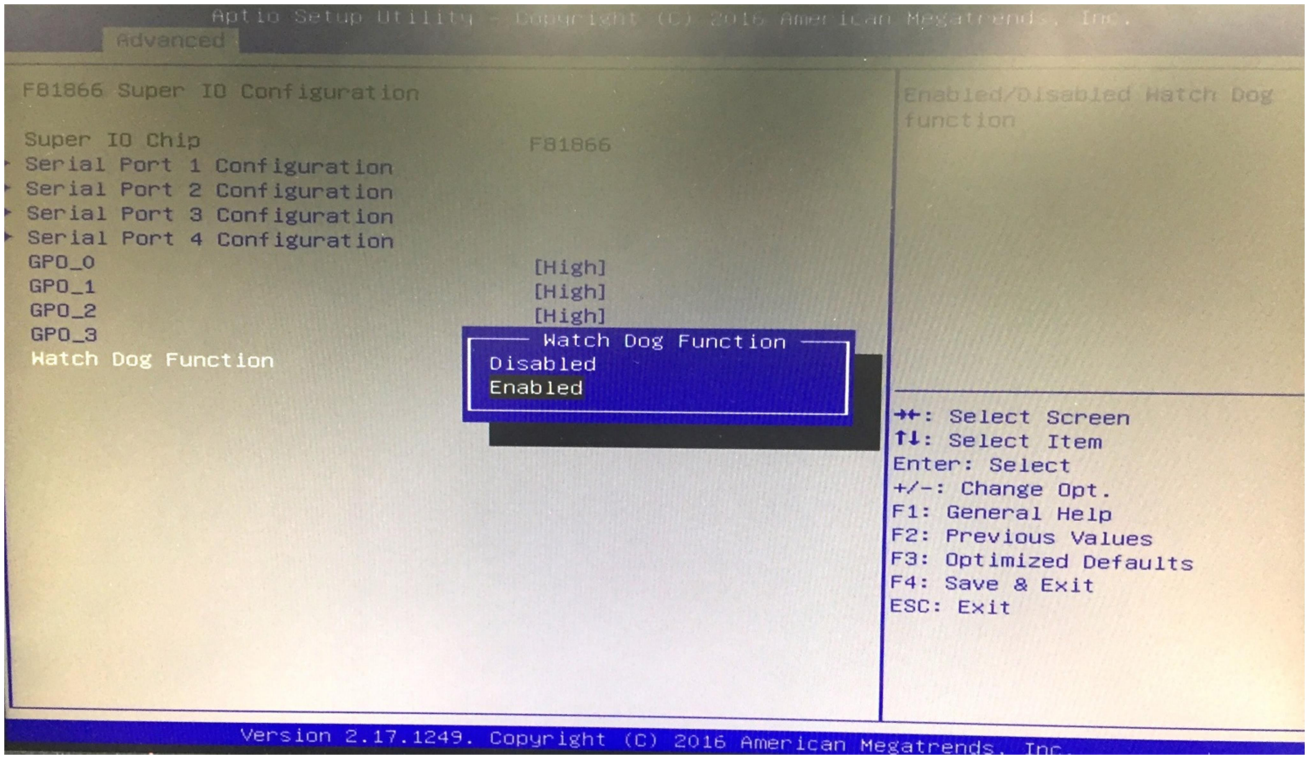




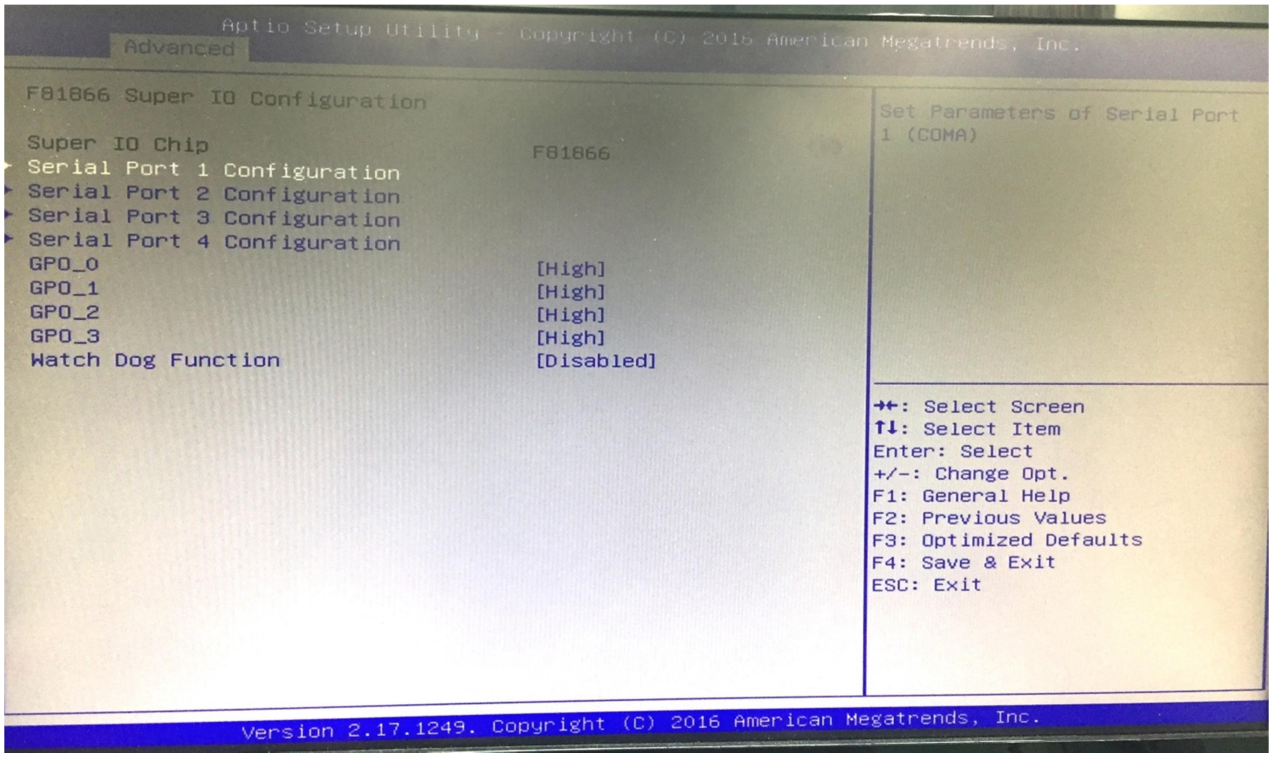
RS422 nee to choice Termination and select Enabled



» Watch Dog Function



» GPIO Configuration

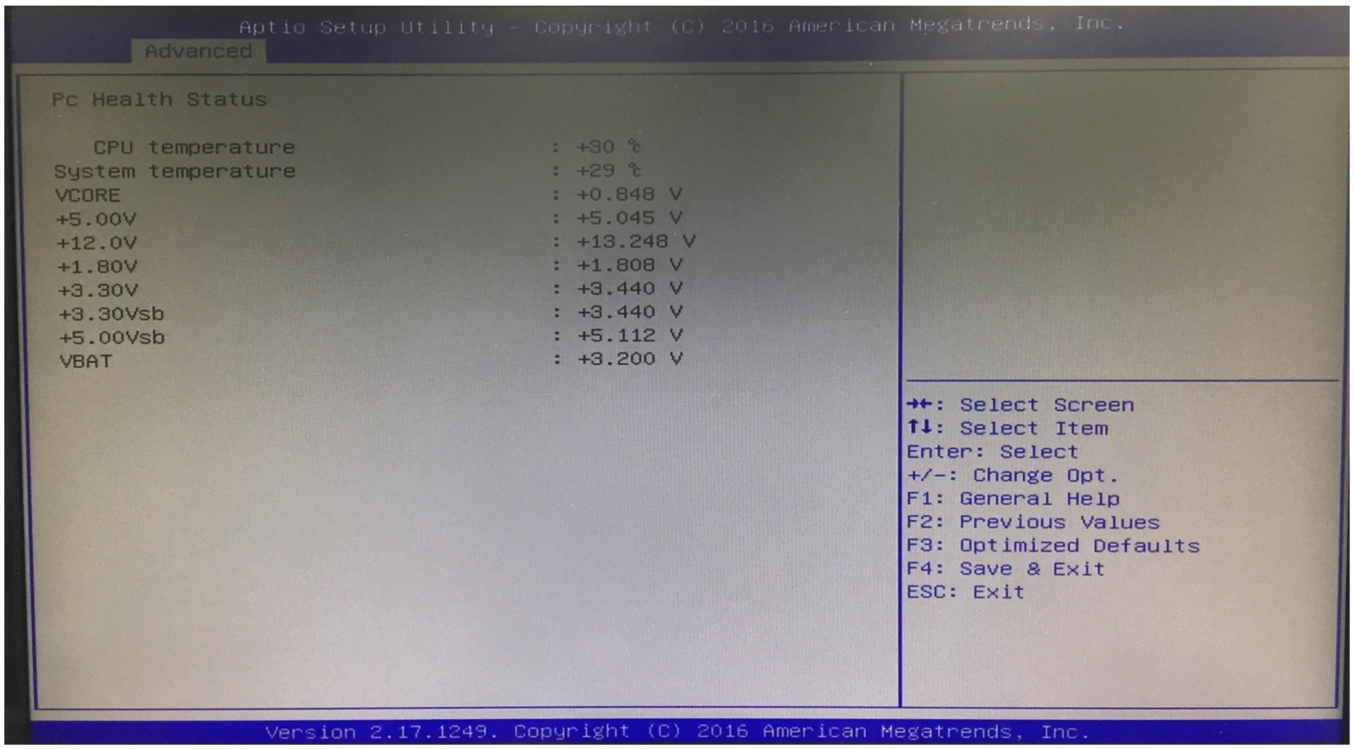


» GPO 0/ 1/ 2/ 3/ Data

These settings configure special GPIO data.

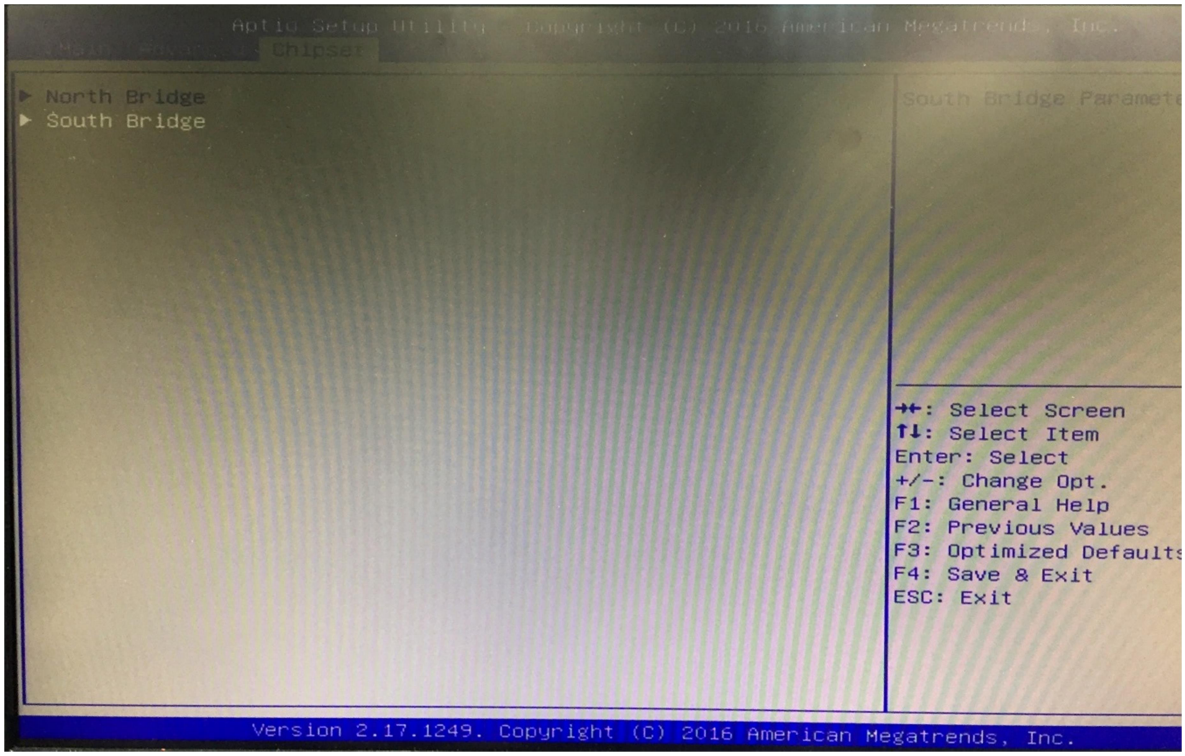
Hardware Health Configuration

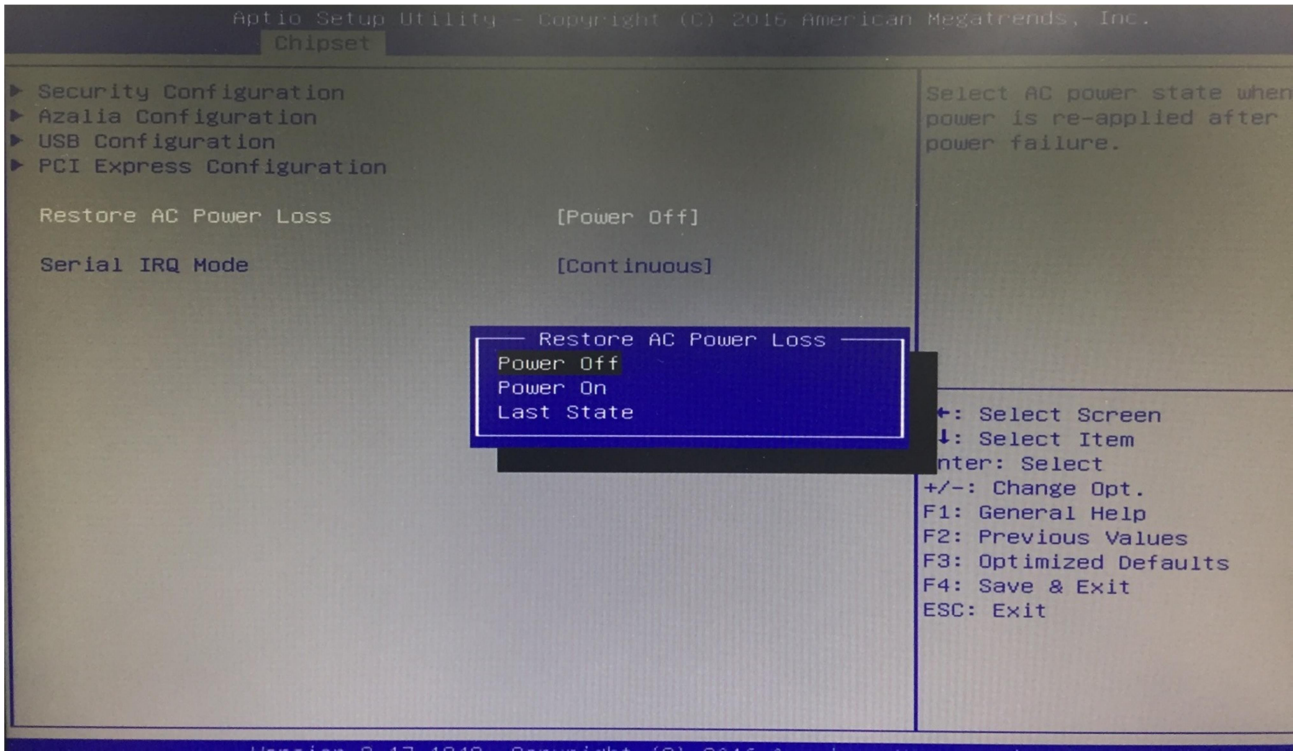
These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.



Chipset

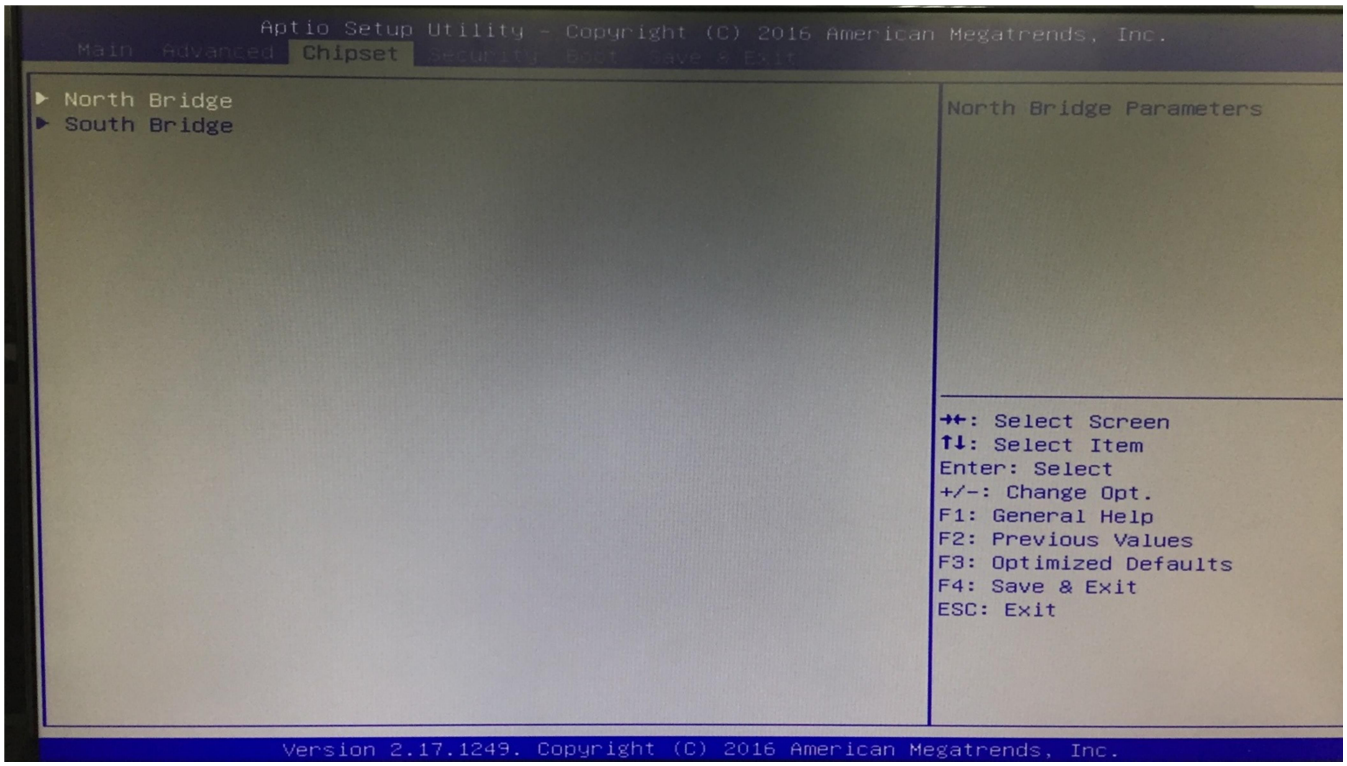
PCH-IO Configuration

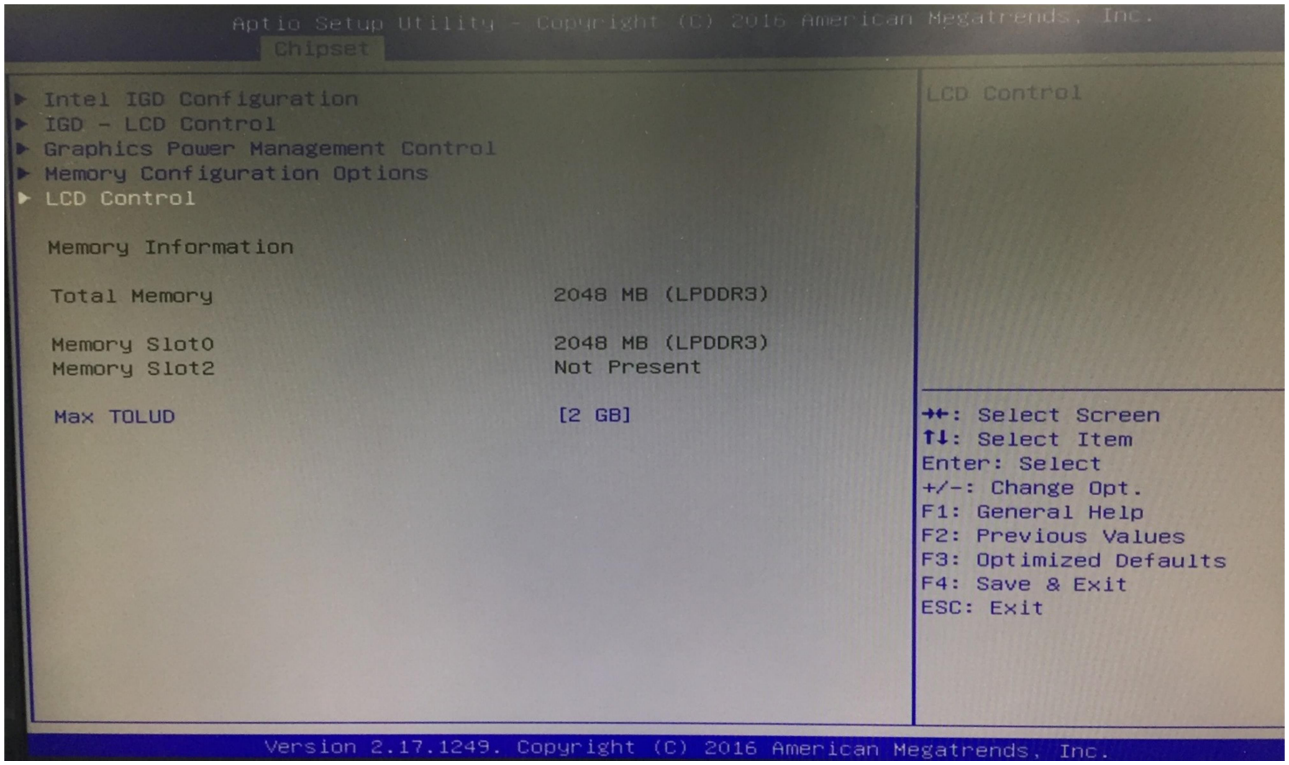


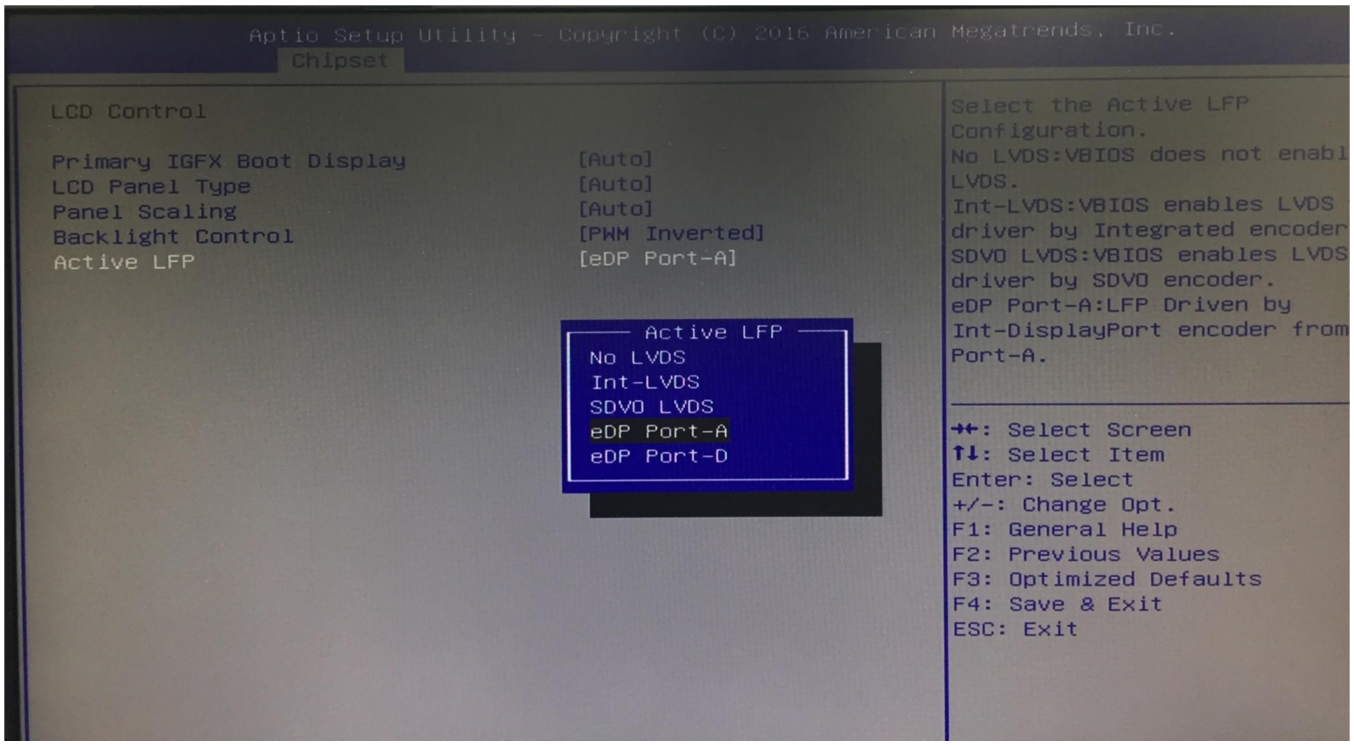


System Agent (SA) Configuration

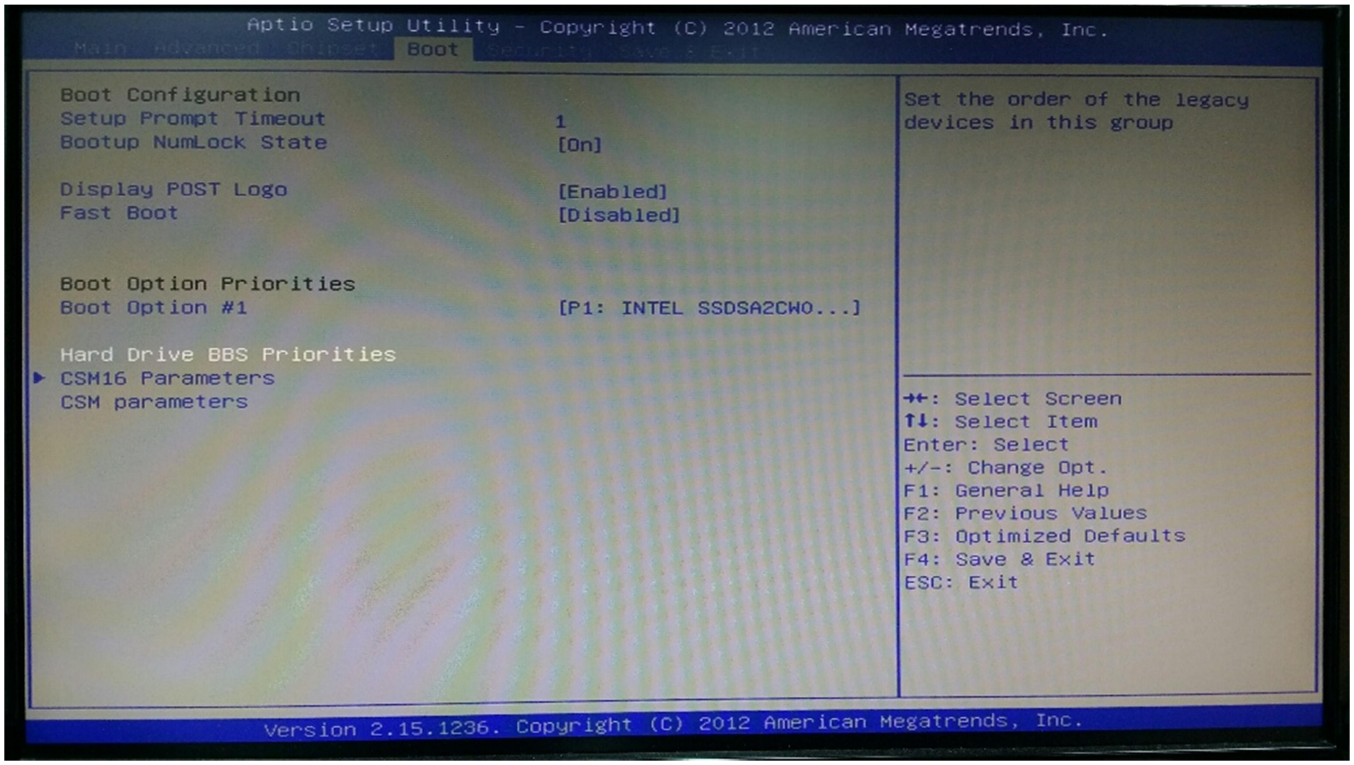
» Graphics Configuration


Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit
North Bridge
South Bridge
North Bridge Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
Chipset
Intel IGD Configuration
IGD – LCD Control
Graphics Power Management Control
Memory Configuration Options
LCD Control
Memory Information
Total Memory 2048 MB (LPDDR3)
Memory Slot0 2048 MB (LPDDR3)
Memory Slot2 Not Present
Max TOLUD [2 GB]
LCD Control
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1249. Copyright (C) 2016 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
Chipset
LCD Control
Primary IGFX Boot Display [Auto]
LCD Panel Type [Auto]
Panel Scaling [Auto]
Backlight Control [PWM Inverted]
Active LFP [eDP Port-A]
Active LFP
No LVDS
Int-LVDS
SDVO LVDS
eDP Port-A
eDP Port-D
Select the Active LFP Configuration.
No LVDS:VBIOS does not enabl LVDS.
Int-LVDS:VBIOS enables LVDS driver by Integrated encoder
SDVO LVDS:VBIOS enables LVDS driver by SDVO encoder.
eDP Port-A:LFP Driven by Int-DisplayPort encoder from Port-A.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Boot

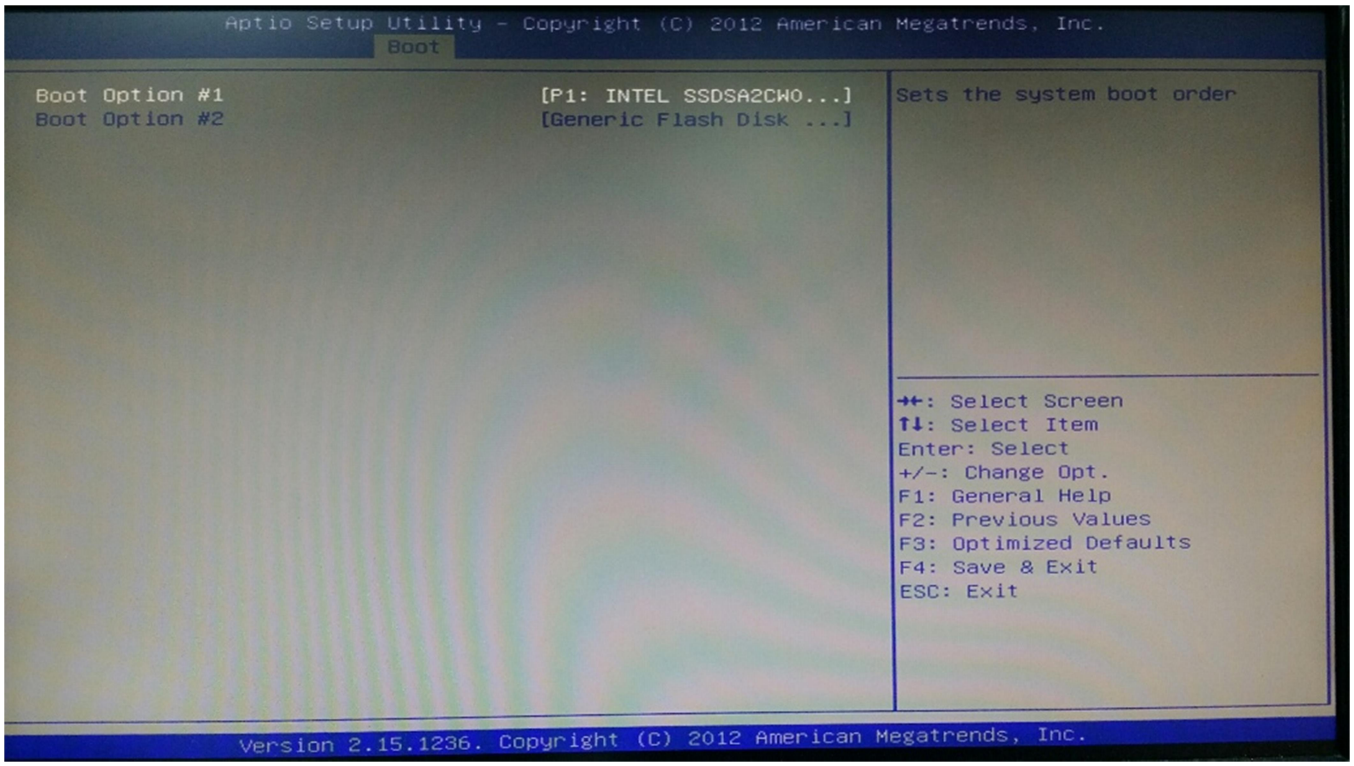


» 1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

» Try Other Boot Devices

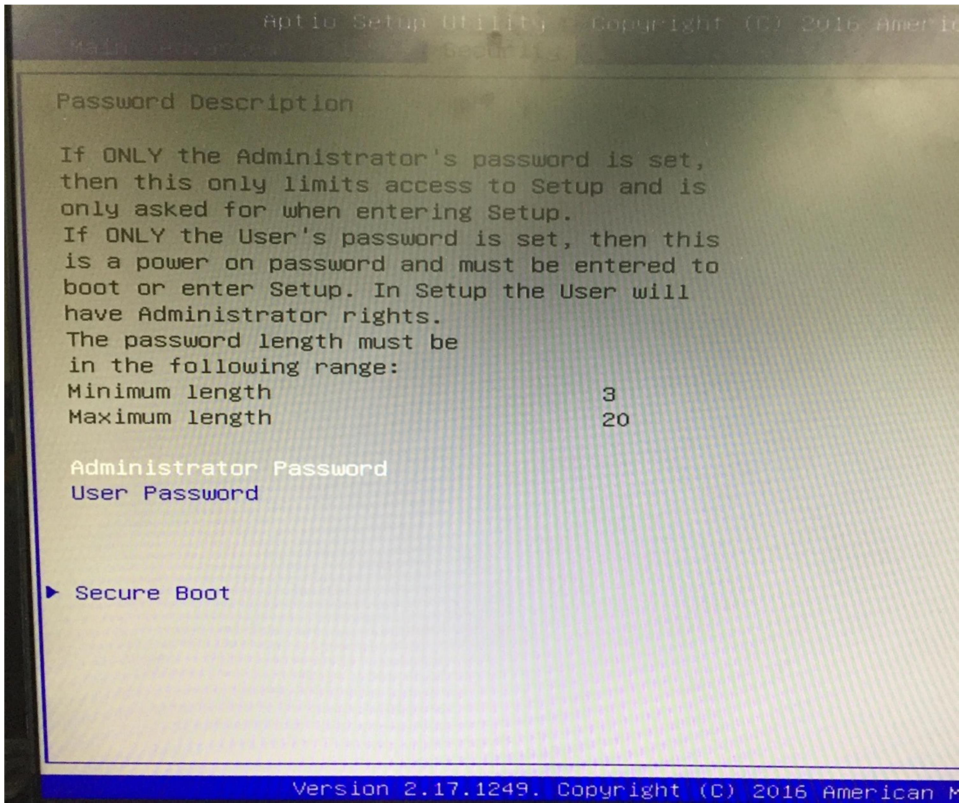
Setting the option to [Enabled] allows the system to try to boot from other device if the system fail to boot from the 1st/2nd/3rd boot device.



» Hard Disk Drives, CD/DVD Drives, USB Drives

These settings allow you to set the boot sequence of the specified devices.

Security



» Administrator Password

Administrator Password controls access to the BIOS Setup utility. These settings allow you to set or change the administrator password.

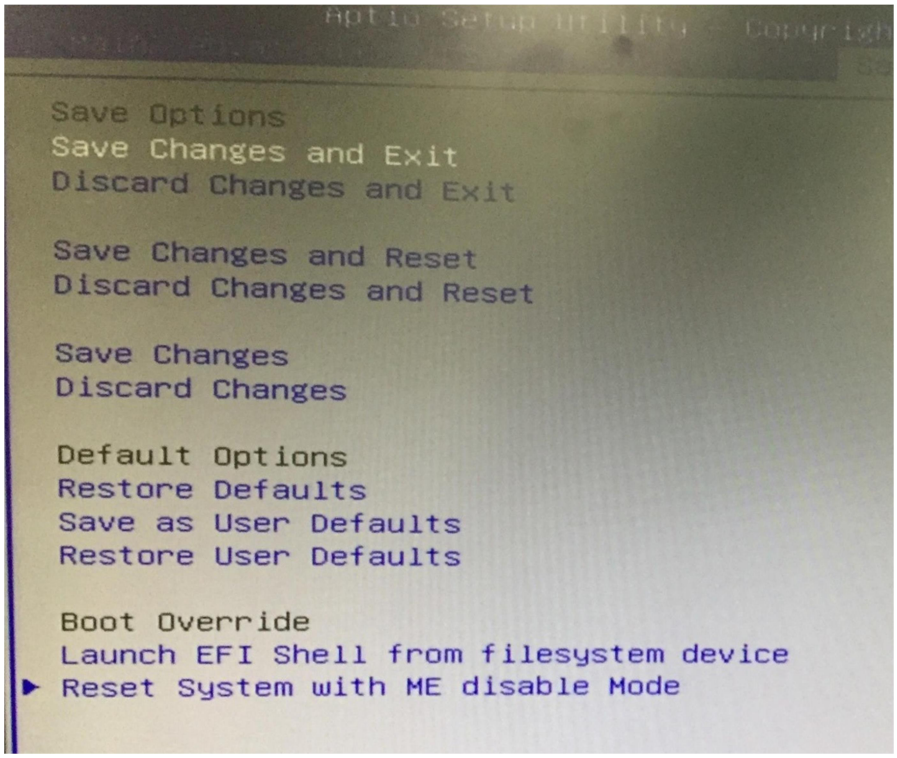
» User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

» Boot Sector Virus Protection

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you will need to disable this Flash Protection function.

Exit



» Save Changes and Exit

Save changes to CMOS and exit the Setup Utility.

» Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

» Discard Changes

Abandon all changes and continue with the Setup Utility.

» Load Optimal Defaults

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

» Load Failsafe Defaults

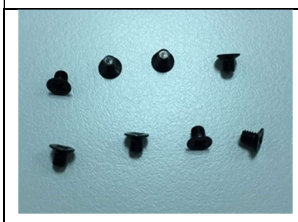
Use this menu to load the default values set by the BIOS vendor for stable system performance.

PACKING LIST

System

Item	Part Number	Module Name
1	762300011000	FBOX-2300-N0 System
2	762300011001	FBOX-2300-N1 System
3	762300011002	FBOX-2300-N2 System
4	762300011003	FBOX-2300-4S System

Accessory

Picture	Part Number	Module Name	Q'ty
	548201206001	Power Adapter 12V/5A 60W Jack	1
	370821201003	FBOX-2120 Mount Bracket	2
	351103040250	Screw F Type M3*4L ISO BK	8